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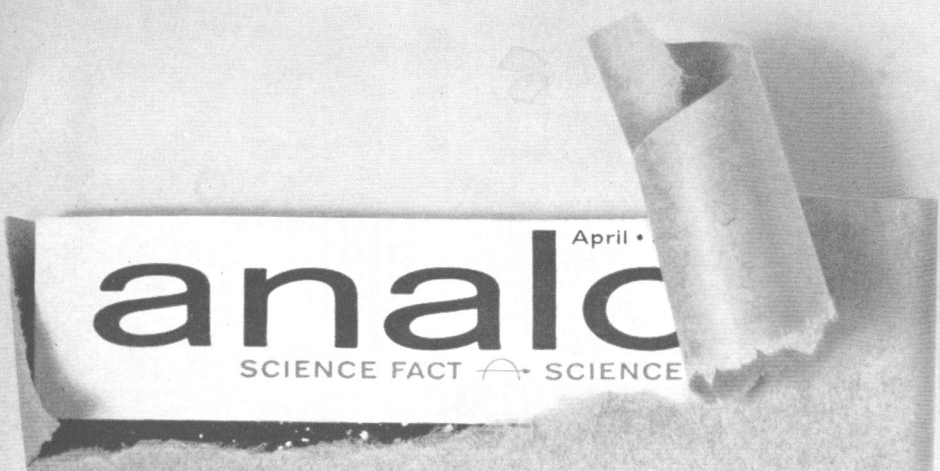
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SPACE VIKING

A great new novel by H. Beam Piper



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AN EDITORIAL BY JOHN W. CAMPBELL

■ Modern demonology goes by another name, of course—but it has been a serious menace to Science during the last couple of decades. Demonology sneaked back into Science when the principles of Quantum Mechanics were recognized, and applied.

You see, it works this way: *any* given theory can explain *any* observation, if only enough Special Entities are allowed. Ptolemaic astronomy could have explained the moons of Jupiter, after Galileo discovered them, if they'd just been given time enough to invent a few more epicycles, conchoids, or involutes. Just allow unlimited multiplication of Special Entities, and you can explain anything.

Clerk-Maxwell showed how to explain how a mass of gas could separate itself into hot and cold gas—all it took was an alert little demon with a trap door.

The essence of such a demon is that we state that he exists, and has "by reason of his nature" just the properties we need to explain what we want explained. Allow me that Anentropic Demons exist having the characteristic of "a natural function" of separating hot and cold molecules, and I can explain some wonderful thermal effects.

The more modern terminology doesn't use the word "demon" of course—"particle" is the approved and acceptable scientific term. And if you just allow me to "discover" special particles having just the "natural characteristics" I need to explain what my experiment produces—why, I can explain anything whatever that happens, and maintain that my theory is perfectly validated. .

I suggest that this modern demonology—the introduction of an unlimited number of special particles to explain everything that the fundamental laws of the accepted theory couldn't explain—got started with Quantum Mechanics

for the following reason:

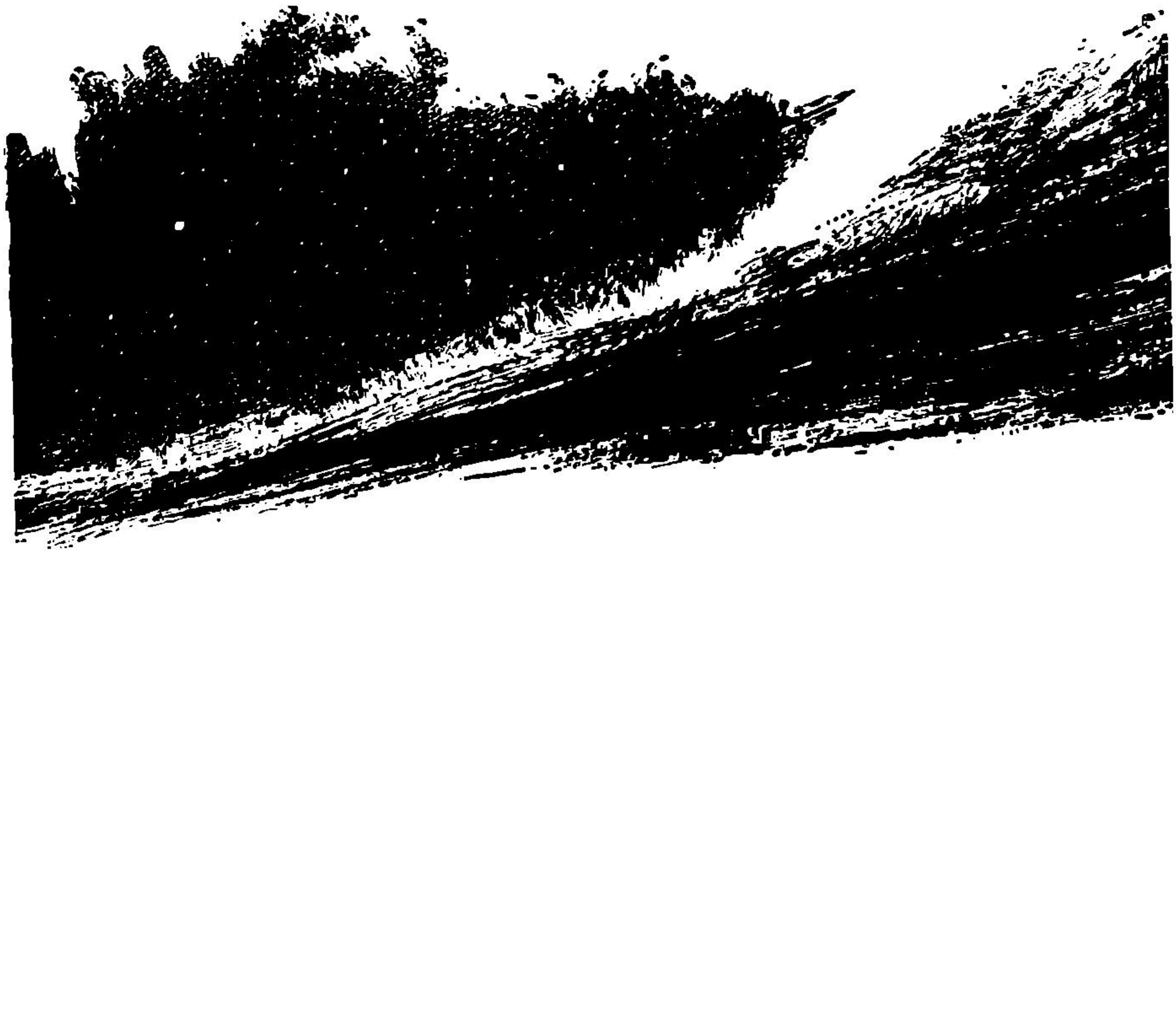
Basically, Quantum Mechanics has never had any theoretical, *logical* justification whatever. It has had a highly *rational* justification—the ultimate rational justification that it works, and allows us to produce needed and useful results. It had, however, no derivation—no logical consistency integrating it to fundamental mechanics, either Newtonian or Einsteinian. It had only the pragmatic justification "Well . it works, and nothing else seems to."

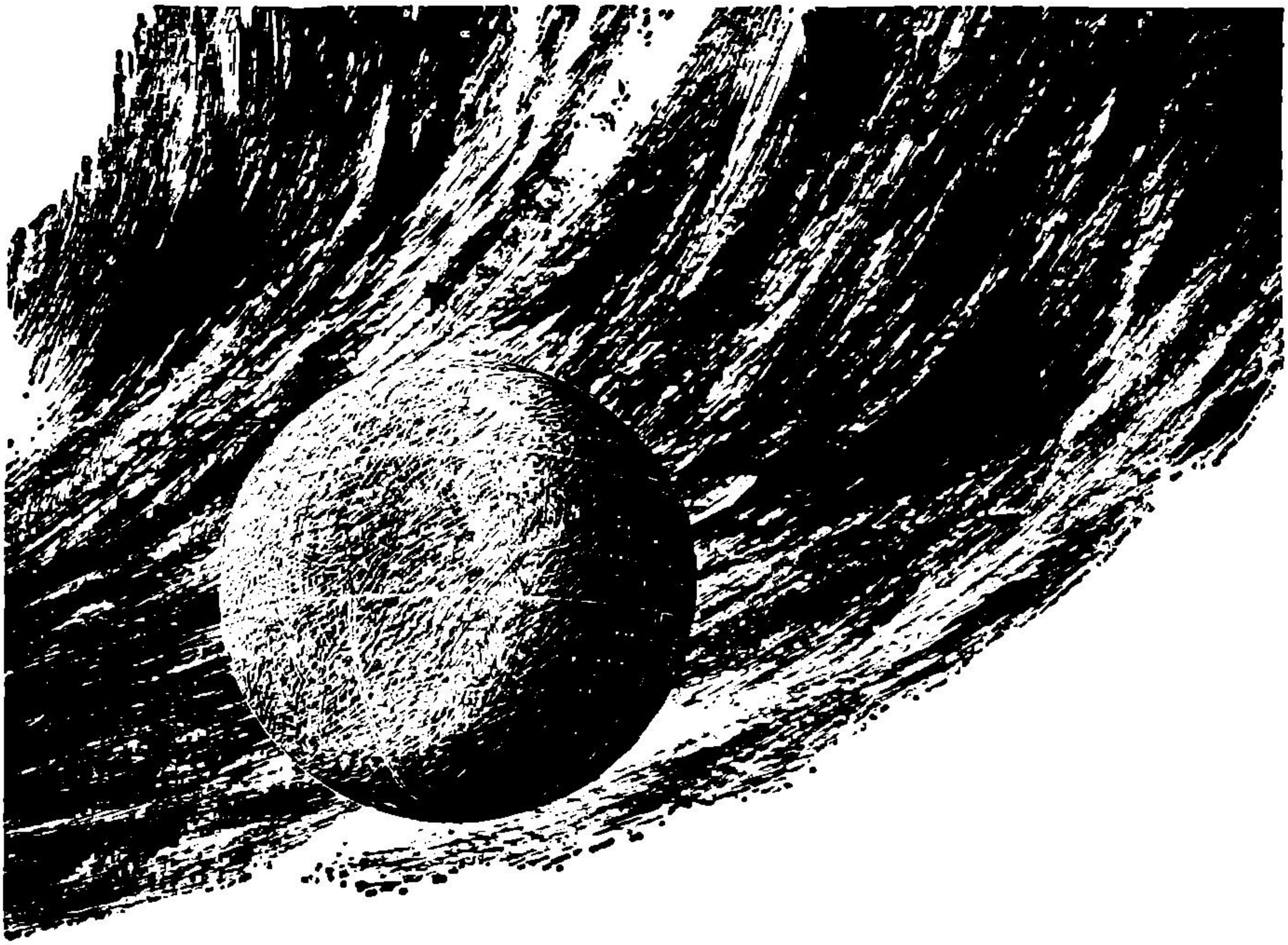
(As an aside, may I point out that that is precisely the point made by those utility company engineers who use dowsing rods to find buried pipes? Dowsing for pipes has precisely the same justification and validation that quantum mechanics had; it works, although it cannot be explained.)

The difficulty does not lie with quantum mechanics itself. It lies with the attitude of credulity and acceptance that it induced; the scientists stopped being strict logicians, and went over to the demonologist attitude of credulity. They got so they'd swallow any new demon proposed to explain a difficulty their theories got into, instead of doing a real job of re-evaluating the theories. As the Ptolemaic astronomers would add endless complications of epicycles, but wouldn't consider re-evaluating the basic geocentric idea.

Once quantum mechanics was accepted without having any logical coherence with fundamental mechanics . . . new demons—called "particles"—began creeping in. In the last decade or so, they haven't been creeping in, they've been marching in in columns abreast.

It started with the neutrino. The laws of conservation of energy and momentum seemed to be in serious trouble, because in beta-decay of radioactive nuclei, neither momentum nor energy added up properly. The laws of conservation of mass-energy and momentum were, for a while, under question; efforts to save them by modifications started . . . but Fermi offered a different explanation that made that doubting of the fundamental dogma of physics unnecessary, and relieved everyone tremendously. The missing energy and momentum were being stolen (*Continued on page 174*)





Space Viking

First of Four Parts.

Vengeance is a strange human motivation —
it can drive a man to do things
which he neither would nor could achieve without it...
and because of that it lies behind some of the
greatest sagas of human literature!

by H. Beam Piper

Illustrated by Schoenherr

They stood together at the parapet, their arms about each other's waists, her head against his cheek. Behind, the broad leaved shrubbery gossiped softly with the wind, and from the lower main terrace came music and laughing voices. The city of Wardshaven spread in front of them, white buildings rising from the wide spaces of green treetops, under a shimmer of sun-reflecting aircars above. Far away, the mountains were violet in the afternoon haze, and the huge red sun hung in a sky as yellow as a ripe peach.

His eye caught a twinkle ten miles to the southwest, and for an instant he was puzzled. Then he frowned. The sunlight on the two thousand-foot globe of Duke Angus' new ship, the *Enterprise*, back at the Gorram shipyards after her final trial cruise. He didn't want to think about that, now.

Instead, he pressed the girl closer and whispered her name, "Elaine," and then, caressing every syllable, "Lady Elaine Trask of Traskon."

"Oh, no, Lucas!" Her protest was half joking and half apprehensive. "It's bad luck to be called by your married name before the wedding."

"I've been calling you that in my mind since the night of the Duke's ball, when you were just home from school on Excalibur."

She looked up from the corner of her eye.

"That was when I started calling me that, too," she confessed.

"There's a terrace to the west at Traskon New House," he told her. "Tomorrow, we'll have our dinner there, and watch the sunset together."

"I know. I thought that was to be our sunset-watching place."

"You have been peeking," he accused. "Traskon New House was to be your surprise."

"I always was a present-peeker, New Year's and my birthdays. But I only saw it from the air. I'll be very surprised at everything inside," she promised. "And very delighted."

And when she'd seen everything and Traskon New House wasn't a surprise any more, they'd take a long space trip. He hadn't mentioned that to her, yet. To some of the other Sword-Worlds—Excalibur, of course, and Morglay and Flamberge and Durendal. No, not Durendal; the war had started there again. But they'd have so much fun. And she would see clear blue skies again, and stars at night. The cloud-veil hid the stars from Gram, and Elaine had missed them, since coming home from Excalibur.

The shadow of an aircar fell briefly upon them and they looked up and turned their heads, in time to see it sink with graceful dignity toward the landing-stage of Karval House, and he glimpsed its blazonry—sword and atom-symbol, the badge of the ducal house of Ward. He wondered if it were Duke Angus himself, or just some of his people come ahead of him. They should get back to their guests, he sup-

posed. Then he took her in his arms and kissed her, and she responded ardently. It must have been all of five minutes since they'd done that before.

A slight cough behind them brought them apart and their heads around. It was Sesar Karvall, gray-haired and portly, the breast of his blue coat gleaming with orders and decorations and the sapphire in the pommel of his dress-dagger twinkling.

"I thought I'd find you two here," Elaine's father smiled. "You'll have tomorrow and tomorrow and tomorrow together, but need I remind you that today we have guests, and more coming every minute."

"Who came in the Ward car?" Elaine asked.

"Rovard Grauffis. And Otto Harkaman; you never met him, did you, Lucas?"

"No; not by introduction. I'd like to, before he spaces out." He had nothing against Harkaman personally; only against what he represented. "Is the Duke coming?"

"Oh, surely. Lionel of Newhaven and the Lord of Northport are coming with him. They're at the Palace now." Karvall hesitated. "His nephew's back in town."

Elaine was distressed; she started to say: "Oh, dear! I hope he doesn't—"

"Has Dunnan been bothering Elaine again?"

"Nothing to take notice of. He was here, yesterday, demanding to speak with her. We got him to leave without too much unpleasantness."

"It'll be something for me to take notice of, if he keeps it up after tomorrow."

For his seconds and Andray Dunnan's, that was; he hoped it wouldn't come to that. He didn't want to have to shoot a kinsman to the house of Ward, and a crazy man to boot.

"I'm terribly sorry for him," Elaine was saying. 'Father, you should have let me talk to him. I might have made him understand."

Sesar Karvall was shocked. "Child, you couldn't have subjected yourself to that! The man is insane!" Then he saw her bare shoulders, and was even more shocked. "Elaine, your shawl!"

Her hands went up and couldn't find it; she looked about in confused embarrassment. Amused, Lucas picked it from the shrub onto which she had tossed it and draped it over her shoulders, his hands lingering briefly. Then he gestured to the older man to precede them, and they entered the arbored walk. At the other end, in an open circle, a fountain played; white marble girls and boys bathing in the jade-green basin. Another piece of loot from one of the Old Federation planets; that was something he'd tried to avoid in furnishing Traskon New House. There'd be a lot of that

coming to Gram, after Otto Harkaman took the *Enterprise* to space.

"I'll have to come back, some time, and visit them," Elaine whispered to him. "They'll miss me."

"You'll find a lot of new friends at your new home," he whispered back. "You wait till tomorrow."

"I'm going to put a word in the Duke's ear about that fellow," Sesar Karvall, still thinking of Dunnan, was saying. "If he speaks to him, maybe it'll do some good."

"I doubt it. I don't think Duke Angus has any influence over him at all."

Dunnan's mother had been the Duke's younger sister; from his father he had inherited what had originally been a prosperous barony. Now it was mortgaged to the top of the manor-house aerial-mast. The Duke had once assumed Dunnan's debts, and refused to do so again. Dunnan had gone to space a few times, as a junior officer on trade-and-raid voyages into the Old Federation. He was supposed to be a fair astrogator. He had expected his uncle to give him command of the *Enterprise*, which had been ridiculous. Disappointed in that, he had recruited a mercenary company and was seeking military employment: It was suspected that he was in correspondence with his uncle's worst enemy, Duke Omfray of Glaspyth.

And he was obsessively in love with Elaine Karvall, a passion which seemed to nourish itself on its own hopelessness. Maybe it would be a good idea to take that space trip right away. There ought to be a ship leaving Bigglersport for one of the other Sword-Worlds, before long.

They paused at the head of the escalators; the garden below was thronged with guests, the bright shawls of the ladies and the coats of the men making shifting color-patterns among the flower-beds and on the lawns and under the trees. Serving-robots, flame-yellow and black in the Karvall colors, floated about playing soft music and offering refreshments. There was a continuous spiral of changing costume-color around the circular robo-table. Voices babbled happily like a mountain river.

As they stood looking down, another aircar circled low; green and gold, lettered PANPLANET NEWS SERVICE. Sesar Karvall swore in irratation.

"Didn't there use to be something they called privacy?" he asked.

"It's a big story, Sesar."

It was; more than the marriage of two people who happened to be in love with each other. It was the marriage of the farming and ranching barony of Traskon and the Karvall steel mills. More, it was public announcement that the wealth and fighting-men of both baronies were now aligned behind Duke Angus of Wardshaven. So it was a general holiday. Every industry had closed down at noon today,

and would be closed until morning-after-next, and there would be dancing in every park and feasting in every tavern. To Sword-Worlders, any excuse for a holiday was better than none.

"They're our people, Sesar; they have a right to have a good time with us. I know everybody at Traskon is watching this by screen."

He raised his hand and waved to the news car, and when it swung its pickup around, he waved again. Then they went down the long escalator.

Lady Lavina Karvall was the center of a cluster of matrons and dowagers, around which tomorrow's bridesmaids fluttered like many-colored butterflies. She took possession of her daughter and dragged her into the feminine circle. He saw Rovard Grauffis, small and saturnine, Duke Angus' henchman, and Burt Sandrasan, Lady Lavina's brother. They spoke, and then an upper-servant, his tabard blazoned with the yellow flame and black hammer of Karvall mills, approached his master with some tale of domestic crisis, and the two went away together.

"You haven't met Captain Harkaman, Lucas," Rovard Grauffis said. "I wish you'd come over and say hello and have a drink with him. I know your attitude, but he's a good sort. Personally, I wish we had a few like him around here."

That was his main objection. There were fewer and fewer men of that sort on any of the Sword-Worlds.

II

A dozen men clustered around the bartending robot—his cousin and family lawyer, Nikkolay Trask; Lothar Ffayle, the banker; Alex Gorram, the shipbuilder, and his son Basil; Baron Rathmore; more of the Wardshaven nobles whom he knew only distantly. And Otto Harkaman.

Harkaman was a Space Viking. That would have set him apart, even if he hadn't topped the tallest of them by a head. He wore a short black jacket, heavily gold-braided, and black trousers inside ankle-boots; the dagger on his belt was no mere dress-ornament. His tousled red-brown hair was long enough to furnish extra padding in a combat-helmet, and his beard was cut square at the bottom.

He had been fighting on Durendal, for one of the branches of the royal house contesting fratricidally for the throne. The wrong one; he had lost his ship, and most of his men and, almost, his own life. He had been a penniless refugee on Flamberge, owning only the clothes he stood in and his personal weapons and the loyalty of half a dozen adventurers as penniless as himself, when Duke Angus had invited him to Gram to command the *Enterprise*.

"A pleasure, Lord Trask. I've met your lovely bride-to-be, and

now that I meet you, let me congratulate both." Then, as they were having a drink together, he put his foot in it by asking: "You're not an investor in the Tanish Adventure, are you?"

He said he wasn't, and would have let it go at that. Young Basil Gorram had to get his foot in, too."

"Lord Trask does not approve of the Tanith Adventure," he said scornfully. "He thinks we should stay home and produce wealth, instead of exporting robbery and murder to the Old Federation for it."

The smile remained on Otto Harkaman's face; only the friendliness was gone. He unobtrusively shifted his drink to his left hand.

"Well, our operations are definable as robbery and murder," he agreed. "Space Vikings are professional robbers and murderers. And you object? Perhaps you find me personally objectionable?"

"I wouldn't have shaken your hand or had a drink with you if I did. I don't care how many planets you raid or cities you sack, or how many innocents, if that's what they are, you massacre in the Old Federation. You couldn't possibly do anything worse than those people have been doing to one another for the past ten centuries. What I object to is the way you're raiding the Sword-Worlds."

"You're crazy!" Basil Gorram exploded.

"Young man," Harkaman reproved, "the conversation was between Lord Trask and myself. And when somebody makes a statement you don't understand, don't tell him he's crazy. Ask him what he means. What *do* you mean, Lord Trask?"

"You should know; you've just raided Gram for eight hundred of our best men. You raided me for close to forty vaqueros, farm-workers, lumbermen, machine-operators, and I doubt I'll be able to replace them with as good." He turned to the elder Gorram. "Alex, how many have you lost to Captain Harkaman?"

Gorram tried to make it a dozen; pressed, he admitted to a score and a half. Roboticians, machine-supervisors, programmers, a couple of engineers, a foreman. There was grudging agreement from the others. Burt Sandrasan's engine-works had lost almost as many, of the same kind. Even Lothar Ffayle admitted to losing a computerman and a guard-sergeant.

And after they were gone, the farms and ranches and factories would go on, almost but not quite as before. Nothing on Gram, nothing on any of the Sword-Worlds, was done as efficiently as three centuries ago. The whole level of Sword-World life was sinking, like the east coastline of this continent, so slowly as to be evident only from the records and monuments of the past. He said as much, and added:

"And the genetic loss. The best Sword-World genes are literally

escaping to space, like the atmosphere of a low-gravity planet, each generation begotten by fathers slightly inferior to the last. It wasn't so bad when the Space Vikings raided directly from the Sword-Worlds; they got home once in a while. Now they're conquering planets in the Old Federation for bases, and staying there."

Everybody had begun to relax; this wouldn't be a quarrel. Harkaman, who had shifted his drink back to his right hand, chuckled.

"That's right. I've fathered my share of brats in the Old Federation, and I know Space Vikings whose fathers were born on Old Federation planets." He turned to Basil Gorram. "You see, the gentleman isn't crazy, at all. That's what happened to the Terran Federation, by the way. The good men all left to colonize, and the stuffed shirts and yes-men and herd-followers and safety-firsters stayed on Terra and tried to govern the galaxy."

"Well, maybe this is all new to you, captain," Rovard Grauffis said sourly, "but Lucas Trask's dirge for the Decline and Fall of the Sword-Worlds is an old song to the rest of us. I have too much to do to stay here and argue.

Lothar Ffayle evidently did intend to stay and argue.

"All you're saying, Lucas, is that we're expanding. You want us to sit here and build up population pressure like Terra in the First Century?"

"With three and a half billion people spread out on twelve planets? They had that many on Terra alone. And it took us eight centuries to reach that."

That had been since the Ninth Century, Atomic Era, at the end of the Big War. Ten thousand men and women on Abigor, refusing to surrender, had taken the remnant of the System States Alliance navy to space, seeking a world the Federation had never heard of and wouldn't find for a long time. That had been the world they had called Excalibur. From it, their grandchildren had colonized Joyeuse and Durendal and Flamberge; Haulteclere had been colonized in the next generation from Joyeuse, and Gram from Haulteclere.

"We're not expanding, Lothar; we're contracting. We stopped expanding three hundred and fifty years ago, when that ship came back to Morglay from the Old Federation and reported what had been happening out there since the Big War. Before that, we were discovering new planets and colonizing them. Since then, we've been picking the bones of the dead Terran Federation."

Something was going on by the escalators to the landing stage. People were moving excitedly in that direction, and the news cars were circling like vultures over a sick cow. Harkaman wondered, hopefully, if it mightn't be a fight.

"Some drunk being bounced."



Nikkolay, Lucas' cousin, commented. "Sesar's let all Wardshaven in here, today. But, Lucas, this Tanith adventure; we're not making any hit-and-run raid. We're taking over a whole planet; it'll be another Sword-World in forty or fifty years."

"Inside another century, we'll conquer the whole Federation," Baron Rathmore declared. He was a politician and never let exaggeration worry him.

"What I don't understand," Harkaman said, "is why you support Duke Angus, Lord Trask, if



you think the Tanith adventure is doing Gram so much harm."

"If Angus didn't do it, somebody else would. But Angus is going to make himself King of Gram, and I don't think anybody else could do that. This planet needs a single sovereignty. I don't know how much you've seen of it outside this duchy, but don't take Wardshaven as typical. Some of these duchies, like Glaspyth or Didreksburg, are literal snake pits. All the major barons are at each other's throats, and they can't even keep their own knights and petty-barons in order.

Why, there's a miserable little war down in Southmain Continent that's been going on for over two centuries."

"That's probably where Dunnan's going to take that army of his," a robot-manufacturing baron said. "I hope it gets wiped out, and Dunnan with it."

"You don't have to go to Southmain; just go to Glaspyth," somebody else said.

"Well, if we don't get a planetary monarchy to keep order, this planet will decivilize like anything in the Old Federation."

"Oh, *come*, Lucas!" Alex Gorram protested. "That's pulling it out too far."

"Yes, for one thing, we don't have the Neobarbarians," somebody said. "And if they ever came out here, we'd blow them to Em-See-Square in nothing flat. Might be a good thing if they did, too; it would stop us squabbling among ourselves."

Harkaman looked at him in surprise. "Just who do you think the Neobarbarians are, anyhow?" he asked. "Some race of invading nomads; Attila's Huns in spaceships?"

"Well, isn't that who they are?" Gorram asked.

"Nifflheim, no! There aren't a dozen and a half planets in the Old Federation that still have hyperdrive, and they're all civilized. That's if 'civilized' is what Gilgamesh is," he added. "These are homemade barbarians. Workers and peasants who revolted to seize and divide the wealth and then found they'd smashed the means of production and killed off all the technical brains. Survivors on planets hit during the Interstellar Wars, from the Eleventh to the Thirteenth Centuries, who lost the machinery of civilization. Followers of political leaders on local-dictatorship planets. Companies of mercenaries thrown out of employment and living by pillage. Religious fanatics following self-anointed prophets."

"You think we don't have plenty of Neobarbarian material here on Gram?" Trask demanded. "If you do, take a look around."

Glaspyth, somebody said.

"That collection of over-ripe gallows-fruit Andray Dunnan's recruited," Rathmore mentioned.

Alex Gorram was grumbling that his shipyard was full of them; agitators stirring up trouble, trying to organize a strike to get rid of the robots.

"Yes," Harkaman pounced on that last. "I know of at least forty instances, on a dozen and a half planets, in the last eight centuries, of anti-technological movements. They had them on Terra, back as far as the Second Century Pre-Atomic. And after Venus seceded from the First Federation, before the Second Federation was organized."

"You're interested in history?" Rathmore asked.

"A hobby. All spacemen have

hobbies. There's very little work aboard ship in hyperspace; boredom is the worst enemy. My guns-and-missiles officer, Vann Larch, is a painter. Most of his work was lost with the *Corisande* on Durendal, but he kept us from starving a few times on Flamberge by painting pictures and selling them My hyperspatial astrogator, Guatt Kirbey, composes music; he tries to express the mathematics of hyperspatial theory in musical terms. I don't care much for it, myself," he admitted. "I study history. You know, it's odd; practically everything that's happened on any of the inhabited planets happened on Terra before the first spaceship."

The garden immediately around them was quiet, now; everybody was over by the landing-stage escalators. Harkaman would have said more, but at that moment he saw half a dozen of Sesar Karvall's uniformed guardsmen run past. They were helmeted and in bullet-proofs; one of them had an auto-rifle, and the rest carried knobbed plastic truncheons. The Space Viking set down his drink.

"Let's go," he said. "Our host is calling up his troops; I think the guests ought to find battle-stations, too."

III

The gaily-dressed crowd formed a semicircle facing the landing-stage escalators; everybody was staring in embarrassed curiosity, those behind craning over the shoulders of those in front. The ladies had drawn up their shawls in frigid formality; many had even covered their heads. There were four news-service cars hovering above whatever was going on was getting a planetwide screen showing. The Karvall guardsmen were trying to get through; their sergeant was saying, over and over, "Please, ladies and gentlemen; your pardon, noble sir," and getting nowhere.

Otto Harkaman swore disgustedly and shoved the sergeant aside. "Make way, here!" he bellowed. "Let these guards pass." With that, he almost hurled a gaily-dressed gentleman aside on either hand; they both turned to glare angrily, then got hastily out of his way. Meditating briefly on the uses of bad manners in an emergency, Trask followed, with the others; the big Space Viking plowed to the front, where Sesar Karvall and Rovard Grauffis and several others were standing.

Facing them, four men in black cloaks stood with their backs to the escalators. Two were common-folk retainers; hired gunmen, to be precise. They were at pains to keep their hands plainly in sight, and seemed to be wishing themselves elsewhere. The man in front wore a diamond sunburst jewel on his beret, and his cloak was lined with pale blue silk. His thin, pointed face was deeply lined about the mouth and penciled with a thin

black mustache. His eyes showed white all around the irises, and now and then his mouth would twitch in an involuntary grimace. Andray Dunnan; Trask wondered briefly how soon he would have to look at him from twenty-five meters over the sights of a pistol. The face of the slightly taller man who stood at his shoulder was paper-white. expressionless, with a black beard. His name was Nevil Ormm, nobody was quite sure whence he had come, and he was Dunnan's henchman and constant companion

"You lie!" Dunnan was shouting. "You lie damnably, in your stinking teeth, all of you! You've intercepted every message she's tried to send me."

"My daughter has sent you no messages, Lord Dunnan," Sesar Karvall said, with forced patience. "None but the one I just gave you, that she wants nothing whatever to do with you."

"You think I believe that? You're holding her a prisoner; Satan only knows how you've been torturing her to force her into this abominable marriage—"

There was a stir among the bystanders; that was more than well-mannered restraint could stand. Out of the murmur of incredulous voices, one woman's was quite audible:

"Well, really! He actually *is* crazy!"

Dunnan, like everybody else, heard it. "Crazy, am I?" he blazed. "Because I can see through this hypocritical sham? Here's Lucas Trask, he wants an interest in Karvall mills, and here's Sesar Karvall, he wants access to iron deposits on Traskon land. And my loving uncle, he wants the help of both of them in stealing Omfray of Glaspyth's duchy. And here's this loan-shark of a Ffayle. trying to claw my lands away from me, and Rovard Grauffis, the fetchdog of my uncle who won't lift a finger to save his kinsman from ruin, and this foreigner Harkaman who's swindled me out of command of the *Enterprise*. You're all plotting against me—"

"Sir Nevil," Grauffis said, "you can see that Lord Dunnan's not himself. If you're a good friend to him, you'll get him out of here before Duke Angus arrives."

Ormm leaned forward and spoke urgently in Dunnan's ear. Dunnan pushed him angrily away.

"Great Satan, are you against me, too?" he demanded.

Ormm caught his arm. "You fool, do you want to ruin everything, now—" He lowered his voice; the rest was inaudible.

"No, curse you, I won't go till I've spoken to her, face to face—"

There was another stir among the spectators; the crowd was parting, and Elaine was coming through, followed by her mother and Lady Sandrasan and five or six other matrons. They all had their shawls over their heads, right ends over left shoulders; they all stopped

except Elaine, who took a few steps forward and confronted Andray Dunnan. He had never seen her look more beautiful, but it was the icy beauty of a honed dagger

"Lord Dunnan, what do you wish to say to me?" she asked. "Say it quickly and then go; you are not welcome here."

"Elaine!" Dunnan cried, taking a step forward. "Why do you cover your head; why do you speak to me as a stranger? I am Andray, who loves you. Why are you letting them force you into this wicked marriage?"

"No one is forcing me; I am marrying Lord Trask willingly and happily, because I love him. Now, please, go and make no more trouble at my wedding."

"That's a lie! They're making you say that! You don't have to marry him; they can't make you. Come with me now. They won't dare stop you. I'll take you away from all these cruel, greedy people. You love me, you've always loved me. You've told me you loved me, again and again—"

Yes, in his own private dream-world, a world of fantasy that had now become Andray Dunnan's reality, in which an Elaine Karvall whom his imagination had created existed only to love him. Confronted by the real Elaine, he simply rejected the reality.

"I never loved you, Lord Dunnan, and I never told you so. I never hated you, either, but you are making it very hard for me not to. Now go, and never let me see you again."

With that, she turned and started back through the crowd, which parted in front of her. Her mother and her aunt and the other ladies followed.

'You lied to me!" Dunnan shrieked after her. "You lied all the time. You're as bad as the rest of them, all scheming and plotting against me, betraying me. I know what it's about; you all want to cheat me of my rights, and keep my usurping uncle on the ducal throne. And you, you false-hearted harlot, you're the worst of them all!"

Sir Nevil Ormm caught his shoulder and spun him around, propelling him toward the escalators. Dunnan struggled, screaming inarticulately like a wounded wolf. Ormm was cursing furiously.

"You two!" he shouted. "Help me, here. Get hold of him."

Dunnan was still howling as they forced him onto the escalator, the backs of the two retainers' cloaks, badged with the Dunnan crescent, light blue on black, hiding him. After a little, an aircar with the blue crescent blazonry lifted and sped away.

"Lucas, he's crazy," Sesar Karvall was insisting. "Elaine hasn't spoken fifty words to him since he came back from his last voyage—"

He laughed and put a hand on Karvall's shoulder. "I know that, Sesar. You don't think, do you, that I need assurance of it?"

"Crazy, I'll say he's crazy,"

Rovard Grauffis put in. "Did you hear what he said about his rights? Wait till his Grace hears about that."

"Does he lay claim to the ducal throne, Sir Rovard?" Otto Harkaman asked, sharply and seriously.

"Oh, he claims that his mother was born a year and a half before Duke Angus and the true date of her birth falsified to give Angus the succession. Why, his present Grace was three years old when she was born. I was old Duke Fergus' esquire; I carried Angus on my shoulder when Andray Dunnan's mother was presented to the lords and barons the day after she was born."

"Of course he's crazy," Alex Gorram agreed. "I don't know why the Duke doesn't have him put under psychiatric treatment."

"I'd put him under treatment," Harkaman said, drawing a finger across under his beard. "Crazy men who pretend to thrones are bombs that ought to be deactivated, before they blow things up."

"We couldn't do that," Grauffis said. "After all, he's Duke Angus' nephew—"

"I could do it," Harkaman said. "He only has three hundred men in this company of his. Why you people ever let him recruit them Satan only knows," he parenthesized. "I have eight hundred; five hundred ground-fighters. I'd like to see how they shape up in combat, before we space out. I can have them ready for action in two hours, and it'd be all over before midnight."

"No, Captain Harkaman; his Grace would never permit it," Grauffis vetoed. "You have no idea of the political harm that would do among the independent lords on whom we're counting for support. You weren't here on Gram when Duke Ridgerd of Didreksburg had his sister Sancia's second husband poisoned—"

IV

They halted under the colonnade; beyond, the lower main terrace was crowded, and a medley of old love songs was wafting from the sound outlets, for the sixth or eighth time around. He looked at his watch; it was ninety seconds later than the last time he had done so. Give it fifteen more minutes to get started, and another fifteen to get away after the marriage toasts and the felicitations. And no marriage, however pompous, lasted more than half an hour. An hour, then, till he and Elaine would be in the aircar, bulleting toward Traskon.

The love songs stopped abruptly; after a momentary silence, a trumpet, considerably amplified, blared; the "Ducal Salute." The crowd stopped shifting, the buzz of voices ceased. At the head of the landing-stage escalators there was a glow of color and the ducal party began moving down. A platoon of guards in red and yellow, with gilded

helmets and tasseled halberds. An esquire bearing the Sword of State. Duke Angus, with his council, Otto Harkaman among them; the Duchess Flavia and her companion-ladies. The household gentlemen, and their ladies. More guardsmen. There was a great burst of cheering; the news-service aircars got into position above the procession. Cousin Nikkolay and a few others stepped out from between the pillars into the sunlight; there was a similar movement at the other side of the terrace. The ducal party reached the end of the central walkway, halted and deployed.

"All right; let's shove off," Cousin Nikkolay said, stepping forward.

Ten minutes since they had come outside; another five to get into position. Fifty minutes, now, till he and Elaine—Lady Elaine Trask of Traskon, for real and for always—would be going home.

"Sure the car's ready?" he asked, for the hundredth time.

His cousin assured him that it was. Figures in Karvall black and flame-yellow appeared across the terrace. The music began again, this time the stately "Nobles' Wedding March," arrogant and at the same time tender. Sesar Karvall's gentleman-secretary, and the Karvall lawyer; executives of the steel mills, the Karvall guard-captain. Sesar himself, with Elaine on his arm; she was wearing a shawl of black and yellow. He looked around in sudden fright; "For the love of Satan, where's our shawl?" he demanded, and then relaxed when one of his gentlemen exhibited it, green and tawny, in Traskon colors. The bridesmaids, led by Lady Lavina Karvall. Finally they halted, ten yards apart, in front of the Duke.

"Who approaches us?" Duke Angus asked of his guard-captain.

He had a thin, pointed face, almost femininely sensitive, and a small pointed beard. He was bareheaded except for the narrow golden circlet which he spent most of his waking time scheming to convert into a royal crown. The guard-captain repeated the question.

"I am Sir Nikkolay Trask; I bring my cousin and liege-lord, Lucas, Lord Trask, Baron of Traskon. He comes to receive the Lady-Demoiselle Elaine, daughter of Lord Sesar Karvall, Baron of Karvall mills, and the sanction of your Grace to the marriage between them."

Sir Maxamon Zhorgay, Sesar Karvall's henchman, named himself and his lord; they brought the Lady-Demoiselle Elaine to be wed to Lord Trask of Traskon. The Duke, satisfied that these were persons whom he could address directly, asked if the terms of the marriage-agreement had been reached; both parties affirmed this. Sir Maxamon passed a scroll to the Duke; Duke Angus began to read the stiff and precise legal phraseology.

Marriages between noble houses were not matters to be left open to dispute; a great deal of spilled blood and burned powder had resulted from ambiguity on some point of succession or inheritance or dower rights. Lucas bore it patiently; he didn't want his great-grandchildren and Elaine's shooting it out over a matter of a misplaced comma.

"And these persons here before us do enter into this marriage freely?" the Duke asked, when the reading had ended. He stepped forward as he spoke, and his esquire gave him the two hand Sword of State, heavy enough to behead a bisonoid. Trask stepped forward; Sesar Karvall brought Elaine up. The lawyers and henchmen obliqued off to the sides. "How say you, Lord Trask?" he asked, almost conversationally.

"With all my heart, your Grace."

"And you, Lady-Demoiselle Elaine?"

"It is my dearest wish, your Grace."

The Duke took the sword by the blade and extended it; they laid their hands on the jeweled pommel.

"And do you, and your houses, avow us, Angus, Duke of Wardshaven, to be your sovereign prince, and pledge fealty to us and to our legitimate and lawful successors?"

"We do." Not only he and Elaine, but all around them, and all the throng in the gardens, answered, the spectators in shouts. Very clearly, above it all, somebody, with more enthusiasm than discretion, was bawling: "*Long live Angus the First of Gram!*"

"And we, Angus, do confer upon you two, and your houses, the right to wear our badge as you see fit, and pledge ourself to maintain your rights against any and all who may presume to invade them. And we declare that this marriage between you two, and this agreement between your respective houses, does please us, and we avow you two, Lucas and Elaine, to be lawfully wed, and who so questions this marriage challenges us, in our teeth and to our despite."

That wasn't exactly the wording used by a ducal lord on Gram. It was the formula employed by a planetary king, like Napolyon of Flamberge or Rodolf of Excalibur. And, now that he thought of it, Angus had consistently used the royal first-person plural. Maybe that fellow who had shouted about Angus the First of Gram had only been doing what he'd been paid to do. This was being telecast, and Omfray of Glaspyth and Ridgerd of Didreksburg would both be listening; as of now, they'd start hiring mercenaries. Maybe that would get rid of Dunnan for him.

The Duke gave the two-hand sword back to his esquire. The young knight who was carrying the green and tawny shawl handed it to him, and Elaine dropped the black and yellow one from her shoulders, the only time a re-

spectable woman ever did that in public, and her mother caught and folded it. He stepped forward and draped the Trask colors over her shoulders, and then took her in his arms. The cheering broke out again, and some of Sesar Karvall's guardsmen began firing a pom-pom somewhere.

It took a little longer than he had expected to finish with the toasts and shake hands with those who crowded around. Finally, the exit march started, down the long walkway to the landing stage, and the Duke and his party moved away to the rear to prepare for the wedding feast at which everybody but the bride and groom would celebrate. One of the bridesmaids gave Elaine a huge sheaf of flowers, which she was to toss back from the escalator; she held it in the crook of one arm and clung to his with the other.

"Darling; we really made it!" she was whispering, as though it were too wonderful to believe.

Well, wasn't it?

One of the new cars—orange and blue, that was Westlands Telecast & Teleprint—had floated just ahead of them and was letting down toward the landing stage. For a moment, he was angry; that went beyond the outer-orbit limits of journalistic propriety, even for Westlands T & T. Then he laughed; today he was too happy for anger about anything. At the foot of the escalator, Elaine kicked off her gilded slippers—there was another pair in the car; he'd seen to that personally—and they stepped onto the escalator and turned about. The bridesmaids rushed forward, and began struggling for the slippers, to the damage and disarray of their gowns, and when they were half way up, Elaine heaved the bouquet and it burst apart among them like a bomb of colored fragrance, and the girls below snatched at the flowers, shrieking deliriously. Elaine stood, blowing kisses to everybody, and he was shaking his clasped hands over his head, until they were at the top.

When they turned and stepped off, the orange and blue aircar had let down directly in front of them, blocking their way. Now he was really furious, and started forward with a curse. Then he saw who was in the car.

Andray Dunnan, his thin face contorted and the narrow mustache writhing on his upper lip; he had a slit beside the window open and was tilting the barrel of a submachine gun up and out of it.

He shouted, and at the same time tripped Elaine and flung her down. He was throwing himself forward to cover her when there was a blasting multiple report. Something sledged him in the chest; his right leg crumpled under him. He fell—

He fell and fell and fell, endlessly, through darkness, out of consciousness.

V

He was crucified, and crowned with a crown of thorns. Who had they done that to? Somebody long ago, on Terra. His arms were drawn out stiffly, and hurt; his feet and legs hurt, too, and he couldn't move them, and there was this prickling at his brow. And he was blind.

No; his eyes were just closed. He opened them, and there was a white wall in front of him, patterned with a blue snow-crystal design, and he realized that it was a ceiling and that he was lying on his back. He couldn't move his head, but by shifting his eyes he saw that he was completely naked and surrounded by a tangle of tubes and wires, which puzzled him briefly.



Then he knew that he was not on a bed, but on a robomedic, and the tubes would be for medication and wound drainage and intravenous feeding, and the wires would be to electrodes imbedded in his body for diagnosis, and the crown-of-thorns thing would be more electrodes for an encephalograph He'd been on one of those robomedics before, when he had been gored by a bisonoid on the cattle range.

That was what it was; he was still under treatment. But that seemed so long ago; so many things —he must have dreamed them— seemed to have happened.

Then he remembered, and struggled futilely to rise.

"Elaine!" he called. "Elaine, where are you?"

There was a stir and somebody



came into his limited view; his cousin, Nikkolay Trask.

"Nikkolay; Andray Dunnan," he said. "What happened to Elaine?"

Nikkolay winced, as though something he had expected to hurt had hurt worse than he had expected.

"Lucas." He swallowed. "Elaine . . . Elaine is dead."

Elaine is dead. That didn't make sense.

"She was killed instantly, Lucas. Hit six times; I don't think she even felt the first one. She didn't suffer at all."

Somebody moaned, and then he realized that it had been himself.

"You were hit twice," Nikkolay was telling him. "One in the leg; smashed the femur. And one in the chest. That one missed your heart by an inch."

"Pity it did." He was beginning to remember clearly, now. "I threw her down, and tried to cover her. I must have thrown her straight into the burst and only caught the last of it myself." There was something else; oh, yes. "Dunnan. Did they get him?"

Nikkolay shook his head. "He got away. Stole the *Enterprise* and took her off-planet."

"I want to get him myself."

He started to rise again; Nikkolay nodded to someone out of sight. A cool hand touched his chin, and he smelled a woman's perfume, nothing at all like Elaine's. Something like a small insect bit him on the neck. The room grew dark.

Elaine was dead. There was no more Elaine, nowhere at all. Why, that must mean there was ho more world. So that was why it had gotten so dark.

He woke again, fitfully, and it would be daylight and he could see the yellow sky through an open window or it would be night and the wall-lights would be on. There would always be somebody with him. Nikkolay's wife, Dame Cecelia; Rovard Grauffis; Lady Lavina Karvall—he must have slept a long time, for she was so much older than he remembered—and her brother, Burt Sandrasan. And a woman with dark hair, in a white smock with a gold caduceus on her breast.

Once, Duchess Flavia, and once Duke Angus himself. He asked where he was, not much caring. They told him, at the Ducal Palace.

He wished they'd all go away, and let him go wherever Elaine was.

Then it would be dark, and he would be trying to find her, because there was something he wanted desperately to show her. Stars in the sky at night, that was it. But there were no stars, there was no Elaine, there was no anything, and he wished that there was no Lucas Trask, either.

But there was an Andray Dunnan. He could see him standing black-cloaked on the terrace, the diamonds in his beret-jewel glittering evilly; he could see the mad face

peering at him over the rising barrel of the submachine gun. And then he would hunt for him without finding him, through the cold darkness of space.

The waking periods grew longer, and during them his mind was clear. They relieved him of his crown of electronic thorns. The feeding tubes came out, and they gave him cups of broth and fruit juice. He wanted to know why he had been brought to the Palace.

"About the only thing we could do," Rovard Grauffis told him. "They had too much trouble at Karvall House as it was. You know, Sesar got shot, too."

"No." So that was why Sesar hadn't come to see him. "Was he killed?"

"Wounded; he's in worse shape than you are. When the shooting started, he went charging up the escalator. Didn't have anything but his dress-dagger. Dunnan gave him a quick burst; I think that was why he didn't have time to finish you off. By that time, the guards who'd been shooting blanks from that rapid-fire gun got in a clip of live rounds and fired at him. He got out of there as fast as he could. They have Sesar on a robomedic like yours. He isn't in any danger."

The drainage tubes and medication tubes came out; the tangle of wires around him was removed, and the electrodes with them. They bandaged his wounds and dressed him in a loose robe and lifted him from the robomedic to a couch, where he could sit up when he wished; they began giving him solid food, and wine to drink, and allowed him to smoke. The woman doctor told him he'd had a bad time, as though he didn't know that. He wondered if she expected him to thank her for keeping him alive.

"You'll be up and around in a few weeks," his cousin added. "I've seen to it that everything at Traskon New House will be ready for you by then."

"I'll never enter that house as long as I live, and I wish that wouldn't be more than the next minute. That was to be Elaine's house. I won't go to it alone."

The dreams troubled his sleep less and less as he grew stronger. Visitors came often, bringing amusing little gifts, and he found that he enjoyed their company. He wanted to know what had really happened, and how Dunnan had gotten away.

"He pirated the *Enterprise*," Rovard Grauffis told him. "He had that company of mercenaries of his, and he'd bribed some of the people at the Gorram shipyards. I thought Alex would kill his chief of security when he found out what had happened. We can't prove anything —we're trying hard enough to— but we're sure Omfray of Glaspyth furnished the money. He's been denying it just a shade too emphatically."

"Then the whole thing was planned in advance"

"Taking the ship was; he must have been planning that for months; before he started recruiting that company. I think he meant to do it the night before the wedding. Then he tried to persuade the Lady-Demoiselle Elaine to elope with him—he seems to have actually thought that was possible—and when she humiliated him, he decided to kill both of you first." He turned to Otto Harkaman, who had accompanied him. "As long as I live, I'll regret not taking you at your word and accepting your offer, then."

"How did he get hold of that Westlands Telecast and Teleprint car?"

"Oh. The morning of the wedding, he screened Westlands editorial office and told them he had the inside story on the marriage and why the Duke was sponsoring it. Made it sound as though there was some scandal; insisted that a reporter come to Dunnan House for a face-to-face interview. They sent a man, and that was the last they saw him alive; our people found his body at Dunnan House when we were searching the place afterward. We found the car at the shipyard; it had taken a couple of hits from the guns at Karvall House, but you know what these press cars are built to stand. He went directly to the shipyard, where his men already had the *Enterprise;* as soon as he arrived, she lifted out."

He stared at the cigarette between his fingers. It was almost short enough to burn him. With an effort, he leaned forward to crush it out.

"Rovard, how soon will that second ship be finished?"

Grauffis laughed bitterly. "Building the *Enterprise* took everything we had. The duchy's on the edge of bankruptcy now. We stopped work on the second ship six months ago because we didn't have enough money to keep on with her and still get the *Enterprise* finished. We were expecting the *Enterprise* to make enough in the Old Federation to finish the second one. Then, with two ships and a base on Tanith, the money would begin coming in instead of going out. But now—"

"It leaves me where I was on Flamberge," Harkaman added. "Worse. King Napolyon was going to help the Elmersans, and I'd have gotten a command in that. It's too late for that now."

He picked up his cane and used it to push himself to his feet. The broken leg had mended, but he was still weak. He took a few tottering steps, paused to lean on the cane, and then forced himself on to the open window and stood for a moment staring out. Then he turned.

"Captain Harkaman, it might be that you could still get a command, here on Gram. That's if you don't mind commanding under me as owner-aboard. I am going hunting for Andray Dunnan."

They both looked at him. After a moment, Harkaman said:

"I'd count it an honor, Lord Trask. But where will you get a ship?"

"She's half finished now. You already have a crew for her. Duke Angus can finish her for me, and pay for it by pledging his new barony of Traskon."

He had known Rovard Grauffis all his life; until this moment, he had never seen Duke Angus' henchman show surprise.

"You mean, you'll trade Traskon for that ship?" he demanded.

"Finished, equipped and ready for space, yes."

"The Duke will agree to that," Grauffis said promptly. "But, Lucas; Traskon is all you own."

"If I have a ship, I won't need them. I am turning Space Viking."

That brought Harkaman to his feet with a roar of approval. Grauffis looked at him, his mouth slightly open.

"Lucas Trask—Space Viking," he said. "Now I've heard everything."

Well, why not? He had deplored the effects of Viking raiding on the Sword-Worlds, because Gram was a Sword-World, and Traskon was on Gram, and Traskon was to have been the home where he and Elaine would live and where their children and children's children would be born and live. Now the little point on which all of it had rested was gone.

"That was another Lucas Trask, Rovard. He's dead, now."

VI

Grauffis excused himself to make a screen call and then returned to excuse himself again. Evidently Duke Angus had dropped whatever he was doing as soon as he heard what his henchman had to tell him. Harkaman was silent until after he was out of the room, then said:

"Lord Trask, this is a wonderful thing for me. It's not been pleasant to be a shipless captain living on strangers' bounty. I'd hate, though, to have you think, some time, that I'd advanced my own fortunes at the expense of yours."

'Don't worry about that. If anybody's being taken advantage of, you are. I need a space-captain, and your misfortune is my own good luck."

Harkaman started to pack tobacco into his pipe. "Have you ever been off Gram, at all?" he asked.

"A few years at the University of Camelot, on Excalibur. Otherwise, no."

"Well, have you any conception of the sort of thing you're setting yourself to?" The Space Viking snapped his lighter and puffed. 'You know, of course, how big the Old Federation is. You know the figures, that is, but do they mean anything to you? I know they don't to a good many spacemen, even. We talk glibly about ten to the hundredth power, but emotionally we still count, 'One, Two, Three, Many.' A ship in hyperspace

logs about a light-year an hour. You can go from here to Excalibur in thirty hours. But you could send a radio message announcing the birth of a son, and he'd be a father before it was received. The Old Federation, where you're going to hunt Dunnan, occupies a space-volume of two hundred billion cubic light-years. And you're hunting for one ship and one man in that. How are you going to do it, Lork Trask?"

"I haven't started thinking about how; all I know is that I have to do it. There are planets in the Old Federation where Space Vikings come and go; raid-and-trade bases, like the one Duke Angus planned to establish on Tanith. At one or another of them, I'll pick up word of Dunnan, sooner or later."

"We'll hear where he was a year ago, and by the time we get there, he'll be gone for a year and a half to two years. We've been raiding the Old Federation for over three hundred years, Lord Trask. At present, I'd say there are at least two hundred Space Viking ships in operation. Why haven't we raided it bare long ago? Well, that's the answer: distance and voyage-time. You know, Dunnan could die of old age—which is not a usual cause of death among Space Vikings—before you caught up with him. And your youngest ship's-boy could die of old age before he found out about it."

"Well, I can go on hunting for him till I die, then. There's nothing else that means anything to me."

"I thought it was something like that. I won't be with you, all your life. I want a ship of my own, like the *Corisande*, that I lost on Durendal. Some day, I'll have one. But till you can command your own ship, I'll command her for you. That's a promise."

Some note of ceremony seemed indicated. Summoning a robot, he had it pour wine for them, and they pledged each other.

Rovard Grauffis had recovered his aplomb by the time he returned accompanied by the Duke. If Angus had ever lost his, he gave no indication of it. The effect on everybody else was literally seismic. The generally accepted view was that Lord Trask's reason had been unhinged by his tragic loss; there might, he conceded, be more than a crumb of truth in that. At first, his cousin Nikkolay raged at him for alienating the barony from the family, and then he learned that Duke Angus was appointing him vicar-baron and giving him Traskon New House for his residence. Immediately he began acting like one at the death-bed of a rich grandmother. The Wardshaven financial and industrial barons, whom he had known only distantly, on the other hand, came flocking around him, offering assistance and hailing him as the savior of the duchy. Duke Angus' credit, almost obliterated by the loss of the *Enterprise*, was firmly re-established, and theirs with it.

There were conferences at which lawyers and bankers argued interminably; he attended a few at first, found himself completely uninterested, and told everybody so. All he wanted was a ship; the best ship possible, as soon as possible. Alex Gorram had been the first to be notified; he had commenced work on the unfinished sister-ship of the *Enterprise* immediately. Until he was strong enough to go to the shipyard himself, he watched the work on the two-thousand-foot globular skeleton by screen, and conferred either in person or by screen with engineers and shipyard executives. His rooms at the ducal palace were converted, almost overnight, from sickrooms to offices. The doctors, who had recently been urging him to find new interests and activities, were now warning of the dangers of overexertion. Harkaman finally added his voice to theirs.

"You take it easy, Lucas." They had dropped formality and were on a first-name basis now. "You got hulled pretty badly; you let damage-control work on you, and don't strain the machinery till it's fixed. We have plenty of time. We're not going to get anywhere chasing Dunnan. The only way we can catch him is by interception. The longer he moves around in the Old Federation before he hears we're after him, the more of a trail he'll leave. Once we can establish a predictable pattern, we'll have a chance. Then, some time, he'll come out of hyperspace somewhere and find us waiting for him."

"Do you think he went to Tanith?"

Harkaman heaved himself out of his chair and prowled about the room for a few minutes, then came back and sat down again.

"No. That was Duke Angus' idea, not his. He couldn't put in a base on Tanith, anyhow. You know the kind of a crew he has."

There had been an extensive inquiry into Dunnan's associates and accomplices; Duke Angus was still hoping for positive proof to implicate Omfray of Glaspyth in the piracy. Dunnan had with him a dozen and a half employees of the Gorram shipyards whom he had corrupted. There was some technical ability among them, but for the most part they were agitators and trouble-makers and incompetent workmen. Even under the circumstances, Alex Gorram was glad to see the last of them. As for Dunnan's own mercenary company, there were about a score of former spacemen among them; the rest graded down from bandits through thugs and sneak-thieves to barroom bums. Dunnan himself was an astrogator, not an engineer.

"That gang aren't even good enough for routine raiding," Harkaman said. "They'd never under any circumstances be able to put in a base on Tanith. Unless Dunnan's completely crazy, which I doubt, he's gone to some regular Viking base planet, like Hoth or

Nergal or Dagon or Xochitl, to recruit officers and engineers and able spacemen."

"All that machinery and robotic equipment and so on that was going to Tanith—was that aboard when he took the ship?"

"Yes, and that's another reason why he'd go to some planet like Hoth or Nergal or Xochitl. On a Viking-occupied planet in the Old Federation, that stuff's almost worth its weight in gold."

"What's Tanith like?"

"Almost completely Terra-type, third of a Class-G sun. Very much like Haulteclere or Flamberge. It was one of the last planets the Federation colonized before the Big War. Nobody knows what happened, exactly. There wasn't any interstellar war; at least, you don't find any big slag-puddles where cities used to be. They probably did a lot of fighting among themselves, after they got out of the Federation. There's still some traces of combat-damage around. Then they started to decivilize, down to the pre-mechanical level—wind and water power and animal power. They have draft-animals that look like introduced Terran carabaos, and a few small sailboats and big canoes and bateaux on the rivers. They have gunpowder, which seems to be the last thing any people lose.

"I was there, five years ago. I liked Tanith for a base. There's one moon, almost solid nickle iron, and fissionable-ore deposits. Then, like a fool, I hired out to the Elmersans on Durendal and lost my ship. When I came here, your Duke was thinking about Xipototsc. I convinced him that Tanith was a better planet for his purpose."

"Dunnan might go there, at that. He might think he was scoring one on Duke Angus. After all, he has all that equipment."

"And nobody to use it. If I were Dunnan, I'd go to Nergal, or Xochitl. There are always a couple of thousand Space Vikings on either, spending their loot and taking it easy between raids. He could sign on a full crew on either. I suggest we go to Xochitl, first. We might pick up news of him, if nothing else."

All right, they'd try Xochitl first. Harkaman knew the planet, and was friendly with the Haulteclere noble who ruled it.

The work went on at the Gorram shipyard; it had taken a year to build the *Enterprise*, but the steel-mills and engine-works were over the preparatory work of tooling up, and material and equipment was flowing in a steady stream. Lucas let them persuade him to take more rest, and day by day grew stronger. Soon he was spending most of his time at the shipyard, watching the engines go in—Abbot lift-and-drive for normal space, Dillingham hyperdrive, power-converters, pseudograv, all at the center of the globular ship.

Living quarters and workshops went in next, all armored in collapsium-plated steel. Then the ship lifted out to an orbit a thousand miles off-planet, followed by swarms of armored work-craft and cargo-lighters; the rest of the work was more easily done in space. At the same time, the four two-hundred-foot pinnaces that would be carried aboard were being finished. Each of them had its own hyperdrive engines, and could travel as far and as fast as the ship herself.

Otto Harkaman was beginning to be distressed because the ship still lacked a name. He didn't like having to speak of her as "her," or "the ship," and there were many things soon to go on that should be name-marked. *Elaine*, Trask thought, at once, and almost at once rejected it. He didn't want her name associated with the things that ship would do in the Old Federation. *Revenge*, *Avenger*, *Retribution*, *Vendetta;* none appealed to him. A news-commentator, turgidly eloquent about the nemesis which the criminal Dunnan had invoked against himself, supplied it, *Nemesis* it was.

Now he was studying his new profession of interstellar robbery and murder against which he had once inveighed. Otto Harkaman's handful of followers became his teachers. Vann Larch, guns-and-missiles, who was also a painter; Guatt Kirbey, sour and pessimistic, the hyperspatial astrogator who tried to express his science in music; Sharll Renner, the normal-space astrogator. Alvyn Karffard, the exec, who had been with Harkaman longest of all. And Sir Paytrik Morland, a local recruit, formerly guard-captain to Count Lionel of Newhaven, who commanded the ground-fighters and the combat contragravity. They were using the farms and villages of Traskon for drill and practice, and he noticed that while the *Nemesis* would carry only five hundred ground and air fighters, over a thousand were being trained.

He commented to Rovard Grauffis.

"Yes. Don't mention it outside," the Duke's henchman said. "You and Sir Paytrik and Captain Harkaman will pick the five hundred best. The Duke will take the rest into his service. Some of these days, Omfray of Glaspyth will find out what a Space Viking raid is really like."

And Duke Angus would tax his new subjects of Glaspyth to redeem the pledges on his new barony of Traskon. Some old Pre-Atomic writer Harkaman was fond of quoting had said, "Gold will not always get you good soldiers, but good soldiers can get you gold."

The *Nemesis* came back to the Gorram yards and settled onto her curved landing legs like a monstrous spider. The *Enterprise* had borne the Ward sword and atom-symbol; the *Nemesis* should

bear his own badge, but the bisonoid head, tawny on green, of Traskon, was no longer his. He chose a skull impaled on an upright sword, and it was blazoned on the ship when he and Harkaman took her out for her shakedown cruise.

When they landed again at the Gorram yards, two hundred hours later, they learned that a tramp freighter from Morglay had come into Bigglersport in their absence with news of Andray Dunnan. Her captain had come to Wardshaven at Duke Angus' urgent invitation and was waiting for them at the Ducal Palace.

They sat, a dozen of them, around a table in the Duke's private apartments. The freighter captain, a small, precise man with a graying beard, alternately puffed at a cigarette and sipped from a beaker of brandy.

"I spaced out from Morglay two hundred hours ago," he was saying. "I'd been there twelve local days, three hundred Galactic Standard hours, and the run from Curtana was three hundred and twenty. This ship, the *Enterprise*, spaced out from there several days before I did. I'd say she's twelve hundred hours out of Windsor, on Curtana, now."

The room was still. The breeze fluttered curtains at the open windows; from the garden below, winged night-things twittered.



"I never expected it," Harkaman said. "I thought he'd take the ship out to the Old Federation at once." He poured wine for himself. "Of course, Dunnan's crazy. A crazy man has an advantage, sometimes, like a left-handed knife-fighter. He does unexpected things."

"That wasn't such a crazy move," Rovard Grauffis said. "We have very little direct trade with Curtana. It's only an accident we heard about this when we did."

The freighter captain's beaker was half empty. He filled it to the brim from the decanter.

"She was the first Gram ship there for years," he agreed. "That attracted notice, of course. And his having the blazonry changed, from the sword and atom-symbol to the blue crescent. And the ill-feeling on the part of other captains and planet-side employers about the men he'd lured away from them."

"How many men and what kind?"

The man with the gray beard shrugged. "I was too busy getting a cargo together for Morglay, to pay much attention. Almost a full spaceship complement, officers and spacemen of every kind. And a lot of industrial engineers and technicians."

"Then he is going to use that equipment that was aboard, and put in a base somewhere," somebody said.



"If he left Curtana twelve hundred hours ago, he's still in hyperspace," Guatt Kirbey said. "It's over two thousand from Curtana to the nearest Old Federation planet."

"How far to Tanith?" Duke Angus asked. "I'm sure that's where he's gone. He'd expect me to finish the other ship and equip her like the *Enterprise* and send her out; he'd want to get there first."

"I'd thought that Tanith would be the last place he'd go," Harkaman said, "but this changes the whole outlook. He could have gone to Tanith."

"He's crazy, and you're trying to apply sane logic to him," Guatt Kirbey said. "You're figuring what you'd do, and you aren't crazy. Of course, I've had my doubts, at times, but—"

"Yes, he's crazy, and Captain Harkaman's allowing for that," Rovard Grauffis said. "Dunnan hates all of us. He hates his Grace, here. He hates Lord Lucas, and Sesar Karvall; of course, he may think he killed both of them. He hates Captain Harkaman. So how could he score all of us off at once? By taking Tanith."

"You say he was buying supplies and ammunition?"

"That's right. Gun ammunition, ship's missiles, and a lot of ground-defense missiles."

"What was he buying them with? Trading machinery?"

"No. Gold."

"Yes. Lothar Ffayle found out that a lot of gold was transferred to Dunnan from banks in Glaspyth and Didreksburg," Grauffis said. "He got that aboard when he took the ship, evidently."

"All right," Trask said. "We can't be sure of anything, but we have some reasons for thinking he went to Tanith, and that's more than we have for any other planet in the Old Federation. I won't try to estimate the odds against our finding him there, but they're a good deal bigger anywhere else. We'll go there, first."

VII

The outside viewscreen, which had been vacantly gray for over three thousand hours, was now a vertiginous swirl of color, the indescribable color of a collapsing hyperspatial field. No two observers ever saw it alike, and no imagination could vision the actuality. Trask found that he was holding his breath. So, he noticed, was Otto Harkaman, beside him. It was something, evidently, that nobody got used to. Even Guatt Kirbey, the astrogator, was sitting with his pipe clenched in his mouth, staring at the screen.

Then, in an instant, the stars, which had literally not been there before, filled the screen with a blaze of splendor against the black velvet backdrop of normal space. Dead in the center, brighter than all the rest, Ertado's Star, the sun

of Tanith, burned yellowly. The light from it was ten hours old.

"Pretty good, Guatt," Harkaman said, picking up his cup.

"Good. Gehenna, it was perfect," somebody else said.

Kirbey was relighting his pipe. "Oh, I suppose it'll have to do," he grudged, around the stem He had gray hair and an untidy mustache, and nothing was ever quite good enough to satisfy him. 'I could have made it a little closer. Need three microjumps, now, and I'll have to cut the last one pretty fine. Now don't bother me." He began punching buttons for data and fiddling with setscrews and verniers.

For a moment, in the screen, Trask could see the face of Andray Dunnan. He blinked it away and reached for his cigarettes, and put one in his mouth wrong-end-to. When he reversed it and snapped his lighter, he saw that his hand was trembling. Otto Harkaman must have seen that, too.

"Take it easy, Lucas," he whispered. "Keep your optimism under control. We only think he might be here."

"I'm sure he is. He has to be."

No; that was the way Dunnan, himself, thought. Let's be sane about this.

"We have to assume he is. If we do, and he isn't it's a disappointment. If we don't, and he is, it's a disaster."

Others, it seemed, thought the same way. The battle-stations board was a solid blaze of red light for full combat readiness.

"All right," Kirbey said. "Jumping."

Then he twisted the red handle to the right and shoved it in viciously. Again the screen boiled with colored turbulence; again dark and mighty forces stalked through the ship like demons in a sorcerer's tower. The screen turned featureless gray as the pickups stared blindly into some dimensionless noplace. Then it convulsed with color again, and this time Ertado's Star, still in the center, was a coin-sized disk, with the little sparks of its seven planets scattered around it. Tanith was the third—the inhabitable planet of a G-class system usually was. It had a single moon, barely visible in the telescopic screen, five hundred miles in diameter and fifty thousand off-planet.

"You know," Kirbey said, as though he was afraid to admit it, "that wasn't too bad. I think we can make it in one more microjump."

Some time, Trask supposed, he'd be able to use the expression "micro-" about a distance of fifty-five million miles, too.

"What do you think about it?" Harkaman asked him, as deferentially as though seeking expert guidance instead of examining his apprentice. "Where should Guatt put us?"

"As close as possible, of course." That would be a light-second at the least; if the *Nemesis* came out

of hyperspace any closer to anything the size of Tanith, the collapsing field itself would kick her back. "We have to assume Dunnan's been there at least nine hundred hours. By that time, he could have put in a detection-station, and maybe missile-launchers, on the moon. The *Enterprise* carries four pinnaces, the same as the *Nemesis;* in his place, I'd have at least two of them on off-planet patrol. So let's accept it that we'll be detected as soon as we come out of the last jump, and come out with the moon directly between us and the planet. If it's occupied, we can knock it off on the way in."

"A lot of captains would try to come out with the moon masked off by the planet," Harkaman said.

"Would you?"

The big man shook his tousled head. "No. If they have launchers on the moon, they could launch at us in a curve around the planet, by data relayed from the other side, and we'd be at a disadvantage replying. Just go straight in. You hearing this, Guatt?"

"Yeah. It makes sense. Sort of. Now, stop pestering me. Sharll. look here a minute."

The normal-space astrogator conferred with him; Alvyn Karffard, the executive officer, joined them. Finally Kirbey pulled out the big red handle, twisted it, and said, "All right, jumping." He shoved it in. "I suppose I cut it too fine; now we'll get kicked back half a million miles."

The screen convulsed again; when it cleared the third planet was directly in the center; its small moon, looking almost as large, was a little above and to the right, sunlit on one side and planetlit on the other. Kirbey locked the red handle, gathered up his tobacco and lighter and things from the ledge, and pulled down the cover of the instrument-console, locking it.

"All yours, Sharll," he told Renner.

"Eight hours to atmosphere," Renner said. "That's if we don't have to waste a lot of time shooting up Junior, there."

Vann Larch was looking at the moon in the six hundred power screen.

"I don't see anything to shoot. Five hundred miles; one planet-buster, or four or five thermonuclears," he said.

It wasn't right, Trask thought indignantly. Minutes ago, Tanith had been six and a half billion miles away. Seconds ago, fifty-odd million. And now, a quarter of a million, and looking close enough to touch in the screen, it would take them eight hours to reach it. Why, on hyperdrive you could go forty-eight trillion miles in that time.

Well, it took a man just as long to walk across a room today as it had taken Pharaoh the First, or Homo Sap.

In the telescopic screen Tanith

looked like any picture of any Terra-type planet from space, with cloud-blurred contours of seas and continents and a vague mottling of gray and brown and green, topped at the pole by an icecap. None of the surface features, not even the major mountain ranges or rivers, were yet distinguishable, but Harkaman and Sharll Renner and Alvyn Karffard and the other old hands seemed to recognize it. Karffard was talking by phone to Paul Koreff, the signals-and-detection officer, who could detect nothing from the moon and nothing that was getting through the Van Allen belt from the planet.

Maybe they'd guessed wrong, at that. Maybe Dunnan hadn't gone to Tanith at all.

Harkaman, who had the knack of putting himself to sleep at will, with some sixth or *n*-th sense posted as a sentry, leaned back in his chair and closed his eyes. Trask wished he could, too. It would be hours before anything happened, and until then he needed all the rest he could get. He drank more coffee, chain-smoked cigarettes; he rose and prowled about the command room, looking at screens. Signals-and-detection was getting a lot of routine stuff—Van Allen count, micrometeor count, surface temperature, gravitation-field strength, radar and scanner echoes. He went back to his chair and sat down, staring at the screen-image. The planet didn't seem to be getting any closer at all, and it ought to; they were approaching it at better than escape velocity. He sat and stared at it.

He woke with a start. The screen-image was much larger, now. River courses and the shadow lines of mountains were clearly visible. It must be early autumn in the northern hemisphere; there was snow down to the sixtieth parallel and a belt of brown was pushing south against the green. Harkaman was sitting up, eating lunch. By the clock, it was four hours later.

"Have a good nap?" he asked. "We're picking up some stuff, now. Radio and screen signals. Not much, but some. The locals wouldn't have learned enough for that in the five years since I was here. We didn't stay long enough, for one thing."

On decivilized planets that were visited by Space Vikings, the locals picked up bits and scraps of technology very quickly. In the four months of idleness and long conversations while they were in hyperspace he had heard many stories confirming that. But from the level to which Tanith had sunk, radio and screen communication in five years was a little too much of a jump.

"You didn't lose any men, did you?"

That happened frequently—men who took up with local women, men who had made themselves unpopular with their shipmates, men who just liked the planet and wanted to stay. They were always

welcomed by the locals for what they could do and teach.

"No, we weren't there long enough for that. Only three hundred and fifty hours. This we're getting is outside stuff; somebody's there beside the locals."

Dunnan. He looked again at the battle-stations board; it was still uniformly red-lighted. Everything was on full combat ready. He summoned a mess-robot, selected a couple of dishes, and began to eat. After the first mouthful, he called to Alvyn Karffard:

"Is Paul getting anything new?" he asked.

Karffard checked. A little contragravity-field distortion effect. It was still too far to be sure. He went back to his lunch. He had finished it and was lighting a cigarette over his coffee when a red light flashed and a voice from one of the speakers shouted.

"Detection! Detection from planet! Radar, and microray!"

Karffard began talking rapidly into a hand-phone; Harkaman unhooked one beside him and listened.

"Coming from a definite point, about twenty-fifth north parallel," he said, aside "Could be from a ship hiding against the planet. There's nothing at all on the moon."

They seemed to be approaching the planet more and more rapidly. Actually, they weren't, the ship was decelerating to get into an orbit, but the decreasing distance created the illusion of increasing speed. The red lights flashed once more.

"*Ship detected!* Just outside atmosphere, coming around the planet from the west."

"Is she the *Enterprise?*"

"Can't tell, yet," Karffard said, and then cried: "There she is, in the screen! That spark, about thirty degrees north, just off the west side."

Aboard her, too, voices from speakers would be shouting, "Ship detected!" and the battle station board would be blazing red. And Andray Dunnan, at the command-desk—

"She's calling us." That was Paul Koreff's voice, out of the squawk-box on the desk. "Standard Sword-World impulse-code. Interrogative: What ship are you? Informative; her screen combination Request: Please communicate."

"All right," Harkaman said. "Let's be polite and communicate. What's her screen-combination?"

Koreff's voice gave it, and Harkaman punched it out. The communication screen in front of them lit at once; Trask shoved over his chair beside Harkaman's, his hands tightening on the arms. Would it be Dunnan himself, and what would his face show when he saw who confronted him out of his own screen?

It took him an instant to realize that the other ship was not the *Enterprise* at all. The *Enterprise* was the *Nemesis'* twin; her command

room was identical with his own. This one was different in arrangements and fittings. The *Enterprise* was a new ship; this one was old, and had suffered for years at the hands of a slack captain and a slovenly crew.

And the man who sat facing him in the screen was not Andray Dunnan, or any man he had ever seen before. A dark-faced man, with an old scar that ran down one cheek from a little below the eye; he had curly black hair, on his head and on a V of chest exposed by an open shirt. There was an ashtray in front of him, and a thin curl of smoke rose from a cigar in it, and coffee steamed in an ornate but battered silver cup beside it. He was grinning gleefully.

"Well! Captain Harkaman, of the *Enterprise*, I believe! Welcome to Tanith. Who's the gentleman with you? He isn't the Duke of Wardshaven, is he?"

VIII

He glanced quickly at the showback over the screen, to assure himself that his face was not betraying him. Beside him, Otto Harkaman was laughing.

"Why, Captain Valkanhayn; this is an unexpected pleasure. That's the *Space Scourge* you're in, I take it? What are you doing here on Tanith?"

A voice from one of the speakers shouted that a second ship had been detected coming over the north pole. The dark-faced man in the screen smirked quite complacently.

"That's Garvan Spasso, in the *Lamia*," he said. "And what we're doing here, we've taken this planet over. We intend keeping it, too."

"Well! So you and Garvan have teamed up. You two were just made for one another. And you have a little planet, all your very own. I'm so happy for both of you. What are you getting out of it—beside poultry?"

The other's self-assurance started to slip. He slapped it back into place.

"Don't kid me; we know why you're here. Well, we got here first. Tanith is our planet. You think you can take it away from us?"

"I know we could, and so do you," Harkaman told him. "We outgun you and Spasso together; why, a couple of our pinnaces could knock the *Lamia* apart. The only question is, do we want to bother?"

By now, he had recovered from his surprise, but not from his disappointment. If this fellow thought the *Nemesis* was the *Enterprise*— Before he could check himself, he had finished the thought aloud

"Then the *Enterprise* didn't come here at all!"

The man in the screen started. "Isn't that the *Enterprise* you're in?"

"Oh, no. Pardon my remissness, Captain Valkanhayn," Harkaman apologized. "This is the *Nemesis*.

The gentleman with me, Lord Lucas Trask, is owner-aboard, for whom I am commanding. Lord Trask, Captain Boake Valkanhayn, of the *Space Scourge*. Captain Valkanhayn is a Space Viking." He said that as though expecting it to be disputed. "So, I am told, is his associate, Captain Spasso, whose ship is approaching. You mean to tell me that the *Enterprise* hasn't been here?"

Valkanhayn was puzzled, slightly apprehensive.

"You mean the Duke of Wardshaven has two ships?"

"As far as I know, the Duke of Wardshaven hasn't any ships," Harkaman replied. "This ship is the property and private adventure of Lord Trask. The *Enterprise*, for which we are looking, is owned and commanded by one Andray Dunnan."

The man with the scarred face and hairy chest had picked up his cigar and was puffing on it mechanically. Now he took it out of his mouth as though he wondered how it had gotten there in the first place.

"But isn't the Duke of Wardshaven sending a ship here to establish a base? That was what we'd heard. We heard you'd gone from Flamberge to Gram to command for him."

"Where did you hear this? And when?"

"On Hoth. That'd be about two thousand hours ago; a Gilgamesher brought the news from Xochitl."

"Well, considering it was fifth or sixth hand, your information was good enough, when it was fresh. It was a year and a half old when you got it, though. How long have you been here on Tanith?"

"About a thousand hours." Harkaman clucked sadly at that.

"Pity you wasted all that time. Well, it was nice talking to you, Boake. Say hello to Garvan for me when he comes up."

"You mean you're not staying?" Valkanhayn was horrified, an odd reaction for a man who had just been expecting a bitter battle to drive them away. "You're just spacing right out again?"

Harkaman shrugged. "Do we want to waste time here, Lord Trask? The *Enterprise* has obviously gone somewhere else. She was still in hyperspace when Captain Valkanhayn and his accomplice arrived here."

"Is there anything worth staying for?" That seemed to be the reply Harkaman was expecting. "Beside poultry, that is?"

Harkaman shook his head. "This is Captain Valkanhayn's planet; his and Captain Spasso's. Let them be stuck with it."

"But, look; this is a good planet. There's a big local city, maybe ten or twenty thousand people; temples and palaces and everything. Then, there are a couple of old Federation cities. The one we're at is in good shape, and there's a big spaceport. We've been doing a lot of work on

it. And the locals won't give you any trouble. All they have is spears and a few crossbows and matchlocks—"

"I know. I've been here."

"Well, couldn't we make some kind of a deal?" Valkanhayn asked. A mendicant whine was beginning to creep into his voice. "I can get Garvan on screen and switch him over to your ship—"

"Well, we have a lot of Sword-World merchandise aboard," Harkaman said. "We could make you good prices on some of it. How are you fixed for robotic equipment?"

"But aren't you going to stay here?" Valkanhayn was almost in a panic. "Listen, suppose I talk to Garvan, and we all get together on this. Just excuse me for a minute—"

As soon as he had blanked out, Harkaman threw back his head and guffawed as though he had just heard the funniest and bawdiest joke in the galaxy. Trask, himself, didn't feel like laughing.

"The humor escapes me," he admitted. "We came here on a fools' errand."

"I'm sorry, Lucas." Harkaman was still shaking with mirth. "I know it's a letdown, but that pair of chiseling chicken thieves! I could almost pity them, if it weren't so funny." He laughed again. "You know what their idea was?"

Trask shook his head. "Who are they?"

"What I called them, a couple of chicken thieves. They raid planets like Set and Hertha and Melkarth, where the locals haven't anything to fight with—or anything worth fighting for. I didn't know they'd teamed up, but that figures. Nobody else would team up with either of them. What must have happened, this story of Duke Angus' Tanith adventure must have filtered out to them, and they thought that if they got here first, I'd think it was cheaper to take them in than run them out. I probably would have, too. They do have ships, of a sort, and they do raid, after a fashion. But now, there isn't going to be any Tanith base, and they have a no-good planet and they're stuck with it."

"Can't they make anything out of it themselves?"

"Like what?" Harkaman hooted. "They have no equipment, and they have no men. Not for a job like that. The only thing they can do is space out and forget it."

"We could sell them equipment."

"We could if they had anything to use for money. They haven't. One thing, we do want to let down and give the men a chance to walk on ground and look at a sky for a while. The girls here aren't too bad, either," Harkaman said. "As I remember, some of them even take a bath, now and then."

"That's the kind of news of Dunnan we're going to get. By the time we'd get to where he's been reported, he'd be a couple of thousand light-years away," he

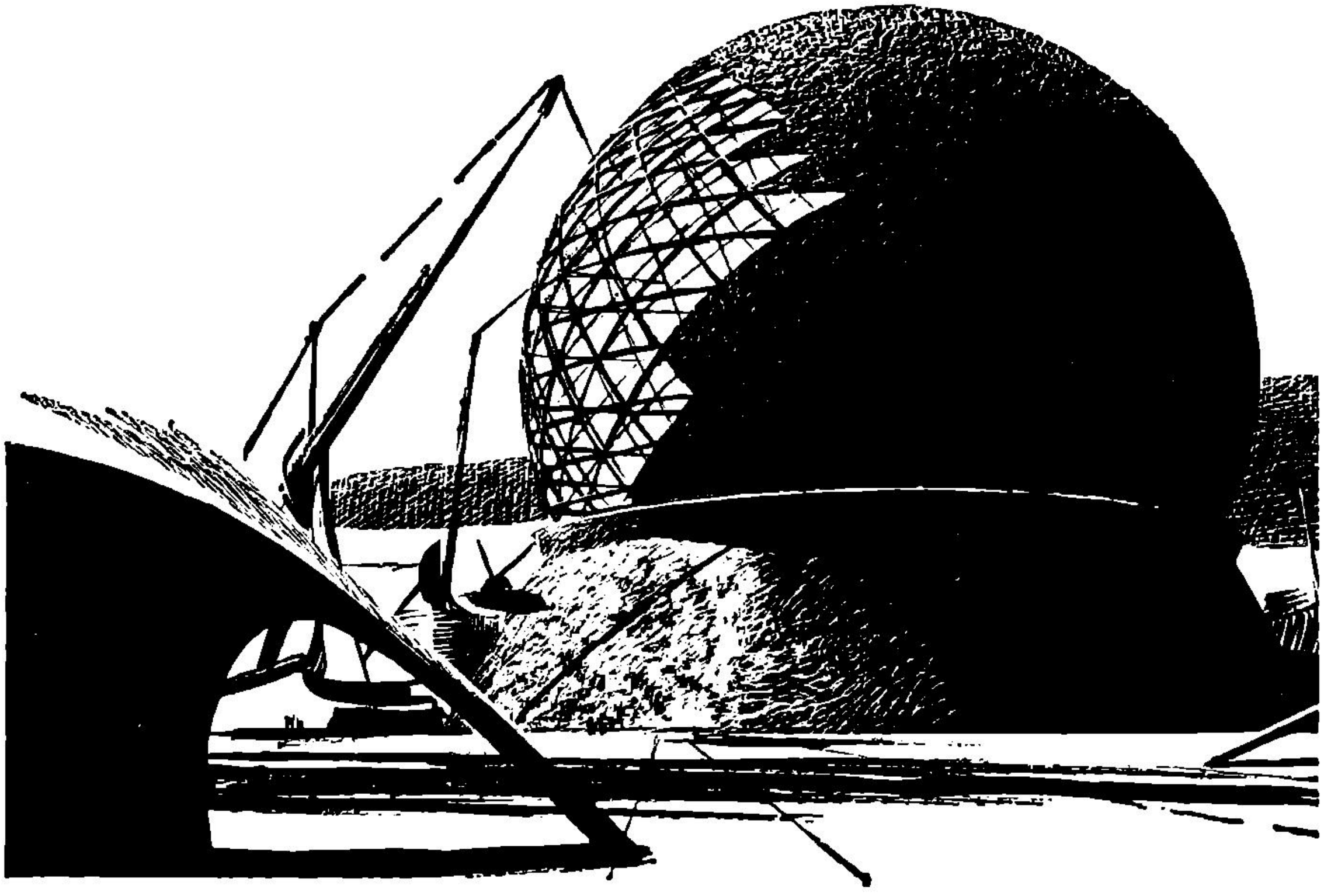
said disgustedly. I agree; we ought to give the men a chance to get off the ship, here. We can stall this pair along for a while and we won't have any trouble with them."

The three ships were slowly converging toward a point fifteen thousand miles off-planet and over the sunset line. The *Space Scourge* bore the device of a mailed fist clutching a comet by the head; it looked more like a whisk broom than a scourge. The *Lamia* bore a coiled snake with the head, arms and bust of a woman. Valkanhayn and Spasso were taking their time about screening back, and he began to wonder if they weren't maneuvering the *Nemesis* into a cross-fire position. He mentioned this to Harkaman and Alvyn Karffard; they both laughed.

"Just holding ship's meetings," Karffard said. "They'll be yakking back and forth for a couple of hours, yet."

"Yes; Valkanhayn and Spasso don't own their ships," Harkaman explained. "They've gone in debt to their crews for supplies and maintenance till everybody owns everything in common. The ships look like it, too. They don't even command, really; they just preside over elected command-councils."

Finally, they had both of the more or less commanders on screen.



Valkanhayn had zipped up his shirt and put on a jacket. Garvan Spasso was a small man, partly bald. His eyes were a shade too close together, and his thin mouth had a bitterly crafty twist. He began speaking at once:

"Captain, Boake tells me you say you're not here in the service of the Duke of Wardshaven at all." He said it aggrievedly.

"That's correct," Harkaman said. "We came here because Lord Trask thought another Gram ship, the *Enterprise*, would be here. Since she isn't, there's no point in our being here. We do hope, though, that you won't make any difficulty about our letting down and giving our men a couple of hundred hours' liberty. They've been in hyperspace for three thousand hours."

'See!" Spasso clamored. "He wants to trick us into letting him land—"

"Captain Spasso," Trask cut in. "Will you please stop insulting everybody's intelligence, your own included." Spasso glared at him, belligerently but hopefully. "I understand what you thought you were going to do here. You expected Captain Harkaman here to establish a base for the Duke of Wardshaven, and you thought, if you were here ahead of him and in a posture of defense, that he'd take you into the Duke's service rather than waste ammunition and risk damage and casualties wiping you



out. Well, I'm very sorry, gentlemen. Captain Harkaman is in my service, and I'm not in the least interested in establishing a base on Tanith."

Valkanhayn and Spasso looked at each other. At least, in the two side-by-side screens, their eyes shifted, each to the other's screen on his own ship.

"I get it!" Spasso cried suddenly. "There's two ships, the *Enterprise* and this one. The Duke of Wardshaven fitted out the *Enterprise*, and somebody else fitted out this one. They both want to put in a base here!"

That opened a glorious vista. Instead of merely capitalizing on their nuisance-value, they might find themselves holding the balance of power in a struggle for the planet. All sorts of profitable perfidies were possible.

"Why, sure you can land, Otto," Valkanhayn said. "I know what it's like to be three thousand hours in hyper, myself."

"You're at this old city with the two tall tower-buildings, aren't you?" Harkaman asked. He looked up at the viewscreen. "Ought to be about midnight there now. How's the spaceport? When I was here, it was pretty bad."

"Oh, we've been fixing it up. We got a big gang of locals working for us—"

The city was familiar, from Otto Harkaman's descriptions and from the pictures Vann Larch had painted during the long jump from Gram. As they came in, it looked impressive, spreading for miles around the twin buildings that spired almost three thousand feet above it, with a great spaceport like an eight-pointed star at one side. Whoever had built it, in the sunset splendor of the old Terran Federation, must have done so confident that it would become the metropolis of a populous and prospering world. Then the sun of the Federation had gone down. Nobody knew what had happened on Tanith after that, but evidently none of it had been good.

At first, the two towers seemed as sound as when they had been built; gradually it became apparent that one was broken at the top. For the most part, the smaller buildings scattered widely around them were standing, though here and there mounds of brush-grown rubble showed where some had fallen in. The spaceport looked good—a central octagon mass of buildings, the landing-berths, and, beyond, the triangular areas of airship docks and warehouses. The central building was outwardly intact, and the ship-berths seemed clear of wreckage and rubble.

By the time the *Nemesis* was following the *Space-Scourge* and the *Lamia* down, towed by her own pinnaces, the illusion that they were approaching a living city had vanished. The interspaces between the buildings were choked with forest-growth, broken by a few small

fields and garden-plots. At one time, there had been three of the high buildings, literally vertical cities in themselves. Where the third had stood was a glazed crater, with a ridge of fallen rubble lying away from it. Somebody must have landed a medium missile, about twenty kilotons against its base. Something of the same sort had scored on the far edge of the spaceport, and one of the eight arrowheads of docks and warehouses was an indistinguishable slagpile.

The rest of the city seemed to have died of neglect rather than violence. It certainly hadn't been bombed out. Harkaman thought most of the fighting had been done with subneutron bombs or Omega-ray bombs, that killed the people without damaging the real estate. Or bio-weapons; a man-made plague that had gotten out of control and all but depopulated the planet.

"It takes an awful lot of people, working together at an awful lot of jobs, to keep a civilization running. Smash the installations and kill the top technicians and scientists, and the masses don't know how to rebuild and go back to stone hatchets. Kill off enough of the masses and even if the planet and the knowhow is left, there's nobody to do the work. I've seen planets that decivilized both ways. Tanith, I think, is one of the latter."

That had been during one of the long after-dinner bull sessions on the way out from Gram. Somebody, one of the noble gentlemen-adventurers who had joined the company after the piracy of the *Enterprise* and the murder, had asked:

"But some of them survived. Don't they know what happened?"

" '*In the old times, there were sorcerers. They built the old buildings by wizard arts. Then the sorcerers fought among themselves and went away,*' " Harkaman said. "That's all they know about it."

You could make any kind of an explanation out of that.

As the pinnaces pulled and nudged the *Nemesis* down to her berth, he could see people, far down on the spaceport floor, at work. Either Valkanhayn and Spasso had more men than the size of their ships indicated, or they had gotten a lot of locals to work for them. More than the population of the moribund city, at least as Harkaman remembered it.

There had been about five hundred in all; they lived by mining the old buildings for metal, and trading metalwork for food and textiles and powder and other things made elsewhere. It was accessible only by oxcarts traveling a hundred miles across the plains; it had been built by a contragravity-using people with utter disregard for natural travel and transportation routes.

"I don't envy the poor buggers," Harkaman said, looking down at the antlike figures on the sapceport floor. "Boake Valkanhayn and Garvan Spasso have probably made slaves of the lot of them. If I was really going to put in a base here, I

wouldn't thank that pair for the kind of public-relations work they've been doing among the locals."

IX

That was just about the situation. Spasso and Valkanhayn and some of their officers met them on the landing stage of the big building in the middle of the spaceport, where they had established quarters. Entering and going down a long hallway, they passed a dozen men and women gathering up rubbish from the floor with shovels and with their hands and putting it into a lifter-skid. Both sexes wore shapeless garments of coarse cloth, like ponchos, and flat-soled sandals. Watching them was another local in a kilt, buskins and a leather jerkin; he wore a short sword on his belt and carried a wickedly thonged whip. He also wore a Space Viking combat helmet, painted with the device of Spasso's *Lamia*. He bowed as they approached, putting a hand to his forehead. After they had passed, they could hear him shouting at the others, and the sound of whip-blows.

You make slaves out of people, and some will always be slave-drivers; they will bow to you, and then take it out on the others. Harkaman's nose was twitching as though he had a bit of rotten fish caught in his mustache.

"We have about eight hundred of them. There were only three hundred that were any good for work here; we gathered the rest up at villages along the big river," Spasso was saying.

"How do you get food for them?" Harkaman asked. "Or don't you bother?"

"Oh, we gather that up all over," Valkanhayn told him. "We send parties out with landing craft. They'll let down on a village, run the locals out, gather up what's around and bring it here. Once in a while they put up a fight, but the best they have is a few crossbows and some muzzle-loading muskets. When they do, we burn the village and machine-gun everybody we see."

"That's the stuff," Harkaman approved. "If the cow doesn't want to be milked, just shoot her. Of course, you don't get much milk out of her again, but —"

The room to which their hosts guided them was at the far end of the hall. It had probably been a conference room or something of the sort, and originally it had been paneled, but the paneling had long ago vanished. Holes had been dug here and there in the walls, and he remembered having noticed that the door was gone and the metal groove in which it had slid had been pried out.

There was a big table in the middle, and chairs and couches covered with colored spreads. All the furniture was handmade, cunningly pegged together and highly polished. On the walls hung trophies

of weapons—thrusting-spears and throwing-spears, crossbows and quarrels, and a number of heavy guns, crude things, but carefully made.

"Pick all this stuff up off the locals?" Harkaman asked.

"Yes, we got most of it at a big town down at the forks of the river," Valkanhayn said. "We shook it down a couple of times. That's where we recruited the fellows we're using to boss the workers."

Then he picked up a stick with a leather-covered knob and beat on a gong, bawling for wine. A voice, somewhere, replies, "Yes, master; I come!" and in a few moments a woman entered carrying a jug in either hand. She was wearing a blue bathrobe several sizes too large for her, instead of the poncho things the slaves in the hallway wore. She had dark brown hair and gray eyes; if she had not been so obviously frightened she would have been beautiful. She set the jugs on the table and brought silver cups from a chest against the wall: when Spasso dismissed her, she went out hastily.

"I suppose it's silly to ask if you're paying these people anything for the work they do or for the things you take from them," Harkaman said. From the way the *Space-Scourge* and *Lamia* people laughed, it evidently was. Harkaman shrugged. "Well, it's your planet. Make any kind of a mess out of it you want to."

"You think we *ought* to pay them?" Spasso was incredulous. "Damn bunch of savages!"

"They aren't as savage as the Xochitl locals were when Haulteclere took it over. You've been there; you've seen what Prince Viktor does with them now."

"We haven't got the men or equipment they have on Xochitl," Valkenhayn said. "We can't afford to coddle the locals."

"You can't afford not to," Harkaman told him. "You have two ships, here. You can only use one for raiding; the other will have to stay here to hold the planet. If you take them both away, the locals, whom you have been studiously antagonizing, will swamp whoever you leave behind. And if you don't leave anybody behind, what's the use of having a planetary base?"

"Well, why don't you join us," Spasso finally came out with it. "With our three ships we could have a real thing, here."

Harkaman looked at him inquiringly. "The gentlemen," Trask said, "are putting this wrongly. They mean, why don't we let them join us?"

"Well, if you want to put it like that," Valkanhayn conceded. "We'll admit, your *Nemesis* would be the big end of it. But why not? Three ships, we could have a real base here. Nicky Gratham's father only had two when he started on Jaganath, and look what the Grathams got there now."

"Are we interested?" Harkaman asked.

"Not very, I'm afraid. Of course, we've just landed; Tanith may have great possibilities. Suppose we reserve decision for a while and look around a little."

There were stars in the sky, and, for good measure, a sliver of moon on the western horizon. It was only a small moon, but it was close. He walked to the edge of the landing stage, and Elaine was walking with him. The noise from inside, where the *Nemesis* crew were feasting with those of the *Lamia* and *Space-Scourge* grew fainter. To the south, a star moved; one of the pinnaces they had left on off-planet watch. There was firelight far below, and he could hear singing. Suddenly he realized that it was the poor devils of locals whom Valkanhayn and Spasso had enslaved. Elaine went away quickly.

"Have your fill of Space Viking glamour, Lucas?"

He turned. It was Baron Rathmore, who had come along to serve for a year or so and then hitch a ride home from some base planet and cash in politically on having been with Lucas Trask.

"For the moment. I'm told that this lot aren't typical."

"I hope not. They're a pack of sadistic brutes, and piggish along with it."

"Well, brutality and bad manners I can condone, but Spasso and Valkanhayn are a pair of ignominious little crooks, and stupid along with it. If Andray Dunnan had gotten here ahead of us, he might have done one good thing in his wretched life. I can't understand why he didn't come here."

"I think he still will," Rathmore said. "I knew him and I knew Nevil Ormm. Ormm's ambitious, and Dunnan is insanely vindictive—" He broke off with a sour laugh. "I'm telling *you* that!"

"Why didn't he come here directly, then?"

"Maybe he doesn't want a base on Tanith. That would be something constructive; Dunnan's a destroyer. I think he took that cargo of equipment somewhere and sold it. I think he'll wait till he's fairly sure the other ship is finished. Then he'll come in and shoot the place up, the way—" He bit that off abruptly.

"The way he did my wedding; I think of it all the time."

The next morning, he and Harkaman took an aircar and went to look at the city at the forks of the river. It was completely new, in the sense that it had been built since the collapse of Federation civilization and the loss of civilized technologies. It was huddled on a long, irregularly triangular mound, evidently to raise it above flood-level. Generations of labor must have gone into it. To the eyes of a civilization using contragravity and powered equipment it wasn't at all impressive. Fifty to a hundred men with adequate equipment could

have gotten the thing up in a summer. It was only by forcing himself to think in terms of spadeful after spadeful of earth, cartload after cartload creaking behind straining beasts, timber after timber cut with axes and dressed with adzes, stone after stone and brick after brick, that he could appreciate it. They even had it walled, with a palisade of tree-trunks behind which earth and rocks had been banked, and along the river were docks, at which boats were moored. The locals simply called it Tradetown.

As they approached, a big gong began booming, and a white puff of smoke was followed by the thud of a signal-gun. The boats, long canoe-like craft and round-bowed, many-oared barges, put out hastily into the river; through binoculars they could see people scattering from the surrounding fields, driving cattle ahead of them. By the time they were over the city, nobody was in sight. They seemed to have developed a pretty fair air-raid warning system in the nine-hundred-odd hours in which they had been exposed to the figurative mercies of Boake Valkanhayn and Garvan Spasso. It hadn't saved them entirely; a section of the city had been burned, and there were evidences of shelling. Light chemical-explosive stuff; this city was too good a cow for even those two to kill before the milking was over.

They circled slowly over it at a thousand feet. When they turned away, black smoke began rising from what might have been pottery works or brick-kilns on the outskirts; something resinous had evidently been fed to the fires. Other columns of black smoke began rising across the countryside on both sides of the river.

"You know, these people are civilized, if you don't limit the term to contragravity and nuclear energy," Harkaman said. "They have gunpowder, for one thing, and I can think of some rather impressive Old Terran civilizations that didn't have that much. They have an organized society, and anybody who has that is starting toward civilization."

"I hate to think of what'll happen to this planet if Spasso and Valkanhayn stay here long."

"Might be a good thing, in the long run. Good things in the long run are often tough while they're happening. I know what'll happen to Spasso and Valkanhayn, though. They'll start decivilizing, themselves. They'll stay here for a while, and when they need something they can't take from the locals they'll go chicken-stealing after it, but most of the time they'll stay here lording it over their slaves, and finally their ships will wear out and they won't be able to fix them. Then, some time, the locals'll jump them when they aren't watching and wipe them out. But in the meantime, the locals'll learn a lot from them."

They turned the aircar west again along the river. They looked at a few villages. One or two dated from the Federation period; they had been plantations before whatever it was had happened. More had been built within the past five centuries. A couple had recently been destroyed, in punishment for the crime of self-defense.

"You know," he said, at length, "I'm going to do everybody a favor. I'm going to let Spasso and Valkanhayn persuade me to take this planet away from them."

Harkaman, who was piloting, turned sharply. "You crazy or something?"

"'When somebody makes a statement you don't understand, don't tell him he's crazy. Ask him what he means.' Who said that?"

"On target," Harkaman grinned. "'What *do* you mean, Lord Trask?'"

"I can't catch Dunnan by pursuit; I'll have to get him by interception. You know the source of that quotation, too. This looks to me like a good place to intercept him. When he learns I have a base here, he'll hit it, sooner or later. And even if he doesn't, we can pick up more information on him, when ships start coming in here, than we would batting around all over the Old Federation."

Harkaman considered for a moment, then nodded. "Yes, if we could set up a base like Nergal or Xochitl," he agreed. "There'll be four or five ships, Space Vikings, traders, Gilgameshers and so on, on either of those planets all the time. If we had the cargo Dunnan took to space in the *Enterprise*, we could start a base like that. But we haven't anything near what we need, and you know what Spasso and Valkanhayn have."

"We can get it from Gram. As it stands, the investors in the Tanith Adventure, from Duke Angus down, lost everything they put into it. If they're willing to throw some good money after bad, they can get it back, and a handsome profit to boot. And there ought to be planets above the rowboat and ox-cart level not too far away that could be raided for a lot of things we'd need."

"That's right; I know of half a dozen within five hundred light-years. They won't be the kind Spasso and Valkanhayn are in the habit of raiding, though. And besides machinery, we can get gold, and valuable merchandise that could be sold on Gram. And if we could make a go of it, you'd go farther hunting Dunnan by sitting here on Tanith than by going looking for him. That was the way we used to hunt marsh pigs on Colada, when I was a kid; just find a good place and sit down and wait."

To be continued

Untechnological Employment

The reaction would not have been so deeply bitter if only it hadn't worked . . .

by E. M. Clinton, Jr.



TWX WHITE HOUSE TO COL. K. A. BROWN COMMANDER PACIFIC SPACEPORT:
CONGRESS PRESSURE HIGH INVESTIGATION IMMINENT MUST HAVE FULL INFORMATION WHY MOON LAUNCHES BEHIND SCHEDULE

TWX COL. K. A. BROWN TO WHITE HOUSE:
UNSEASONABLY CONSTANT BAD WEATHER PREVENTS LAUNCHING FOR PAST THREE WEEKS

TWX WHITE HOUSE TO BROWN PSP:
WHAT KIND OF BAD WEATHER

TWX COL. K. A. BROWN TO WHITE HOUSE: FOG

TWX WHITE HOUSE TO BROWN PSP:
CONGRESS PRESSURE GREATER BAD PUBLICITY INVOLVED RUSSIANS ARE LAUNCHING ON SCHEDULE WHY CAN'T WE SOMETHING MUST BE DONE

TWX COL. K. A. BROWN TO WHITE HOUSE: STILL FOGGED IN

TWX WHITE HOUSE TO BROWN PSP:
CHAIRMAN SENATE SPACE COMMITTEE SAYS FLY THIS WEEK OR HE WILL INVESTIGATE

TWX COL. K. A. BROWN TO WHITE HOUSE:
SIR INVESTIGATE

TWX WHITE HOUSE TO COL. A. A. NEUMAN
COMMANDER PACIFIC SPACEPORT:
EXPECT YOU TO ACT IMMEDIATELY SOLVING
PREVIOUS ADMINISTRATION PROBLEMS
RE LAUNCHINGS

TWX COL. A. A. NEUMAN TO WHITE HOUSE:
WISH TO ADVISE FOG REMAINS WAS CLEAR FOR
THIRTEEN MINUTES THIS A.M. PLEASE INSTRUCT

TWX WHITE HOUSE TO NEUMAN PSP:
SENATE SPACE COMMITTEE UNDER SENATOR
HARRY WASHWATER ARIZONA DUE PACIFIC
SPACEPORT THIS FRIDAY

TWX COL. A. A. NEUMAN TO WHITE HOUSE:
ADVISE YOU THIS OFFICE REGARDS WASHWATER
SUGGESTION AS NOT ACCEPTABLE

TWX WHITE HOUSE TO NEUMAN PSP:
IN CONFIDENCE ADVISE ANCILLARY POLITICAL
CONSIDERATIONS MAKE IT DESIRABLE YOU
RE-EVALUATE WASHWATER RECOMMENDATION

TWX COL. A. A. NEUMAN TO WHITE HOUSE:
IN CONFIDENCE ASK WHAT POSSIBLE
POLITICAL CONSIDERATIONS CAN APPLY HERE

TWX WHITE HOUSE TO NEUMAN PSP:
IN CONFIDENCE HIGH UNEMPLOYMENT RATE
NATIVE AMERICANS IN WASHWATER CONSTITUENCY

TWX COL. B. M. DEWAR ACTING COMMANDER PACIFIC
SPACEPORT TO WHITE HOUSE: ADVISE YOU
COL. NEUMAN'S DEATH ESTABLISHED AS SUICIDE

TWX WHITE HOUSE TO DEWAR PSP
REGRETS OFFICIALLY FROM THIS OFFICE
NOW SUGGEST RE-EVALUATION OF WASHWATER
RECOMMENDATION HOW IS THE WEATHER

TWX COL. B. M. DEWAR TO WHITE HOUSE:
RE-EVALUATING WEATHER STILL UNSPEAKABLY BAD
WAS THIS PLACE EVALUATED FOR WEATHER BEFORE
SPACEPORT FACILITIES BUILT

TWX WHITE HOUSE TO DEWAR PSP:
OFFICIAL POSITION IS CHANGE IN JAPANESE
CURRENT ANXIOUS FOR YOUR DECISION ON
WASHWATER RECOMMENDATION

TWX COL. B. M. DEWAR TO WHITE HOUSE:
RESPECTFULLY DEFER DECISION TO YOUR
OFFICE

TWX WHITE HOUSE TO DEWAR PSP:
EMERGENCY FORCES ON WAY FROM ARIZONA
THIS A.M. PER THIS OFFICE DECISION TO
FOLLOW WASHWATER RECOMMENDATION PLEASE
KEEP HOURLY INFORMATION COMING TO THIS
OFFICE

TWX COL. B. M. DEWAR TO WHITE HOUSE:
DANCING BEGAN AT OH FOUR TWENTY PST
EVERY ASSISTANCE BEING EXTENDED
BY THIS BASE

TWX COL. B. M. DEWAR TO WHITE HOUSE:
DANCING STILL IN PROGRESS CHIEF BLUE
SKY DECLARES REPERTOIRE OF SUN DANCES
FAR FROM EXHAUSTED

TWX COL. B. M. DEWAR TO WHITE HOUSE:
COUNTDOWN COMPLETED LAUNCHING
SUCCESSFUL VISIBILITY UNLIMITED
WEATHER CONTROL PERSONNEL ASKING FOR
OVERTIME PLEASE ADVISE AND ACCEPT
MY RESIGNATION ■



Solomon's Orbit

There will, sooner or later, be problems of "space junk," and the right to dump in space. But not like this...!

by William Carroll

Illustrated by Schoenherr

■ "Comrades," said the senior technician, "notice the clear view of North America. From here we watch everything; rivers, towns, almost the people. And see, our upper lens shows the dark spot of a meteor in space. Comrades, the meteor gets larger. It is going to pass close to our wondrous machine Comrades . . . Comrades . turn to my channel. It is no meteor—it is square. The accursed Americans have sent up a house. Comrades . . . an ancient automobile is flying toward our space machine. Comrades . . . it is going to—Ah . . . the picture is gone."

Moscow reported the conversation, verbatim, to prove their space vehicle was knocked from the sky by a capitalistic plot. Motion pictures clearly showed an American automobile coming toward the Russian satellite. Russian astronomers ordered to seek other strange orbiting devices reported: "We've observed cars for weeks. Have been exiling technicians and photographers to Siberia for making jokes of Soviet science. If television proves ancient automobiles are orbiting the world, Americans are caught in obvious attempt to ridicule our efforts to probe mysteries of space."

Confusion was also undermining American scientific study of the heavens. At Mount Palomar the busy 200-inch telescope was photographing a strange new object, but plates returned from the laboratory caused astronomers to explode angrily. In full glory, the photograph showed a tiny image of an ancient car. This first development only affected two photographers at Mount Palomar. They were fired for playing practical jokes on the astronomers. Additional exposures of other newfound objects were made. Again the plates were returned; this time with three little old cars parading proudly across the heavens as though they truly belonged among the stars.

The night the Russian protest crossed trails with the Palomar report, Washington looked like a kid with chicken pox, as dozens of spotty yellow windows marked midnight meetings of the nation's greatest minds. The military denied responsibility for cars older than 1942. Civil aviation proved they had no projects involving motor vehicles. Central Intelligence swore on their classification manual they were not dropping junk over Cuba in an attempt to hit Castro. Disgusted, the President established a civilian commission which soon located three more reports.

Two were from fliers The pilot of Flight 26, New York to Los Angeles, had two weeks before reported a strange object rising over Southern California about ten the evening of April 3rd. A week after this report, a private pilot on his way from Las Vegas claimed seeing an old car flying over Los Angeles. His statement was ignored, as he was arrested later while trying to drink himself silly because no one believed his story.

Fortunately, at the approximate times both pilots claimed sighting unknown objects, radar at Los Angeles International recorded something rising from earth's surface into the stratosphere. Within hours after the three reports met, in the President's commission's office, mobile radar was spotted on Southern California hilltops in twenty-four-hour watches for unscheduled flights not involving aircraft.

Number Seven, stationed in the Mount Wilson television tower

parking lot, caught one first. "Hey fellows," came his excited voice, "check 124 degrees, vector 62 now . . . rising . . . 124 degrees . . . vector 66 . . . rising—"

Nine and *Four* caught it moments later. Then *Three*. Army long-range radar, picked it up. "O.K., we're on. It's still rising . . . leaving the atmosphere . . . gone. Anyone else catch it?" Negative responses came from all but *Seven*, *Nine* and *Four*. So well spread were they, that within minutes headquarters had laid four lines over Southern California. They crossed where the unsuspecting community of Fullerton was more or less sound asleep, totally unaware of the making of history in its back yard.

The history of what astronomers call Solomon's Orbit had its beginning about three months ago. Solomon, who couldn't remember his first name, was warming tired bones in the sun, in front of his auto-wrecking yard a mile south of Fullerton. Though sitting, he was propped against the office; a tin shed decorated like a Christmas tree with hundreds of hub caps dangling from sagging wooden rafters. The back door opened on two acres of what Solomon happily agreed was the finest junk in all California. Fords on the left, Chevys on the right, and across the sagging back fence, a collection of honorable sedans whose makers left the business world years ago. They were known as Solomon's "Classics."

The bright sun had Solomon's tiny eyes burrowed under a shaggy brow which, added to an Einstein-like shock of white hair, gave him the appearance of a professor on sabattical. Eyes closed, Solomon was fondling favorite memories, when as a lad he repaired steam tractors and followed wheat across central plains of the United States. Happiness faded as the reverie was broken by spraying gravel signaling arrival of a customer's car.

"There's Uncle Solomon, Dad," a boy's voice was saying. "He gives us kids good deals on hot-rod parts. You've just gotta take a look at his old cars. 'cause if you want a classic Uncle Solomon would make you a good deal, too. I just know he would."

"Sure, Son, let's go in and see what he's got," replied a man's voice As Solomon opened his eyes, the two popped into reality. Heaving himself out of the sports car bucket seat that was his office chair, Solomon stood awaiting approach of the pair

'Mr Solomon, Georgie here, tells me you have some fine old cars for sale?"

"Sure have. Sure have. They're in back. Come along. I'll show you the short cuts." Without waiting for a reply, Solomon started, head bent, white hair blowing; through the office, out the back door and down passages hardly wide enough for a boy, let alone a man. He disappeared around a hearse, and sur-

faced on the other side of a convertible, leading the boy and his father a chase that was more a guided tour of Solomon's yard than a short cut. "Yes, sir, here they are," announced Solomon over his shoulder. Stepping aside he made room for the boy and his father to pass, between a couple of Ford tudors.

Three pair of eyes, one young, one old, the other tired, were faced by two rows of hulks, proud in the silent agony of their fate. Sold, resold and sold again, used until exhaustion set in, they reached Solomon's for a last brave stand. No matter what beauties they were to Solomon's prejudiced eyes; missing fenders, rusted body panels, broken wheels and rotted woodwork bespoke the utter impossibility of restoration.

"See, Dad, aren't they great?" Georgie gleefully asked. He could just imagine shaking the guys at school with the old Packard, after Dad restored it.

"Are you kidding?" Georgie's Dad exploded, "Those wrecks aren't good for anything but shooting at the moon. Let's go." Not another word did he say. Heading back to the car parked outside Solomon's office, his footsteps were echoed by those of a crestfallen boy. Solomon, a figure of lonely dejection in the gloom overshadowing his unloved old cars, was troubled with smog causing his eyes to water as tired feet aimlessly found their way back to his seat in the sun.

That night, to take his mind off worrisome old cars, Solomon began reading the previous Sunday's newspaper. There were pictures of moon shots, rockets and astronauts, which started Solomon to thinking; "So, my classics are good only for shooting at the moon. This thing called an ion engine, which creates a force field to move satellites, seems like a lot of equipment. Could do it easier with one of my old engines, I bet."

As Solomon told the people in Washington several months later, he was only resting his eyes, thinking about shop manuals and parts in the back yard. When suddenly he figured there was an easier way to build a satellite power plant. But, as it was past his bedtime, he'd put one together tomorrow.

It was late the next afternoon before Solomon had a chance to try his satellite power plant idea. Customers were gone and he was free of interruption. The engine of his elderly Moreland tow-truck was brought to life by Solomon almost hidden behind the huge wooden steering wheel. The truck lumbered carefully down rows of cars to an almost completely stripped wreck holding only a broken engine. In a few minutes Solomon had the engine waving behind the truck while he reversed to a clear space near the center of his yard.

Once the broken engine was blocked upright on the ground, Solomon backed his Moreland out

of the way, carried a tray of tools to the engine and squatted in the dirt to work. First, the intake manifold came off and was bolted to the clutch housing so the carburetor mounting flange faced skyward. Solomon stopped for a minute to worry. "If it works," he thought, "when I get them nearer each other, it'll go up in my face." Scanning the yard he thought of fenders, doors, wheels, hub caps and that was it. A hub cap would do the trick.

At his age, running was a senseless activity, but walking faster than usual, Solomon took a direct route to his office. From the ceiling of hub caps, he selected a small cap from an old Chevy truck. Back at the engine he punched a hole in the cap, through which he tied a length of strong twine. The cap was laid on the carburetor flange and stuck in place with painter's masking tape. He then bolted the exhaust manifold over the intake so the muffler connection barely touched the hub cap. Solomon stood up, kicked the manifolds with his heavy boots to make sure they were solid and grunted with satisfaction of a job well done

He moved his tray of tools away and trailed the hub cap twine behind the solid body of a big old Ford station wagon. He'd read of scientists in block houses when they shot rockets and was taking no chances. Excitement glistened Solomon's old eyes as what blood pressure there was rose a point or two with happy thoughts. If his idea worked, he would be free of the old cars, yet not destroy a single one. Squatting behind the station wagon, to watch the engine, Solomon gingerly pulled the twine to eliminate slack. As it tightened, he tensed braced himself with a free hand on the wagon's bumper, and taking a deep breath, jerked the cord Tired legs failed and Solomon slipped backward when the hub cap broke free of the tape and sailed through the air to clang against the wagon's fender. Lying on his back, struggling to rise, Solomon heard a slight swish as though a whirlwind had come through the yard. The scent of air-borne dust bit his nostrils as he struggled to his feet

Deep in the woods behind Solomon's yard two boys were hunting crows Eyes high, they scanned branches and horizons for game. "Look. there goes one," the younger cried as a large dark object majestically rose into the sky and rapidly disappeared into high clouds

"Yup, maybe so," said the other. "But it's flying too high for us."

I must be a silly old man," Solomon thought; scanning the cleared space behind his tow truck where he remembered an engine. There was nothing there, and as Solomon now figured it, never had been. Heart heavy with belief in the

temporary foolishness of age, Solomon went to the hub cap, glittering the sun where it lit after bouncing off the fender. It was untied from the string, and in the tool tray, before Solomon realized he'd not been daydreaming. In the cleared area, were two old manifold gaskets, several rusty nuts, and dirt blown smooth in a wide circle around greasy blocks on which he'd propped the now missing engine.

That night was a whirlwind of excitement for Solomon. He had steak for dinner, then sat back to consider future success Once the classic cars were gone he could use the space for more profitable Fords and Chevys. All he'd have to do would be bolt manifolds from spare engines on a different car every night, and he'd be rid of it. All he used was vacuum in the intake manifold, drawing pressure from the outlet side of the exhaust. The resulting automatic power flow raised anything they were attached to. Solomon couldn't help but think, "The newspapers said scientists were losing rockets and space capsules, so a few old cars could get lost in the clouds without hurting anything."

Early the next morning, he towed the oldest hulk an Essex to the cleared space. Manifolds from junk engines were bolted to the wheels but this time carburetor flanges were covered by wooden shingles because Solomon figured he couldn't afford to ruin tour salable hub caps just to get rid of his old sedans. Each shingle was taped in place so they could be pulled off in unison with a strong pull on the twine. The tired Essex was pretty big, so Solomon waited until bedtime before stumbling through the dark to the launching pad in his yard. Light from kitchen matches helped collect the shingle cords as he crouched behind the Ford wagon. He held the cords in one calloused hand, a burning match in the other so he could watch the Essex. Solomon tightened his fist, gave a quick tug to jerk all shingles at the same time, and watched in excited satisfaction as the old sedan rose in a soft swish of midsummer air flowing through ancient curves of four rusty manifold assemblies.

Day after day, only a mile from Fullerton, Solomon busied himself buying wrecked cars and selling usable parts. Each weekday night—Solomon never worked on Sunday—another old car from his back lot went silently heavenward with the aid of Solomon's unique combination of engine vacuum and exhaust pressure. His footsteps were light with accomplishment as he thought, "In four more days, they'll all be gone."

While the Fullerton radar net smoked innumerable cigarettes and cursed luck ruining the evening, Solomon scrambled two eggs, enjoyed his coffee and relaxed with a newly found set of old 1954 Buick shop manuals. As usual, when the

clock neared ten, he closed his manuals and let himself out the back door.

City lights, reflected in low clouds, brightened the way Solomon knew well. He was soon kneeling behind the Ford wagon without having stumbled once. Only two kitchen matches were needed to collect the cords from a big Packard, handsome in the warmth of a moonless summer night. With a faint "God Bless You," Solomon pulled the shingles and watched its massive hulk rise and disappear into orbit with his other orphans.

If you'd been able to see it all, you'd have worried. The full circle of radar and communications crews around Fullerton had acted as though the whole town were going to pussyfoot away at sundown. *Nine* was hidden in a curious farmer's orange grove. *Seven* was tucked between station wagons in the back row of a used car lot. *Four* was assigned the loading dock of a meat-packing plant, but the night watchman wouldn't allow them to stay. They moved across the street behind a fire station. *Three* was too big to hide, so it opened for business inside the National Guard Armory.

They all caught the Packard's takeoff. Degree lines from the four stations around Fullerton were crossed on the map long before Solomon reached his back door. By the time bedroom lights were out and covers under his bristly chin, a task force of quiet men was speeding on its way to surround four blocks of country land; including a chicken ranch, Solomon's junk yard and a small frame house. Dogs stirred, yapping at sudden activity they alone knew of, then nose to tail, returned to sleep when threats of intrusion failed to materialize.

The sun was barely up when the chicken farmer was stopped a block from his house, Highway patrolmen slowly inspected his truck from front to back, while three cars full of civilians, by the side of the road, watched every move. Finding nothing unusual, a patrolman reported to the first civilian car then returned to wave the farmer on his way. When the widow teacher from the frame house, started for school, she, too, was stopped. After a cursory inspection the patrolman passed her on. Two of the three accounted for. What of the third?

Quietly a calvacade formed, converged in Solomon's front yard and parked facing the road ready for quick departure. Some dozen civilians muddied shoes and trousers circling the junk yard, taking stations so they could watch all approaches. Once they were in position, a Highway patrolman and two civilians went to Solomon's door.

His last cup of coffee was almost gone as Solomon heard the noise of their shoes, followed by knuckles

thumping his front door. Wondering who could be in such a hurry, so early in the morning, he pulled on boots and buttoned a denim jacket as he went to answer. "Hello," said Solomon to the patrolman, while opening the door. "Why you bother me so early? You know I only buy cars from owners."

"No, Mr. Solomon, we're not worried about your car buying. This man, from Washington, wants to ask you a few questions.

"Sure, come in," Solomon replied.

The questions were odd: Do you have explosives here? Can you weld metal tanks? What is your education? Were you ever an engineer? What were you doing last night? To these, and bewildering others, Solomon told the truth. He had no explosives, couldn't weld, didn't finish school and was here, in bed, all night.

Then they wanted to see his cars. Through the back door so he'd not have to open the office, Solomon led the three men into his yard. Once inside, and without asking permission, they began searching like a hungry hound trailing a fat rabbit. Solomon's eyes, blinking in the glare of early morning sun, watched invasion of his privacy. "What they want," he wondered. He'd broken no laws in all the years he'd been in the United States. "For what do they bother a wrecking yard?" he asked himself.

His depressing thoughts were rudely shattered by a hail from the larger civilian, standing at the back of Solomon's yard. There, three old cars stood in an isolated row. "Solomon, come here a moment," he shouted. Solomon trudged back, followed by the short civilian and patrolman who left their curious searching to follow Solomon's lead. When he neared, the tall stranger asked, "I see where weeds grew under other cars which, from the tracks, have been moved out in the past few weeks. How many did you have?"

"Twenty; but these are all I have left," Solomon eagerly replied, hoping at last he'd a customer for the best of his old cars. "They make classic cars, if you'd take the time to fix them up. That one, the Hupmobile, is the last—"

"Who bought the others?" the big man interrupted.

"No one," quavered Solomon, terror gripping his throat with a nervous hand. Had he done wrong to send cars into the sky? Everyone else was sending things up. Newspapers said Russians and Americans were racing to send things into the air. What had he done that was wrong. Surely there was no law he'd broken. Wasn't the air free, like the seas. People dumped things into the ocean.

"Then where did they go?" snapped his questioner.

"Up there," pointed Solomon. "I needed the space. They were too good to cut up. No one would buy

them. So I sent them up. The newspapers—"

"You did what?"

"I sent them into the sky," quavered Solomon. So this is what he did wrong. Would they lock him up? What would happen to his cars? And his business?

"How did you . . . no! Wait a minute. Don't say a word. Officer, go and tell my men to prevent anyone from approaching or leaving this place." The patrolman almost saluted, thought better of it, and left grumbling about being left out of what must be something big.

Solomon told the civilians of matching vacuum in intake manifolds to pressure from exhaust manifolds. A logical way to make an engine that would run on pressure, like satellite engines he'd read about in newspapers. It worked on a cracked engine block, so he'd used scrap manifolds to get rid of old cars no one would buy. It hadn't hurt anything, had it?

Well, no, it hadn't. But as you can imagine, things happened rather fast. They let Solomon get clean denims and his razor. Then without a bye-your-leave, hustled him to the Ontario airport where an unmarked jet flew him to Washington and a hurriedly arranged meeting with the President. They left guards posted inside the fence of Solomon's yard, so they'll cause no attention while protecting his property. A rugged individual sits in the office and tells buyers and sellers alike, that he is Solomon's nephew. "The old man had to take a trip in a hurry." Because he knows nothing of the business, they'll have to wait until Solomon returns.

Where's Solomon now? Newspaper stories have him in Nevada showing the Air Force how to build gigantic intake and exhaust manifolds, which the Strategic Air Command is planning to attach to a stratospheric decompression test chamber. They figure if they can throw it into the sky, they can move anything up to what astronomers now call Solomon's Orbit, where at last count, sixteen of the seventeen cars are still merrily circling the earth. As you know, one recently hit the Russian television satellite.

The Russians? We're told they're still burning their fingers trying to orbit a car. They can't figure how to control vacuum and pressure from the manifolds. Solomon didn't tell many people about the shingles he uses for control panels and the Russians think control is somehow related to kitchen matches a newspaper reporter found scattered behind a station wagon in Solomon's junk yard. ■



The Servant Problem

Selling a whole town, and doing it inconspicuously, can be a little difficult...either giving it away freely, or in a more normal sense of "selling". People don't quite believe it...

by Robert J. Young

Illustrated by Schoenherr



■ If you have ever lived in a small town, you have seen Francis Pfleuger, and probably you have sent him after sky-hooks, left-handed monkey-wrenches and pails of steam, and laughed uproariously behind his back when he set forth to do your bidding. The Francis Pfleugers of the world have inspired both fun and laughter for generations out of mind.

The Francis Pfleuger we are concerned with here lived in a small town named Valleyview, and in addition to suffering the distinction of being the village idiot, he also suffered the distinction of being the village inventor. These two distinctions frequently go hand in hand, and afford, in their incongruous togetherness, an even greater inspiration for fun and laughter. For in this advanced age of streamlined electric can openers and sleek pop-up toasters, who but the most naïve among us can fail to be titillated by the thought of a buck-toothed, wall-eyed moron building Rube Goldberg contrivances in his basement?

The Francis Pfleuger we are concerned with did his inventing in his kitchen rather than in his basement; nevertheless, his machines were in the Rube Goldberg tradition. Take the one he was assembling now, for example. It stood on the kitchen table, and its various attachments jutted this way and that with no apparent rhyme or reason. In its center there was a transparent globe that looked like an upside-down goldfish bowl, and in the center of the bowl there was an object that startlingly resembled a goldfish, but which, of course, was nothing of the sort. Whatever it was, though, it kept growing brighter and brighter each time Francis added another attachment, and had already attained a degree of incandescence so intense that he had been forced to don cobalt-blue goggles in order to look at it. The date was the First of April, 1962—April Fool's Day.

Actually, the idea for this particular machine had not originated in Francis' brain, nor had the parts for it originated in his kitchen-workshop. When he had gone out to get the milk that morning he had found a box on his doorstep, and in the box he had found the goldfish bowl and the attachments, plus a sheet of instructions entitled, DIRECTIONS FOR ASSEMBLING A MULTIPLE MÖBIUS-KNOT DYNAMO. Francis thought that a machine capable of tying knots would be pretty keen, and he had carried the box into the kitchen and set to work forthwith.

He now had but one more part to go, and he proceeded to screw it into place. Then he stepped back to admire his handiwork. Simultaneously his handiwork went into action. The attachments began to quiver and to emit sparks; the globe glowed, and the goldfishlike object in its center began to dart this way and that as though striking at flies. A blue halo formed above the ma-

chine and began to rotate. Faster and faster it rotated, till finally its gaseous components separated and flew off in a hundred different directions. Three things happened then in swift succession: Francis' back doorway took on a bluish cast, the sheet of instructions vanished, and the machine began to melt.

A moment later he heard a whining sound on his back doorstep.

Simultaneously all of the residents of Valleyview heard whining sounds on *their* back doorsteps.

Naturally everybody went to find out about the whining.

The sign was a new one. At the most it was no more than six months old. YOU ARE ENTERING THE VILLAGE OF VALLEYVIEW, it said. PLEASE DRIVE CAREFULLY—WE ARE FOND OF OUR DOGS.

Philip Myles drove carefully. He was fond of dogs, too.

Night had tiptoed in over the October countryside quite some time ago, but the village of Valleyview had not turned on so much as a single streetlight—nor, apparently, any other kind of light. All was in darkness, and not a soul was to be seen. Philip began to suspect that he had entered a ghost town, and when his headlights darted across a dark intersection and picked up the overgrown grass and unkempt shrubbery of the village park, he was convinced that he had. Then he saw the girl walking the dog.

He kitty-cornered the intersection and pulled up alongside her. She was a blonde, tall and chic in a gray fall suit. Her face was attractive—beautiful even, in a cold and classic way—but she would never see twenty-five again. But then, Philip would never again see thirty. When she paused, her dog paused too, although she did not have it on a leash. It was on the small side, tawny in hue, with golden-brown eyes, a slender white-tipped tail, and shaggy ears that hung down on either side of its face in a manner reminiscent of a cocker spaniel's. It wasn't a cocker spaniel, though. The ears were much too long, for one thing, and the tail was much too delicate, for another. It was a breed—or combination of breeds—that Philip had never seen before.

He leaned across the seat and rolled down the right-hand window. "Could you direct me to number 23 Locust Street?" he asked. "It's the residence of Judith Darrow, the village attorney. Maybe you know her."

The girl gave a start. "Are *you* the real-estate man I sent for?"

Philip gave a start, too. Recovering himself, he said, "Then *you're* Judith Darrow. I'm . . . I'm afraid I'm a little late."

The girl's eyes flashed. The radiant backwash of the headlights revealed them to be both green and gray. "I specified in my letter that you were supposed to be here at nine o'clock this morning!" she

said. "Maybe you'll tell me how you're going to appraise property in the dark!"

"I'm sorry," Philip said. "My car broke down on the way, and I had to wait for it to be fixed. When I tried to call you, the operator told me that your phone had been disconnected. If you'll direct me to the hotel, I'll stay there overnight and appraise your property in the morning. There *is* a hotel, isn't there?"

"There is—but it's closed. Zarathustra—down!" The dog had raised up on its hind legs and placed its forepaws on the door in an unsuccessful attempt to peer in the window. At the girl's command, it sank obediently down on its haunches. "Except for Zarathustra and myself," she went on, "the village is empty. Everyone else has already moved out, and we'd have moved out, too, if I hadn't been entrusted with arranging for the sale of the business places and the houses. It makes for a rather awkward situation."

She had leaned forward, and the light from the dash lay palely upon her face, softening its austerity. "I don't get this at all," Philip said. "From your letter I assumed you had two or three places you wanted me to sell, but not a whole town. There must have been at least a thousand people living here, and a thousand people just don't pack up and move out all at once." When she volunteered no explanation, he added, "Where did they move to?"

"To Pfleugersville. I know you've never heard of it, so save the observation." Then, "Do you have any identification?" she asked.

He gave her his driver's license, his business card and the letter she had written him. After glancing at them, she handed them back. She appeared to be undecided about something. "Why don't you let me stay at the hotel?" he suggested. "You must have the key if it's one of the places I'm supposed to appraise."

She shook her head. "I have the key, but there's not a stick of furniture in the place. We had a village auction last week and got rid of everything that we didn't plan on taking with us." She sighed. "Well, there's nothing for it, I guess. The nearest motel is thirty miles away, so I'll have to put you up at my house. I have a few articles of furniture left—wedding gifts, mostly, that I was too sentimental to part with." She got into the car. "Come on, Zarathustra."

Zarathustra clambered in, leaped across her lap and sat down between them. Philip pulled away from the curb. "That's an odd name for a dog," he said.

"I know. I guess the reason I gave it to him is because he puts me in mind of a little old man sometimes."

"But the original Zarathustra isn't noted for his longevity."

"Perhaps another association was at work then. Turn right at the next corner."

A lonely light burned in one of number 23 Locust Street's three front windows. Its source, however, was not an incandescent bulb, but the mantle of a gasoline lantern. "The village power-supply was shut off yesterday," Judith Darrow explained, pumping the lantern into renewed brightness. She glanced at him sideways. "Did you have dinner?"

"As a matter of fact—no. But please don't—"

"Bother? I couldn't if I wanted to. My larder is on its last legs. But sit down, and I'll make you some sandwiches. I'll make a pot of coffee too—the gas hasn't been turned off yet."

The living room had precisely three articles of furniture to its name—two armchairs and a coffee table. After Judith left him, Philip set his brief case on the floor and sat down in one of the chairs. He wondered idly how she expected to make the trip to Pfleugersville. He had seen no car in the driveway, and there was no garage on the property in which one could be concealed. Moreover, it was highly unlikely that buses serviced the village any more. Valleyview had been bypassed quite some time ago by one of the new super-duper highways. He shrugged. Getting to Pfleugersville was her problem, not his.

He returned his attention to the living room. It was a large room. The house was large, too—large and Victorianesque. Judith, apparently, had opened the back door, for a breeze was wafting through the downstairs rooms—a breeze laden with the scent of flowers and the dew-damp breath of growing grass. He frowned. The month was October, not June, and since when did flowers bloom and grass grow in October? He concluded that the scent must be artificial.

Zarathustra was regarding him with large golden eyes from the middle of the living-room floor. The animal did somehow bring to mind a little old man, although he could not have been more than two or three years old. "You're not very good company," Philip said.

"Ruf," said Zarathustra, and turning, trotted through an archway into a large room that, judging from the empty shelves lining its walls, had once been a library, and thence through another archway into another room—the dining room, undoubtedly—and out of sight.

Philip leaned back wearily in the armchair he had chosen. He was beat. Take six days a week, ten hours a day, and multiply by fifty-two and you get three hundred and twelve. Three hundred and twelve days a year, hunting down clients, talking, walking, driving, expounding; trying in his early thirties to build the foundation he should have begun building in his early twenties—the foundation for the family he had suddenly realized he wanted and someday hoped to

have. Sometimes he wished that ambition had missed him altogether instead of waiting for so long to strike. Sometimes he wished he could have gone right on being what he once had been. After all, there was nothing wrong in living in cheap hotels and even cheaper rooming houses; there was nothing wrong in being a lackadaisical door-to-door salesman with run-down heels.

Nothing wrong, that is, except the aching want that came over you sometimes, and the loneliness of long and empty evenings.

Zarathustra had re-entered the room and was sitting in the middle of the floor again. He had not returned empty-handed—or rather, empty-mouthed—although the object he had brought with him was not the sort of object dogs generally pick up. It was a rose—

A green rose.

Disbelievingly, Philip leaned forward and took it from the animal's mouth. Before he had a chance to examine it, however, footsteps sounded in the next room, and prompted by he knew not what, he thrust the rose into his suitcoat pocket. An instant later, Judith Darrow came through the archway bearing a large tray. After setting it down on the coffee table, she poured two cups of coffee from a little silver pot and indicated a plate of sandwiches. "Please help yourself," she said.

She sat down in the other chair and sipped her coffee. He had one of the sandwiches, found that he didn't want any more. Somehow, her proximity, coupled with her silence, made him feel uncomfortable. "Has your husband already left for Pfleugersville?" he asked politely.

Her gray-green eyes grew cold. "Yes, he left quite some time ago," she said. "A year ago, as a matter of fact. But for parts unknown, not Pfleugersville. Pfleugersville wasn't accessible then, anyway. He had a brunette on one arm, a redhead on the other, and a pint of Cutty Sark in his hip pocket."

Philip was distressed. "I . . . I didn't mean to pry," he said. "I'm—"

"Sorry? Why should you be? Some men are born to settle down and raise children and others are born to drink and philander. It's as simple as that."

"Is it?" something made Philip ask. "Into which category would you say I fall?"

"You're in a class by yourself." Tiny silver flecks had come into her eyes, and he realized to his astonishment that they were flecks of malevolence. "You've never married, but playing the field hasn't made you one hundred per cent cynical. You're still convinced that somewhere there is a woman worthy of your devotion. And you're quite right—the world is full of them."

His face tingled as though she

had slapped it, and in a sense, she had. He restrained his anger with difficulty. "I didn't know that my celibacy was that noticeable," he said.

"It isn't. I took the liberty of having a private investigator check into your background. It proved to be unsavory in some respects, as I implied before, but unlike the backgrounds of the other real-estate agents I had checked, it contained not the slightest hint of dishonesty. The nature of my business is such that I need someone of maximum integrity to contract it with. I had to go far and wide to find you."

"You're being unfair," Philip said, mollified despite himself. "Most real-estate agents are honest. As a matter of fact, there's one in the same office building with me that I'd trust with the family jewels—if I had any family jewels."

"Good," Judith Darrow said. "I gambled on you knowing someone like that."

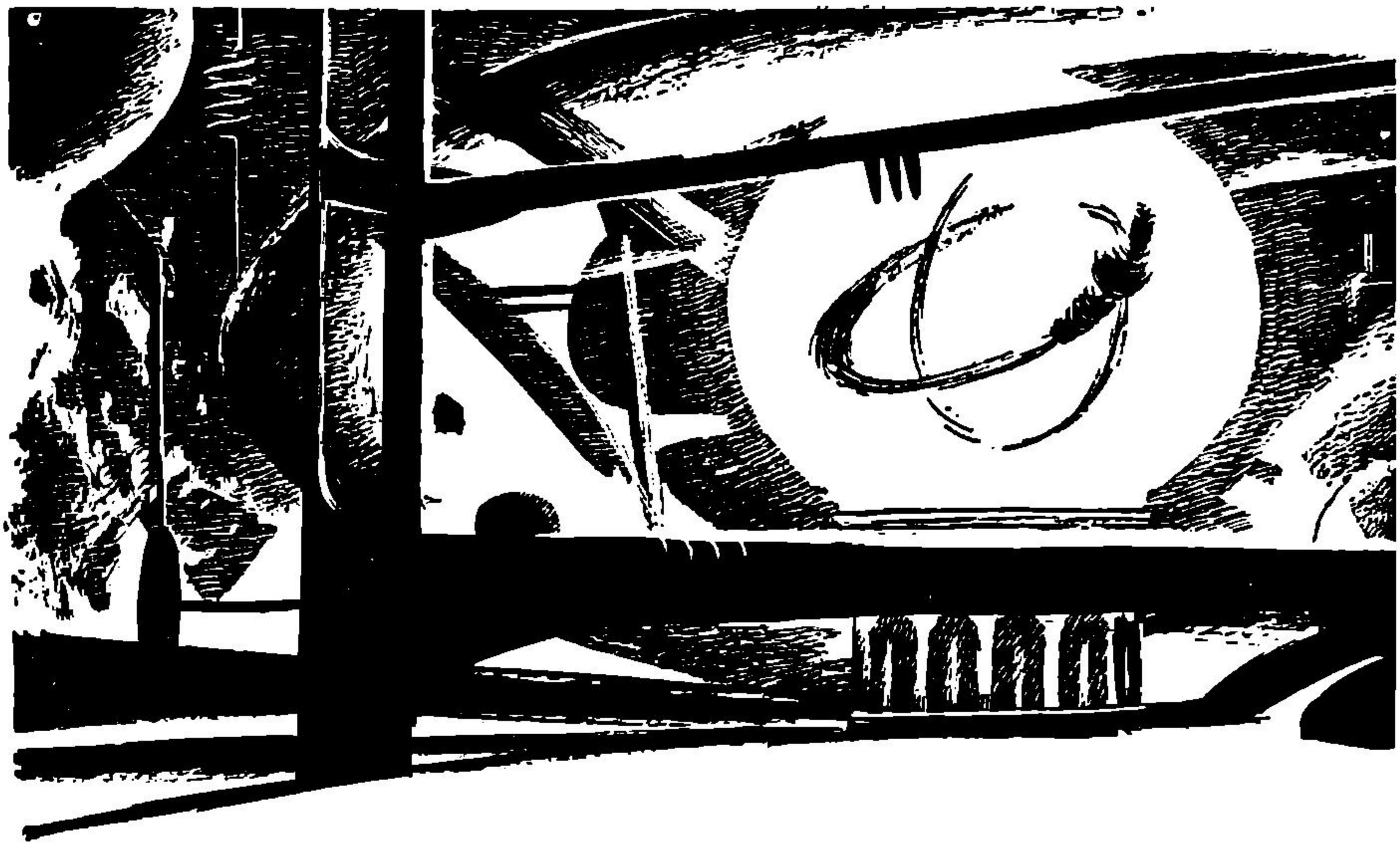
He waited for her to elaborate, and when she did not he finished his coffee and stood up. "If you don't mind, I'll turn in," he said. "I've had a pretty hard day."

"I'll show you your room."

She got two candles, lit them, and after placing them in gilt candlesticks, handed one of the candlesticks to him. The room was on the third floor in under the eaves—as faraway from hers, probably, as the size of the house permitted. Philip did not mind. He liked to sleep in rooms under eaves. There was an enchantment about the rain on the roof that people who slept in less celestial bowers never got to know. After Judith left, he threw open the single window and undressed and climbed into bed. Remembering the rose, he got it out of his coat pocket and examined it by candlelight. It was green all right—even greener than he had at first thought. Its scent was reminiscent of the summer breeze that was blowing through the downstairs rooms, though not at all in keeping with the chill October air that was coming through his bedroom window. He laid it on the table beside the bed and blew out the candle. He would go looking for the bush tomorrow.

Philip was an early riser, and dawn had not yet departed when, fully dressed, he left the room with the rose in his coat pocket and quietly descended the stairs. Entering the living room, he found Zarathustra curled up in one of the armchairs, and for a moment he had the eerie impression that the animal had extended one of his shaggy ears and was scratching his back with it. When Philip did a doubletake, however, the ear was back to normal size and reposing on its owner's tawny cheek. Rubbing the sleep out of his eyes, he said, "Come on, Zarathustra, we're going for a walk."

He headed for the back door,

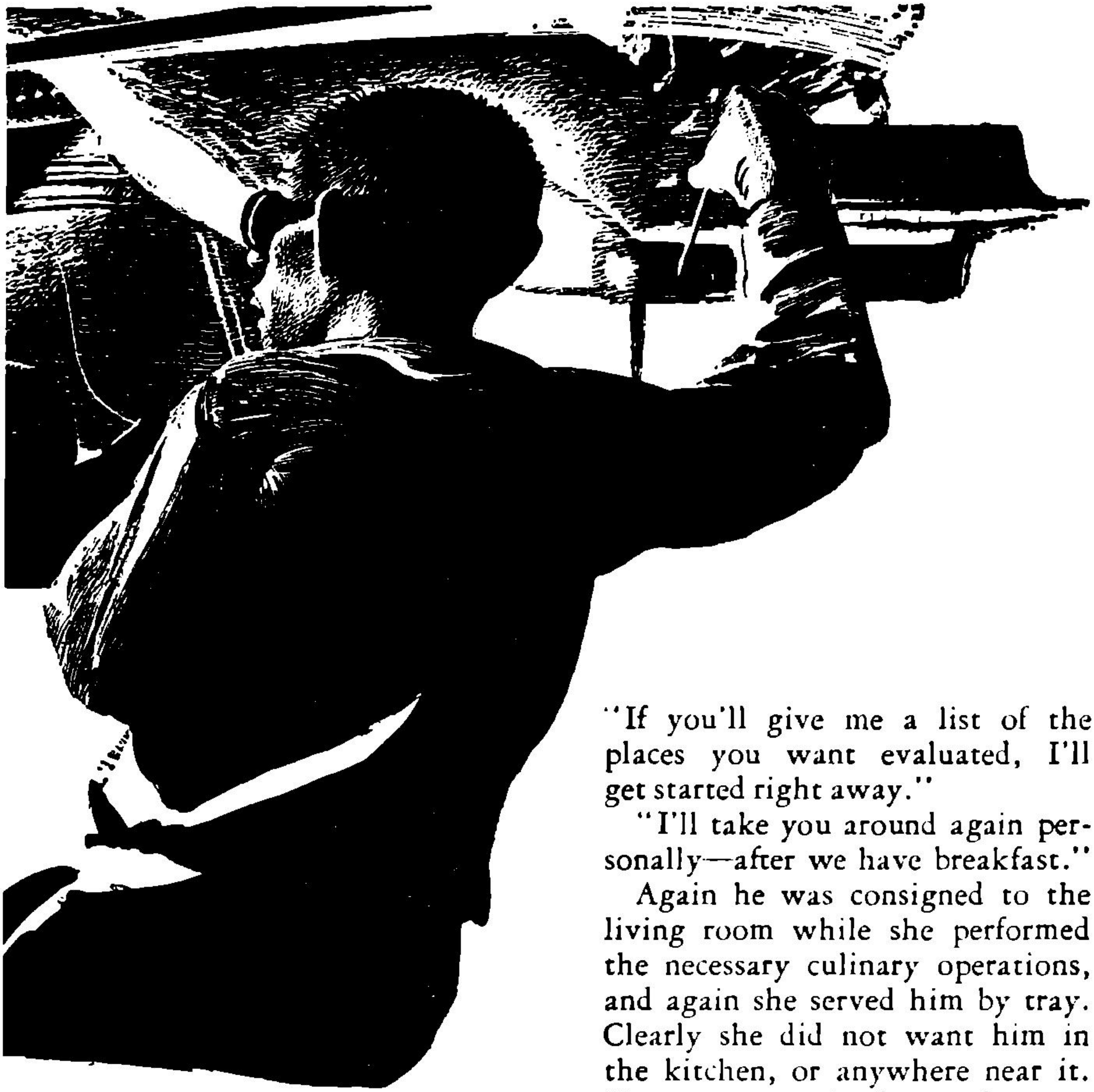


Zarathustra at his heels. A double door leading off the dining room barred his way and proved to be locked. Frowning, he returned to the living room. "All right," he said to Zarathustra, "we'll go out the front way then."

He walked around the side of the house, his canine companion trotting beside him. The side yard turned out to be disappointing. It contained no roses—green ones, or any other kind. About all it did contain that was worthy of notice was a dog house—an ancient affair that was much too large for Zarathustra and which probably dated from the days when Judith had owned a larger dog. The yard itself was a mess: the grass hadn't been cut all summer, the shrubbery was ragged, and dead leaves lay everywhere. A similar state of affairs existed next door, and glancing across lots, he saw that the same desuetude prevailed throughout the entire neighborhood. Obviously the good citizens of Valleyview had lost interest in their real estate long before they had moved out.

At length his explorations led him to the back door. If there were green roses anywhere, the trellis that adorned the small back porch was the logical place for them to be. He found nothing but bedraggled Virginia creeper and more dead leaves.

He tried the back door, and finding it locked, circled the rest of the way around the house. Judith was waiting for him on the front porch. "How nice of you to walk Zarathustra," she said icily. "I



do hope you found the yard in order."

The yellow dress she was wearing did not match the tone of her voice, and the frilly blue apron tied round her waist belied the frostiness of her gray-green eyes. Nevertheless, her rancor was real. "Sorry," he said. "I didn't know your back yard was out of bounds." Then,

"If you'll give me a list of the places you want evaluated, I'll get started right away."

"I'll take you around again personally—after we have breakfast."

Again he was consigned to the living room while she performed the necessary culinary operations, and again she served him by tray. Clearly she did not want him in the kitchen, or anywhere near it. He was not much of a one for mysteries, but this one was intriguing him more and more by the minute.

Breakfast over, she told him to wait on the front porch while she did the dishes, and instructed Zarathustra to keep him company. She had two voices: the one she used in addressing Zarathustra contained overtones of summer, and the one she used in addressing

Philip contained overtones of fall. "Some day," Philip told the little dog, "that chip she carries on her shoulder is going to fall off of its own accord, and by then it will be too late—the way it was too late for me when I found out that the person I'd been running away from all my life was myself in wolf's clothing."

"Ruf," said Zarathustra, looking up at him with benign golden eyes. "Ruf-ruf!"

Presently Judith re-appeared, sans apron, and the three of them set forth into the golden October day. It was Philip's first experience in evaluating an entire village, but he had a knack for estimating the worth of property, and by the time noon came around, he had the job half done. "If you people had made even half an effort to keep your places up," he told Judith over cold-cut sandwiches and coffee in her living room, "we could have asked for a third again as much. Why in the world did you let everything go to pot just because you were moving some place else?"

She shrugged. "It's hard to get anyone to do housework these days—not to mention gardening. Besides, in addition to the servant problem, there's another consideration—human nature. When you've lived in a shack all your life and you suddenly acquire a palace, you cease caring very much what the shack looks like."

"Shack!" Philip was indignant. "Why, this house is lovely! Practically every house you've shown me is lovely. Old, yes—but oldness is an essential part of the loveliness of houses. If Pfleugersville is on the order of most housing developments I've seen, you and your neighbors are going to be good and sorry one of these fine days!"

"But Pfleugersville isn't on the order of most housing developments you've seen. In fact, it's not a housing development at all. But let's not go into that. Anyway, we're concerned with Valleyview, not Pfleugersville."

"Very well," Philip said. "This afternoon should wind things up so far as the appraising goes."

That evening, after a coffee-less supper—both the gas and the water had been turned off that afternoon—he totaled up his figures. They made quite a respectable sum. He looked across the coffee table, which he had commandeered as a desk, to where Judith, with the dubious help of Zarathustra, was sorting out a pile of manila envelopes which she had placed in the middle of the living-room floor. "I'll do my best to sell everything," he said, "but it's going to be difficult going till we get a few families living here. People are reluctant about moving into empty neighborhoods, and businessmen aren't keen about opening up business places before the customers are available. But I think it'll work out all right. There's a plaza not

far from here that will provide a place to shop until the local markets are functioning, and Valleyview is part of a centralized school district." He slipped the paper he had been figuring on into his brief case, closed the case and stood up. "I'll keep in touch with you."

Judith shook her head. "You'll do nothing of the sort. As soon as you leave, I'm moving to Pfleugersville. My business here is finished."

"I'll keep in touch with you there then. All you have to do is give me your address and phone number."

She shook her head again. "I could give you both, but neither would do you any good. But that's beside the point. Valleyview is your responsibility now—not mine."

Philip sat back down again. "You can start explaining any time," he said.

"It's very simple. The property owners of Valleyview signed all of their houses and places of business over to me. I, in turn, have signed all of them over to you—with the qualification, of course, that after selling them you will be entitled to no more than your usual commission." She withdrew a paper from one of the manila envelopes. "After selling them," she went on, "you are to divide the proceeds equally among the four charities specified in this contract." She handed him the paper. "Do you understand now why I tried so hard to find a trustworthy agent?

Philip was staring at the paper, unable, in his astonishment, to read the words it contained. "Suppose," he said presently, "that circumstances should make it impossible for me to carry out my end of the agreement?"

"In case of illness, you will already have taken the necessary steps to transfer the property to another agent who, in your opinion, is as completely honest as you are, and in case of death, you will already have taken the necessary steps to bequeath the property to the same agent; and he, in both cases, will already have agreed to the terms laid down in the contract you're holding in your hands. Why don't you read it?"

Now that his astonishment had abated somewhat, Philip found that he could do so. "But this still doesn't make sense," he said a short while later. "Obviously you and the rest of the owners have purchased new houses. Would it be presumptuous of me to ask how you're going to pay for them when you're virtually giving your old houses away?"

"I'm afraid it would be, Mr. Myles." She withdrew another paper from the envelope and handed it to him. "This is the other copy. If you'll kindly affix your signature to both, we can bring our business to a close. As you'll notice, I've already signed."

"But if you're going to be in-

communicado," Philip pointed out, anger building up in him despite all he could do to stop it, "what good will your copy do you?"

Judith's countenance took on a glacial quality. So did her voice. "My copy will go into the hands of a trusted attorney, sealed in an envelope which I have already instructed him not to open till five years from this date. If, at the time it is opened, you have violated the terms of our agreement, he will institute legal proceedings at once. Fortunately, although the Valley-view post office is closed, a mail truck passes through every week-day evening at eight. It's not that I don't trust you, Mr. Myles—but you are a man, you know."

Philip was tempted to tear up the two copies then and there, and toss the pieces into the air. But he didn't, for the very good reason that he couldn't afford to. Instead, he bore down viciously on his pen and brought his name to life twice in large and angry letters. He handed Judith one copy, slipped the other into his breast pocket and got to his feet. "That," he said, "brings our official business to a close. Now I'd like to add an unofficial word of advice. It seems to me that you're exacting an exorbitant price from the world for your husband's having sold you out for a brunette and a red-head and a pint of Scotch. I've been sold out lots of times for less than that, but I found out long ago that the world doesn't pay its bills even when you ask a fair price for the damages done to you. I suggest that you write the matter off as a bad debt and forget about it; then maybe you'll become a human being again."

She had risen to her feet and was standing stiffly before him. She put him in mind of an exquisite and fragile statue, and for a moment he had the feeling that if he were to reach out and touch her, she would shatter into a million pieces. She did not move for some time, nor did he; then she bent down, picked up three of the manila envelopes, straightened, and handed them to him. "Two of these contain the deeds, maps and other records you will need," she said in a dead voice. "The third contains the keys to the houses and business places. Each key is tagged with the correct address. Good-by, Mr. Myles."

"Good-by," Philip said

He looked around the room intending to say good-by to Zarathustra, but Zarathustra was nowhere to be seen. Finally he went into the hall, opened the front door and stepped out into the night. A full moon was rising in the east. He walked down the moonlit walk, climbed into his car and threw his brief case and the manila envelopes into the back seat. Soon, Valley-view was far behind him.

But not as far as it should have been. He couldn't get the green rose out of his mind. He couldn't get Judith Darrow out of his mind either. Nor could he exorcise the

summer breeze that kept wafting through the crevices in his common sense.

A green rose and a grass widow and a breeze with a green breath. A whole town taking off for greener pastures . . .

He reached into his coat pocket and touched the rose. It was no more than a stem and a handful of petals now, but its reality could not be denied. But roses do not bloom in autumn, and green roses do not bloom at all—

"Ruf!"

He had turned into the new highway some time ago, and was driving along it at a brisk sixty-five. Now, disbelievingly, he slowed, and pulled over onto the shoulder. Sure enough, he had a stowaway in the back seat—a tawny-haired stowaway with golden eyes, oversized ears, and a restless, white-tipped tail. "Zarathustra!" he gasped. "How in the dickens did you get in there?"

"Ruf," Zarathustra replied.

Philip groaned. Now he would have to go all the way back to Valleyview. Now he would have to see Judith Darrow again. Now he would have to—He paused in midthought, astonished at the abrupt acceleration of his heartbeat. "Well I'll be damned!" he said, and without further preamble transferred Zarathustra to the front seat, U-turned, and started back.

The gasoline lantern had been moved out of the living-room window, but a light still showed beyond the panes. He pulled over to the curb and turned off the ignition. He gave one of Zarathustra's oversized ears a playful tug, absently noting a series of small nodules along its lower extremity. "Come on, Zarathustra," he said. "I may as well deliver you personally while I'm at it."

After locking the car, he started up the walk, Zarathustra at his heels. He knocked on the front door. Presently he knocked again. The door creaked, swung partially open. He frowned. Had she forgotten to latch it? he wondered. Or had she deliberately left it unlatched so that Zarathustra could get in? Zarathustra himself lent plausibility to the latter conjecture by rising up on his hind legs and pushing the door the rest of the way open with his forepaws, after which he trotted into the hall and disappeared.

Philip pounded on the panels. "Miss Darrow!" he called. "Judith!"

No answer. He called again. Still no answer.

A summer breeze came traipsing out of the house and engulfed him in the scent of roses. What kind of roses? he wondered. Green ones?

He stepped into the hall and closed the door behind him. He made his way into the living room. The two chairs were gone, and so was the coffee table. He walked through the living room and into

the library; through the library and into the dining room. The gasoline lantern burned brightly on the dining-room table, its harsh white light bathing bare floors and naked walls.

The breeze was stronger here, the scent of roses almost cloying. He saw then that the double door that had thwarted him that morning was open, and he moved toward it across the room. As he had suspected, it gave access to the kitchen. Pausing on the threshold, he peered inside. It was an ordinary enough kitchen. Some of the appliances were gone, but the stove and the refrigerator were still there. The back doorway had an odd bluish cast that caused the framework to shimmer. The door itself was open, and he could see starlight lying softly on fields and trees.

Wonderingly he walked across the room and stepped outside. There was a faint sputtering sound, as though live wires had been crossed, and for a fleeting second the scene before him seemed to waver. Then, abruptly, it grew still.

He grew still, too—immobile in the strange, yet peaceful, summer night. He was standing on a grassy plain, and the plain spread out on either hand to promontories of little trees. Before him, the land sloped gently upward, and was covered with multicolored flowers that twinkled like microcosmic stars. In the distance, the lights of a village showed. To his right, a riotous green-rose bush bloomed, and beneath it Zarathustra sat, wagging his tail.

Philip took two steps forward, stopped and looked up at the sky. It was wrong somehow. For one thing, Cassiopeia had changed position, and for another, Orion was awry. For still another, there were no clouds for the moon to hide behind, and yet the moon had disappeared.

Zarathustra trotted over to where he was standing, gazed up at him with golden eyes, then headed in the direction of the lights. Philip took a deep breath, and followed him. He would have visited the village anyway, Zarathustra or no Zarathustra. Was it Pfleugersville? He knew suddenly that it was.

He had not gone far before he saw a highway. A pair of headlights appeared suddenly in the direction of the village and resolved rapidly into a moving van. To his consternation, the van turned off the thoroughfare and headed in his direction. He ducked into a coppice, Zarathustra at his heels, and watched the heavy vehicle bounce by. There were two men in the cab, and painted on the paneling of the truckbed were the words, PFLEUGERSVILLE MOVERS, INC.

The van continued on in the direction from which he had come, and presently he guessed its destination. Judith, clearly, was in the

Continued on page 145

The Educated Flatworms

Concerning some m markable research
on the nature of learnin memory—work that has
yielded impossible-sou answers, some of which
seem straight from F s "The Golden Bough"!
And, incidentally, r original contributions
to this wor e been made by
High School Sc Fair project workers.

by Er olmes, M. D.

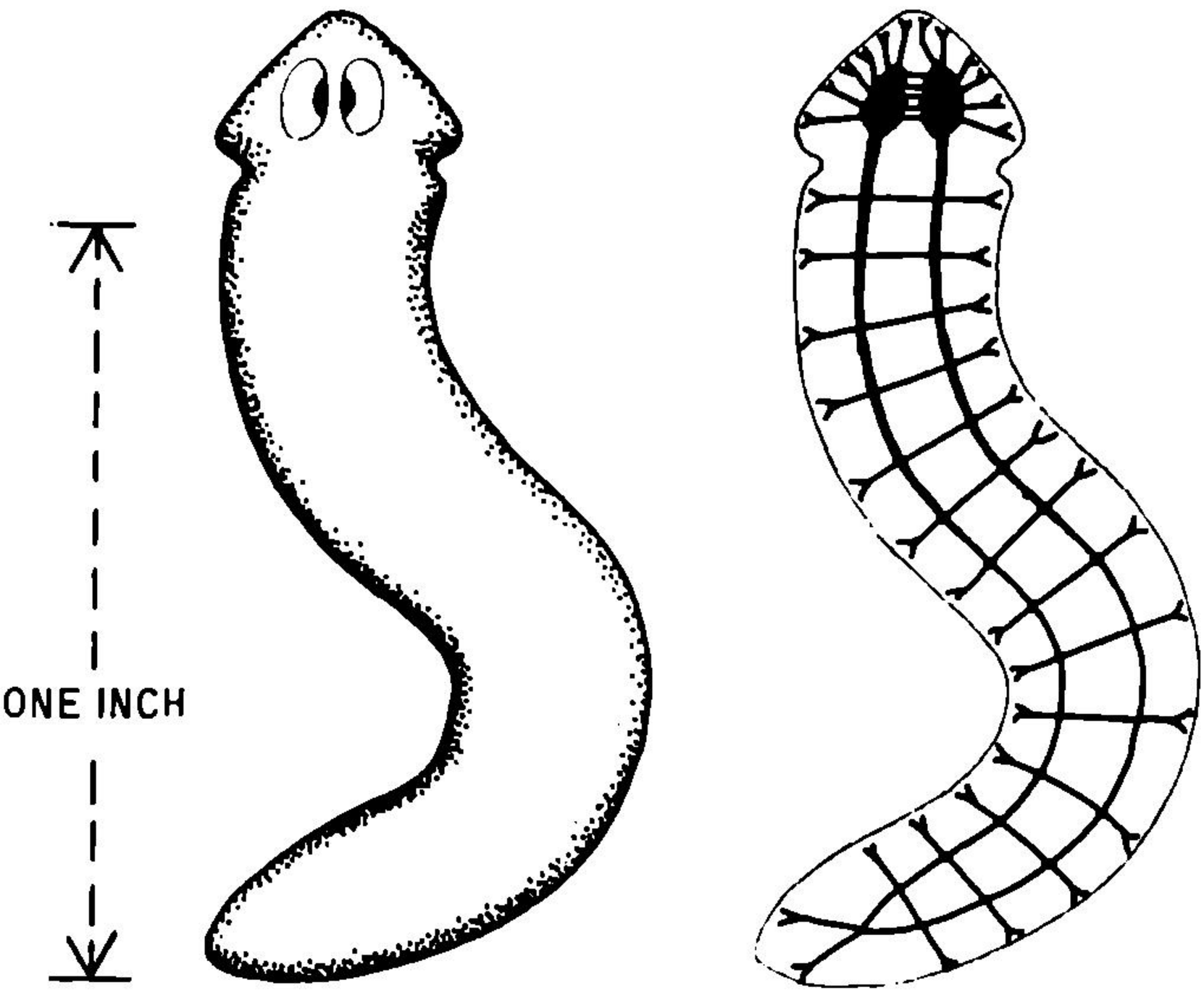
Going up the evolutionary scale from amoeba to man, the flatworms occupy a unique position. In this group of creatures appears for the first time a head with a brain in it. Small wonder, then, that these animals should draw the bemused attention of the psychologist. In 1955 Robert Thompson and James McConnell asked the question: "Can flatworms learn?" And came up with an unequivocal *yes*.[1] Out of this not too startling discovery has mushroomed a field of research psychology so vast that McConnell has had to publish a separate journal for it: *The Worm Runner's Digest, An Informal Journal of Comparative Psychology*.[2]

The trouble with the worms is that in addition to being able to learn they have several other peculiarities. Among these are a fantastic ability to regenerate whole individuals from cut pieces and a strong tendency toward cannibalism. This has led to experiments on the chemical nature of the memory trace and to attempts to answer such age-old and

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[1] Robert Thompson and James McConnell, "Classical Conditioning in the Planarian, Dugesia Dorotocephala," *Journal of Comparative and Physiological Psychology* 48:65–68, 1955.

[2] Published irregularly by The Planaria Research Group, University of Michigan.



Planarian Flatworm
the hero of our tale

dramatic questions as "Do you really need to use your head?" "Can you eat your way to knowledge?" and "Are two heads actually better than one?"

The animal used in these studies is the planarian, an inch-or-less long fellow who lives in fresh pond water. He has an obvious head end with two light sensitive eye spots pigmented to give a cross-eyed appearance. The head also contains the brain and a number of sensory receptors—mostly chemical. His mouth is placed about where the umbilicus would be on a vertebrate and the planarian feeds by extending his pharynx into his food rather like a drinking straw.

Thompson and McConnell conditioned the animals in a trough of water made of a piece of plastic tubing cut lengthwise. At each end of the tube was an electrode connected to a shock generator. A light was turned on over the trough for two seconds and then the animal was given a shock. The response to shock was either a longitudinal contraction of the body or a sideways turn. The planaria were given one hundred fifty trials of paired light and shock. During the first fifty trials they gave an average of 13.8 "conditioned responses." A conditioned response was a turn or contraction during exposure to light alone *before* the shock came on. During the last fifty trials the planaria gave 21.6 conditioned responses—an increase of 7.8 responses which proved to be statistically significant. Three control groups exposed to the apparatus, but not given specific training, showed a decrease in the number of responses to light.

This type of learning is directly comparable to the "classical conditioning" of Pavlov. The sound of a metronome initially produces no salivation in a dog. After pairing with food in a situation in which the metronome starts ticking a few

seconds before food is introduced into the mouth—the food always producing salivation), the metronome alone will cause salivation before the food arrives.[3]

BEFORE TRAINING

	Conditioned Stimulus	*Response*	*Unconditioned Stimulus*	*Unconditioned Response*
Pavlov's dogs	Metronome	?	Food	Salivation
McConnell's worms	Light	?	Shock	Contraction of body

AFTER TRAINING

	Conditioned Stimulus	*Conditioned Response*
Pavlov's dogs	Metronome	Salivation
McConnell's worms	Light	Contraction

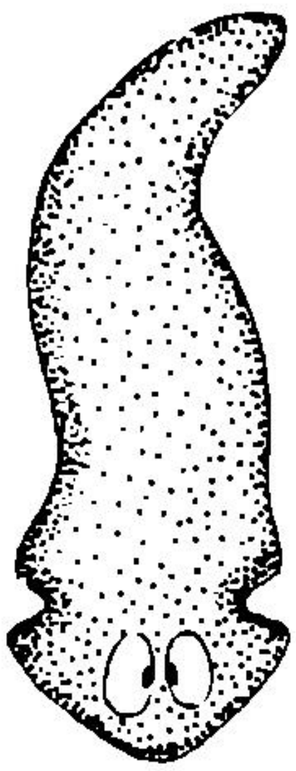
[3] I. P. Pavlov, *Conditioned Reflexes*, page 22. Dover Publications, New York, 1960 (English translation by Anrep).

HEADS OR TALES

Since planaria can regenerate from cut pieces, we can now ask: Where in the animal is the "learning" located? Is it all in the primitive brain?

Planaria reproduce by two methods—sexually, mating in pairs (planaria are hermaphrodites), and by fission. In the latter case the animal merely drops off its tail which grows a new head while the head grows a new tail. Planaria were now trained to respond to light and then cut in half. Each head end grew a new tail and each tail end grew a new head. The original animals were trained to a criteria of twenty-three conditioned responses in twenty-five trials. The regenerated heads and tails were then trained back to the same criteria. Both the "tails" and the "heads" showed the same amount of retention for the conditioned response! As a matter of fact, both groups did as well as a control group which was not cut in half but merely waited during the four weeks the cut planaria were regenerating. Whatever "memory" is, there was as much in the tail as there was in the head or in the whole animal[4]

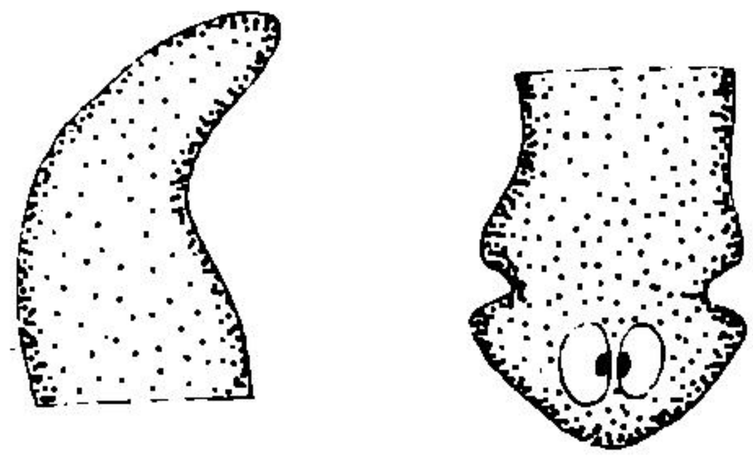
[4] James McConnell, A. L. Jacobson and D. P. Kimble, *Journal of Comparative and Physiological Psychology* 52:1, 1959.



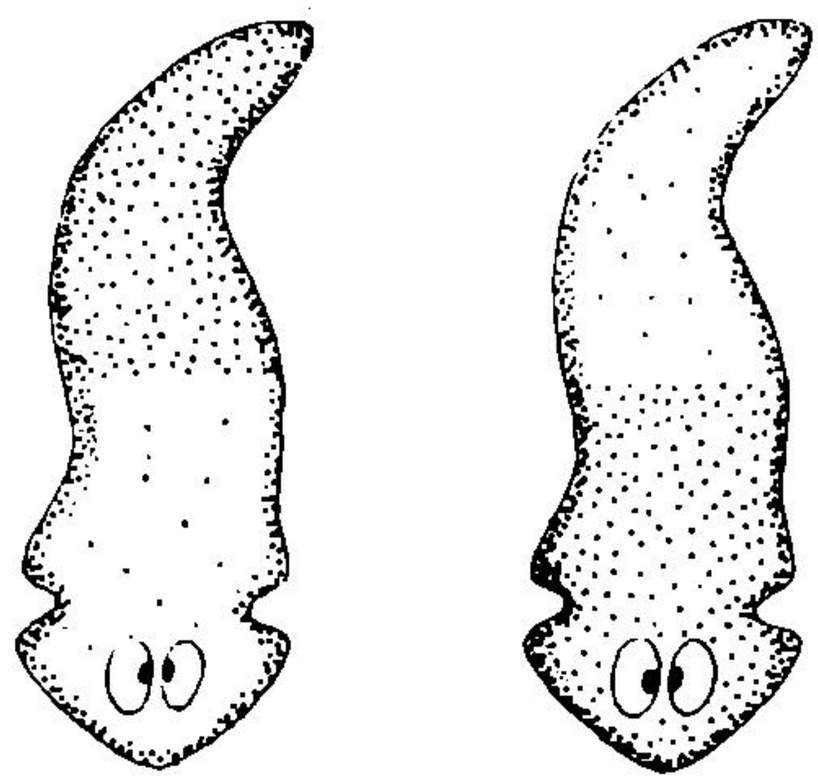
EXPERIMENTAL GROUP

NUMBER OF TRIALS TO CRITERIA
134

CUT IN TWO



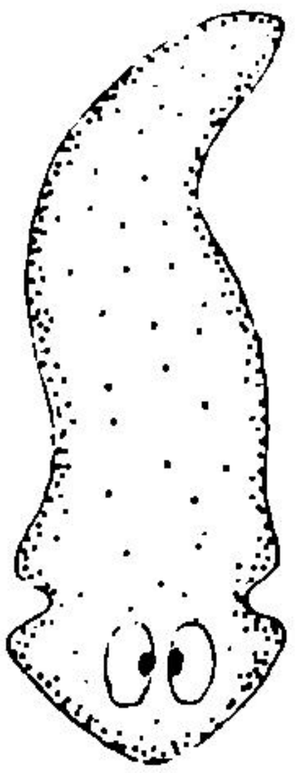
AND ALLOWED TO REGENERATE



RETRAINED TO CRITERIA

TRIALS:
43.2

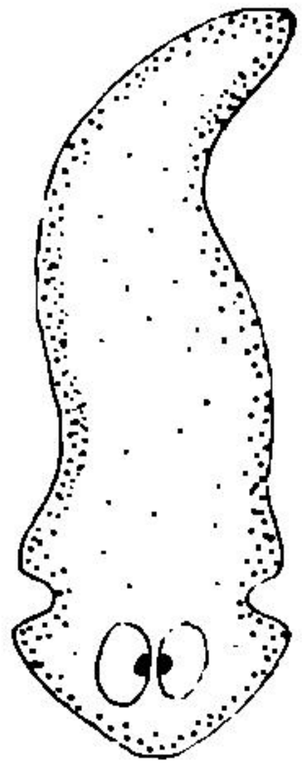
TRIALS:
40.0



CONTROL GROUP

NUMBER OF TRIALS TO CRITERIA
185

ALLOWED TO REST
FOR SAME PERIOD



RETRAINED TO CRITERIA

TRIALS:
39.8

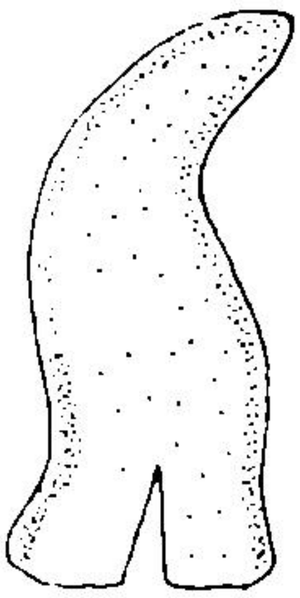
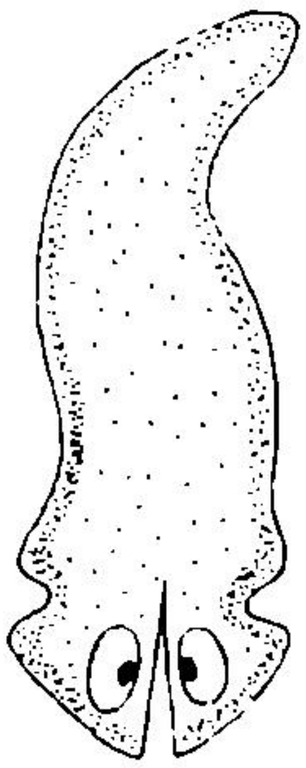
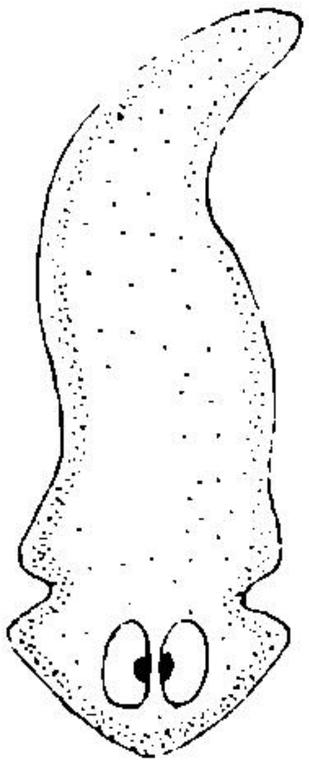
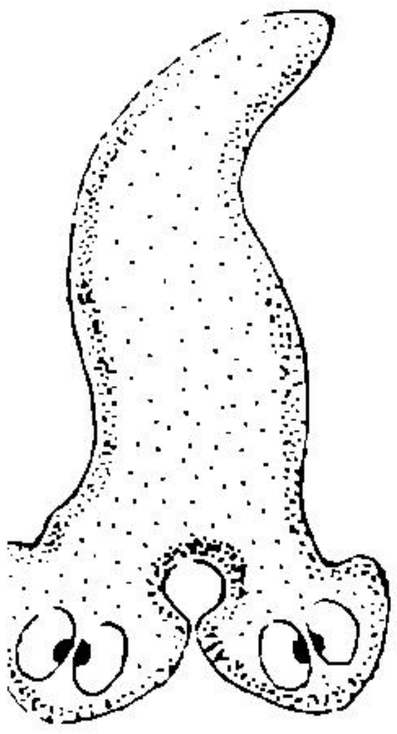
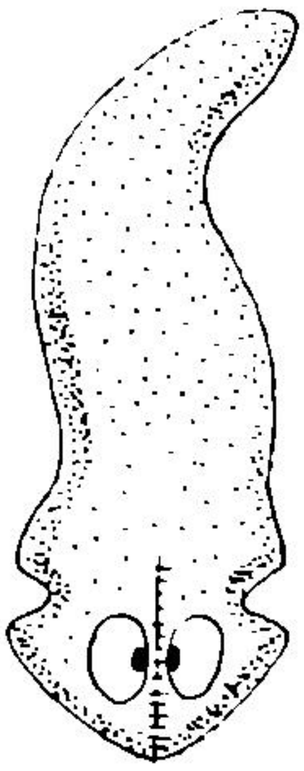
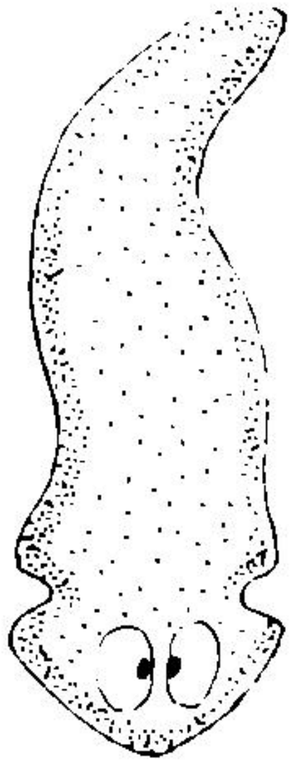
TWO HEADS ARE BETTER THAN ONE

Aside from the unwelcome suggestion that you are at least as smart in the seat of your pants as you are between the ears, this discovery indicated that the memory trace was coded in some way in all of the nervous system equally. Heads, however, are not merely useless appendages to an educated tail—even in planaria. In an ingenious application of the planarian's regenerative ability, Dean Ernhart at Washington University, St. Louis, demonstrated that it is worthwhile having one or more heads.[5]

Ernhart beheaded a group of worms and sectioned the "neck" so that the regenerating animals grew two complete heads. There were two control groups—one operated but allowed to heal back into normal one-headed animals, the other unoperated. The planaria were then trained in the light-shock apparatus until they gave seventeen conditioned responses in twenty trials.

At three weeks the normal controls were better than both operated groups. After six weeks of recovery, however, the

[5] D. E. Ernhart, "An Informal Report on Two Heads Being Better Than One," *The Worm Runner's Digest* II:3, page 92, 1960.

EXPERIMENTAL ANIMALS	OPERATED CONTROLS	NORMAL CONTROLS
		
BEHEADED AND NECK SPLIT	HEAD SPLIT	UNOPERATED
		
SIX WEEKS LATER		
REGENERATE TWO HEADS	HEALED TO NORMAL APPEARANCE	REMAIN NORMAL
NOW ALL ANIMALS TRAINED TO CRITERIA		
TRIALS TO CRITERIA 104	TRIALS TO CRITERIA 135	TRIALS TO CRITERIA 131

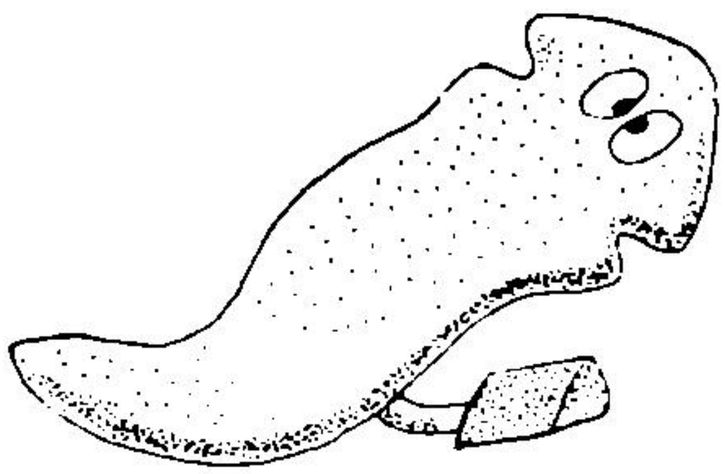
YOU ARE WHAT YOU EAT

two-headed worms were significantly faster learners than either of the control groups! Although admitting that he had demonstrated two heads to be better than one, Ernhart hastened to suggest that the difference might be due to the double number of eye spots in the experimental animals, making them more sensitive to the light stimulus.

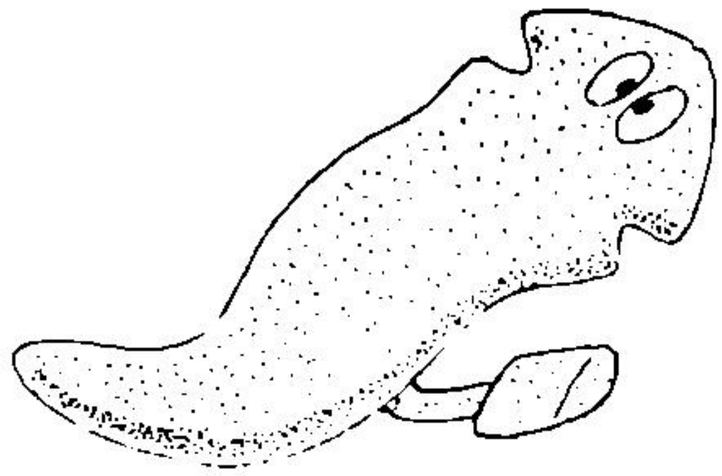
The motto inscribed below the coat of arms emblazoned on the cover of *The Worm Runner's Digest* is: "Ignotum per Ignotius" which is loosely translated: "The unknown explained through the still more unknown." In keeping with this credo the worm runners turned to an examination of the nature of the memory trace. Apparently it could be localized anywhere in the worm's body. What other attributes could be ascribed to the trace?

It turned out to be eatable. The cannibalism of planaria has been mentioned. Worms were chopped up and fed to other animals. Some were fed worms that had been trained in the light-shock apparatus, some were fed worms with no experience. The planaria fed educated food did better on their first day in the conditioning trough than the control planaria. By the

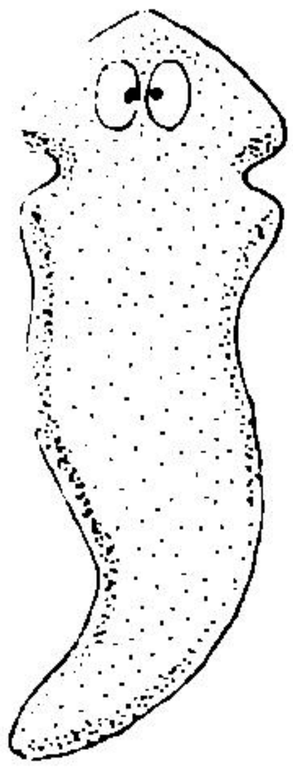
EXPERIMENTAL CANNIBALS



CONTROL CANNIBALS

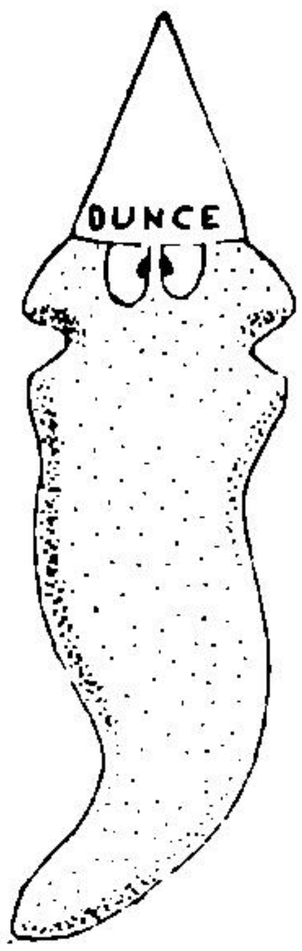


FED CONDITIONED PLANARIA



TESTED NEXT DAY:

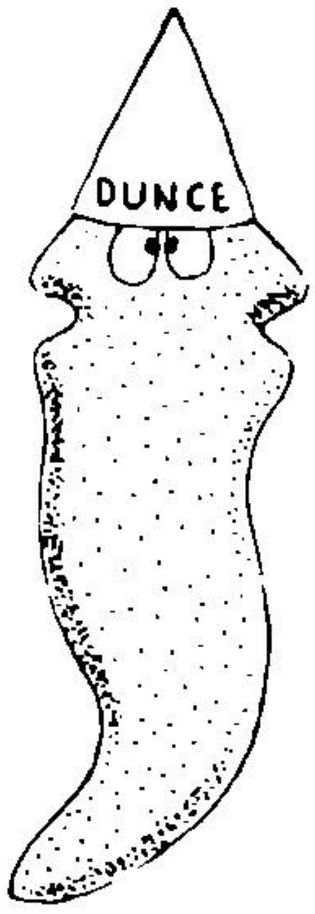
13.0 RESPONSES IN 25 TRIALS



TESTED SECOND DAY

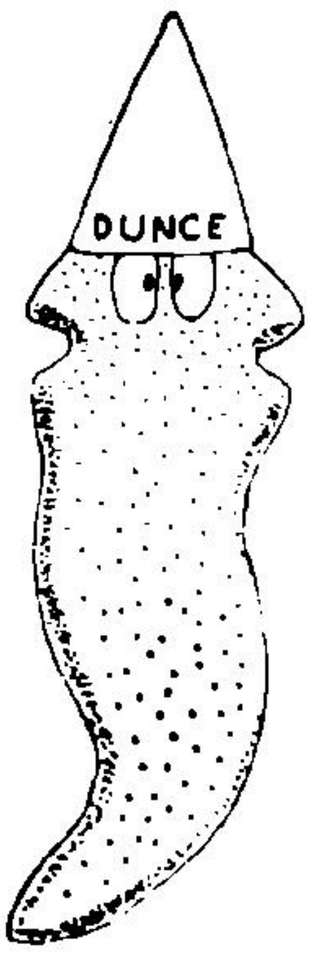
6.4 RESPONSES IN 25 TRIALS

FED UNTRAINED PLANARIA



TESTED NEXT DAY:

5.9 RESPONSES IN 25 TRIALS



TESTED SECOND DAY

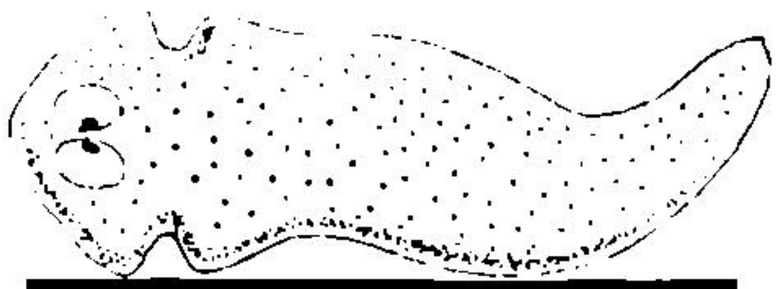
6.2 RESPONSES IN 25 TRIALS

second or third day this advantage seems to have worn off.[6]

Experiments like this suggest that the memory trace—at least in flatworms—may be coded on some specific chemical. The most obvious candidate for this job would be the nucleic acids. These long chained molecules have recently been implicated as the carriers of hereditary traits in the cell nucleus and as the "mold" or "template" on which proteins are formed. Alterations in the long nucleic acid molecules, then, might alter the entire behavior of the cell, although the specific mechanisms involved are still largely unknown.

Two major varieties of nucleic acids have been described, and one of these, ribonucleic acid, is the most likely candidate for the title of "memory molecule." In addition, there is available an enzyme, ribonuclease, which destroys it, W. C. Corning and E. R. John, at the University of Rochester,

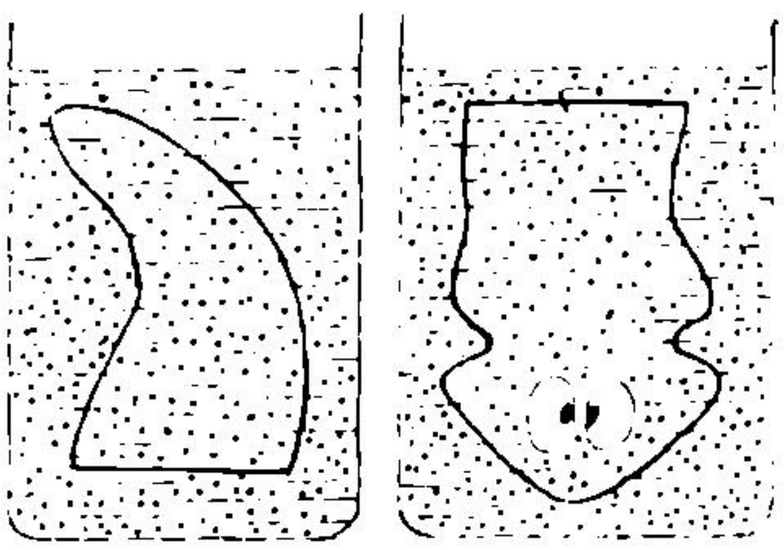
[6] Barbara Humphries and Reeva Jacobsen. "The Effect of Ingestion of Conditioned Planaria on the Response Level of Naive Planaria II," *The Worm Runner's Digest* III:3 page 165, 1961.



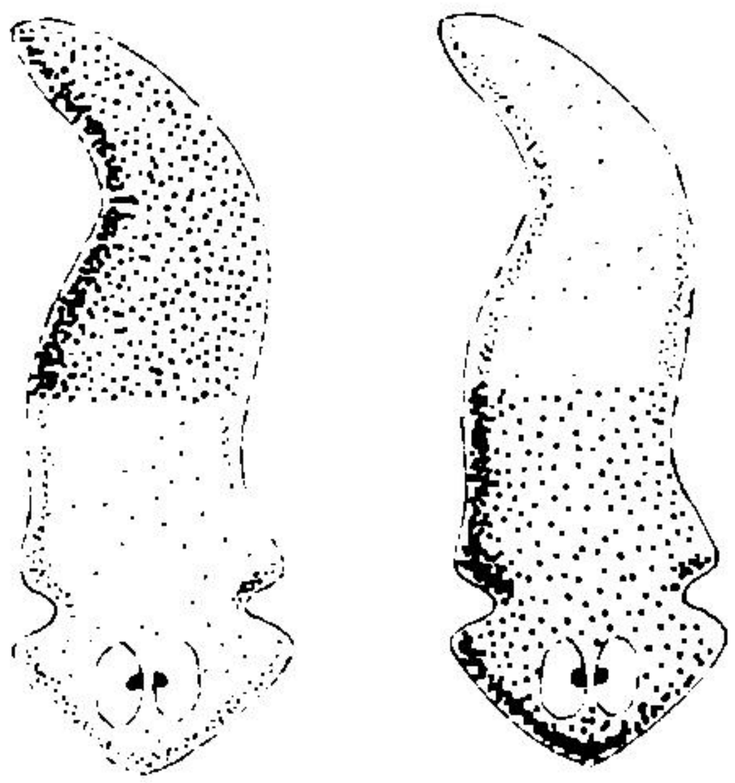
EXPERIMENTAL GROUP

TRIALS TO CRITERIA 500.8

CUT IN TWO

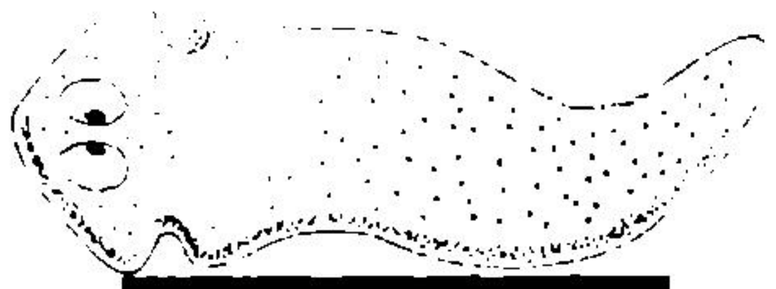


REGENERATE IN POND WATER WITH ADDED ENZYME RIBONUCLEASE



PERCENTAGE OF RESPONSES ON FIRST DAY OF RETESTING:

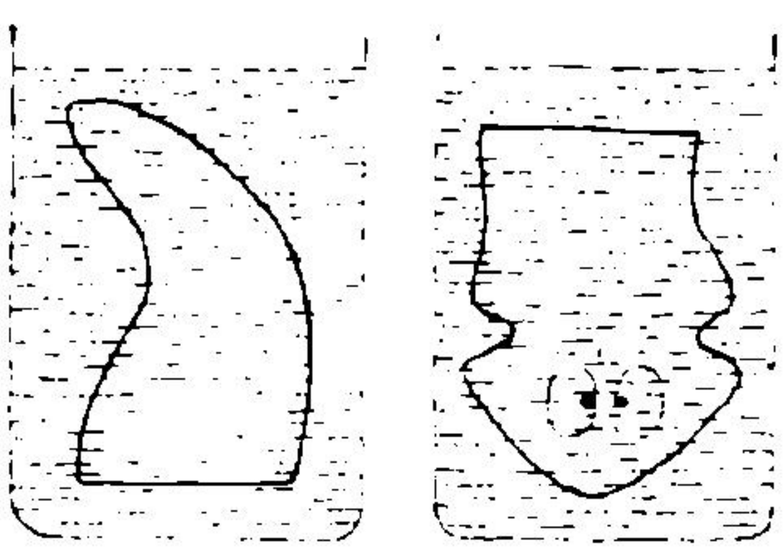
"TAILS"	"HEADS"
16.2%	46.6%



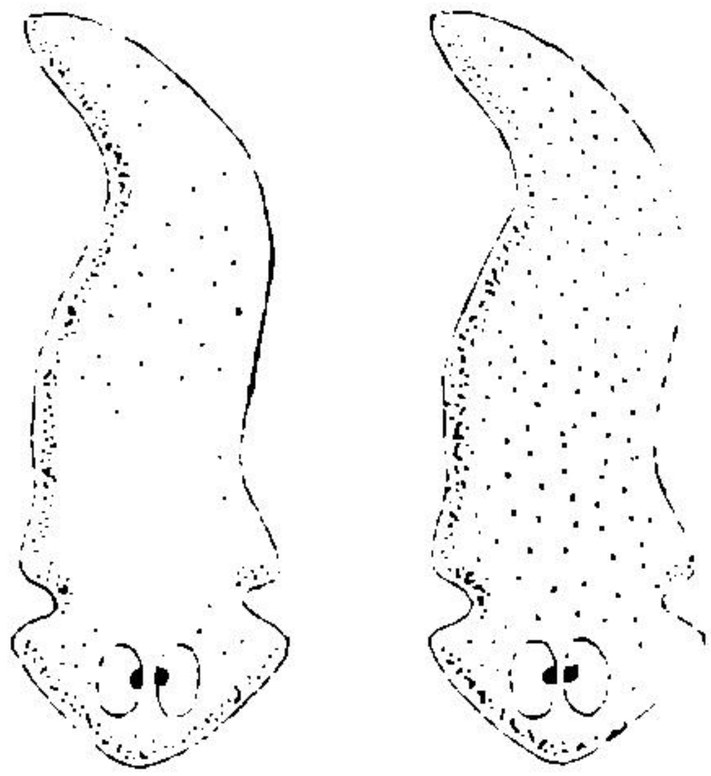
CONTROL GROUP

TRIALS TO CRITERIA 512.4

CUT IN TWO



REGENERATE IN POND WATER WITH NO ADDED ENZYME



PERCENTAGE OF RESPONSES ON FIRST DAY OF RETESTING:

"TAILS"	"HEADS"
37.4%	42.8%

used this enzyme on regenerating planaria heads and tails. The animals were first trained to a criteria of thirty-four conditioned responses out of forty consecutive trials. Then they were cut in half and the heads and tails allowed to regenerate over a two-week period in pond water containing the ribonuclease enzyme. On retesting, the head ends showed as many conditioned responses as a control group which had regenerated in normal water. The tail ends, however, showed a significantly poorer performance than the head ends or the control tails. It looked as if the memory trace had been "erased" from the regenerating tails but not from the heads. This would make it appear that the tail can hold a memory as well as the head, but the memory must get to the head in order to be effective.

Corning and John conclude that the experiment does not prove, but certainly suggests, that ribonucleic acid is responsible for the memory trace. Experiments involving injecting ribonuclease into the brains of higher animals have been inconclusive but also suggestive of memory loss.[7]

[7] W. C. Corning and E. R. John, "Effect of Ribonuclease on Retention of Conditioned Response in Regenerated Planarians," *Science* 134:1363-65, 27 Oct. 1961.

The ribonuclease treated animals are not normal. As might be expected from tinkering with a mechanism related to heredity, some of the worms were deformed. At lower levels of enzyme in the water, Corning and John could see no obvious abnormalities in the worms. It remains possible, of course, that the regenerated brains were improperly put together. However, all the regenerated planaria were able to relearn the conditioned response to the same criteria they had previously reached.

Any study which promises to shed light on the problem of memory is obviously worth pursuing. Planaria have now been taught to turn to one side in a T-shaped maze and further demands on their intellect are being made by the contributors to *The Worm Runner's Digest*.

It would, of course, be most interesting to know if the second generation of worms generated by sexual reproduction —rather than fission or regeneration of cut halves—would also show retention of learning. This doctrine of "transmission of acquired characteristics" is generally said to be disproved, but it has not yet been tested with flatworms. One ugly rumor from the worm-running laboratories is that educated planaria

will not mate. If true, this discovery also deserves further investigation. At any rate, the psychology of worms, certainly one of the newest branches of science, seems destined to a long and brilliant future. ■

The most recent issue of The Worm Runner's Digest *contains the opening lines of the next chapter of this remarkable story. Dr. James McConnell's Ph.D. is still quite new—yet the fundamental importance of the work he got started has been very rapidly established. The High School Science Fair projects of many youngsters supplied masses of solid, useful data—and led to more university-level studies.*

This past summer, Dr. McConnell has been working with not one, but two Nobel Prize winners, who are now seeking to carry through the problem of identifying the chemical entities that are involved in this "heritable and digestible memory" phenomenon. Dr. Levin Calvin, Nobel Laureate in Chemistry in 1961, and Dr. Donald Glaser, the originator of the bubble-chamber, are now joining the Society of Worm Runners.

The Editor.

Anchorite

**There are two basic kinds of fools—
the ones who know they are fools, and
the kind that, because they do not know that,
are utterly deadly menaces!**

by Johnathan Blake Mackenzie

Illustrated by Schelling

■ The mountain was spinning.

Not dizzily, not even rapidly, but very perceptibly, the great mass of jagged rock was turning on its axis.

Captain St. Simon scowled at it. "By damn, Jules," he said, "if you can see 'em spinning, it's too damn fast!" He expected no answer, and got none.

He tapped the drive pedal gently with his right foot, his gaze shifting alternately from the instrument board to the looming hulk of stone before him. As the little spacecraft moved in closer, he tapped the reverse pedal with his left foot. He was now ten meters from the surface of the asteroid. It was moving, all right. "Well, Jules," he said in his most commanding voice, "we'll see just how fast she's moving. Prepare to fire Torpedo Number One!"

"Yassuh, boss! Yassuh, Cap'n Sain' Simon, suh! All ready on the firin' line!"

He touched a button with his right thumb. The ship quivered almost imperceptibly as a jet of liquid leaped from the gun mounted in the nose of the ship. At the same time, he hit the reverse pedal and backed the ship away from the





asteroid's surface. No point getting any more gunk on the hull than necessary.

The jet of liquid struck the surface of the rotating mountain and splashed, leaving a big splotch of silvery glitter. Even in the vacuum of space, the silicone-based solvents of the paint vehicle took time to boil off.

"How's that for pinpoint accuracy, Jules?"

"Veddy good, M'lud. Top hole, if I may say so, m'lud."

"You may." He jockeyed the little spacecraft around until he was reasonably stationary with respect to the great hunk of whirling rock and had the silver-white blotch centered on the crosshairs of the peeper in front of him. Then he punched the button that started the timer and waited for the silver spot to come round again.

The asteroid was roughly spherical—which was unusual, but not remarkable. The radar gave him the distance from the surface of the asteroid, and he measured the diameter and punched it through the calculator. "Observe," he said in a dry, didactic voice. "The diameter is on the order of five times ten to the fourteenth micromicrons." He kept punching at the calculator. "If we assume a mean density of two point six six times ten to the minus thirty-sixth metric tons per cubic micromicron, we attain a mean mass of some one point seven four times ten to the eleventh kilograms." More punching, while he kept his eye on the meteorite, waiting for the spot to show up again. "And that, my dear Jules, gives us a surface gravity of approximately two times ten to the minus sixth standard gees.

"*Jawohl, Herr Oberstleutnant.*"

"Und zo, mine dear Chules, ve haff at least der grave zuspicion dot der zurface gravity iss less dan der zentrifugal force at der eqvator! *Nein? Ja!* Zo."

"*Jawohl, Herr Konzertmeister.*"

Then there was a long, silent wait, while the asteroid went its leisurely way around its own axis.

"There it comes," said Captain St. Simon. He kept his eyes on the crosshair of the peeper, one hand over the timer button. When the silver splotch drifted by the crosshair, he punched the stop button and looked at the indicator.

"Sixteen minutes, forty seconds. How handy." He punched at the calculator again. "Ah! You see, Jules! Just as we suspected! Negative gees at the surface, on the equator, comes to ten to the minus third standard gees—almost exactly one centimeter per second squared. So?"

"Ah, so, honorabu copton! Is somesing rike five hundred times as great as gravitationar attraction, is not so?"

"Sukiyaki, my dear chap, sometimes your brilliance amazes me."

Well, at least it meant that there would be no loose rubble on the surface. It would have been tossed off long ago by the centrifugal force, flying off on a tangent to

become more of the tiny rubble of the belt. Perhaps "flying" wasn't exactly the right word, though, when applied to a velocity of less than one centimeter per second. *Drifting* off, then.

"What do you think, Jules?" said St. Simon.

"Waal, Ah reckon we can do it, cap'n. Ef'n we go to the one o' them thar poles . well, let's see—" He leaned over and punched more figures into the calculator. "Ain't that purty! 'Cordin' ter this, thar's a spot at each pole, 'bout a meter in diameter, whar the gee-pull is *greater* than the centry-foogle force!"

Captain St. Simon looked at the figures on the calculator. The forces, in any case, were negligibly small. On Earth, where the surface gravity was ninety-eight per cent of a Standard Gee, St. Simon weighed close to two hundred pounds. Discounting the spin, he would weigh about four ten-thousandths of a pound on the asteroid he was inspecting. The spin at the equator would try to push him off with a force of about two tenths of a pound.

But a man who didn't take those forces into account could get himself killed in the Belt.

"Very well, Jules," he said, "we'll inspect the poles."

"Do you think they vill velcome us in Kraukau, *Herr Erzbischof?*"

The area around the North Pole —defined as that pole from which the body appears to be spinning counterclockwise—looked more suitable for operations than the South Pole. Theoretically, St. Simon could have stopped the spin, but that would have required an energy expenditure of some twenty-three thousand kilowatt-hours in the first place, and it would have required an anchor to be set somewhere on the equator. Since his purpose in landing on the asteroid was to set just such an anchor stopping the spin would be a waste of time and energy.

Captain St. Simon positioned his little spacecraft a couple of meters above the North Pole. It would take better than six minutes to fall that far, so he had plenty of time. "Perhaps a boarding party, Mr. Christian! On the double!"

"Aye, sir! On the double it is, sir!"

St. Simon pushed himself over to the locker, took out his vacuum suit, and climbed into it. After checking it thoroughly, he said: "Prepare to evacuate main control room, Mr. Christian!"

"Aye, aye, Sir! All prepared and ready. I hope."

Captain St. Simon looked around to make sure he hadn't left a bottle of coffee sitting somewhere. He'd done that once, and the stuff had boiled out all over everywhere when he pulled the air out of the little room. Nope, no coffee. No obstacles to turning on the pump. He thumbed the button, and the pumps started to whine. The whine

built up to a crescendo, then began to die away until finally it could only be felt through the walls or floor. The air was gone.

Then he checked the manometer to make sure that most of the air had actually been pumped back into the reserve tanks. Satisfied, he touched the button that would open the door. There was a faint jar as the remaining wisps of air shot out into the vacuum of space.

St. Simon sat back down at the controls and carefully repositioned the ship. It was now less than a meter from the surface. He pushed himself over to the open door and looked out.

He clipped one end of his safety cable to the steel eye-bolt at the edge of the door. "Fasten on carefully, Jules," he said. "We don't want to lose anything."

"Like what, *mon capitain?*"

"Like this spaceship, *mon petit tête de mouton.*"

"Ah, but no, my old and raw; we could not afford to lose the so-dear *Nancy Bell*, could we?"

The other end of the long cable was connected to the belt of the suit. Then St. Simon launched himself out the open door toward the surface of the planetoid. The ship began to drift—very slowly, but not so slowly as it had been falling —off in the other direction.

He had picked the spot he was aiming for. There was a jagged hunk of rock sticking out that looked as though it would make a good handhold. Right nearby, there was a fairly smooth spot that would do to brake his "fall". He struck it with his palm and took up the slight shock with his elbow while his other hand grasped the outcropping.

He had not pushed himself very hard. There is not much weathering on the surface of an asteroid. Micrometeorites soften the contours of the rock a little over the millions of millennia, but not much, since the debris in the Belt all has roughly the same velocity. Collisions do occur, but they aren't the violent smashes that make the brilliant meteor displays of Earth. (And there is still a standing argument among the men of the Belt as to whether that sort of action can be called "weathering".) Most of the collisions tend to cause fracturing of the surface, which results in jagged edges. A man in a vacuum suit does not push himself against a surface like that with any great velocity.

St. Simon knew to a nicety that he could propel himself against a bed of nails and broken glass at just the right velocity to be able to stop himself without so much as scratching his glove. And he could see that there was no ragged stuff on the spot he had selected. The slanting rays of the sun would have made them stand out in relief.

Now he was clinging to the surface of the mountain of rock like a bug on the side of a cliff. On a nickel-iron asteroid, he could have

walked around on the surface, using the magnetic soles of his vacuum suit. But silicate rock is notably lacking in response to that attractive force. No soul, maybe.

But directly and indirectly, that lack of response to magnetic forces was the reason for St. Simon's crawling around on the surface of that asteroid. Directly, because there was no other way he could move about on a nonmetallic asteroid. Indirectly, because there was no way the big space tugs could get a grip on such an asteroid, either.

The nickel-iron brutes were a dead cinch to haul off to the smelters. All a space tug had to do was latch on to one of them with a magnetic grapple and start hauling. There was no such simple answer for the silicate rocks.

The nickel-iron asteroids were necessary. They supplied the building material and the major export of the Belt cities. They averaged around eighty to ninety per cent iron, anywhere from five to twenty per cent nickel, and perhaps half a per cent cobalt, with smatterings of phosphorous, sulfur, carbon, copper, and chromium. Necessary—but not sufficient.

The silicate rocks ran only about twenty-five per cent iron—in the form of nonmagnetic compounds. They averaged eighteen per cent silicon, fourteen per cent magnesium, between one and one point five per cent each of aluminum, nickel, and calcium, and good-sized dollops of sodium, chromium, phosphorous, manganese, cobalt, potassium, and titanium.

But more important than these, as far as the immediate needs of the Belt cities were concerned, was a big, whopping thirty-six per cent oxygen. In the Belt cities, they had soon learned that, physically speaking, the staff of life was *not* bread. And no matter how carefully oxygen is conserved, no process is one hundred per cent efficient. There will be leakage into space, and that which is lost must be replaced.

There is plenty of oxygen locked up in those silicates; the problem is towing them to the processing plants where the stuff can be extracted.

Captain St. Simon's job was simple. All he had to do was sink an anchor into the asteroid so that the space tugs could get a grip on it. Once he had done that, the rest of the job was up to the tug crew.

He crawled across the face of the floating mountain. At the spot where the North Pole was, he braced himself and then took a quick look around at the *Nancy Bell*. She wasn't moving very fast, he had plenty of time. He took a steel piton out of his tool pack, transferred it to his left hand, and took out a hammer. Then, working carefully, he hammered the piton into a narrow cleft in the rock. Three more of the steel spikes were hammered into the surface, forming a rough quadrilateral around the Pole.

"That looks good enough to me, Jules," he said when he had finished. "Now that we have our little anchors, we can put the monster in."

Then he grabbed his safety line, and pulled himself back to the *Nancy Bell*.

The small craft had floated away from the asteroid a little, but not much. He re-positioned it after he got the rocket drill out of the storage compartment.

"Make way for the stovepipe!" he said as he pushed the drill ahead of him, out the door. This time, he pulled himself back to his drilling site by means of a cable which he had attached to one of the pitons.

The setting up of the drill didn't take much time, but it was done with a great deal of care. He set the four-foot tube in the center of the quadrilateral formed by the pitons and braced it in position by attaching lines to the eyes on a detachable collar that encircled the drill. Once the drill started working, it wouldn't need bracing, but until it did, it had to be held down.

All the time he worked, he kept his eyes on his lines and on his ship. The planetoid was turning under him, which made the ship appear to be circling slowly around his worksite. He had to make sure that his lines didn't get tangled or twisted while he was working.

As he set up the bracing on the six-inch diameter drill, he sang a song that Kipling might have been startled to recognize:

"*To the tables down at Mory's,*
To the place where Louie dwells,
Where it's always double drill and no canteen,
Sit the Whiffenpoofs assembled,
With their glasses raised on high,
And they'll get a swig in Hell from Gunga Din"

When the drill was firmly based on the surface of the planetoid, St. Simon hauled his way back to his ship along his safety line. Inside, he sat down in the control chair and backed well away from the slowly spinning hunk of rock. Now there was only one thin pair of wires stretching between his ship and the drill on the asteroid.

When he was a good fifty meters away, he took one last look to make sure everything was as it should be.

"Stand by for a broadside!"

"Standing by, sir!"

"You may fire when ready, Gridley!"

"Aye, sir! Rockets away!" His forefinger descended on a button which sent a pulse of current through the pair of wires that trailed out the open door to the drill fifty meters away.

A flare of light appeared on the top of the drill. Almost immediately, it developed into a tongue of rocket flame. Then a glow appeared at the base of the drill and flame began to billow out from beneath the tube. The drill began to sink into the surface, and the

planetoid began to move ever so slowly.

The drill was essentially a pair of opposed rockets. The upper one, which tried to push the drill into the surface of the planetoid, developed nearly forty per cent more thrust than the lower one. Thus, the lower one, which was trying to push the drill *off* the rock, was outmatched. It had to back up, if possible. And it was certainly possible; the exhaust flame of the lower rocket easily burrowed a hole that the rocket could back into, while the silicate rock boiled and vaporized in order to get out of the way.

Soon there was no sign of the drill body itself. There was only a small volcano, spewing up gas and liquid from a hole in the rock. On the surface of a good-sized planet, the drill would have built up a little volcanic cone around the lip of the hole, but building a cone like that requires enough gravity to pull the hot matter back to the edge of the hole.

The fireworks didn't last long. The drill wasn't built to go in too deep. A drill of that type could be built which would burrow its way right through a small planetoid, but that was hardly necessary for planting an anchor. Ten meters was quite enough.

Now came the hard work.

On the outside of the *Nancy Bell*, locked into place, was a specially-treated nickel-steel eye-bolt—thirty feet long and eight inches in diameter. There had been ten of them, just as there had been ten drills in the storage locker. Now the last drill had been used, and there was but one eye-bolt left. The *Nancy Bell* would have to go back for more supplies after this job.

The anchor bolts had a mass of four metric tons each. Maneuvering them around, even when they were practically weightless, was no easy job.

St. Simon again matched the velocity of the *Nancy Bell* with that of the planetoid, which had been accelerated by the drill's action. He positioned the ship above the hole which had been drilled into the huge rock. Not directly above it—rocket drills had been known to show spurts of life after they were supposed to be dead. St. Simon had timed the drill, and it had apparently behaved as it should, but there was no need to take chances.

"Fire brigade, stand by!"

"Fire brigade standing by, sir!"

A nozzle came out of the nose of the *Nancy Bell* and peeped over the rim of the freshly-drilled hole.

"Ready! Aim! Squirt!"

A jet of kerosene-like fluosilicone oil shot down the shaft. When it had finished its work, there was little possibility that anything could happen at the bottom. Any unburned rocket fuel would have a hard time catching fire with that stuff soaking into it.

"Ready to lower the boom, Mr. Christian!" bellowed St. Simon.

"Aye, sir! Ready, sir!"

"Lower away!"

His fingers played rapidly over the control board.

Outside the ship, the lower end of the great eye-bolt was released from its clamp, and a small piston gave it a little shove. In a long, slow, graceful arc, it swung away from the hull, swiveling around the pivot clamp that held the eye. The braking effect of the pivot clamp was precisely set to stop the eye-bolt when it was at right angles to the hull. Moving carefully, St. Simon maneuvered the ship until the far end of the bolt was directly over the shaft. Then he nudged the *Nancy Bell* sideways, pushing the bolt down into the planetoid It grated a couple of times, but between the power of the ship and the mass of the planetoid, there was enough pressure to push it past the obstacles. The rocket drill and the eye-bolt had been designed to work together; the hole made by the first was only a trifle larger than the second. The anchor settled firmly into place.

St. Simon released the clamps that held the eye-bolt to the hull of the ship, and backed away again. As he did, a power cord unreeled, for the eye-bolt was still connected to the vessel electrically.

Several meters away, St. Simon pushed another button. There was no sound, but his practiced eye saw the eye of the anchor quiver. A small explosive charge, set in the buried end of the anchor, had detonated, expanding the far end of the bolt, wedging it firmly in the hole. At the same time, a piston had been forced up a small shaft in the center of the bolt, forcing a catlyst to mix with a fast-setting resin, and extruding the mixture out through half a dozen holes in the side of the bolt. When the stuff set, the anchor was locked securely to the sides of the shaft and thus to the planetoid itself.

St. Simon waited for a few minutes to make sure the resin had set completely. Then he clambered outside again and attached a heavy towing cable to the eye of the anchor, which projected above the surface of the asteroid. Back inside the ship again, he slowly applied power. The cable straightened and pulled at the anchor as the *Nancy Bell* tried to get away from the asteroid.

"Jules, old bunion," he said as he watched the needle of the tension gauge, "we have set her well."

"Yes, m'lud. So it would appear, m'lud."

St. Simon cut the power. "Very good, Jules. Now we shall see if the beeper is functioning as it should." He flipped a switch that turned on the finder pickup, then turned the selector to his own frequency band.

Beep! said the radio importantly. *Beep!*

The explosion had also triggered on a small but powerful transmitter



built into the anchor. The tugs would be able to find the planetoid by following the beeps.

"Ah, Jules! Success!"

"Yes, m'lud. Success. For the tenth time in a row, this trip. And how many trips does this make "

"Ah, but who's counting? Think of the money!"

"And the monotony, m'lud. To say nothing of molasses, muchness, and other things that begin with an M."

"Quite so, Jules; quite so. Well, let's detach the towing cable and be on our way."

"Whither, m'lud Vesta?"

"I rather thought Pallas this time, old thimble."

"Still, m'lud, Vesta—"

"Pallas, Jules."

"Vesta?"

"Hum, hi, ho," said Captain St. Simon thoughtfully. "Pallas?"

The argument continued while the tow cable was detached from the freshly-placed anchor, and while the air was being let back into the control chamber, and while St. Simon divested himself of his suit. Actually, although he would like to go to Vesta, it was out of the question. Energywise and timewise, Pallas was much closer.

He settled back in the bucket seat and shot toward Pallas.

Mr. Edway Tarnhorst was from San Pedro, Greater Los Angeles, California, Earth. He was a businessman of executive rank, and was fairly rich. In his left lapel was the Magistral Knight's Cross of the Sovereign Hierosolymitan Order of Malta, reproduced in miniature. In his wallet was a card identifying him as a Representative of the Constituency of Southern California to the Supreme Congress of the People of the United Nations of Earth. He was just past his fifty-third birthday, and his lean, ascetic face and graying hair gave him a look of saintly wisdom. Aside from the eight-pointed cross in his lapel, the only ornamentation or jewelry he wore consisted of a small, exquisitely thin gold watch on his left wrist, and, on the ring finger of his left hand, a gold signet ring set with a single, flat, unfaceted diamond which was delicately engraved with the Tarnhorst coat of arms. His clothing was quietly but impressively expensive, and under Earth gravity would probably have draped impeccably, but it tended to fluff oddly away from his body under a gee-pull only a twentieth of Earth's.

He sat in his chair with both feet planted firmly on the metal floor, and his hands gripping the armrests as though he were afraid he might float off toward the ceiling if he let go. But only his body betrayed his unease; his face was impassive and calm.

The man sitting next to him looked a great deal more comfortable. This was Mr. Peter Danley, who was twenty years younger than Mr. Tarnhorst and looked it.

Instead of the Earth-cut clothing that the older man was wearing, he was wearing the close-fitting tights that were the common dress of the Belt cities. His hair was cropped close, and the fine blond strands made a sort of golden halo about his head when the light from the panels overhead shone on them. His eyes were pale blue, and the lashes and eyebrows were so light as to be almost invisible. That effect, combined with his thin-lined, almost lipless mouth, gave his face a rather expressionless expression. He carried himself like a man who was used to low-gravity or null-gravity conditions, but he talked like an Earthman, not a Belt man. The identification card in his belt explained that; he was a pilot on the Earth-Moon shuttle service. In the eyes of anyone from the Belt cities, he was still an Earthman, not a true spaceman. He was looked upon in the same way that the captain of a transatlantic liner might have looked upon the skipper of the Staten Island ferry two centuries before. The very fact that he was seated in a chair gave away his Earth habits.

The third man was standing, leaning at a slight angle, so that his back touched the wall behind him. He was not tall—five nine—and his face and body were thin. His tanned skin seemed to be stretched tightly over this scanty padding, and in places the bones appeared to be trying to poke their way through to the surface. His ears were small and lay nearly flat against his head, and the hair on his skull was so sparse that the tanned scalp could be easily seen beneath it, although there was no actual bald spot anywhere. Only his large, luminous brown eyes showed that Nature had not skimped on everything when he was formed. His name was lettered neatly on the outside of the door to the office: Georges Alhamid. In spite of the French spelling, he pronounced the name "George," in the English manner.

He had welcomed the two Earthmen into his office, smiling the automatic smile of the diplomat as he welcomed them to Pallas. As soon as they were comfortably seated—though perhaps that word did not exactly apply to Edway Tarnhorst—Georges Alhamid said:

"Now, gentlemen, what can I do for you?"

He asked it as though he were completely unaware of what had brought the two men to Pallas.

Tarnhorst looked as though he were privately astonished that his host could speak grammatically. "Mr. Alhamid," he began, "I don't know whether you're aware that the industrial death rate here in the Belt has been the subject of a great deal of discussion in both industrial and governmental circles on Earth." It was a half question, and he let it hang in the air, waiting to see whether he got an answer.

"Certainly my office has received a great deal of correspondence on

the subject," Alhamid said. His voice sounded as though Tarnhorst had mentioned nothing more serious than a commercial deal. Important, but nothing to get into a heavy sweat over.

Tarnhorst nodded and then held his head very still. His actions betrayed the fact that he was not used to the messages his semicircular canals were sending his brain when he moved his head under low gee.

"Exactly," he said after a moment's pause. "I have 'stat copies of a part of that correspondence. To be specific, the correspondence between your office and the Workers' Union Safety Control Board, and between your office and the Workingman's Compensation Insurance Corporation."

"I see. Well, then, you're fully aware of what our trouble is, Mr. Tarnhorst. I'm glad to see that an official of the insurance company is taking an interest in our troubles."

Tarnhorst's head twitched, as though he were going to shake his head and had thought better of it a fraction of a second too late. It didn't matter. The fluid in his inner ears sloshed anyway.

"I am not here in my capacity as an officer of the Workingman's Compensation Insurance Corporation," he said carefully. "I am here as a representative of the People's Congress."

Alhamid's face showed a mild surprise which he did not feel. "I'm honored, of course, Mr. Tarnhorst," he said, "but you must understand that I am not an official of the government of Pallas."

Tarnhorst's ascetic face betrayed nothing. "Since you have no unified government out here," he said, "I cannot, of course, presume to deal with you in a governmental capacity. I have spoken to the Governor of Pallas, however, and he assures me that you are the man to speak to."

"If it's about the industrial death rate," Alhamid agreed, "then he's perfectly correct. But if you're here as a governmental representative of Earth, I don't understand—"

"Please, Mr. Alhamid," Tarnhorst interrupted with a touch of irritation in his voice. "This is not my first trip to the Belt, nor my first attempt to deal with the official workings of the Confederated Cities."

Alhamid nodded gently. It was, as a matter of fact, Mr. Tarnhorst's second trip beyond the Martian orbit, the first having taken place some three years before. But the complaint was common enough; Earth, with its strong centralized government, simply could not understand the functioning of the Belt Confederacy. A man like Tarnhorst apparently couldn't distinguish between *government* and *business*. Knowing that, Alhamid could confidently predict what the general sense of Tarnhorst's next sentence would be.

"I am well aware," said Tarnhorst, "that the Belt Companies not only have the various governors under their collective thumb, but have thus far prevented the formation of any kind of centralized government. Let us not quibble, Mr. Alhamid; the Belt Companies run the Belt, and that means that I must deal with officials of those companies—such as yourself."

Alhamid felt it necessary to make a mild speech in rebuttal. "I cannot agree with you, Mr. Tarnhorst. I have nothing to do with the government of Pallas or any of the other asteroids. I am neither an elected nor an appointed official of any government. Nor, for that matter, am I an advisor in either an official or unofficial capacity to any government. I do not make the laws designed to keep the peace, nor do I enforce them, except in so far as I am a registered voter and therefore have some voice in those laws in that respect. Nor, again, do I serve any judiciary function in any Belt government, except inasmuch as I may be called upon for jury duty.

"I am a business executive, Mr. Tarnhorst. Nothing more. If you have governmental problems to discuss, then I can't help you, since I'm not authorized to make any decisions for any government."

Edway Tarnhorst closed his eyes and massaged the bridge of his thin nose between thumb and forefinger. "I understand that. I understand that perfectly. But out here, the Companies have taken over certain functions of government, shall we say?"

"Shall we say, rather, that on Earth the government has usurped certain functions which rightfully belong to private enterprise? Alhamid said gently. "Historically, I think, that is the correct view."

Tarnhorst opened his eyes and smiled. "You may be quite correct. Historically speaking, perhaps, the Earth government has usurped the functions that rightfully belong to kings, dictators, and warlords. To say nothing of local satraps and petty chieftains. Hm-m-m. Perhaps we should return to that? Perhaps we should return to the human suffering that was endemic in those times?"

"You might try it," said Alhamid with a straight face. "Say, one year out of every ten. It would give the people something to look forward to with anticipation and to look back upon with nostalgia." Then he changed his tone. "If you wish to debate theories of government, Mr. Tarnhorst, possibly we could get up a couple of teams. Make a public affair of it. It could be taped and televised here and on Earth, and we could charge royalties on each—"

Peter Danley's blond, blank face became suddenly animated. He looked as though he were trying to suppress a laugh. He almost succeeded. It came out as a cough.

At the same time, Tarnhorst in-

terrupted Alhamid. "You have made your point, Mr. Alhamid," he said in a brittle voice. "Permit me to make mine. I have come to discuss business with you. But, as a member of the Congressional Committee for Industrial Welfare, I am also in search of facts. Proper legislation requires facts, and legislation passed by the Congress will depend to a great extent upon the report on my findings here."

"I understand," said Alhamid. "I'll certainly be happy to provide you with whatever data you want —with the exception of data on industrial processes, of course. That's not mine to give. But anything else—" He gestured with one hand, opening it palm upwards, as though dispensing a gift.

"I'm not interested in industrial secrets," said Tarnhorst, somewhat mollified. "It's a matter of the welfare of your workers. We feel that we should do something to help. As you know, there have been protests from the Worker's Union Safety Control Board and from the Workingman's Compensation Insurance Corporation."

Alhamid nodded. "I know. The insurance company is complaining about the high rate of claims for deaths. They've threatened to raise our premium rates."

"Considering the expense, don't you, as a businessman, think that a fair thing to do?"

"No," Alhamid said. "I have pointed out to them that the total amount of the claims is far less per capita than, for instance, the Steel Construction Workers' Union of Earth. Granted, there are more death claims, but these are more than compensated for by the fact that the claims for disability and hospitalization are almost negligible."

"That's another thing we don't understand," Tarnhorst said carefully. "It appears that not only are the safety precautions insufficient, but the post-accident care is . . . er . . . inefficient."

"I assure you that what post-accident care there is," Alhamid said, "is quite efficient. But there is a high mortality rate because of the very nature of the job. Do you know anything about anchor-placing, Mr. Tarnhorst?"

"Very little," Tarnhorst admitted. "That is one of the things I am here to get information on. You used the phrase 'what post-accident care there is'—just how do you mean that?"

"Mr. Tarnhorst, when a man is out in space, completely surrounded by a hard vacuum, *any* accident is very likely to be fatal. On Earth, if a man sticks his thumb in a punch press. he loses his thumb. Out here, if a man's thumb is crushed off while he's in space, he loses his air and his life long before he can bleed to death. Anything that disables a man in space is deadly ninety-nine times out of a hundred.

"I can give you a parallel case. In the early days of oil drilling,

wells occasionally caught fire. One of the ways to put them out was to literally blow them out with a charge of nitroglycerine. Naturally, the nitroglycerine had to be transported from where it was made to where it was to be used. Sensibly enough, it was not transported in tank-car lots; it was carried in small special containers by a single man in an automobile, who used the back roads and avoided traffic and stayed away from thickly populated areas—which was possible in those days. In many places these carriers were required to paint their cars red, and have the words *Danger Nitroglycerine* painted on the vehicle in yellow.

"Now, the interesting thing about that situation is that, whereas insurance companies in those days were reluctant to give policies to those men, even at astronomical premium rates, disability insurance cost practically nothing—provided the insured would allow the insertion of a clause that restricted the covered period to those times when he was actually engaged in transporting nitroglycerine. You can see why."

"I am not familiar with explosives," Tarnhorst said. "I take it that the substance is . . . er . . . easily detonated?"

"That's right," said Alhamid. "It's not only sensitive, but it's unreliable. You might actually drop a jar of the stuff and do nothing but shatter the jar. Another jar, apparently exactly similar, might go off because it got jiggled by a seismic wave from a passing truck half a mile away. But the latter was a great deal more likely than the former."

"Very well," said Tarnhorst after a moment, "I accept that analogy. I'd like to know more about the work itself. What does the job entail, exactly? What safety precautions are taken?"

It required the better part of three hours to explain exactly what an anchor setter did and how he did it—and what safety precautions were being taken. Through it all, Peter Danley just sat there, listening, saying nothing.

Finally, Edway Tarnhorst said: "Well, thank you very much for your information, Mr. Alhamid. I'd like to think this over. May I see you in the morning?"

"Certainly, sir. You're welcome at any time."

"Thank you." The two Earthmen rose from their seats—Tarnhorst carefully, Danley with the ease of long practice. "Would nine in the morning be convenient?"

"Quite convenient. I'll expect you."

Danley glided over to the door and held it open for Tarnhorst. He was wearing magnetic glide-shoes, the standard footwear of the Belt, which had three ball-bearings in the forward part of the sole, allowing the foot to move smoothly in any direction, while the rubber heel could be brought down to act as a brake when necessary. He

didn't handle them with the adeptness of a Belt man, but he wasn't too awkward. Tarnhorst was wearing plain magnetic-soled boots—the lift-'em-up-and-lay-'em-down type. He had no intention of having his dignity compromised by shoes that might treacherously scoot out from under him.

As soon as the door had closed behind them, Georges Alhamid picked up the telephone on his desk and punched a number.

When a woman's voice answered at the other end, he said: "Miss Lehman, this is Mr. Alhamid. I'd like to speak to the governor." There was a pause. Then:

"George? Larry here."

Alhamid leaned back comfortably against the wall. "I just saw your guests, Larry. I spent damn near three hours explaining why it was necessary to put anchors in rocks, how it was done, and why it was dangerous."

"Did you convince him? Tarnhorst, I mean."

"I doubt it. Oh, I don't mean he thinks I'm lying or anything like that. He's too sharp for that. But he *is* convinced that we're negligent, that we're a bunch of barbarians who care nothing about human life."

"You've got to unconvince him, George," the governor said worriedly. "The Belt still isn't self-sufficient enough to be able to afford an Earth embargo. They can hold out longer than we can."

"I know," Alhamid said. "Give us another generation, and we can tell the World Welfare State where to head in—but right now, things are touchy, and you and I are in the big fat middle of it." He paused, rubbing thoughtfully at his lean blade of a nose with a bony forefinger. "Larry, what did you think of that blond nonentity Tarnhorst brought with him?"

"He's not a nonentity," the governor objected gently. "He just looks it. He's Tarnhorst's 'expert' on space industry, if you want my opinion. Did he say much of anything while he was with you?"

"Hardly anything."

"Same here. I have a feeling that his job is to evaluate every word you say and report his evaluation to Tarnhorst. You'll have to be careful."

"I agree," Alhamid said. "But he complicates things. I have a feeling that if I tell Tarnhorst a straight story he'll believe it. He seems to be a pretty shrewd judge. But Danley just might be the case of the man who is dangerous because of his little learning. He obviously knows a devil of a lot more about operations in space than Tarnhorst does, and he's evidently a hand-picked man, so that Tarnhorst will value his opinion. But it's evident that Danley doesn't know anything about space by our standards. Put him out on a boat as an anchor man, and he'd be lucky if he set a single anchor."

"Well, there's not much chance

of that. How do you mean, he's dangerous?"

"I'll give you a f'rinstance. Suppose you've got a complex circuit using alternatic current, and you're trying to explain to a reasonably intelligent man how it works and what it does. If he doesn't know anything about electricity, he mightn't understand the explanation, but he'll believe that you're telling him the truth even if he doesn't understand it. But if he knows the basic theory of direct currents, you're likely to find yourself in trouble because he'll know just enough to see that what you're telling him doesn't jibe with what he already knows. Volts times amperes equal watts, as far as he's concerned, and the term 'power factor' does nothing but confuse him. He knows that copper is a conductor, so he can't see how a current could be cut off by a choke coil. He knows that a current can't pass through an insulator, so a condenser obviously can't be what you say it is. Mentally, he tags you as a liar, and he begins to try to dig in to see how your gadget *really* works."

"Hm-m-m. I see what you mean. Bad." He snorted. "Blast Earthmen, anyway! Have you ever been there?"

"Earth? Nope. By careful self-restraint, I've managed to forego that pleasure so far, Larry Why?"

"Brrr! It's the feel of the place that I can't stand. I don't mean the constant high-gee; I take my daily exercise spin in the centrifuge just like anyone else, and you soon get used to the steady pull on Earth. I mean the constant, oppressive *psychic* tension, if you see what I mean. The feeling that everyone hates and distrusts everyone else. The curious impression of fear underneath every word and action.

"I'm older than you are, George, and I've lived with a kind of fear all my life—just as you and everyone else in the Belt has. A single mistake can kill out here, and the fear that it will be some fool who makes a mistake that will kill hundreds is always with us. We've learned to live with that kind of fear; we've learned to take steps to prevent any idiot from throwing the wrong switch that would shut down a power plant or open an air lock at the wrong time.

"But the fear on Earth is different. It's the fear that everyone else is out to get you, the fear that someone will stick a figurative knife in your back and reduce you to the basic subsistence level. And that fear is solidly based, believe me. The only way to climb up from basic subsistence is to climb over everyone else, to knock aside those in your way, to get rid of whoever is occupying the position you want. And once you get there, the only way you can hold your position is to make sure that nobody below you gets too big for his britches. The rule is: Pull down those above you, hold down those below you.



"I've seen it, George. The big cities are packed with people whose sole ambition in life is to badger their local welfare worker out of another check—they need new clothes, they need a new bed, they need a new table, they need more food for the new baby, they need this, they need that. All they ever do is *need!* But, of course, they're far to aristocratic to *work.*

"Those who do have ambition have to become politicians—in the worst sense of the word. They have to gain some measure of control over the dispersal of largesse to the mob; they have to get themselves into a position where they can give away other people's money, so that they can get their cut, too.

"And even then the man who gets to be a big shot doesn't dare show it. Take a look at Tarnhorst. He's probably one of the best of a bad lot. He has his fingers in a lot of business pies which make him money, and he's in a high enough position in the government to enable him to keep some of his money. But his clothing is only a little bit better than the average, just as the man who is on basic subsistence wears clothes that are only a little bit worse than the average. That diamond ring of his is a real diamond, but you can buy imitations that can't be told from the real thing except by an expert, so his diamond doesn't offend anyone by being ostentatious. And it's unfaceted, to eliminate offensive flash.

"All the color has gone out of life on Earth, George. Women held out longer than men did, but now no man or woman would be caught wearing a bright-colored suit. You don't see any reds or yellows or blues or greens or oranges—only grays and browns and black.

"It's not for me, George. I'd much rather live in fear of the few fools who might pull a stupid trick that would kill me than live in the constant fear of everyone around me, who all want to destroy me deliberately."

"I know what you mean," said Alhamid, "but I think you've put the wrong label on what you're calling 'fear'; there's a difference between fear and having a healthy respect for something that is dangerous but not malignant. That vacuum out there isn't out to 'get' anybody. The only people it kills are the fools who have no respect for it and the neurotics who think that it wants to murder them. You're neither, and I know it."

The governor laughed. "That's the advantage we have over Earthmen, George. We went through the same school of hard knocks together—all of us. And we know how we stack up against each other."

"True," Alhamid said darkly, "but how long will that hold if Tarnhorst closes the school down?"

"That's what you've got to prevent," said the governor flatly. "If you need help, yell."

"I will," Alhamid said. "Very

loudly." He hung up, wishing he knew what Tarnhorst—and Danley—had in mind.

The trouble with these people, Danley," said Edway Tarnhorst, "is that they have no respect whatever for human dignity. They have a tendency to overlook the basic rights of the individual."

"They're certainly—different," Peter Danley said.

Tarnhorst juggled himself up and down on the easy-chair in which he was seated, as though he could hardly believe that he had weight again. He hated low gee. It made him feel awkward and undignified. The only thing that reminded him that this was not "real" gravity was the faint, but all-pervasive hum of the huge engines that drove the big centrifuge. The rooms had cost more, but they were well worth it, as far as Tarnhorst was concerned.

"How do you mean, 'different'?" he asked almost absently, settling himself comfortably into the cushions.

"I don't know exactly. There's a hardness, a toughness—I can't quite put my finger on it, but it's in the way they act, the way they talk."

"Surely you'd noticed that before?" Tarnhorst asked in mild surprise. "You've met these Belt men on Luna."

"And their women," Danley said with a nod. "But the impact is somewhat more pronounced on their own home ground—seeing them *en masse*."

"Their women!" Tarnhorst said, caught by the phrase. "*Fah!* Bright-colored birds! Giggling children! And no more morals than a common house-cat!"

"Oh, they're not as bad as all that," Danley objected. "Their clothing is a little bright, I'll admit, and they laugh and kid around a lot, but I wouldn't say that their morals were any worse than those of a girl from New York or London."

"Arrogance is the word," said Tarnhorst. "Arrogance. Like the way that Alhamid kept standing all the time we were talking, towering over us that way."

"Just habit," Danley said. "When you don't weigh more than six or seven pounds, there's not much point in sitting down. Besides, it leaves them on their feet in case of emergency."

"He could have sat down out of politeness," Tarnhorst said. "But no. They try to put on an air of superiority that is offensive to human dignity." He leaned back in his chair, stretched out his legs, and crossed his ankles. "However, attitude itself needn't concern us until it translates itself into anti-social behavior. What cannot be tolerated is this callous attitude toward the dignity and well-being of the workers out here. What did you think of Alhamid's explanation of this anchor-setting business?"

Danley hesitated. "It sounded

straightforward enough, as far as it went."

"You think he's concealing something, then?"

"I don't know. I don't have all the information." He frowned, putting furrows between his almost invisible blond brows. "I know that neither government business nor insurance business are my specialty, but I would like to know a little more about the background before I render any decision."

"Hm-m-m. Well." Tarnhorst frowned in thought for a moment, then came to a decision. "I can't give you the detailed data, of course; that would be a violation of the People's Mutual Welfare Code. But I can give you the general story."

"I just want to know what sort of thing to look for," Danley said.

"Certainly. Certainly. Well." Tarnhorst paused to collect his thoughts, then launched into his speech. "It has now been over eighty years since the first colonists came out here to the Belt. At first, the ties with Earth were quite strong, naturally. Only a few actually intended to stay out there the rest of their lives; most of them intended to make themselves a nice little nest egg, come back home, and retire. At the same time, the World State was slowly evolving from its original loosely tied group of independent nations toward what it is today.

"The people who came out here were mostly misfits, sociologically speaking." He smiled sardonically. "They haven't changed much.

"At any rate, as I said, they were strongly tied to Earth. There was the matter of food, air, and equipment, all of which had to be shipped out from Earth to begin with. Only the tremendous supply of metal—almost free for the taking—made such a venture commercially possible. Within twenty-five years, however, the various industrial concerns that managed the Belt mining had become self-supporting. The robot scoopers which are used to mine methane and ammonia from Jupiter's atmosphere gave them plenty of organic raw material. Now they grow plants of all kinds and even raise food animals.

"They began, as every misfit does, to complain about the taxes the government put on their incomes. The government, in my opinion, made an error back then. They wanted to keep people out in the Belt, since the mines on Earth were not only rapidly being depleted, but the mining sites were needed for living space. Besides, asteroid metals were cheaper than metals mined on Earth. To induce the colonists to remain in the Belt, no income tax was levied; the income tax was replaced by an eighty per cent tax on the savings accumulated when the colonist returned to Earth to retire.

"They resented even that. It was explained to them that the asteroids were, after all, natural resources,

and that they had no moral right to make a large profit and deprive others of their fair share of the income from a natural resource, but they insisted that they had earned it and had a right to keep it.

"In other words, the then government bribed them to stay out here, and the bribe was more effective than they had intended."

"So they stayed out here and kept their money," Danley said.

"Exactly. At that time, if you will recall, there was a great deal of agitation against colonialism—there had been for a long time, as a matter of fact. That agitation was directed against certain industrialist robber-baron nations who had enslaved the populace of parts of Asia and Africa solely to produce wealth, and not for the benefit of the people themselves. But the Belt operators took advantage of the anticolonialism of the times and declared that the Belt cities were, and by right ought to be, free and independent political entities. It was a ridiculous assumption, of course, but since the various Belt cities were, at that time, under the nominal control of three or four of the larger nations, the political picture required that they be allowed to declare themselves independent. It was not anticipated at the time that they would be so resistant toward the World Government."

He smiled slightly. "Of course, by refusing to send representatives to the People's Congress, they have, in effect, cut themselves off from any voice in human government."

Then he shrugged. "At the moment, that is neither here nor there. What interests us at the moment is the death rate curve of the anchor-sinkers or whatever they are. Did you know that it is practically impossible for anyone to get a job out there in the Belt unless he has had experience in the anchor-setting field?"

"No," Danley admitted.

"It's true. For every other job, they want only men with space experience. And by 'space experience' they mean anchor-setting, because that's the only job a man can get without previous space experience. They spend six months in a special school, learning to do the work, according to our friend, Mr. Georges Alhamid. Then they are sent out to set anchors. Small ones, at first, in rocks only a few meters in diameter—then larger ones. After a year or so at that kind of work, they can apply for more lucrative positions.

"I see nothing intrinsically wrong in that, I will admit, but the indications are that the schooling, which should have been getting more efficient over the years, has evidently been getting more lax. The death rate has gone up."

"Just a minute," Danley interrupted. "Do you mean that a man has to have what they call 'space experience' before he can get *any* kind of job?"

Tarnhorst shook his head and was pleased to find that no nausea resulted. "No, of course not. Clerical jobs, teaching jobs, and the like don't require that sort of training. But there's very little chance for advancement unless you're one of the elite. A physician, for example, wouldn't have many patients unless he had had 'space experience'; he wouldn't be allowed to own or drive a space boat, and he wouldn't be allowed to go anywhere near what are called 'critical areas'—such as air locks, power plants, or heavy industry installations."

"It sounds to me as though they have a very strong union," said Danley.

"If you want to call it that, yes," Tarnhorst said. "Anything that has anything to do with operations in space requires that sort of experience—and there are very few jobs out here that can avoid having anything to do with space. Space is only a few kilometers away." The expression on his face showed that he didn't much care for the thought.

"I don't see that that's so bad," Danley said. "Going out there isn't something for the unexperienced. A man who doesn't know what he's doing can get himself killed easily, and, what's worse, he's likely to take others with him."

"You speak, of course, from experience," Tarnhorst said with no trace of sarcasm. "I accept that. By not allowing inexperienced persons in critical areas, the Belt Companies are, at least indirectly, looking out for the welfare of the people. But we mustn't delude ourselves into thinking that that is their prime objective. These Belt Companies are no better than the so-called 'industrial giants' of the nineteenth and twentieth centuries. The government here is farcical. The sole job is to prevent crime and to adjudicate small civil cases Every other function of proper government—the organization of industry, the regulation of standards the subsidizing of research, the control of prices, and so on—are left to the Belt Companies or to the people. The Belt Cities are no more than what used to be called 'company towns'."

"I understand that," Danley said. "But they seem to function fairly smoothly "

Tarnhorst eyed him. "If, by 'smoothly functioning', you mean the denial of the common rights of human freedom and dignity yes. Oh, they give their sop to such basic human needs as the right of every individual to be respected—but only because Earth has put pressure on them. Otherwise, people who, through no fault of their own, were unable to work or get 'space experience' would be unable to get jobs and would be looked down upon as pariahs."

"You mean there are people here who have no jobs? I wouldn't think that unemployment would be a problem out here."

"It isn't," said Tarnhorst, "yet. But there are always those unfortunates who are psychologically incapable of work, and society must provide for them. The Belt Cities provide for a basic education, of course. As long as a person is going to school, he is given a stipend. But a person who has neither the ability to work nor the ability to study is an outcast, even though he is provided for by the companies. He is forced to do something to earn what should be his by right; he is given menial and degrading tasks to do. We would like to put a stop to that sort of thing, but we . . . ah . . . have no . . . ah . . . means of doing so." He paused, as though considering whether he had said too much

"The problem at hand," he went on hurriedly, "is the death curve. When this technique for taking the rocks to the smelters was being worked out, the death rate was—as you might imagine—quite high. The Belt Companies had already been operating out here for a long time before the stony meteorites were mined commercially. At first, the big thing was nickel-iron. That's what they came here to get in the beginning. That's where most of the money still is. But the stony asteroids provide them with their oxygen.

"This anchor-setting technique was worked out at a time when the Belt Companies were trying to find ways to make the Belt self-sufficient. After they got the technique worked out so that it operated smoothly, the death rate dropped 'way down. It stayed down for a little while, and then began to rise again. It has nearly reached an all-time high. Obviously, something is wrong, and we have to find out what it is."

Danley scratched ruminatively behind his right ear and wished he'd had the opportunity to study history. He had been vaguely aware of the broad outlines, but the details had never been brought to his attention before. "Suppose Alhamid *is* trying to hide something," he said after a moment. "What would it be, do you think?"

Tarnhorst shrugged and spread his hands. "What could it be but some sort of money-saving scheme? Inferior materials being used at a critical spot, perhaps. Skimping on quality or quantity. Somewhere, somehow, they are shaving costs at the risk of the workers' lives. We have to find out what it is."

Peter Danley nodded. *You don't mean "we,"* Danley thought to himself. I *am the one who's going to have to go out there and find it, while you sit here safe.* He felt that there was a pretty good chance that these Belt operators might kill him to keep him from finding out what it was they were saving money on.

Aloud, he said: "I'll do what I can, Mr. Tarnhorst."

Tarnhorst smiled. "I'm certain you will. That's why I needed someone who knows more about this business than I."

"And when we do find it—what then?"

"Then? Why, then we will force them to make the proper changes or there will be trouble."

Georges Alhamid heard the whole conversation early the next morning. The governor himself brought the recording over to his office.

"Do you think he knew he was being overheard "

The governor shrugged. "Who knows He waltzed all around what he was trying to say, but that may have been just native caution. Or he may not want Danley to know what's on his mind."

"How could he bring Danley out here without telling him anything beforehand?" Alhamid asked thoughtfully. "Is Danley really that ignorant, or was the whole conversation for our ears?"

"I'm inclined to think that Danley really didn't know. Remember, George, the best way to hold down the ones below you is to keep them from gaining any knowledge, to keep data out of their hands—except for the carefully doctored data you want them to have."

"I know," Alhamid said. "History isn't exactly a popular subject on Earth." He tapped his fingers gently on the case of the playback and looked at it as if he were trying to read the minds of the persons who had spoken the words he had just heard.

"I really think he believed that his nullifying equipment was doing its job," the governor continued. "He wouldn't have any way of knowing we could counteract it."

Alhamid shrugged. "It doesn't matter much. We still have to assume that he's primarily out to bring the Belt Cities under Earth control. To do that, all he'd have to do is find something that could be built up into a scandal on Earth."

"Not, *all*, George," the governor said. "It would take a lot more than that alone. But it would certainly be a start in the right direction."

"One thing we do know," Alhamid said, "is that nobody on Earth will allow any action against the Belt unless popular sentiment is definitely against us. As long as we are apparently right-thinking people, we're all right. I wonder why Tarnhorst is so anxious to get us under the thumb of the People's Congress? Is it purely that half-baked idealism of his?"

"Mostly. He has the notion that everybody has a right to be accorded the respect of his fellow man, and that that right is something that every person is automatically given at birth, not something he has to earn. What gave him his particular gripe against us, I don't know, but he's been out to get us ever since his trip here three years ago."

"You know, Larry," Alhamid said slowly, "I'm not quite sure which is harder to understand:

How a whole civilization could believe that sort of thing, or how a single intelligent man could."

"It's a positive feedback," the governor said. "That sort of thing has wrecked civilizations before and will do it again. Let's not let it wreck ours. Are you ready for the conference with our friend now?"

Georges Alhamid looked at the clock on the wall. "Ready as I'll ever be. You'd better scram, Larry. We mustn't give Mr. Tarnhorst the impression that there's some sort of collusion between business and government out there in the Belt."

"Heaven forfend! I'll get."

When he left, the governor took the playback with him. The recording would have to be filed in the special secret files.

Captain St. Simon eased his spaceboat down to the surface of Pallas and threw on the magnetic anchor which held the little craft solidly to the metal surface of the landing field. The traffic around Pallas was fairly heavy this time of year, since the planetoid was on the same side of the sun as Earth, and the big cargo haulers were moving in and out, loading refined metals and raw materials, unloading manufactured goods from Earth. He'd had to wait several minutes in the traffic pattern before being given clearance for anchoring.

He was already dressed in his vacuum suit, and the cabin of the boat was exhausted of its air. He checked his control board, making sure every switch and dial was in the proper position. Only then did he open the door and step out to the gray surface of the landing field. His suitcase—a spherical, sealed container that the Belt men jokingly referred to as a "bomb"—went with him. He locked the door of his boat and walked down the yellow-painted safety lane toward the nearest air lock leading into the interior of the planetoid.

He lifted his feet and set them down with precision—nobody but a fool wears glide boots on the outside. He kept his eyes moving—up and around, on both sides, above, and behind. The yellow path was supposed to be a safety lane, but there was no need of taking the chance of having an out-of-control ship come sliding in on him. Of course, if it was coming in really fast, he'd have no chance to move; he might not even see it at all. But why get slugged by a slow one?

He waited outside the air-lock door for the green light to come on. There were several other space-suited figures around him, but he didn't recognize any of them. He hummed softly to himself.

The green light came on, and the door of the air lock slid open. The small crowd trooped inside, and, after a minute, the door slid shut again. As the elevator dropped, St. Simon heard the familiar *whoosh* as the air came rushing in. By the time it had reached the

lower level, the elevator was up to pressure.

On Earth, there might have been a sign in such an elevator, reading: *DO NOT REMOVE VACUUM SUITS IN ELEVATOR*. There was no need for it here; every man there knew how to handle himself in an air lock. If he hadn't, he wouldn't have been there.

After he had stepped out of the elevator, along with the others, and the door had closed behind him, St. Simon carefully opened the cracking valve on his helmet. There was a faint hiss of incoming air, adjusting the slight pressure differential. He took off his helmet, tucked it under his arm, and headed for the check-in station.

He was walking down the corridor toward the checker's office when a hand clapped him on the shoulder. "Bless me if it isn't St. Simon the Silent! Long time no, if you'll pardon the cliché, see!"

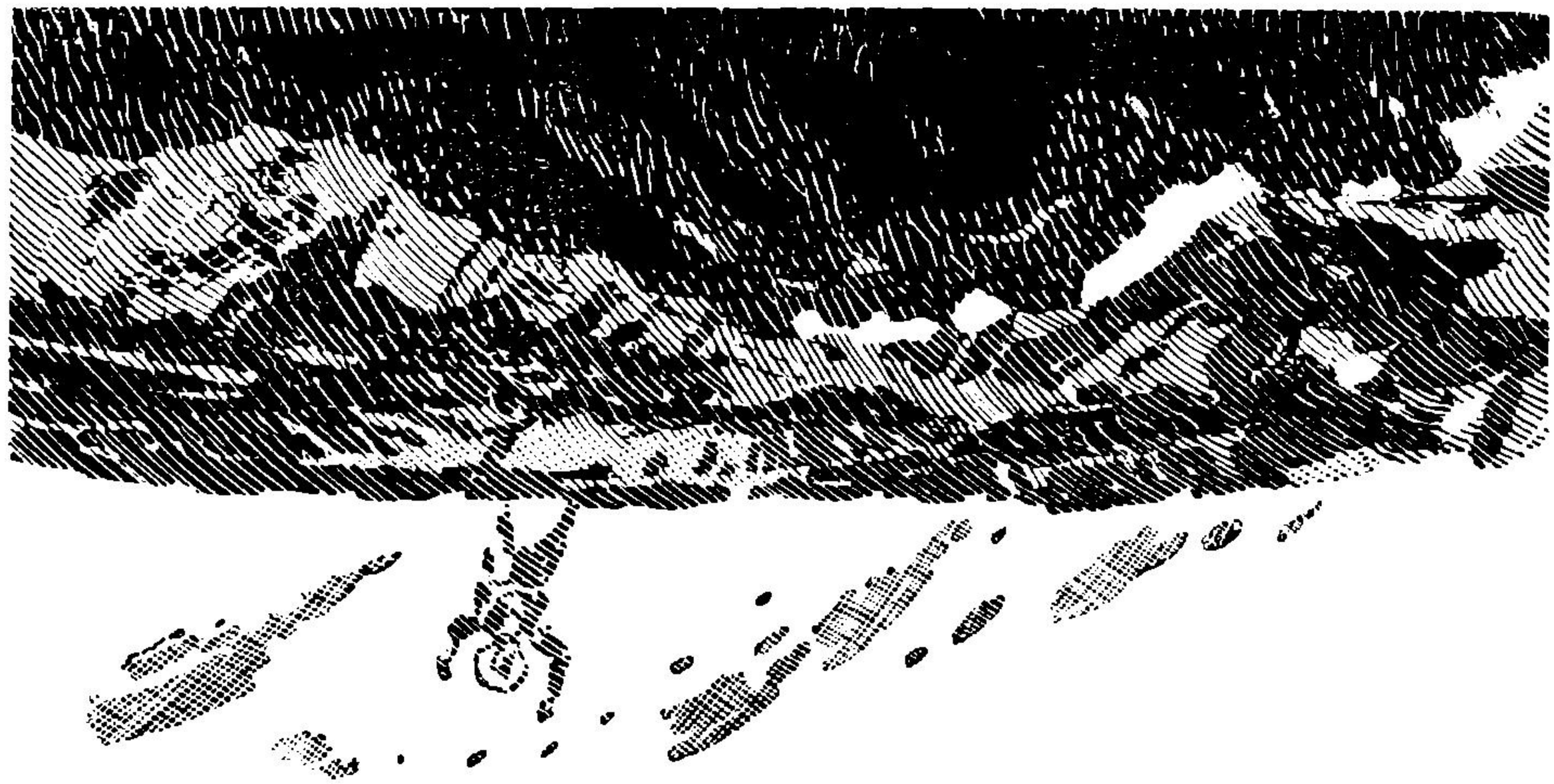
St. Simon turned, grinning. He had recognized the voice. "Hi, Kerry. Good to see you."

"Good to see me? Forsooth! Od's bodkins! Hast turned liar on top of everything else, Good Saint? Good to see me, indeed!' From such a face and form as mine, the noblest sentiments sound like the black utterances of a depraved imagination.' No, dear old holy pillar-sitter, no indeed! It may be a pleasure to hear my mellifluous voice—a pleasure I often indulge in, myself—but it couldn't possibly be a pleasure to *see* me!" And all the while, St. Simon was being pummeled heartily on the shoulder, while his hand was pumped as though the other man was expecting to strike oil at any moment.

His assailant was not a handsome man. Years before, a rare, fast-moving meteor had punched its way through his helmet and taken part of his face with it. He had managed to get back to his ship and pump air in before he lost consciousness. He had had to stay conscious, because the only thing that held the air in his helmet had been his hand pressed over the quarter-inch hole. Even so, the drop in pressure had done its damage. The surgeons had done their best to repair the smashed face, but Kerry Brand's face hadn't been much to look at to begin with. And the mottled purple of the distended veins and capillaries did little to improve his looks.

But his ruined face was a badge of honor, and Kerry Brand knew the fact as well as anyone.

Like St. Simon, Captain Brand was a professional anchor-setter. Most of the men who put in the necessary two years went on to better jobs after they had the required space experience. But there were some who liked the job and stuck with it. It was only these men—the real experts among the anchor-setting fraternity—who rated the title of "Captain". They were free-lancers who ran things pretty much their own way.



"Just going to the checker?" St. Simon asked.

Kerry Brand shook his head. "I've already checked in, old sanctus. And I'll give you three and one-seventh guesses who got a blue ticket."

St. Simon said nothing, but he pointed a finger at Brand's chest.

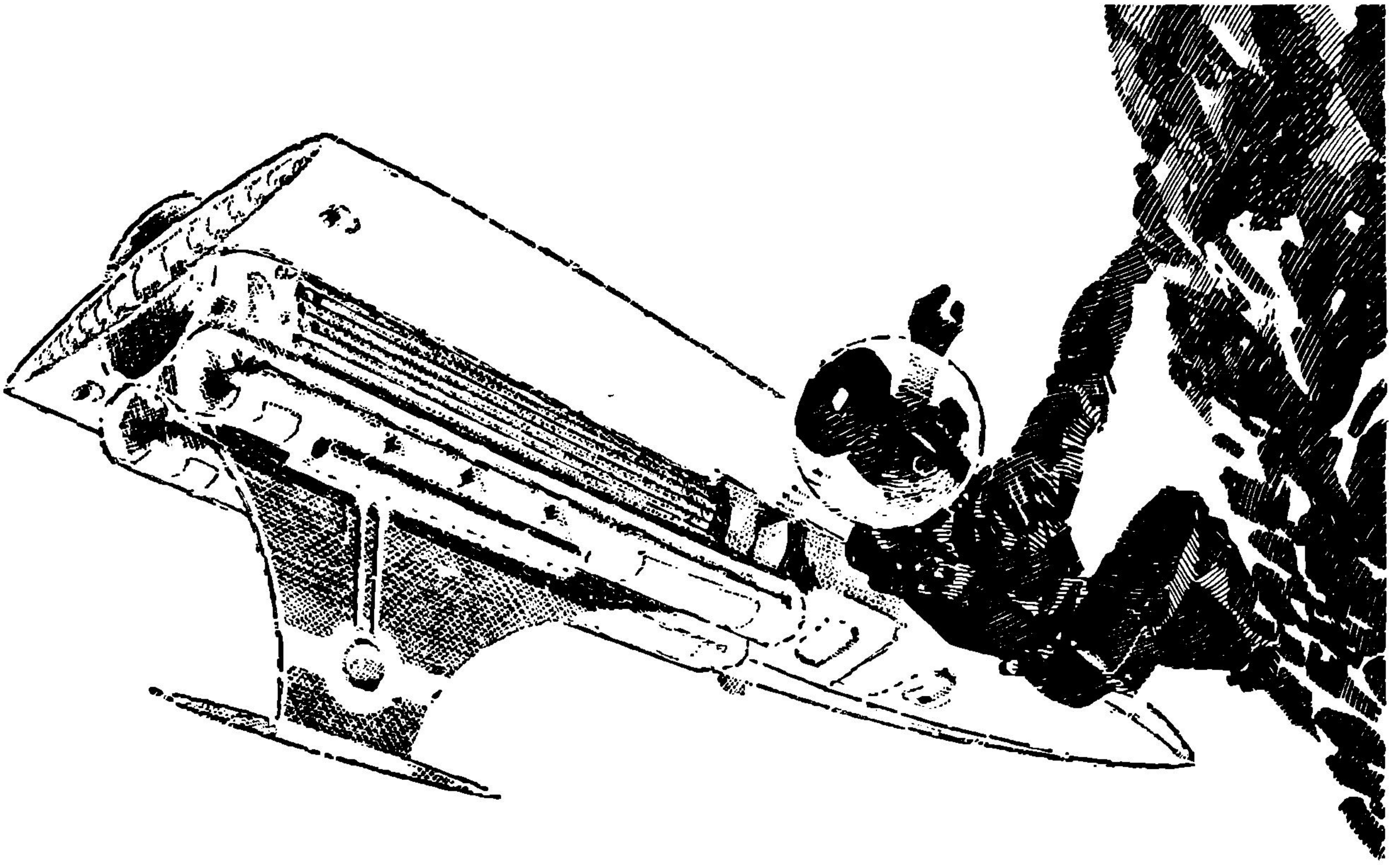
"A mild surmise, but a true one," said Brand. "You are, indeed, gazing upon Professor Kerry Brand, B.A., M.A., Ph.D.—that is to say, Borer of Asteroids, Master of Anchors, and Planetoid-hauler Deluxe. No, no; don't look sorry for me. *Some*body has to teach the tadpoles How To Survive In Space If You're Not Too Stupid To Live—a subject upon which I am an expert."

"On Being Too Stupid To Live?" St. Simon asked gently.

"A touch! A distinct touch! You are developing a certain unexpected vein of pawky humor, Watson, against which I must learn to guard myself." He looked at the watch on his wrist. "Why don't you go ahead and check in, and then we'll go pub-crawling. I have it on good authority that a few thousand gallons of Danish ale were piped aboard Pallas yesterday, and you and I should do our best to reduce the surplus."

"Sounds good to me," said St. Simon agreeably. They started on toward the checker's office.

"Consider, my dear St. Simon," said Brand, "how fortunate we are to be living in an age and a society



where the dictum, 'Those who can, do; those who can't, teach,' no longer holds true. It means that we weary, work-hardened experts are called in every so often, handed our little blue ticket, and given six months off—*with* pay—if we will only do the younger generation the favor of pounding a modicum of knowledge into their heads. During that time, if we are very careful, we can try to prevent our muscles from going to flab and our brains from corroding with ennui, so that when we again debark into the infinite sea of emptiness which surrounds us to pursue our chosen profession, we don't get killed on the first try. Isn't it wonderful?"

"Cheer up," said St. Simon. "Teaching isn't such a bad lot. And, after all, you do get paid for it."

" 'And at a salary! A Pooh-Bah paid for his services! I a salaried minion! But I do it! It revolts me, but I do it!' "

The short, balding man behind the checker's desk looked up as the two men approached. "Hello, captain," he said as St. Simon stepped up to the desk.

"How are you, Mr. Murtaugh?" St. Simon said politely. He handed over his log book. "There's the data on my last ten. I'll be staying here for a few days, so there's no need to rush the refill requisition. Any calls for me?"

The checker put the log book in the duplicator. "I'll see if there are, captain." He went over to the auto-file and punched St. Simon's serial number.

Very few people write to an anchor man. Since he is free to check in and reload at any of the major Belt Cities, and since, in his search for asteroids, his erratic orbit is likely to take him anywhere, it might be months or years before a written letter caught up with him. On the other hand, a message could be beamed to every city, and he could pick it up wherever he was. It cost money, but it was sure.

"One call," the checker said. He handed St. Simon a message slip.

It was unimportant. Just a note from a girl on Vesta. He promised himself that he'd make his next break at Vesta, come what may. He stuck the flimsy in his pocket, and waited while the checker went through the routine of recording his log and making out a pay voucher.

There was no small talk between himself and the checker. Mr. Murtaugh had not elected to take the schooling necessary to qualify for other than a small desk job. He had no space experience. Unless and until he did, there would be an invisible, but nonetheless real barrier between himself and any spaceman. It was not that St. Simon looked down on the man, exactly; it was simply that Murtaugh had not proved himself, and, therefore, there was no way of knowing whether he could be trusted or not. And since trust is

a positive quality, lack of it can only mean mistrust.

Murtaugh handed Captain St. Simon an envelope. "That's it, captain. Thank you."

St. Simon opened the envelope, took out his check—and a blue ticket.

Kerry Brand broke into a guffaw.

When the phone on his desk rang, Georges Alhamid scooped it up and identified himself.

"This is Larry, George," said the governor's voice. "How are things so far?"

"So far, so good," Alhamid said. "For the past week, Mr. Peter Danley has been working his head off, under the tutelage of two of the toughest, smartest anchor men in the business. But you should have seen the looks on their faces when I told them they were going to have an Earthman for a pupil."

The governor laughed. "I'll bet! How's he coming along?"

"He's learning. How are you doing with your pet?"

"I think I'm softening him, George. I found out what it was that got his goat three years ago."

"Yeah?"

"Sure. On Ceres, where he went three years ago, he was treated as if he weren't as good as a Belt man."

Alhamid frowned. "Someone was disrespectful?"

"No—that is, not exactly. But he was treated as if we didn't trust his judgment, as though we were a little bit afraid of him."

"Oh-*ho!* I see what you mean."

"Sure. We treated him just as we would anyone who hasn't proved himself. And that meant we were treating him the same way we treated our own 'lower classes', as he thought of them. I had Governor Holger get his Ceres detectives to trace down everything that happened. You can read the transcript if you want. There's nothing particularly exciting in it, but you can see the pattern if you know what to look for.

"I'm not even certain it was fully conscious on his part; I'm not sure he knew why he disliked us. All he was convinced of was that we were arrogant and thought we were better than he is. It's kind of hard for us to see that a person would be that deeply hurt by seeing the plain truth that someone else is obviously better at something than he is, but you've got to remember that an Earthman is brought up to believe that every person is just exactly as good as every other—and no better. A man may have a skill that you don't have, but that doesn't make him superior—oh, my, no!

"Anyway, I started out by apologizing for our habit of standing up all the time. I managed to plant the idea in his mind that the only thing that made him think we felt superior was that habit. I've even got him to the point where he's standing up all the time, too.

Makes him feel very superior. He's learned the native customs."

"I get you," Alhamid said. "I probably contributed to that inferiority feeling of his myself."

"Didn't we all? Anyway, the next step was to take him around and introduce him to some of the execs in the government and in a couple of the Companies—I briefed 'em beforehand. Friendly chats—that sort of thing. I think we're going to have to learn the ancient art of diplomacy out here if we're going to survive, George.

"The crowning glory came this afternoon. You should have been there."

"I was up to here in work, Larry. I just couldn't take the time off to attend a club luncheon. Did the great man give his speech?"

"Did he? I should hope to crack my helmet he did! We must all pull together, George, did you know that? We must care for the widow and the orphan—and the needy, George, the needy. We must be sure to provide the fools, the idiots, the malingerers, the moral degenerates, and such useful, lovable beings as that with the necessities and the luxuries of life. We must see to it that they are respected and permitted to have their dignity. We must see to it that the dear little things are permitted the rights of a human being to hold his head up and spit in your eye if he wishes. We must see to it that they be fruitful, multiply, and replenish the Earth."

"They've already done that," Alhamid said caustically. "And they can have it. Let's just see that they don't replenish the Belt. So what happened?"

"Why, George, you'll never realize how much we appreciated that speech. We gave him a three-minute rising ovation. I think he was surprised to see that we could stand for three minutes under a one-gee pull in the centrifuge. And you should have seen the smiles on our faces, George."

"I hope nobody broke out laughing."

"We managed to restrain ourselves," the governor said.

"What's next on the agenda?"

"Well, it'll be tricky, but I think I can pull it off. I'm going to take him around and show him that we *do* take care of the widow and the orphan, and hope that he assumes we are as solicitous toward the rest of his motley crew. Wish me luck."

"Good luck. You may need it."

"Same to you. Take care of Danley."

"Don't worry. He's in good hands. See you, Larry."

"Right."

There were three spacesuited men on the bleak rocky ground near the north pole of Pallas, a training area of several square miles known as the North Forty. Their helmets gleamed in the bright, hard light from a sun that looked uncomfortably small to an Earthman's

eyes. Two of the men were standing, facing each other some fifteen feet apart. The third, attached to them by safety lines, was hanging face down above the surface, rising slowly, like a balloon that has almost more weight than it can lift.

"No, no, *no*, Mr. Danley! You are not *crawling*, Mr. Danley, you are climbing! Do you understand that? *Climbing!* You have to *climb* an asteroid, just as you would climb a cliff on Earth. You have to hold on every second of the time, or you will fall off!" St. Simon's voice sounded harsh in Danley's earphones, and he felt irritatingly helpless poised floatingly above the ground that way.

His instructors were well anchored by metal eyes set into the rocky surface for just that purpose. Although Pallas was mostly nickel-iron, this end of it was stony, which was why it had been selected as a training ground.

"*Well?* snapped St. Simon. "What do you do now? If this were a small rock, you'd be drifting a long ways away by now. Think, Mr. Danley, *think* "

"Then shut up and let me think!" Danley snarled.

"If small things distract you from thinking about the vital necessity of saving your own life, Mr. Danley, you would not live long in the Belt."

Danley reached out an arm to see if he could touch the ground. When he had pushed himself upwards with a thrust of his knee, he hadn't given himself too hard a shove. He had reached the apex of his slow flight, and was drifting downward again. He grasped a jutting rock and pulled himself back to the surface.

"Very good, Mr. Danley—but that wouldn't work on a small rock. You took too long. What would you have done on a rock with a millionth of a gee of pull?"

Danley was silent.

"*Well?*" St. Simon barked. "*What would you do?*"

"I . . . I don't know," Danley admitted.

"Ye gods and little fishhooks!" This was Kerry Brand's voice. It was supposed to be St. Simon's turn to give the verbal instructions, but Brand allowed himself an occasional remark when it was appropriate.

St. Simon's voice was bitingly sweet. "What do you think those safety lines are for, Mr. Danley? Do you think they are for decorative purposes?"

"Well . . . I thought I was supposed to think of some other way. I mean, that's so obvious—"

"Mr. Danley," St. Simon said with sudden patience, "we are not here to give you riddles to solve. We're here to teach you how to stay alive in the Belt. And one of the first rules you must learn is that you will *never* leave your boat without a safety line. *Never!*

"An anchor man, Mr. Danley, is called that for more than one

reason. You cannot anchor your boat to a rock unless there is an eye-bolt set in it. And if it already has an eye-bolt, you would have no purpose on that rock. In a way, *you* will be the anchor of your boat, since you will be tied to it by your safety line. If the boat drifts too far from your rock while you are working, it will pull you off the surface, since it has more mass than you do. That shouldn't be allowed to happen, but, if it does, you are still with your boat, rather than deserted on a rock for the rest of your life—which wouldn't be very long. When the power unit in your suit ran out of energy, it would stop breaking your exhaled carbon dioxide down into carbon and oxygen, and you would suffocate. Even with emergency tanks of oxygen, you would soon find yourself freezing to death. That sun up there isn't very warm, Mr. Danley."

Peter Danley was silent, but it was an effort to remain so. He wanted to remind St. Simon that he, Danley, had been a spaceman for nearly fifteen years. But he was also aware that he was learning things that weren't taught at Earthside schools. Most of his professional life had been spent aboard big, comfortable ships that made the short Earth-Luna hop. He could probably count the total hours he had spent in a spacesuit on the fingers of his two hands.

"All right, Mr. Danley; let's begin again. Climb along the surface. Use toeholds, handholds, and fingerholds. Feel your way along. Find those little crevices that will give you a grip. It doesn't take much. You're a lot better off than a mountain climber on Earth because you don't have to fight your weight. You have only your mass to worry about. That's it. Fine. Very good, Mr. Danley."

And, later:

"Now, Mr. Danley," said Captain Brand, "you are at the end of your tether, so to speak."

The three men were in a space boat, several hundred miles from Pallas. Or, rather, two of them were in the boat, standing at the open door. Peter Danley was far out from it, at the end of his safety line.

"How far are you from us, Mr. Danley?" Brand asked.

"Three hundred meters, Captain Brand," Danley said promptly.

"Very good. How do you know?"

"I am at the end of my safety line, which is three hundred meters long when fully extended."

"Your memory is excellent, Mr. Danley. Now, how will you get back to the boat?"

"Pull myself hand over hand along the line."

"Think, Mr. Danley! *Think!*"

"Uh. Oh. Well, I wouldn't keep pulling. I'd just give myself a tug and then coast in, taking up the line slowly as I went."

"Excellent! What would happen

if you, as you put it, pulled yourself in hand over hand, as if you were climbing a rope on Earth?"

"I would accelerate too much," Danley said. "I'd gain too much momentum and probably bash my brains out against the boat And I'd have no way to stop myself."

"Bully for you, Mr. Danley! Now see if you can put into action that which you have so succinctly put into words. Come back to the boat. Gently the first time. We'll have plenty of practice, so that you can get the feel of the muscle pull that will give you a maximum of velocity with a minimum of impact at this end. Gently, now."

Still later:

"Judgment, Mr. Danley!" St. Simon cautioned. "You have to use judgment! A space boat is not an automobile. There is no friction out here to slow it to a stop. Your accelerator is just exactly that—an accelerator. Taking your foot off it won't slow you down a bit; you've got to use your reverse."

Peter Danley was at the controls of the boat. There were tiny beads of perspiration on his forehead. Over a kilometer away was a good-sized hunk of rock; his instructors wouldn't let him get any closer. They wanted to be sure that they could take over before the boat struck the rock, just in case Danley should freeze to the accelerator a little too long.

He wasn't used to this sort of thing. He was used to a taped acceleration-deceleration program which lifted a big ship, aimed it, and went through the trip all automatically. All he had ever had to do was drop it the last few hundred feet to a landing field.

"Keep your eyes moving," St. Simon said. "Your radar can give you data that you need, just remember that it can't think for you."

Your right foot controls your forward acceleration.

Your left foot controls your reverse acceleration.

They can't be pushed down together; when one goes down, the other goes up. Balance one against the other.

Turning your wheel controls the roll of the boat.

Pulling your wheel toward you, or pushing it away, controls the pitch.

Shifting the wheel left, or right, controls the yaw.

The instructions had been pounded into his head until each one seemed to ring like a separate little bell. The problem was coordinating his body to act on those instructions.

One of the radar dials told him how far he was from the rock. Another told him his radial velocity relative to it. A third told him his angular velocity.

"Come to a dead stop exactly one thousand meters from the surface, Mr. Danley," St. Simon ordered.

Danley worked the controls until both his velocity meters read zero, and the distance meter read exactly one kilometer.

"Very good, Mr. Danley. Now assume that the surface of your rock is at nine hundred ninety-five meters. Bring your boat to a dead stop exactly fifty centimeters from that surface."

Danley worked the controls again. He grinned with satisfaction when the distance meter showed nine nine five point five on the nose.

Captain St. Simon sighed deeply. "Mr. Danley, do you feel a little shaken up? Banged around a little? Do you feel as though you'd just gotten a bone-rattling shock?"

"Uh . . . no."

"You should. You slammed this boat a good two feet into the surface of that rock before you backed out again." His voice changed tone. "Dammit, Mr. Danley, when I say 'surface at nine nine five', I mean *surface!*"

Edway Tarnhorst had been dictating notes for his reports into his recorder, and was rather tired, so when he asked Peter Danley what he had learned, he was rather irritated when the blond man closed his blue eyes and repeated, parrotlike:

"Due to the lack of a water-oxygen atmosphere, many minerals are found in the asteroids which are unknown on Earth. Among the more important of these are: Oldhamite (CaS); Daubréelite ($FeCr_2S_4$); Schreibersite and Rhabdite (Fe_3Ni_3P); Lawrencite ($FeCl^2$); and Taenite, an alloy of iron containing—"

"That's not precisely the sort of thing I meant," Tarnhorst interrupted testily.

Danley smiled. "I know. I'm sorry. That's my lesson for tomorrow."

"So I gathered. May I sit down?" There were only two chairs in the room. Danley was occupying one, and a pile of books was occupying the other.

Danley quickly got to his feet and began putting the books on his desk. "Certainly, Mr. Tarnhorst. Sit down."

Tarnhorst lowered himself into the newly emptied chair. "I apologize for interrupting your studies," he said. "I realize how important they are. But there are a few points I'd like to discuss with you."

"Certainly." Danley seated himself and looked at the older man expectantly. "The nullifiers are on," he said.

"Of course," Tarnhorst said absently. Then, changing his manner, he said abruptly: "Have you found anything yet?"

Danley shook his head. "No. It looks to me as though they've done everything possible to make sure that these men get the best equipment and the best training. The training instructors have been through the whole affair themselves—they know the ropes. The equipment, as far as I can tell, is top grade stuff. From what I have seen so far, the Company isn't stinting on the equipment or the training."

Tarnhorst nodded. "After nearly three months of investigation, I have come to the same conclusion myself. The records show that expenditures on equipment has been steadily increasing. The equipment they have now, I understand, is almost failure-proof?" He looked questioningly at Danley.

Danley nodded. "Apparently. Certainly no one is killed because of equipment failure. It's the finest stuff I've ever seen."

"And yet," Tarnhorst said, "their books show that they are constantly seeking to improve it."

"I don't suppose there is any chance of juggling the books on you, is there?"

Tarnhorst smiled a superior smile. "Hardly. In the first place, I know bookkeeping. In the second, it would be impossible to whip up a complete set of balancing books—covering a period of nearly eighty years—overnight."

"I agree," Danley said. "I don't think they set up a special training course just for me overnight, either. I've seen classes on Vesta, Juno, and Eros—and they're all the same. There aren't any fancy false fronts to fool us, Mr. Tarnhorst: I've looked very closely."

"Have you talked to the men?"

"Yes. They have no complaints."

Again Tarnhorst nodded. "I have found the same thing. They all insist that if a man gets killed in space, it's not the fault of anyone but himself. Or, as it may be, an act of God."

"One of my instructors ran into an act of God some years ago," Danley said. "You've met him. Brand—the one with the scarred face." He explained to Tarnhorst what had caused Brand's disfigurement. "But he survived," he finished, "because he kept his wits about him even after he was hit."

"Commendable; very commendable," Tarnhorst said. "If he'd been an excitable fool, he'd have died."

"True. But what I was trying to point out was that it wasn't equipment failure that caused the accident."

"No. You're quite right." Tarnhorst was silent for a moment, then he looked into Danley's eyes. "Do you think you could take on a job as anchor man now?"

"I don't know," said Danley evenly. "But I'm going to find out tomorrow."

Peter Danley took his final examination the following day. All by himself, he went through the procedure of positioning his ship, setting up a rocket drill, firing it, and setting in an anchor. It was only a small rock, nine meters through, but the job was almost the same as with the big ones. Not far away, Captain St. Simon watched the Earthman's procedure through a pair of high-powered field glasses. He breathed a deep sigh of relief when the job was done.

"Jules," he said softly, "I am

sure glad that man didn't hurt himself any."

"Yes, *suh*! We'd of sho' been in trouble if he'd of killed hisself!"

"We will have to tell Captain Brand that our pupil has done pretty well for such a small amount of schooling."

"I think that would be proper, m'lud."

"And we will also have to tell Captain Brand that this boy wouldn't last a month. He wouldn't come back from his first trip."

There was no answer to that.

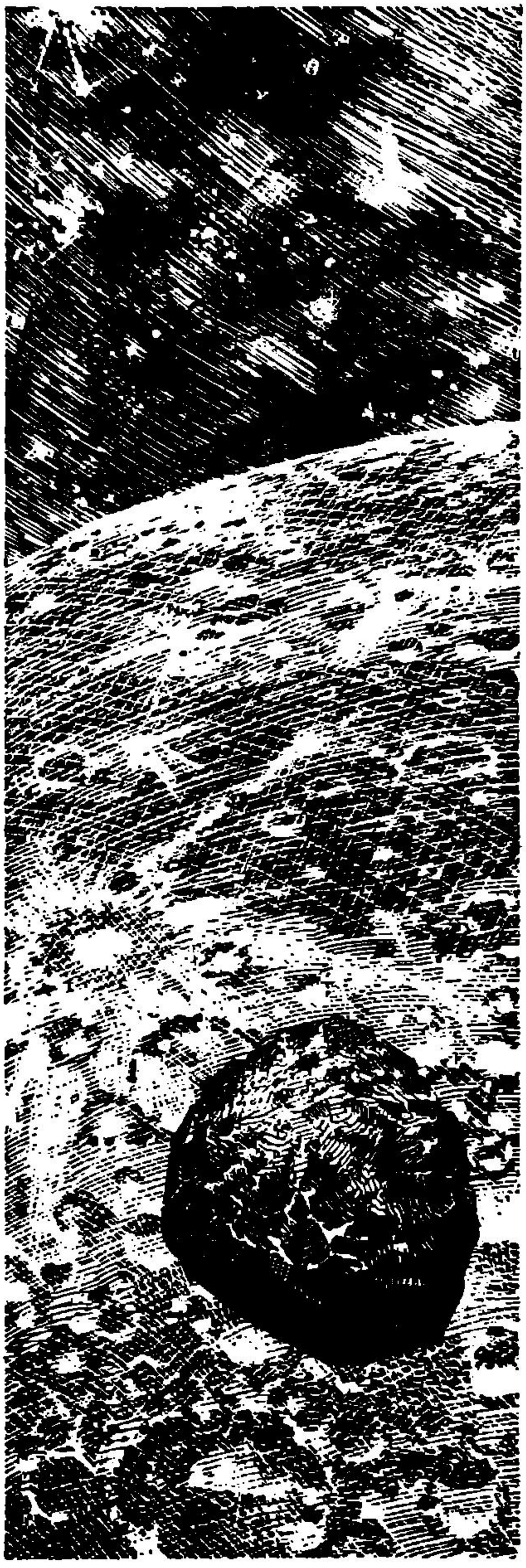
Three days later, amid a cloud of generally satisfied feelings, Edway Tarnhorst and Peter Danley took the ship back to Earth.

"I cannot, of course, give you a copy of my report," Tarnhorst had told Georges Alhamid. "That is for the eyes of the Committee only. However, I may say that I do not find the Belt Companies or the governments of the Belt Cities at fault. Do you want to know my personal opinion?"

"I would appreciate it, Mr. Tarnhorst," Georges had said.

"Carelessness. Just plain carelessness on the part of the workers. That is what has caused your rise in death rates. You people out here in the Belt have become too used to being in space. Familiarity breeds contempt, Mr. Alhamid.

"Steps must be taken to curb that carelessness. I suggest a publicity campaign of some kind. The people



must be thoroughly indoctrinated in safety procedures and warned against carelessness. Just a few months of schooling isn't enough, Mr. Alhamid. You've got to start pounding it into their heads early.

"If you don't—" He shook his head. (He had grown used to doing so in low gravity by now.) "If the death rate isn't cut down, we shall have to raise the premium rates, and I don't know what will happen on the floor of the People's Congress. However, I think I can guarantee six months to a year before any steps are taken. That will give you time to launch your safety campaign. I'm certain that as soon as this carelessness is curbed, the claims will drop down to their former low point."

"We'll certainly try that," Alhamid had said heartily. "Thank you very much, Mr. Tarnhorst."

When they had finally gone, Alhamid spoke to the governor.

"That's that, Larry. You can bring it up at the next meeting of the Board of Governors. Get some kind of publicity campaign going. Plug safety. Tell 'em carelessness is bad. It can't hurt anything and actually might help, who knows?"

"What are you going to do at your end?"

"What we should have done long ago: finance the insurance ourselves. For the next couple of years, we'll only make death claims to Earth for a part of the total. We'll pay off the rest ourselves. Then we'll tell 'em we've brought the cost down so much that we can afford to do our own insurance financing.

"We let this insurance thing ride too long, and it has damn near got us in a jam. We needed the income from Earth. We still could use it, but we need our independence more."

"I second the motion," the governor said fervently. "Look, suppose you come over to my place tonight, and we'll work out the details of this report. O.K.? Say at nine?"

"Fine, Larry. I'll see you then."

Alhamid went back to his office. He was met at the door by his secretary, who handed him a sealed envelope. "The Earthman left this here for you. He said you'd know what to do with it."

Alhamid took the envelope and looked at the name on the outside. "Which Earthman?" he asked.

"The young one," she said, "the blond one."

"It isn't even addressed to me," Alhamid said with a note of puzzled speculation in his voice.

"No. I noticed that. I told him he could send it straight to the school, but he said you would know how to handle it."

Alhamid looked at the envelope again, and his eyes narrowed a little. "Call Captain St. Simon, will you? Tell him I would like to have him come to my office. Don't mention this letter; I don't want it breezed all over Pallas."

It was nearly twenty minutes before St. Simon showed up. Alha-

mid handed him the envelope. "You have a message from your star pupil. For some reason, he wanted me to deliver it to you. I have a hunch you'll know what that reason is after you read it." He grinned. "I'd appreciate it if you'd tell me when you find out. This Mr. Danley has worried me all along."

St. Simon scowled at the envelope, then ripped off one end and took out the typed sheets. He read them carefully, then handed them over to Alhamid. "You'd better read this yourself, George."

Georges Alhamid took the pages and began to read.

Dear Captain St. Simon:

I am addressing this to you rather than anyone else because I think you will understand more than anyone else. Captain Brand is a fine person, but I have never felt very much at ease with him. (I won't go into the psychological reasons that may exist, other than admit that my reasons are purely emotional. I don't honestly know how much they are based on his disfigurement.) Mr. Alhamid is almost a stranger to me. You are the only Belt man I feel I know well.

First, I want to say that I honestly enjoyed our three months together. There were times when I could have cheerfully bashed your head in, I'll admit, but the experience has left me feeling more like a real human being, more like a person in my own right, than I have ever felt before in my life. Believe me, I appreciate it deeply. I know now that I can do things on my own without being dependent on the support of a team or a committee, and for that I am grateful.

Tarnhorst has heard my report and accepted it. His report to the People's Congress will lay the entire blame for the death rate rise on individual carelessness rather than on any fault of management.

I think, in the main, I am justified in making such a report to Tarnhorst, although I am fully aware that it is incomplete. I know that if I had told him the whole truth there would be a ruckus kicked up on Earth that would cause more trouble in the Belt than I'd care to think about. I'm sure you're as aware of the political situation as I am.

You see, I know that anchor-setting could be made a great deal safer. I know that machines could be developed which would make the job so nearly automatic that the operator would never be exposed to any more danger than he would be in a ship on the Earth-Luna run. Perhaps that's a little exaggerated, but not much.

What puzzled me was: *Why?* Why shouldn't the Companies build these machines if they were more efficient? Why should every

Belt man defend the system as it was? Why should men risk their necks when they could demand better equipment? (I don't mean that the equipment presently used is poor; I just mean that full mechanization would do away with the present type of equipment and replace it with a different type.)

Going through your course of instruction gave me the answer to that, even though I didn't take the full treatment.

All my life, I've belonged to an organization of some kind—the team, the crew, whatever it might be. But the Team was everything, and I was recognized only as a member of the Team. I was a replaceable plug-in unit, not an individual in my own right. I don't know that I can explain the difference exactly, but it seems to me that the Team is something outside of which the individual has no existence, while the men of the Belt can form a team because they know that each member is self-sufficient in his own right.

On Earth, we all depend on the Team, and, in the long run, that means that we are depending on each other—but none of us feels he can depend on himself. Every man hopes that, as a member of the Team, he will be saved from his own errors, his own failures. But he knows that everyone else is doing the same thing, and, deep down inside, he knows that they are not deserving of his reliance. So he puts his reliance in the Team, as if that were some sort of separate entity in itself, and had magical, infallible powers that were greater than the aggregate of the individuals that composed it.

In a way, this is certainly so, since teamwork can accomplish things that mobs cannot do. But the Team is a failure if each member assumes that he, himself, is helpless and can do nothing, but that the Team will do it for him.

Men who have gone through the Belt training program, men who have "space experience," as you so euphemistically put it, are men who can form a real team, one that will get things done because each man knows he can rely on the others, not only as a team, but as individuals. But to mechanize the anchor-setting phase would destroy all that completely.

I don't want to see that destroyed, because I have felt what it is to be a part of the Belt team, even though only a small and unreliable part. Actually, I know I was not and could never be a real member of that team, but I was and am proud to have scrimmaged with the team, and I'm glad to be able to sit on the sidelines and cheer even if I can't carry the ball. (It just occurred to me that those metaphors might be a little cloudy to you, since you don't have football in

the Belt, but I think you see what I mean.) I imagine that most of the men who have no "space experience" feel the same way. They know they'd never make a go of it out in space, but they're happy to be water boys.

I wish I could stay in the Belt. I'm enough of a spaceman to appreciate what it really is to be a member of a space society. But I also know that I'd never last. I'm not fitted for it, really. I've had a small taste of it, but I know I couldn't take a full dose. I've worked hard for the influence and security I have in my job, and I couldn't give it up. Maybe this brands me as a coward in your eyes, and maybe I am a coward, but that's the way I'm built. I hope you'll take that into account when you think of me.

At any rate, I have done what I have done. On Earth, there are men who envy you and hate you, and there will be others who will try to destroy you, but I have done what I could to give you a chance to gain the strength you need to resist the encroachment of Earth's sickness.

I have a feeling that Tarnhorst saw your greatness, too, although he'd never admit it, even to himself. Certainly something changed him during the last months, even though he doesn't realize it. He came out wanting to help—and by that, he meant help the common people against the "tyranny" of the Companies. He still wants to help the common people, but now he wants to do it *through* the Companies. The change is so subtle that he doesn't think he's changed at all, but I can see it.

I don't deserve any thanks for what I have done. All I have done is repay you in the only way I knew how for what you have done for me. I may never see you again, captain, but I will always remember you. Please convey my warmest regards to Captain Brand and to Mr. Alhamid.

Sincerely,

Peter Danley

Georges Alhamid handed the letter back to St. Simon. "There's your star pupil," he said gently.

St. Simon nodded. "The wise fool. The guy who's got sense enough to know that he isn't competent to do the job."

"Did you notice that he waltzed all around the real reason for the anchor-setting program without quite hitting it?"

St. Simon smiled humorlessly. "Sure. Notice the wording of the letter. He still thinks in terms of the Team, even when he's trying not to. He thinks we do this just to train men to have a real good Team Spirit. He can't see that that is only a very useful by-product."

"How could he think otherwise?" Alhamid asked. "To him, or to Tarnhorst, the notion of deliberately tailoring a program so

that it would kill off the fools and the incompetents, setting up a program that will deliberately destroy the men who are dangerous to society, would be horrifying. They would accuse us of being soulless butchers who had no respect for the dignity of the human soul."

"We're not butchering anybody," St. Simon objected. "Nobody is forced to go through two years of anchor setting. Nobody is forced to die. We're not running people into gas chambers or anything like that."

"No; of course not. But would you expect an Earthman like Tarnhorst to see the difference? How could we explain to him that we have no objection to fools other than that we object to putting them in positions where they can harm others by their foolishness? Would you expect him to understand that we must have a method of eliminating those who are neither competent enough to be trusted with the lives of others nor wise enough to see that they are not competent? How would you tell him that the reason we send men out alone is so that if he destroys anyone by his foolishness —after we have taught him everything we know in the best way we know how—he will only destroy himself?"

"I wouldn't even try," St. Simon said. "There's an old saying that neither money, education, liquor, nor women ever made a fool of a man, they just give a born fool a chance to display his foolishness. Space ought to be added to that list."

"Did you notice something else about that letter?" Alhamid asked. "I mean, the very fact that he wrote a letter instead of telling you personally?"

"Sure. He didn't trust me. He was afraid I, or someone else, would dispose of him if we knew he knew our secret."

"I think that's it," Alhamid agreed. "He wanted to be safely away first."

"Killing him would have brought down the biggest investigation the Earth Congress has launched since the crack-up of the Earth-Luna ship thirty years ago. Does he think we are fools?"

"You can't blame him. He's been brought up that way, and three months of training isn't going to change him."

St. Simon frowned. "Suppose he changes his mind? Suppose he tells Tarnhorst what he thinks?"

"He won't. He's told his lie, and now he'll have to stick by it or lose his precious security. If he couldn't trade that for freedom, he sure isn't going to throw it away." Alhamid grinned. "But can you imagine a guy thinking that anchor setting could be completely mechanized?"

St. Simon grinned back. "I guess I'm not a very good teacher after all. I told him and told him and told him for three solid months that the job required judgment, but it

evidently didn't sink in. He's got the heart of a romantic and the soul of an Earthman—a very bad combination."

"He has my sympathy," Alhamid said with feeling. "Now, about you. Your blue ticket still has three months to run, but I can't give you a class if you're only going to run through the first half of the course with them, and I don't have any more Earthmen for you to give special tutoring to. You have three choices: You can loaf with pay for three months; you can go back to space and get double pay for three months; or you can take a regular six-month class and get double pay for the last three months. Which'll it be?"

St. Simon grinned widely. "I'm going to loaf until I get sick of it, then I'll go back to space and collect double pay for what's left of the three months. First off, I'm going to take a run over to Vesta. After that, who knows?"

"I thought so. Most of you guys would stay out there forever if you didn't have to come back for supplies."

St. Simon shook his head. "Nope. Not true. A man's got to come back every so often and get his feet on the ground. If you stay out there too long, you get to talking to yourself."

An hour later, the spaceboat *Nancy Bell* lifted from the surface of Pallas and shot toward Vesta.

"Jules, old cobblestone, we have just saved civilization."

"*Jawohl, Herr Hassenpfefferesser!* Und now ve go to find *das Mädchen, nicht war?*"

"Herr *Professor* Hassenpfefferesser to you, my boy."

And then, all alone in his spaceboat, Captain Jules St. Simon burst into song:

"Oh, I'm the cook and the captain,
too,
And the men of the *Nancy's*
brig;
The bosun tight, and the midshipmite,
And the crew of the captain's
gig!"

And the *Nancy Bell* sped on toward Vesta and a rendezvous with Eros. ■

The Analytical Laboratory

July 19[illegible]

PLACE	TITLE	AUTHOR	POINTS
1.	Border, Breed Nor Birth (Pt. 1)	*Mack Reynolds*	1.[illegible]
2.	Listen! The Stars!	*John Brunner*	1.97
3.	Junior Achievement,	*William Lee*	3.07
4.	The Other Likeness,	*James H. Schmitz*	3.13
5.	The Rescuer,	*Arthur Porges*	4.35

The Editor

Continued from page 82
midst of moving out the furniture she had been too sentimental to sell. The only trouble was, her house had disappeared. So had the village of Valleyview.

He stared at where the houses should have been, saw nothing at first except a continuation of the starlit plain. Then he noticed an upright rectangle of pale light hovering just above the ground, and presently he identified it as Judith's back doorway. He could see through it into the kitchen, and by straining his eyes, he could even see the stove and the refrigerator.

Gradually he made out other upright rectangles hovering just above the ground, some of them on a line with Judith's. All of them, however, while outlined in the same shimmering blue that outlined hers lacked lighted interiors.

As he stood there staring, the van came to a halt, turned around and backed up to the brightest rectangle, hiding it from view. The two men got out of the cab and walked around to the rear of the truckbed. "We'll put the stove on first," Philip heard one of them say. And then, "Wonder why she wants to hang onto junk like this?"

The other man's voice was fainter, but his words were unmistakable enough: "Grass widows who turn into old maids have funny notions sometimes."

Judith Darrow wasn't really moving out of Valleyview after all. She only thought she was.

Philip went on. The breeze was all around him. It blew through his hair, kissed his cheeks and caressed his forehead. The stars shone palely down. Some of the land was under cultivation, and he could see green things growing in the starlight, and the breeze carried their green breath to his nostrils. He reached the highway and began walking along it. He saw no further sign of vehicles till he came opposite a large brick building with bright light spilling through its windows. In front of it were parked a dozen automobiles of a make that he was unfamiliar with.

He heard the whir of machinery and the pounding of hammers, and he went over and peered through one of the windows. The building proved to be a furniture factory. Most of the work was being done by machines, but there were enough tasks left over to keep the owners of the parked cars busily occupied. The main manual task was upholstering. The machines cut and sewed and trimmed and planed and doweled and assembled, but apparently none of them was up to the fine art of spitting tacks.

Philip returned to the highway and went on. He came to other buildings and peered into each. One was a small automobile-assembly plant, another was a dairy, a third was a long greenhouse. In the first two the preponderance of the work was being performed by machines. In the third, however, machines



were conspicuously absent. Clearly it was one thing to build a machine with a superhuman work potential, but quite another to build one with a green thumb.

He passed a pasture, and saw animals that looked like cows sleeping in the starlight. He passed a field of newly-sprouted corn He passed a power plant, and heard the whine of a generator. Finally he came to the outskirts of Pfleugersville.

There was a big illuminated sign by the side of the road. It stopped him in his tracks, and he stood there staring at its embossed letters: PFLEUGERSVILLE, SIRIUS XXI

Discovered April 1, 1962
Incorporated September 11, 1962

Philip wiped his forehead.

Zarathustra had trotted on ahead. Now he stopped and looked back. *Come on*, he seemed to say. *Now that you've seen this much, you might as well see the rest.*

So Philip entered Pfleugersville . . . and fell in love—

Fell in love with the lovely houses, and the darling trees in summer bloom. With the parterres of twinkling star-flowers and the expanses of verdant lawns. With the trellised green roses that tapestried every porch. With the hy-

drangealike blooms that garnished every corner. With Pfleugersville itself.

Obviously the hour was late, for, other than himself, there was no one on the streets, although lights burned in the windows of some of the houses, and dogs of the same breed and size as Zarathustra occasionally trotted by. And yet according to his watch the time was 10:51. Maybe, though, Pfleugersville was on different time. Maybe, here in Pfleugersville, it was the middle of the night.

The farther he progressed into the village, the more enchanted he became. He simply couldn't get over the houses. The difference between them and the houses he was familiar with was subtle, but it was there. It was the difference that exists between good- and not-quite-good taste. Here were no standardized patios, but little marble aprons that were as much a part of the over-all architecture as a glen is a part of a woods. Here were no stereotyped picture windows. but walls that blended imperceptibly into pleasing patterns of transparency. Here were no four-square back yards, but rambling star-flowered playgrounds with swings and seesaws and shaded swimming holes; with exquisite doghouses good enough for little girls' dolls to live in.

He passed a school that seemed to grow out of the very ground it stood on. He passed a library that had been built around a huge tree, the branches of which had intertwined their foliage into a living roof. He passed a block-long supermarket built of tinted glass. Finally he came to the park

He gasped then. Gasped at the delicate trees and the little blue-eyed lakes; at the fairy-fountains and the winding, pebbled paths. Star-flowers shed their multicolored radiance everywhere, and starlight poured prodigally down from the sky. He chose a path at random and walked along it in the twofold radiance till he came to the cynosure.

The cynosure was a statue—a statue of a buck-toothed, wall-eyed youth gazing steadfastly up into the heavens. In one hand the youth held a Phillips screw driver, in the other a six-inch crescent wrench. Standing several yards away and staring raptly up into the statue's face was the youth himself, and so immobile was he that if it hadn't been for the pedestal on which the statue rested, Philip would have been unable to distinguish one from the other.

There was an inscription on the pedestal. He walked over and read it in the light cast by a nearby parterre of star-flowers:

FRANCIS FARNSWORTH
PFLEUGER,
DISCOVERER OF
PFLEUGERSVILLE

Born: May 5, 1941. Died: ——
Profession Inventor. On the first day of April of the year of our Lord, 1962, Francis Farnsworth Pfleuger

brought into being a Möbius coincidence field and established multiple contact with the twenty-first satellite of the star Sirius. thereby giving the people of Valleyview access, via their back doorways, to a New World. Here we have come to live. Here we have come to raise our children. Here, in this idyllic village, which the noble race that once inhabited this fair planet left behind them when they migrated to the Greater Magellanic Cloud, we have settled down to create a new and better Way of Life. Here, thanks to Francis Farnsworth Pfleuger, we shall know happiness prosperity and freedom from fear.
FRANCIS FARNSWORTH PFLEUGER, WE, THE NEW INHABITANTS OF SIRIUS XXI, SALUTE YOU!

Philip wiped his forehead again.

Presently he noticed that the flesh-and-blood Francis Pfleuger was looking in his direction. "Me," the flesh-and-blood Francis Pfleuger said, pointing proudly at the statue. "Me."

"So I gather," Philip said dryly. And then. "Zarathustra—come back here!"

The little dog had started down one of the paths that converged on the statue. At Philip's command, he stopped but did not turn; instead he remained where he was, as though waiting for someone to come down the path. After a moment, someone did—Judith Darrow.

She was wearing a simple white dress, reminiscent both in design and décor of a Grecian tunic. A wide gilt belt augmented the effect, and her delicate sandals did nothing to mar it. In the radiance of the star-flowers, her eyes were more gray than green. There were shadows under them, Philip noticed. and the lids were faintly red.

She halted a few feet from him and looked at him without saying a word. "I . . . I brought your dog back," he said lamely. "I found him in the back seat of my car."

"Thank you. I've been looking all over Pfleugersville for him. I left my Valleyview doors open, hoping he'd come home of his own accord, but I guess he had other ideas. Now that you've discovered our secret, Mr. Myles, what do you think of our brave new world?"

"I think it's lovely," Philip said, "but I don't believe it's where you seem to think it is."

"Don't you?" she asked. "Then suppose you show me the full moon that rose over Valleyview tonight. Or better yet, suppose I show you something else." She pointed to a region of the heavens just to the left of the statue's turned-up nose. "You can't see them from here," she said, "but around that insignificant yellow star, nine planets are in orbit. One of them is Earth."

"But that's impossible!" he objected. "Consider the—"

"Distance? In the sort of space we're dealing with, Mr. Myles, distance is not a factor. In Möbius space—as we have come to call it

for lack of a better term—any two given points are coincidental, regardless of how far apart they may be in non-Möbius space. But this becomes manifest only when a Möbius coincidence-field is established. As you probably know by now, Francis Pfleuger created such a field."

At the mention of his name, Francis Pfleuger came hurrying over to where they were standing. "E," he declared, "equals mc^2."

"Thank you, Francis," Judith said. Then, to Philip, "Shall we walk?"

They started down one of the converging paths, Zarathustra bringing up the rear. Behind them, Francis returned to his Narcissistic study of himself in stone. "We were neighbors back in Valleyview," Judith said, "but I never dreamed he thought quite so much of himself. Ever since we put up that statue last week, he's been staring at it night and day. Sometimes he even brings his lunch with him."

"He seems to be familiar with Einstein."

"He's not really, though. He memorized the energy-mass equation in an attempt to justify his new status in life, but he hasn't the remotest notion of what it means It's ironic in a way that Pfleugersville should have been discovered by someone with an IQ of less than seventy-five."

"No one with an IQ of less than seventy-five could create the sort of field you were talking about."

"He didn't create it deliberately —he brought it into being accidentally by means of a machine he was building to tie knots with. Or at least that's what he says. But we do know that there was such a machine because we saw its fused parts in his kitchen, and there's no question but what it was the source of the field. Francis, though, can't remember how he made the parts or how he put them together. As a matter of fact, to this day he still doesn't understand what happened —though I have a feeling that he knows more than he lets on."

"What *did* happen?" Philip asked.

For a while Judith was silent. Then, "All of us promised solemnly not to divulge our secret to an outsider unless he was first accepted by the group as a whole," she said. "But thanks to my negligence, you know most of it already, so I suppose you're entitled to know the rest." She sighed. "Very well— I'll try to explain . . ."

When Francis Pfleuger's field had come into being, something had happened to the back doors of Valleyview that caused them to open upon a planet which one of the local star-gazers promptly identified as Sirius XXI. The good folk of Valleyview had no idea of how such a state of affairs could exist, to say nothing of how it could have come about, till one of the scientists whom they asked to join them as a part of the plan which they presently devised to make their

forthcoming utopia self-sufficient, came up with a theory that explained everything.

According to his theory, the round-trip distance between any two planetary or stella bodies was curved in the manner of a Möbius strip—i.e., a strip of paper given a half-twist before bringing the two ends together. In this case, the strip represented the round-trip distance from Earth to Sirius XXI. Earth was represented on the strip by one dot, and Sirius XXI by another, and, quite naturally, the two dots were an equal distance—or approximately 8.8 light years—apart. This brought them directly opposite one another—one on one side of the strip, the other on the other side; but since a Möbius strip has only one surface—or side—the two dots were actually occupying the same space at the same time. In "Möbius space", then, Earth and Sirius XXI were "coincidental".

Philip looked over his shoulder at the little yellow sun twinkling in the sky. "Common sense," he said, "tells me differently."

"Common sense is a liar of the first magnitude," Judith said. "It has misled man ever since he first climbed down from the trees. It was common sense that inspired Ptolemy's theory of cosmogony. It was common sense that inspired the burning of Giordano Bruno . . ."

The fact that common sense indicated that 8.8 light years separated Earth and Sirius XXI in common-sense reality didn't prove that 8.8 light years separated them in a form of reality that was outside common-sense's dominion—i.e., Möbius space—and Francis Pfleuger's field had demonstrated as much. The back-door nodal areas which it had established, however, were merely limited manifestations of that reality—in other words, the field had merely provided limited access to a form of space that had been in existence all along.

"Though why," Judith concluded, "our back doors should have been affected rather than our front doors, for example, is inexplicable—unless it was because Francis built the machine in his kitchen. In any event, when they did become nodal areas, they manifested themselves on Sirius XXI, and the dogs in the immediate vicinity associated them with the doorways of their departed masters and began whining to be let in."

"Their departed masters?"

"The race that built this village. The race that built the factories and developed the encompassing farms. A year ago, according to the records they left behind them, they migrated to the Greater Magellanic Cloud."

Philip was indignant. "Why didn't they take their dogs with them?"

"They couldn't. After all, they had to leave their cars and their furniture behind them too, not to mention almost unbelievable stock-

piles of every metal imaginable that will last us for centuries. The logistics of space travel make taking even an extra handkerchief along a calculated risk. Anyway, when their dogs 'found' us, they were overjoyed, and as for us, we fell in love with them at first sight. Our own dogs, though, didn't take to them at all, and every one of them ran away."

"This can't be the only village," Philip said. "There must be others somewhere."

"Undoubtedly there are. All we know is that the people who built this one were the last to leave."

The park was behind them now, and they were walking down a pleasant street. "And when you and your neighbors discovered the village, did you decide to become expatriates right then and there?" Philip asked.

She nodded. "Do you blame us? You've seen for yourself what a lovely place it is. But it's far more than that. In Valleyview, we had unemployment. Here, there is work for everyone, and a corresponding feeling of wantedness and togetherness. True, most of the work is farmwork, but what of that? We have every conceivable kind of machine to help us in our tasks. Indeed, I think that the only machine the Sirians lacked was one that could manufacture food out of whole cloth. But consider the most important advantage of all: when we go to bed at night we can do so without being afraid that sometime during our sleep a thermonuclear missile will descend out of the sky and devour us in one huge incandescent bite. If we've made a culture hero out of our village idiot, it's no more than right, for unwittingly or not, he opened up the gates of paradise."

"And you immediately saw to it that no one besides yourselves and a chosen few would pass through them."

Judith paused beside a white gate. "Yes, that's true," she said. "To keep our secret, we lived in our old houses while we were settling our affairs, closing down our few industries and setting up a new monetary system. In fact, we even kept our . . . the children in the dark for fear that they would talk at school. Suppose, however, we *had* publicized our utopia. Can't you imagine the mockery opportunists would have made out of it? The village we found was large enough to accommodate ourselves and the few friends, relatives and specialists we asked to join us, but no larger; and we did, after all, find it in our own back yard." She placed her hand on the white gate. "This is where I live."

He looked at the house, and it was enchanting. Slightly less enchanting, but delightful in its own right, was the much smaller house beside it. Judith pointed toward the latter dwelling and looked at Zarathustra. "It's almost morning, Zarathustra," she said sternly. "Go to bed this minute!" She



opened the gate so that the little dog could pass through and raised her eyes to Philip. "Our time is different here," she explained And then, "I'm afraid you'll have to hurry if you expect to make it to my back door before the field dies out."

He felt suddenly empty. "Dies out?" he repeated numbly

"Yes. We don't know why, but it's been diminishing in strength ever since it first came into being, and our 'Möbius-strip scientist' has predicted that it will cease to exist during the next twenty-four hours. I guess I don't need to remind you that you have important business on Earth."

"No," he said, "I guess you don't." His emptiness bowed out before a wave of bitterness. He had rested his hand on the gate, as close to hers as he had dared. Now he saw that while it was inches away from hers in one sense, it was light years away in another. He removed it angrily. "Business always comes first with you, doesn't it?"

"Yes. Business never lets you down."

"Do you know what I think?" Philip said. "I think that you were the one who did the selling out, not your husband. I think you sold him out for a law practice."

Her face turned white as though he had slapped it, and in a sense, he had. "Good-by," she said, and this time he was certain that if he were to reach out and touch her, she would shatter into a million pieces. "Give my love to the planet Earth," she added icily

"Good-by," Philip said, his anger gone now, and the emptiness rushing back. "Don't sell us short, though—we'll make a big splash in your sky one of these days when we blow ourselves up."



He turned and walked away. Walked out of the enchanting village and down the highway and across the flower-pulsing plain to Judith's back doorway. It was unlighted now, and he had trouble distinguishing it from the others. Its shimmering blue framework was flickering. Judith had not lied then: the field was dying out.

He locked the back door behind him, walked sadly through the dark and empty house and let himself out the front door. He locked the front door behind him, too, and went down the walk and climbed into his car He had thought he had locked it. but apparently he hadn't. He drove out of town and down the road to the highway, and down the highway toward the big bright bonfire of the city.

Dawn was exploring the eastern sky with pale pink fingers when at last he parked his car in the garage behind his apartment building. He reached into the back seat for his brief case and the manila envelopes. His brief case had hair on it. It was soft and warm. "Ruf," it barked. "Ruf-ruf!"

He knew then that everything was all right. Just because no one had invited him to the party didn't mean that he couldn't invite himself He would have to hurry, though—he had a lot of things to do, and time was running out.

Noon found him on the highway again, his business transacted, his affairs settled, Zarathustra sitting beside him on the seat. One o'clock found him driving into Valleyview; two-five found him turning down a familiar street. He would have to leave his car behind him, but that was all right. Leaving it to rust away in a ghost town was better than selling it to some opportunistic dealer for a sum he would

have no use for anyway. He parked it by the curb, and after getting his suitcase out of the trunk, walked up to the front door of Number 23. He unlocked and opened the door, and after Zarathustra followed him inside, closed and locked it behind him. He strode through the house to the kitchen. He unlocked and opened the back door. He stepped eagerly across the threshold—and stopped dead still.

There were boards beneath his feet instead of grass. Instead of a flower-pied plain, he saw a series of unkempt back yards. Beside him on an unpainted trellis, Virginia creeper rattled in an October wind.

Zarathustra came out behind him, descended the back-porch steps and ran around the side of the house. Looking for the green-rose bush probably.

"Ruf!"

Zarathustra had returned and was looking up at him from the bottom step. On the top step he had placed an offering.

The offering was a green rose.

Philip bent down and picked it up. It was fresh, and its fragrance epitomized the very essence of Sirius XXI. "Zarathustra," he gasped, "where did you get it?"

"Ruf!" said Zarathustra, and ran around the side of the house.

Philip followed, rounded the corner just in time to see the white-tipped tail disappear into the ancient dog house. Disappointment numbed him. That was where the rose had been then—stored away for safe-keeping like an old and worthless bone.

But the rose was fresh, he reminded himself.

Did dog houses have back doorways?

This one did, he saw, kneeling down and peering inside. A lovely back doorway, rimmed with shimmering blue. It framed a familiar vista, in the foreground of which a familiar green-rosebush stood. Beneath the rosebush Zarathustra sat, wagging his tail.

It was a tight squeeze, but Philip made it. He even managed to get his suitcase through. And just in time too, for hardly had he done so when the doorway began to flicker. Now it was on its way out, and as he watched, it faded into transparency and disappeared.

He crawled from beneath the rosebush and stood up. The day was bright and warm, and the position of the sun indicated early morning or late afternoon. No, not sun—suns. One of them was a brilliant blue-white orb, the other a twinkling point of light.

He set off across the plain in Zarathustra's wake. He had a speech already prepared, and when Judith met him at the gate with wide and wondering eyes, he delivered it without preamble. "Judith," he said, "I am contemptuous of the notion that some things are meant to be and others aren't, and I firmly believe in my own free will; but when your dog stows away in the back seat of my car two times

running and makes it impossible for me not to see you again, then there must be something afoot which neither you nor I can do a thing about. Whatever it is, I have given in to it and have transferred your real estate to an agent more trustworthy than myself. I know you haven't known me long, and I know I'm not an accepted member of your group, but maybe somebody will give me a job raking lawns or washing windows or hoeing corn long enough for me to prove that I am not in the least antisocial; and maybe, in time, you yourself will get to know me well enough to realize that while I have a weakness for blondes who look like Grecian goddesses, I have no taste whatever for redheads, brunettes, or Cutty Sark. In any event, I have burned my bridges behind me, and whether I ever become a resident of Pfleugersville or not, I have already become a resident of Sirius XXI."

Judith Darrow was silent for some time. Then, "This morning," she said, "I wanted to ask you to join us, but I couldn't for two reasons. The first was your commitment to sell our houses, the second was my bitterness toward men. You have eliminated the first, and the second seems suddenly inane." She raised her eyes. "Philip, please join us. I want you to."

Zarathustra, whose real name was Siddenon Phenphonderill, left them standing there in each other's arms and trotted down the street and out of town. He covered the ground in easy lopes that belied his three hundred and twenty-five years, and soon he arrived at the Meeting Place. The mayors of the other villages had been awaiting him since early morning and were shifting impatiently on their haunches. When he clambered up on the rostrum they extended their audio-appendages and retractile fingers and accorded him a round of applause. He extended his own "hands" and held them up for silence, then, retracting them again, he seated himself before the little lectern and began his report, the idiomatic translation of which follows forthwith:

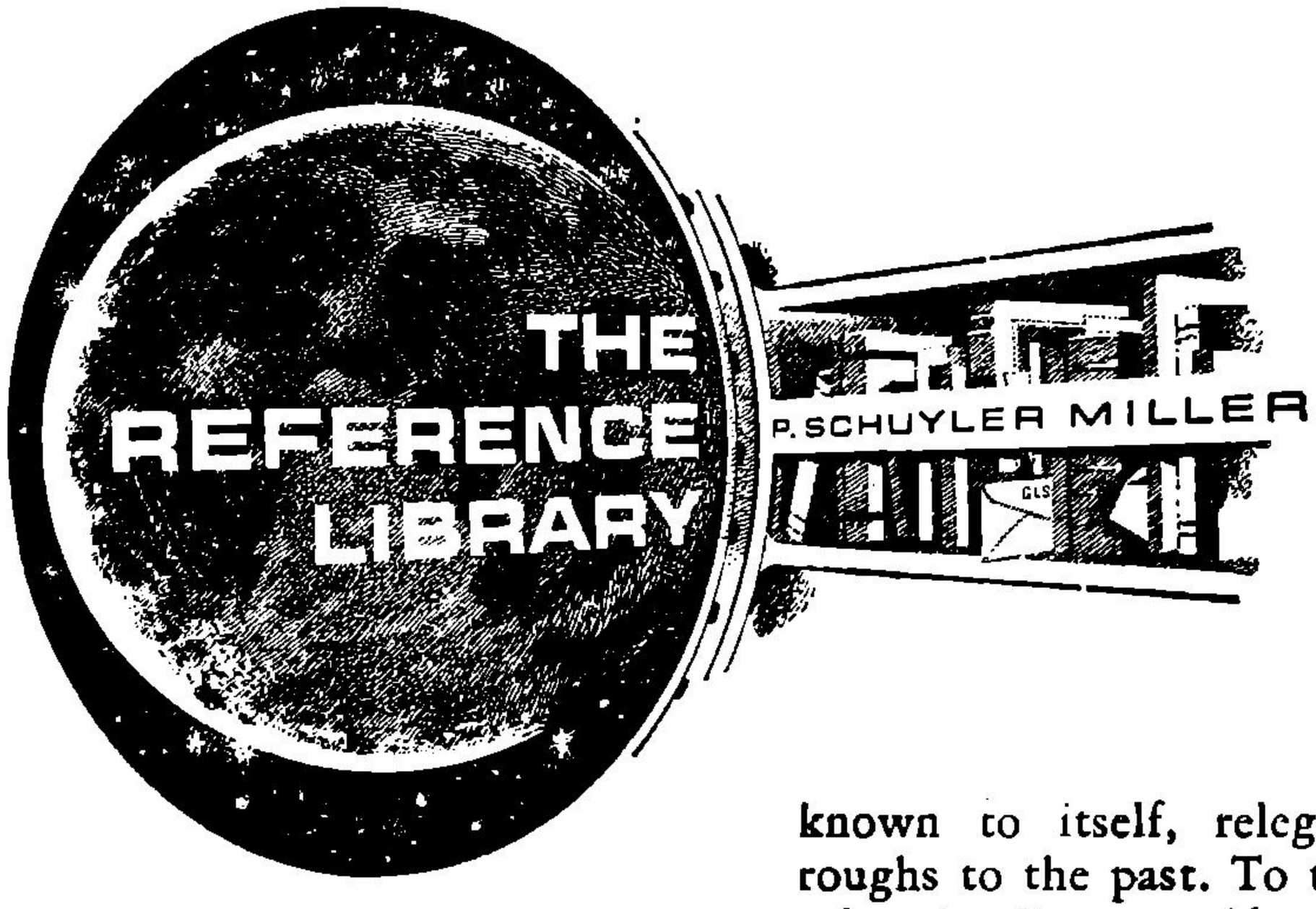
"Gentlemen, my apologies for my late arrival. I will touch upon the circumstances that were responsible for it presently.

"To get down to the matter uppermost in your minds: Yes, the experiment was a success, and if you will use your psycho-transmutative powers to remodel your villages along the lines my constituents and I remodeled ours and to build enough factories to give your 'masters' that sense of self-sufficiency so essential to their well-being, and if you will 'plant' your disassembled Multiple Möbius-Knot Dynamos in such a way that the resultant fields will be ascribed to accidental causes, you will have no more trouble attracting personnel than we did. Just make sure that your 'masters' quarters are superior to your own,

and that you behave like dogs in their presence. And when you fabricate your records concerning your mythical departed masters, see to it that they do not conflict with the records we fabricated concerning ours. It would be desirable indeed if our Sirian-human society could be based on less deceitful grounds than these, but the very human attitude we are exploiting renders this impossible at the moment. I hate to think of the resentment we would incur were we to reveal that, far from being the mere dogs we seem to be, we are capable of mentally transmuting natural resources into virtually anything from a key to a concert hall, and I hate even more to think of the resentment we would incur were we to reveal that, for all our ability in the inanimate field, we have never been able to materialize so much as a single blade of grass in the animate field, and that our reason for coincidentalizing the planet Earth and creating our irresistible little utopias stems not from a need for companionship but from a need for gardeners. However, you will find that all of this can be ironed out eventually through the human children, with whom you will be thrown into daily contact and whom you will find to possess all of their parents' abiding love for us and none of their parents' superior attitude toward us. To a little child, a dog is a companion, not a pet; an equal, not an inferior—and the little children of today will be the grown-ups of tomorrow.

"To return to the circumstances that occasioned my late arrival: I . . . I must confess, gentlemen, that I became quite attached to the 'mistress' into whose house I sought entry when we first established our field and who subsequently adopted me when I convinced her real dog that he would find greener pastures elsewhere. So greatly attached did I become, in fact, that when the opportunity of ostracizing her loneliness presented itself, I could not refrain from taking advantage of it. The person to whom she was most suited and who was most suited to her appeared virtually upon her very doorstep; but in her stubbornness and in her pride she aggravated rather than encouraged him, causing him to rebel against the natural attraction he felt toward her. I am happy to report that, by means of a number of subterfuges—the final one of which necessitated the use of our original doorway—I was able to set this matter right, and that these two once-lonely people are about to embark upon a relationship which in their folklore is oftentimes quaintly alluded to by the words, 'They lived happily ever after.'

"And now, gentlemen, the best of luck to you and your constituents, and may you end up with servants as excellent as ours. I hereby declare this meeting adjourned." ■



THE RETURN OF E.R.B.

■ And it came to pass that there was a generation that knew not Burroughs . . .

Oh, it hasn't happened yet. The film industry and the cartoon strips have preserved a series of pseudo-Tarzans, and the latter are collected from time to time in so-called "comic" books. Grossett & Dunlap have kept several of the early Tarzan books in print. But the adventure fantasies that *were* Edgar Rice Burroughs to an older generation—the Burroughs of John Carter and Tars Tarkas, of Barsoom and Pellucidar and the Land That Time Forgot—have been out of print for a long time. In England some of them have been available as paperbacks, but not west of the Atlantic. In Burroughs' own country the Burroughs estate, for reasons best known to itself, relegated Burroughs to the past. To those who take the literary side of science fiction and fantasy very seriously, it was just as well.

Now the Burroughs books, or some of them, are coming back. Rumor has it that it was possible because of an oversight in copyright, but neither the publishers nor the Burroughs heirs have anything to say for the record. What counts is that some of Edgar Rice Burroughs' better known—and better—adventure fantasies are available again in new editions, and it seems fitting to take a look at them as they appear.

Two publishers are responsible for the resurrection: Dover Publications, whose 499-page "3 Martian Novels by Edgar Rice Burroughs" is *the* bargain of the lot at $1.75, and a new publisher, Canaveral Press, 63 Fourth Avenue, New York, which has announced a line of new hard-bound editions of

early Burroughs books at $2.75 apiece, with new illustrations by the well-known artist of the grotesque, Mahlon Blaine. The Dover omnibus has reproductions of sixteen of the original J. Allen St. John illustrations.

For obscure reasons, Dover has skipped the first three of Burroughs' Martian stories and taken up the series with the fourth, fifth and sixth volumes: "Thuvia, Maid of Mars," "The Chessmen of Mars," and "The Master Mind of Mars." Canaveral continues the series with "A Fighting Man of Mars," and proposes to go back and pick up "Gods of Mars", the second book. This leaves the first of the series, "A Princess of Mars," and the third, "The Warlord of Mars," mysteriously missing, and the fate of books published later than "Fighting Man" in some kind of limbo.

Canaveral's first lot of three titles also included a very early and pretty poor book, "The Monster Men," and a retitled version of "The Moon Maid"—now "Moon Men." The latter is usually cited as Burroughs' best from a literary standpoint. The first three of the Pellucidar series and one of my own favorites, "The Land That Time Forgot," were scheduled for August, and "Cave Girl" and "Pirates of Venus," with some non-fantasies, in October "Gods of Mars" has a November date.

Nowadays Edgar Rice Burroughs is generally ruled out of the science-fiction class on the ground that his "science" is rank fantasy, and out of serious consideration in any class on the grounds that his writing is hopelessly stiff and archaic. But in evaluating this criticism, let's also put the books in their own setting. Burroughs' first published story, "Under the Moons of Mars"—"A Princess of Mars" in book form—was serialized in the winter of 1912, more than fifty years ago. "The Monster Men" dates from 1913. "Thuvia," the first in the Dover trio, was serialized in 1916 and "Fighting Man," the newest of the present lot, dates from 1930.

We know now that a world like Burroughs' Barsoom, with abundant vegetation and animal life, a variety of humanoid and non-human races, breathable air and flowing streams and seas, can not exist on Mars. But when Burroughs began to write, the kind of astronomy which got into the popular magazines and Sunday newspapers was very big on Percival Lowell's proclamation that he had seen evidence of intelligent civilization on Mars. Burroughs simply brought Lowell's Mars to life as Barsoom. He gave it plains of red moss instead of a painted desert, and peopled it with the remnants of a once-great civilization, whose society is a paradoxical muddle of feudal chivalry and advanced science. He propels a Virginia gentleman and Confederate officer, John Carter, down in these bizarre

surroundings and keeps him unconscionably busy staying alive and working his way up to his proper niche as a natural-born nobleman, through three books. In chapter after chapter he opens new corners of the Red Planet to exploration, shows us queer races and queerer monsters, and makes a man fight for a maid and win. He was still doing it when he died in 1950.

Some day—and I hope it is some day soon—a serious biographer will give us a full-length study of Burroughs. We may then know more about his sources. My own guess is that his "Mars" was based on the Sunday-supplement mirages of the time, and on other popular material, plus, perhaps, Lowell's books and the "everybody knows" mythology of the time. He can come up with biologically nonsensical crosses between dogs and cats—but the press of his time gave full credence to the supposed offspring of girls raped by Great Danes, and the like. The Eighth Barsoomian Ray, and the Eighth Rays of the other planets, are utter double talk, and—as science-fiction characters were doing long afterward—his people play around with radium with utter disregard for the effects of radiation, but the latter at least did not become common knowledge until long after Burroughs had established his ground rules and was stuck with them.

The hollow-world concept that is the basis for the Pellucidar books and the first part of "Moon Men" is something that could have been demolished by any student of integral calculus—but I don't recall that mathematicians attacked Symmes' perfectly serious belief in a world inside the Earth, and the German mathematicians that could plot interplanetary trajectories didn't speak too loudly against the idea held in some Nazi circles that we *are* on the inside. On the positive side, Carthoris—in 1916, in "Thuvia"—spelled out the principles of radar pretty clearly, though he used ultra-short gamma rays rather than short radio waves.

Nor did Burroughs omit serious themes in his bizarre adventure fantasies. "Monster Men," which is certainly one of his poorest books, nevertheless had a very serious "message" to put over. Its original magazine title was "A Man Without a Soul," and that is precisely what the book's theme is —not the Frankensteinian exploit of creating humanoids, but the very real philosophical question, at least for 1913: "Would a man created by science have a soul?" Nowadays, science-fiction writers are more sophisticated: they ask, "Are androids people?"

As he grew more successful, more expert, and more sure of himself, Burroughs took frequent opportunities to satirize aspects of society which he disliked. "Master Mind" opens with a snappish comment about "a dowager empress of pork or real estate," and later in the

book there is a broad and heavy-handed satire on the hollowness of religion that is all form and dogma and no content. Incidentally, a very telling point is made in a long, unpublished and probably unpublishable sequel to the Mars books, written by another author after Burroughs' death—that John Carter made a fatal mistake when he destroyed the ancient, corrupt Barsoomian religion in "Gods of Mars" *without* providing something to replace it. Edgar Rice Burroughs would probably never have seen this point.

That Burroughs himself had deep prejudices is evident in every book. To some extent these were the racist, chauvinist and class prejudices of his time and background—boyhood affluence, prep-school education, brief military service, and through personal failure up to the time his stories began to sell. His ideal was clearly the man represented by John Carter and for that matter, Tarzan: the born gentleman and aristocrat, inherently superior to men of lower social classes, other races, and other philosophies. In "Chessmen" there is a long discussion of the "balanced" life, ridiculing intellectualism—yet every book deals with the marvels of science, usually in danger of running wild until the lid is tied down by a down-to-earth scion of Nature's nobility.

Remember, though, that in Burroughs' day the Ku Klux Klan was burning crosses in northern fields and California was clamping down its exclusion legislation on anyone from across the Pacific. Sax Rohmer's "Fu Manchu" stories underscored the accepted stereotype of the villainous oriental. Charley Chan would not be possible for years to come.

Critics point to Burroughs' style as hopelessly stiff and stuffy—and you will find it at its worst in "The Monster Men." But Burroughs wrote before the Hemingway revolution got under way, when teachers of composition in schools and colleges admired and praised exactly this brand of genteel, high-flown prose as the model which self-taught writers should emulate. Even now, with the competence—if not the content—of most science fiction far higher than it was a generation ago, it is not exactly an *avant garde* movement. It is a form of popular fiction, and as such should be judged by the standards of popular fiction.

When Burroughs was writing a story which he enjoyed and believed in—as he was in the Mars books, and the best of the Tarzan series—he could force his readers to suspend disbelief and overlook his archaisms because of the sheer drive and movement of his stories. To me, the first three Mars books are by far the best for this very reason, but it is still evident when you compare the present sample with the other books. John Carter, like Conan, lives because his creator believed in his reality.

The mild literary reputation that "The Moon Maid"—now "Moon Men" in the Canaveral edition—has gained hangs on the last two sections. This is one of very few of Burroughs' stories that take the reader into the future. The first part is a routine enough hollow-world adventure: Julian V, in 2025, heads for Barsoom but winds up inside the Moon. A renegade officer and scientist, Orthis, leads a force of the Moon men—Kalkars—back to conquer Earth. In the second episode, set in 2120, we are with Julian IX in the first revolt against the oppressors, and in the final episode Julian XX, three hundred years later, drives the Kalkars into the Pacific and ends the feud between the lines of Julian and Orthis. These two latter parts of the book have fewer of Burroughs' mannerisms and stereotypes and come closest to "modern" style of any of his books. By now the theme has none of the novelty it had in 1925; too many better writers have made better use of it—over and over again.

The Mahlon Blaine illustrations for the Canaveral books are not a success. Blaine's style is a bizarre, oriental grotesquerie which makes his drawings look like a section of a Cambodian temple come to life. A prime example is the jacket illustration for "Moon Men," representing an alleged "mounted warrior of Mars" who is not astride a thoat or any other creature recognizable from the Burroughs text, and whose elaborate armor—the antithesis of the simple "harness" of Barsoom—is composed of a series of monster heads that form carapace, breastplate and greaves. He would do very well in a scene from Aztec or Maya mythology, but not in a John Carter story. The characters of "Fighting Man of Mars" are similarly overdressed. St. John, on the other hand, had precisely the right blend of romanticism and muscular activity to fit the mood and pace of a typical Burroughs plot. The illustrations by other artists and imitators, for the later books, never came close to his, although a new artist, Roy Krenkel, comes as close as any I have seen.

I have no intention of urging every Edgar Rice Burroughs book on modern science-fiction readers. Something like "Monster Men" hasn't anything to offer anyone—except possibly a Hollywood producer of wide-screen monsterosities. But the Mars stories still swing, and I have a feeling they always will.

A FOR ANDROMEDA, by Fred Hoyle and John Eliot. Harper & Brothers, New York. 1962. 206 pp. $3.50

British television apparently takes science fiction more seriously than does the American industry. We have heard of the popular Quartermass programs and now we have the novelization of a seven-part serial that is alleged to have been seen by eighty per cent of the TV

audience of Great Britain. This is, moreover, head-on science fiction with no holds barred, written by a far-out astronomer, Hoyle, and an experienced television producer and writer.

For good measure, the authors have given us a feasible means of communicating with an extraterrestrial civilization over some two hundred light-years of space. The method: send a messenger. To be precise, a new English radio telescope picks up dot-dash signals from a point somewhere in the constellation Andromeda. Recorded, it divides into three parts. instructions for making a super-computer, a program for it, and data to be fed into the programmed "brain." It then begins asking multiple-choice questions, and the answers lead to still more complex questions as it fills its memory units with a binary analysis of the human race. Finally it issues instructions for making a DNA molecule—then a cyclopean monster—and then a woman

Meanwhile a series of sub-plots have been carefully and intricately interwoven with the main theme. There is the tension between the military and scientific authorities in the British "Establishment," and between both of them and their American "coordinator." There is espionage, with one of the computer designers selling information to an international cartel that is happy to resell to the highest bidder. There is the heroine, masquerading as an unnecessary Press Officer but actually working—not very effectually or plausibly—for Military Intelligence. There is the hero, Fleming, a prickly sort of genius who is normally at odds with everyone around him, but who does in the end see the purpose for which the computer was designed and undertake to defeat it.

For, unable to cross the void of space, the unseen conquerors in Andromeda have persuaded mankind to re-create their conquerors here on Earth. The program of conquest has been designed into the computer and its program, and in the android woman which human biologists are taught to create in their own image. If Earth's ruling race had been sentient silica, the program would have provided for the creation of a silica being.

Toward the end the plot gets a bit conventional—a sop, perhaps, to the TV formula. But through most of the book the story moves fast, if not really furiously, and the characters become reasonably real, if somewhat stupid. I still think Hoyle's last book, "Ossian's Ride," is a better story.

RAIDERS FROM THE RINGS, by Alan E. Nourse. David McKay Co., New York. 1962. 211 pp. $3.50

Nominally, this is a book for teen-agers. The hero is eighteen, a girl he kidnaps in a raid on Earth is a little younger, and her brother is a bit older. But with these qualifying technicalities out of the

way, we have an excellent space-adventure yarn about a breakdown situation in a well plotted future social system.

It seems that the present space race has produced American, Russian and English military posts on the Moon and some of the planets. When World War III breaks out on Earth, the men of the outposts refuse to participate; exiled, they become the Spacers who are feared and hated by Earth, and who in turn raid Earth periodically for food and women. Ben Trefon, heir of one of the oldest and proudest Spacer families, is about to make his first raid when the story opens. But this time Earth is ready, and a war fleet bypasses the raiders, destroys their bases and homes on Mars, and heads out into the asteroid belt to exterminate them.

A series of mysteries are deftly interwoven with the plot. There is the mysterious black belt which Ben's father has worn and has passed on to him. There is the gigantic ship, invisible except on radar and belonging neither to Earth nor the Spacers. There is the mauki chant, recorded in a language that nobody knows. There are the little gray creatures that can breathe space.

All this is satisfactorily knitted together in the end, as the three young people set out to end the war and the enmity between Earth and Spacers. If it seems a bit too easy, as did the earlier quick conversion from superstition to reason of Tom and Joyce Barron, it hardly matters. And the concept of the maukis and their chants, which ties the book together in more ways than one, is a choice one.

TELEPATH, by Arthur Sellings. Ballantine Books, N.Y. 1962. No. F-609. 160 pp. 50c

Here, from one of the new school of British writers, is an underplayed, almost realistic novel about how it feels to be a telepath. It starts when an unsuccessful advertising copywriter, Arnold Ash, suddenly plunges into the mind of a fiercely independent artist, Claire Bergen. He feels that the power should be expanded and exploited, especially after he finds that it can be communicated to others, she deeply resents the intrusion on her innermost privacy and hides in the country.

The first half of the book deals with Ash's efforts to explore his telepathic power, to find Claire, and then, when she will have none of him, to find others who will take him seriously. This latter part, a series of satiric vignettes of career psychic investigators, occultists, fortune tellers, and other hangers on of the borderlands, is telling and amusing and relieves what threatened to become tedious soul-searching. Then Ash is drafted to probe the mind of an insane physicist, and the story comes to life. A bit of melodrama is also injected for the happy finale.

Where conventional science fic-

tion dealing with psi themes almost automatically bursts into wild melodrama, Arthur Sellings has underplayed most of his story to the point of making it dull. After Ash has maundered around London for several scores of pages trying to convey his "gift" to people who don't understand what he is talking about, the reader is almost ready to say "Who cares?" Then a kind of melodrama saves the day and the plot and gets Ash the girl.

On the other hand, the author has made his people far more real than those who inhabit the usual story. You may be impatient with Arnold Ash, but they do act as recognizably real people, unlike the purely functional heroes and heroines of most fiction. Somewhere between the two will be the real classic of telepathy.

BURGESS MEREDITH READS RAY BRADBURY Prestige Records Lively Arts Series, No 30004

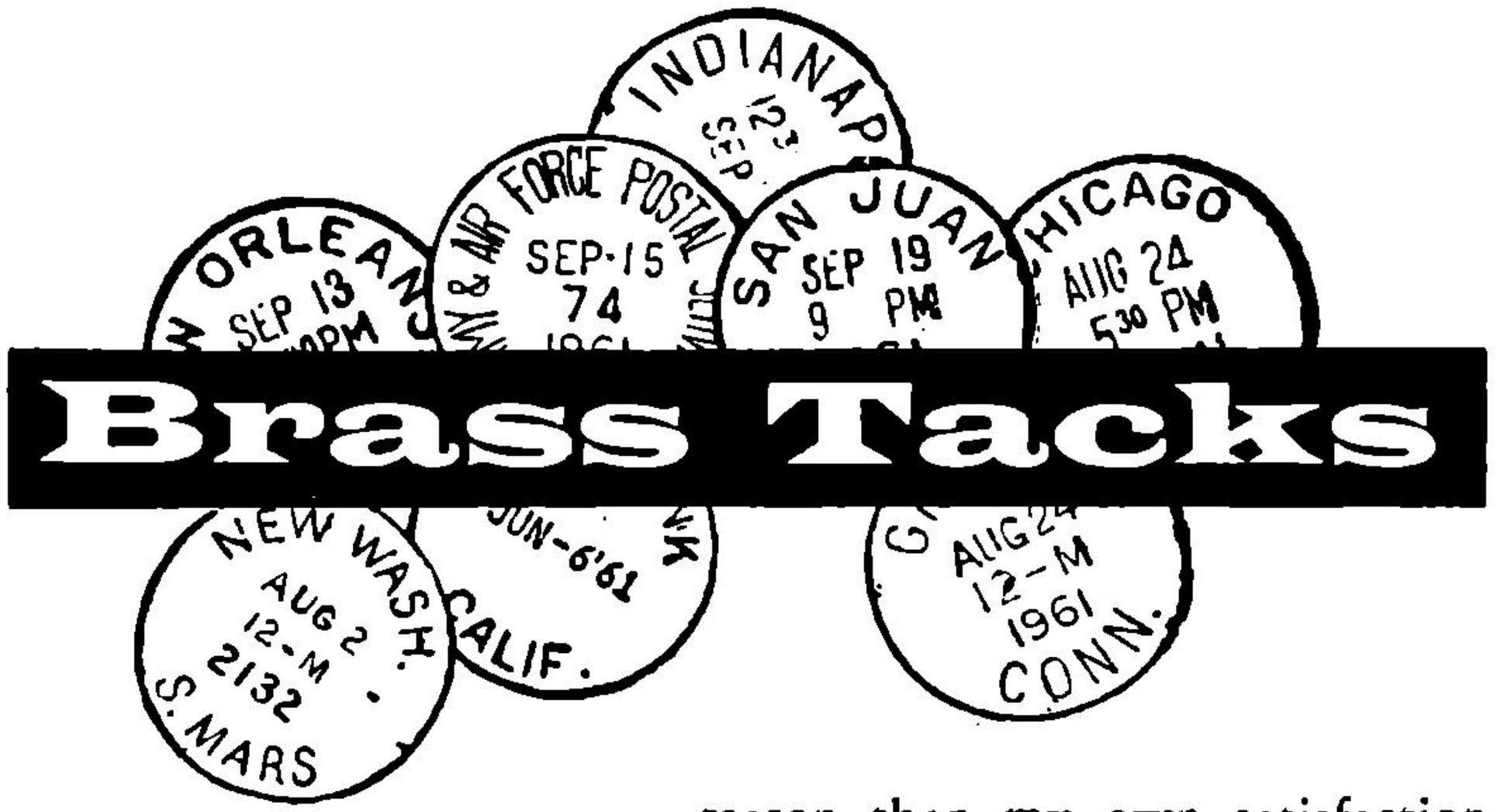
RODDY McDOWELL READS THE HORROR STORIES OF H.P. LOVECRAFT Prestige Records Lively Arts Series, No. 30003

These records seem to be a new venture for a publisher who has specialized in jazz. He didn't supply prices, and neither could local record shops, so check around, for I'd say they are both worth having. Ray Bradbury writes and H.P. Lovecraft wrote with a very strong feeling for the sound of their words, and these long-playing records demonstrate that some, at least, of their stories sound even better than they read.

The two Bradbury stories read by Burgess Meredith—one on each side—are "There Shall Come Soft Rain" and "Marionettes, Inc." The first of these is probably *the* Bradbury story—the one most people remember best, the one with fewer of his faults and more of his virtues. Yet Meredith at times seems to overdramatize the overdramatic bits, and the final death of the automatic house is the least effective part of the reading. His characterization of the two men in "Marionettes, Inc.", on the other hand—and of the man and his marionette or android replica—is beautifully done and brings to life a wry but not too original story.

Roddy McDowell, unfortunately, does not have the kind of voice for Lovecraft's sonorously archaic invocations of Gothic horror. I'd like to hear these same stories read by Boris Karloff. McDowell's lighter voice and rather precious characterization of the dilettante necrophile in "The Hound" is probably right in character, but it does not help build horror. Moreover. McDowell has some trouble with his pronunciation of the archaic words that Lovecraft loved to slaver over. "The Outsider," the second side, is much more successful and the flaws are more the author's than the reader's.

If I hear more records like these, be sure I'll report on them. Both are well worth having. ■



Brass Tacks

Dear Mr. Campbell:

After five or ten years of observing your editorials in ASF, culminating with the May issue, I feel compelled to tell you that you are suffering from an acute case of color blindness; i.e. the inability to see other than black and white, the good guys and the bad guys. This is not really what prompted me to write to you, however; it is the unjustified insults which you blithely toss out.

I am a physicist, and therefore appear in the pages of your magazine as a member of the vast conspiracy to suppress all non-union or amateur scientists despite the fact that 90% of them are potential Einsteins or Newtons. You have never explained exactly why I do this, but I presume it is because I am afraid of the competition or reluctant to share the glory and public recognition which abounds in our profession. For no other reason than my own satisfaction there are several things I would like to point out to you.

First, there is a great difference between science and technology (engineering) although you use the two words almost synonymously. "Scientific" ideas are generally born in one man's mind, while engineering concepts are generally the product of an organization. (This is not to say that the individuals within the group do not contribute individual ideas.) This is an important difference since it means that you can buy technological progress with money and man-hours, but it is extremely difficult to buy "basic" physics. How do you write a contract with Albert Einstein in which he promises to produce a theory of the photo-electric effect in return for x dollars?

Secondly, you complain because our rockets are not as good as the Russian ones. It is unfair to blame the rocket engineers, rather blame the politicians who decide how

money and *time* is to be spent. We are building large rockets now, not because of some scientific breakthrough, but simply because we have decided to spend the money and the man-hours. Despite all the shouting American technology is as good as you can find anywhere. To mention only a few of the most recent developments, there are the laser, the advances in solid state physics, the recent marked progress in geophysics, the sophistication of American computer work, and—dear to your heart—the fact that our satellite program has yielded far more information than has the Russian. Don't misunderstand me; I am not saying we have reason to be complacent, but we have no cause to be ashamed.

Finally, we come to the main bone I have to pick; the suppression of worthwhile inventions by "organized science." Your main argument along this line is that Mr. Dean could not get his "inertia drive" invention reviewed by any government agency. Have *you* ever tried to get a government agency to do anything? The obvious fault here is Mr. Dean's gullibility in trying to work through a government agency. Please don't blame "science" for it. As far as Dr. Davis' Fourth Law of Motion is concerned, there may be something to it or there may not be. ASF's article did not contain enough information to tell. Let me assure you, however, that if his experiments show there is something there they will receive the recognition they merit.

The majority of physicists are in the business because they love it and not for any other reason. They are not hypocrites and they have no more liking for a flaw in their science than a sculptor has for a crack in his statue. However, most of the laws of physics have been around for a long time and have held up pretty well. When good cause has been given they are thrown out—witness the abolition of parity conservation. The key phrase is "good cause." There is (and should be) a strong element of conservatism. A basic concept which has withstood years of use is not replaced on the basis of one or two experiments unless that concept was highly suspect in the first place. Nevertheless, anyone working in physics recognizes that it is a rapidly changing science and most of our "laws" are probably only approximations of more complete laws. Furthermore, there are undoubtedly whole fields of physics about which we know absolutely nothing.

BUT, any physicist could spend the rest of his life listening to crackpots with great new ideas 99.9999% of which would be a complete waste of time. The other 0.00 . . . 01% might be worthwhile, but would they be that worthwhile? I suggest that if you feel the world is not listening to you, perhaps you are not speaking the same language. Rather than expecting the world to

communicate with you, you should revise your methods of communicating with it. Standing on top of the Empire State Building and shouting, "You're all wrong," will probably get you thrown in jail. Floating down the Potomac twenty feet above water in your antigravity car will bring all the physicists you want at a dead run!—Jack Slattery, 20764 Hartland #1, Canoga Park, California

Shall we debate this issue, friend?

Being originally trained as a physicist myself, I think I can claim to know something of your side of the fence . . . but do you know the other side? You make the flat statement that floating down the Potomac in my antigravity car would bring the physicists running. Nonsense! It would send *them running, so they wouldn't be forced to admit they saw it.*

The dowsing rods work for locating pipes—as thousands of utility company engineers can show you. Has physics come running to investigate?

I know of a group that wanted to spend some real money on a sound research into what makes psi phenomena work. They had phenomena to study, money to pay for it . . . and couldn't get professional scientists to take the contract. (There's always a type that will take a crackpot's money and waste it for him; this group weren't interested in that type.)

The fact is that professional Science—not technology or engineering—won't touch anything until there is a theory already provided. They refuse to seek a theory to explain a fact that doesn't fit—they deny the facts

Now on the "sophistication of American computer work"—may I suggest that American computer technology needs a little more humility—or to hire a Russian controls engineer to build our next try for a Moon probe? We've missed every time so far because of controls-system failures, not because of too-low thrust. And how about the beauty of a goof they pulled by sending the wrong polarity "correction" signals that made the probe go farther from the Moon, instead of toward it?

Those crude, unsophisticated Russians have tried twice—and scored two bulls-eyes. They've got good computer engineers. that's not to be denied.

Sure we're good! With the money, the industrial potential the United States has we ought to be good!

In fact, we should be a damn sight better!

And you're quite right you can't contract with an Einstein to produce a photoelectric effect equation. Nor with an Edison to invent an electric power system, when the top physicists of the world have proven the thing is impossible. Nor with Mendel to discover genetics.

That's why the mass-production, government-operated, strictly-logical-by-the-known-theories approach to Science won't work. Why we have to find that 0.0001% of cranks who are geniuses—because there is no other way. And they'll be cranky, hard-to-

deal-with, unpleasant personalities, too—arrogant, demanding, belligerent and given to calling people fools. The easy-to-get-along-with genius is as rare among geniuses as geniuses are among the population They may, quite literally, be acute neurotics—as both Faraday and Newton were, for some time. The great Maxim brothers were so irascible they couldn't stand each other, even. Henry Ford had what would, in anyone else, be called a crackpot hatred-fear of "Wall Street"—which maybe wasn't so foolish of him, at that!

I distinguish between engineer-technologist and Scientist in a fashion you don't like: an engineer is a pragmatist who has to make things work, and will use anything that helps get it done. A Scientist insists on having theories, and rejects anything that works but can't be explained. Hence engineers use dowsing rods and Maxwell's equations and Gibb's thermodynamics with equal and impartial satisfaction—they all work. But Scientists won't touch the dowsing rods, because they have no theoretical explanation.

And may I point out that the Ni-Cd battery was operating in mass commercial use for forty years in Europe, and it definitely did not "bring all the physicists you want at a dead run!"

I appreciate that you speak in genuine sincerity and honest belief; the trouble is that the theory that physicists "will be happy to look" IS A THEORY.

Now try the engineering approach: Does the theory work in fact? How many physicists have "come at a dead run" to investigate the remarkable fact that dowsing rods are used in routine engineering?

Sorry, friend—your theory doesn't match the experimental evidence.

»» »» »»

Dear Mr. Campbell:

Your editorial and the article in the July 1962 issue, have led me to write you about a somewhat related "discovery" in the hope that it may come to the attention of some persons able to do proper research on it.

Very simple experiments indicate that the part of the "mind" that "thinks in words" *requires* slight motions of the voice muscles. In other words, "thinking in words" is a form of muscular behavior.

I would be glad to correspond with anyone in regard to the studies that led me to this "discovery," but it is self-proving to any person who can *honestly* observe what happens when he swallows.

My "demonstration," so far, is in three stages—the first demonstrates the "discovery," the others merely show added facts. The first is to have a person try to think words—or a prolonged sound—while drinking a glass of water. (Persons do tend to trick themselves by thinking *between* swallows so that several tries may be necessary). The second stage is to hold the breath and clamp the throat

in a prolonged tight swallow. In —at least—some people, this prevents a person from writing, as well as "thinking in words." The third stage takes more practice and consists of relaxing the voice muscles in the same way that every person must do hundreds or thousands of times every day when listening intently. The third stage is a more comfortable way of observing the effects of stopping our "silent conversation with ourselves" and shows, by contrast, the effects of that "silent conversation."

Like the experiment with the external ear, no one needs any special equipment to test this idea. So far, some twenty *very* skeptical people have suddenly learned something that apparently is unknown to our scientific "Authorities." A few persons have not learned it. I have no way of learning if this indicates that this idea is not true of all persons or if these people are only a bit more skillful in fooling themselves.

To the extent that this idea is true, the exploration of a part of Dr. Holmes' "black box" and "electro-telepathy," could be accomplished by very sensitive microphones instead of deep electrode probes. Certainly, such equipment would seem to be well worth including in neurophysiological studies of humans.

The implications of this idea are so broad that they deserve more than a letter. For one thing, it throws a great light on the physiological mechanisms of panic, hypnosis, all forms of analysis, and most forms of psychotherapy. The implications in semantics, anthropology, sociology, education, and politics can best be judged by reference to page 270 of Margaret Mead's "New Lives for Old" (Mentor No. MT 324). The psychoanalytic implications may be judged from pages 55 to 59 of "Psychoanalysis and Psychotherapy, Selected Papers of Frieda Fromm-Reichman" (L.C.: 59–10746, Univ. of Chicago Press: 1959). In brief, it would appear that analysis is a reconditioning of—muscular—verbal behavior by—unreinforced—extinction of chain-conditioned responses of the vocal muscles normally repressed by a selective amnesia—in a manner similar to hypnosis. It also explains why emotionally important words are delayed in word-association tests and how people "forget" important but unpleasant names and facts.

In a few brief experiments, I have been able to demonstrate that repeated suggestions to relax all the voice muscles causes a *very* deep state of both hypnosis and autohypnosis—the latter despite the fact that the same muscles are giving the "command."

A person who normally "thinks" in sub-vocalized words would be reduced to about the level of a one- or two-year-old child by anything that prevents this muscular behavior. A conditioned fear response could very easily produce such a

muscular spasm. Surely, this idea is worth some extensive research by well equipped laboratories even if it does not prove to be as important as the writer believes. The only *initial* cost is a little *attention* the next time a person is thirsty.—John W. Snell, 612 D Street, Marysville, California.

Simple and interesting experiment! Do you HAVE to talk to yourself?

» » »

Dear Mr. Campbell:

I have just read your editorial "How to get more than your share."

I have been for many years a maritime worker, one of the individuals who is getting, "fuel value greater than my product value." I am one of the "bums" receiving more than my fair share of the national wealth. Rather than argue your pseudo scientific theory point by point, I, and other maritime workers who have read your editorial will demonstrate an economic fact of life which your theory does not take into account. Your editorial was presented as a question of morality, your conclusion is that we do not deserve the wages which we receive for a fifty-six hour work week. You feel that our wage scale is wrong and immoral. Since you feel that we do not deserve these wage scales, then we are sure that you would not want to derive any benefit from money which you think was coerced from the shipping companies. Therefore, I, for one, will no longer buy your magazine, or any Condé Nast publication. In this way your moral beliefs will remain uncontaminated, and you will need not feel any guilt at accepting any of our ill-received gains. At the same time I shall make it a point to express my concern for your moral purity to your publishers, and to the maritime union of which I am a member. I feel sure that hundreds of maritime workers will be as concerned as myself that you not be contaminated by accepting any part of "more than our fair share of the national wealth." Does your editorial courage extend to giving permission for the maritime unions to reprint your editorial?—William Guertner, 1589 Chestnut Street, San Francisco, California.

You mean . . . you'll stop buying Mademoiselle *and* Vogue?! *How will you keep up with fashion?* ■

Crucial Experiment

By Joseph F. Goodavage

■ November's astro-meteorological forecast was calculated during the heat and drought of July. The anonymous author of these forecasts indicates that Jupiter and Uranus form a 180-degree angle in *geocentric* longitude approximately every 13.81 years. At these times the Earth is directly in line with whatever magnetic or electromagnetic influences emanate from these bodies and penetrate through the Earth's axis.

This happened in February, 1948, when Mr. X's 6-month-in-advance forecast of magnetic perturbances was fully confirmed by the phenomena's occurrence.

ASTRO-FORECAST FOR NOVEMBER

The wettest weather for the fall season will center during November over the eastern Pacific Ocean directly southward from Alaska. That region will be dominated by frequent southerly air flows, unseasonable mildness, abnormally low barometric readings, saturating humidity, chronic cloudiness and sporadic copious rains. Alaska shares the same pattern this November—figuratively, fifty-seven varieties of moisture, which will include alternating freezes, snow in elevations, fog, thaw, rain, then more snow.

This is in sharp contrast to 1961, when Fairbanks, Alaska reported a minimum temperature of −13° on October 31st and −39° on November 26th!

Air and marine transport interests will be coping with generally foul weather drifting eastward from Longitude 148° West, especially on November 5th and 6th—and most especially in the northern latitudes

of this region. Conversely, the 11th and 12th of November will find spongy lows extending far southward; falling temperatures in Alaska will send snowfall to the Canadian Rockies with a cold wave. Over the 18th and 19th, flash rains will be more scattered. Prevailing southerlies and rising temperatures will be generated over November 25th and 26th. By the 28th, this disturbance, colliding with a mass of frigid polar air will churn up major storm conditions, possibly blizzards, over the northern Rockies. And severe weather conditions with intense cold spawning in the Far Northwest will spread eastward over the northern border states.

These interpretations are pertinent because any abnormal atmospheric phenomena blanketing the eastern Pacific and Alaska will naturally affect the general character of weather in eastward transit from the Pacific coast.

There will be unseasonably early deep freezes in inland Maine, especially east of Portland, with a cold wave on the night of November 4th that will preview cold weather patterns stemming eastward from that area.

Although lows in eastward transit over the northern border states will be preceded by rising temperatures eastward, the cold fronts which follow will intensify over those normally cold areas from Denver and the Dakotas eastward to the northern Appalachians. A high centering over the plains states on November 4th will test the intensity of these cold fronts.

Low pressure areas traveling eastward over the Pacific coast will be centering farther northward than usual. Above-normal precipitation is slated for the far Northwest and over the northern tier states. But rain will be *far* above normal in the upper lakes region and in northern New England. Generally heavier rains stemming from California on the 13th will travel eastward over the south central states early on the 15th and from Hatteras along the Atlantic coast to reach New York on the 16th of November. At the same time, the masses of cold Canadian air blanketing the higher inlands and transiting eastward will not be intense enough to force the lines of freeze and frost very far southward, except in mountain areas.

Except for a brief invasion of cold air on the 14th and 15th, relatively mild, generally drier atmospheric conditions are scheduled for the southwest. But this area will experience a sharp rise in temperatures over the 17th and 18th of November. Over the southern half of the nation it will be seasonably temperate until the transition during the last week of the month.

Around the 18th and 19th of November especially, there will be sporadic southing Bermuda highs with clockwise air flows activated east of the Carolinas. These will cause occasional warming south-

westerly winds over the Atlantic coastal lowlands.

November's weather highlight will be an abrupt transition to critically cold wintry weather, intense storm activity, high wind velocities and snow stemming from the Pacific Northwest immediately after the 27th. From this date until the 29th, high and low pressure areas will converge over mountains and elevated areas. We can expect blizzards over the Cascade mountains and the Great Divide. Wind-blown snows will stall traffic, maroon motorists and down power and communications lines.

Between 1:30 and 4:00 a.m. (EST) on November 27th, there should be another activation of secondary electromagnetic disturbances in the high atmosphere. This, of course, will be accompanied by auroral displays in the northern skies and interference with short-wave radio reception. Major centers of receptivity will manifest about two hundred miles east of Japan and in a region northwest of the Azores. The Pacific coast and northern plains states near Longitude 99° West will lie within the areas of secondary manifestations. It will be interesting to observe higher barometric reaction to follow in the northern plains states.

If these phenomena manifest within any of the regions specified, it will be self-evident fact that magnetic storms and accompanying solar flares are both related to the same cause—planetary phenomena.

RANDOM FORECAST NOVEMBER

The Bahamas and the coastlines of Florida and Cuba will experience extremely high tides and high velocity winds on November 1st. From the 2nd to the 5th of November the west coast of America will be excessively hot and humid until the 6th, when high velocity winds in eastward transit will buffet southern California and Mexico.

Centering over the Chicago-St. Louis area from the 8th to the 11th: a cold front and heavy snows. On November 13th the northwestern states will be pelted with freezing rain and hailstones.

From the 15th to the 26th of November it will be relatively calm, bright and sunny from Mexico to Texas and Oklahoma. Alternating cloudiness and unseasonably warm weather is in store for the majority of the southwestern states during this period.

But around November 19th, the Hawaiian Islands will experience an intensely dry cold snap, in sharp contrast to the usual weather in this area. In eastward transit, this cold front will develop into severe storm intensity with heavy snows over Montana, Utah and Washington from the 27th to the 29th.

At the end of the month, southern California and Arizona are in store for unusually heavy precipitation. These flash rains will endanger low-lying areas and floods are expected, especially in the Los Angeles area. ■

(*Continued from page 5*) away by a sly, invisible, indetectable demon . . . er, particle, that is, called "the little neutral one," or *neutrino*.

Allow the special entity having just the characteristics required—as "natural characteristics" and therefore not open to questioning of whys and howcums—of being possessed of kinetic energy, and momentum, but not of any detectable or catchable property, and the necessary sly thief of momentum was loose. And the sacred laws of conservation didn't have to be doubted and everyone could breath easier again.

Primarily, however, the justification of the neutrino was exactly that offered for quantum mechanics —the hypothesis worked. And nobody had an alternative.

However, once one demon is allowed into the laboratory, his friends and cohorts start gathering in the wings—offering to do all sorts of special and difficult jobs for the mere tossing of a few Names of Power. One need only invoke the proper Greek letters, and one knotty problem of explanation after another is taken over and arranged neatly by a demon of just exactly the right characteristics, and no alteration of basic theoretical approach is needed. In a sense, it started with the now-ancient chant of "Alpha, Beta, Gamma . . ." when radium was first studied. Special Demons . . . particles, I mean . . . were invoked right at the start.

However, the attitude of acceptance wasn't well developed in Physics at the time, and those special particles were rapidly exorcised by spelling them out as helium nuclei, electrons, and high-energy electromagnetic radiation packets.

Professor Serge Korff, of New York University, says that in his philosophy, nothing can be called a "fundamental particle" that cannot maintain its existence in empty space. It seems to me that's a reasonable viewpoint; if an entity can't maintain its own existence, how can one reasonably hold that the permanent structures of the universe are built of it

The Greek Chorus has expanded mightily in the last couple of decades—but it's getting to be pretty shoddy Greek, as a matter of fact, what with "pions" and "muons". I'm sort of waiting for someone to discover "onions". It does seem that "demons" would fit quite nicely in that motley crew . . . perhaps as a particle not quite as good as a meson, sort of a demoted meson.

What's happened is, quite clearly, that every time the particle accelerator workers got a result that simply didn't fit with either classical or relativistic mechanics, they invented a new special-properties entity to explain the discrepancy, instead of taking a hard look at the basic theory structure.

The real danger of Demonology—

and in this I am not just kidding or being sarcastic—is its terrible attraction as a lazy way out. The invention of special entities to solve your problems is the most primitive, laziest, and most attractive of all techniques of problem solving—and dangerous, because it leads to the blind alley of specialization. William of Occam proposed what became known as "Occam's Razor" long ago, in recognition of that dangerous attraction: "Of two hypotheses, each of which can explain observed phenomena, choose that which requires the fewest entities" . . . or "Do not multiply entities needlessly."

Nuclear physics, in the last few decades, has been definitely guilty of heedless multiplication of entities. They're now talking about dozens of "fundamental" particles, most of which have life-spans so excessively short as to make the concept of "fundamental" seem somewhat peculiar.

But they have not questioned the validity of the hypothesis that Newton's basic three laws of motion were all that were or could be.

Remember that you can always explain anything if you're just allowed to invent special-effects entities. In science fiction, that's perfectly legitimate; that's what science fiction is supposed to do. Hal Clement raised the question "How can you recover a highly valuable instrument package that's stuck at the south pole of a planet with a surface gravity 650 times Earth's?" "Easy! With the help of a special entity designed with natural characteristics such that he operates perfectly in a 650-g environment at the temperature of liquid methane and in a hydrogen atmosphere."

In science fiction that's fine; made a hell of a good yarn.

But is it proper for Science to keep rescuing the Laws of Conservation by similar tactics? When Conservation gets into trouble in beta-decay, we send in a Little Neutral One to rescue it, with characteristics cooked up as neatly as Clement's gravity-proof, methane-drinking, hydrogen-breathing Barlenan. And when it gets in trouble again . . . special-effects entities with some *very* special characteristics are invented to rescue it again.

Tops in that line I think is the peculiar characteristics that some of those demon-particles have, a characteristic known as "strangeness'. Obviously, if a particle behaves in a very strange manner indeed, then it has the characteristic strangeness!

Now practically all the recent nuclear research has been concerned with extremely high-energy particle physics—the billion volt to million-billion volt ranges produced by super particle-accelerators and cosmic rays. The observations are made by studying the results

when those enormously high-energy particles impact on terrestrial matter, and observing the trails left in cloud or bubble chambers or photographic emulsions. In each instance, what is actually studied is one aspect or another of terminal ballistics—what happens when the projectile hits the target.

In every such event, the rate of change of acceleration is inconceivably great. You get a surge of millions of g's per second when a steel projectile traveling half a mile a second strikes a steel armor plate; what sort of surge values do you suppose show up when a helium nucleus with 1,000 billion volts of energy strikes an iron nucleus?

When the Greeks were trying to understand motion, and inertia, they came to a rather wildly wrong answer . . . because acceleration was simply not observable. A man could observe *velocity* by eye—but the acceleration of an oxcart, or even a bird taking off, is not something that can be understood by simple observation. The acceleration of a falling body is not observable by eye; it simply seems to *go* at a speed, rather than to accelerate.

So from Aristotle up to Galileo's time, the true nature of inertia was completely misunderstood. Properly, inertia and momentum are *not* associated with velocity but with acceleration. True, velocity is the *measure* of momentum—but it is generated or withdrawn only via acceleration.

And acceleration is *not* easy to observe! Not, that is, until you have machines that can maintain a moderate, but measurable acceleration for a reasonable, measurable time. A modern automobile makes it easy—you can observe it over a period of ten seconds with a stop watch and a simple plumb-bob accelerometer. You should try observing it with an oxcart and a sand glass, though!

And sure—a free-falling body in an evacuated tube can be observed with photography and multiple flash techniques, or by simple electronic circuitry and a photocell, or variable-frequency oscillator.

Having been stuck in the middle of the problem, I'm in a position to assert, as a matter of personal experience, that measuring the rate of change of acceleration accurately is, even with modern nonasecond electronic gadgetry, damn near as nasty a job as measuring the acceleration of an oxcart with a sand glass. If you have a value of surge large enough to measure readily, this means that, each second, the acceleration is mounting rapidly, the velocity is mounting on a square-of-the-elapsed-time curve, and the distance is increasing as the cube of the time!

Newton finally cracked the problem of motion when he studied acceleration as the key, rather than velocity—and he did it, basically,

by considering astronomical bodies, where he could observe long periods of acceleration, and velocities that were not being distorted by friction.

He did not have any means of observing surge effects.

Surge could be neglected as unimportant to practical work in almost all areas, because of exactly the factors that make it so extremely difficult to measure—"It ain't long for this world!" Because if it exists for any appreciable time, the surged body won't be in this world any more!

The areas where it was important were those involving short-duration situations of very high surge—internal ballistics, terminal ballistics, mechanical vibration, and, of course, nuclear physics.

In those areas, the entire problem concentrates in the transient phase—internal ballistics refers specifically to what happens inside the gun barrel while the projectile is being accelerated; terminal ballistics to what happens while it is being stopped in the target; vibration inherently is a series of transients, and nuclear physics has, in effect studied nothing but the terminal ballistics events.

To hold that Newtonian laws of motion could be applied to those areas was, clearly, a highly dubious extrapolation. It's not surprising that a whole cohort of special-effects demon-particles had to be invoked to explain away the endless discrepancies! Naturally, every time the particle accelerators raised the energy of the projectiles, even more violent surge effects occurred on impact . . and a new style of explanatory particle became necessary.

Also, now, we can see why the efforts of many laboratories to produce hydrogen fusion have flubbed. The magnetic-bottle effect involves making the ions of the hydrogen plasma bounce from the "walls" of the magnetic-bottle. But the impacts involved in the ultra-high-temperature environment attempted mean very high velocities, accelerations and, therefore, surges. The effects of velocity and acceleration were carefully considered and computed . . but no allowance was made for the surge effects.

All the hydrogen-fusion attempts have failed because of unexplainable instabilities of the plasma-magnetic-bottle system.

The vibration analysis people have, for some time, had a sort of "Finagle s Law" to the effect that "Above 2,000 cycles per second, the Universe is made of jelly." The behavior of mechanical equipment above that frequency is anything but sensible, reasonable, and predictable—and certainly nothing any sane man wants to trust his life to. Vibration analysis has been one of those horrible jobs that has to be done, and yet simply can't be done with the tools available—bricks without straw doesn't begin to express the problem. At

least the clay didn't get up and walk away by itself when you weren't looking.

Part of their trouble has been, we can now realize, that with the intractance and surge terms missing from their equations, they were bound to get somewhat irrelevant solutions!

An engineering rule-of-thumb factor can be thrown into a problem, and made to solve it entirely satisfactorily, provided the problem is a transient problem. But in vibration problems, the "transients" *aren't* transient—they *are* the problem!

Under those conditions, Demonology doesn't help. Demons are great magicians—good with the wave-of-the-hand stuff—but they don't stay on the job and work steadily and hard.

The vibration analysts are going to get rid of a bunch of demons, and install some good, hard workers now!

Multiplication of special-effects entities is always the intellectually easy method of solving problems—and it has a double-barreled danger. Not only does it content you with the feeling of "Well, that's solved!", but has the additional effect of convincing you that you don't need a better answer—that anyone offering a new approach is obviously misguided, because the well-known answer is working perfectly . . . with the aid of its supporting patchwork, which, somehow, seems not to be patchwork now, but aesthetically beautiful decoration and a joy forever.

And anyone who wants to change it must, obviously, be a crackpot.

It's remarkably easy for demonology to creep into the most scientific of laboratories!

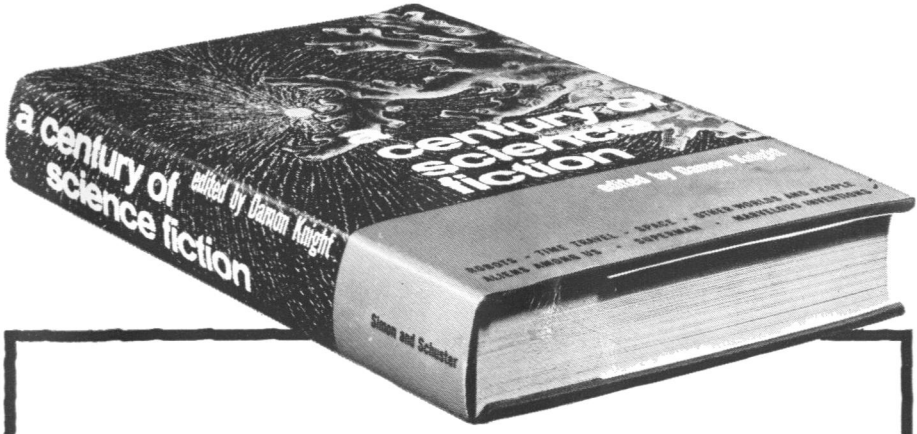
The Editor.

IN TIMES TO COME

Next month—in addition to getting a glimpse of the normal course of human history in "Space Viking" (for remember that in all the period of written history, the normal manner of men's death has been by violence!)—there will be a very different story about young Mr. Aaron Stoltzfoos and his wife, good Amish folk, on an interstellar colonizing project. Alan Kim Lang, who knows his Amish people, has a most interesting reason why a wise government would select those seemingly-backward people for such colonizing work!

They're remarkable in a number of ways . . . and very unlike the Space Vikings, too . . .

The Editor.



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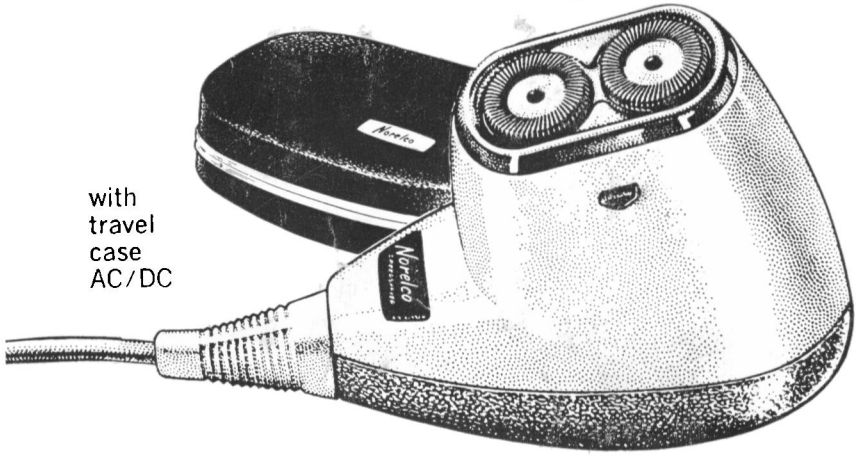
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