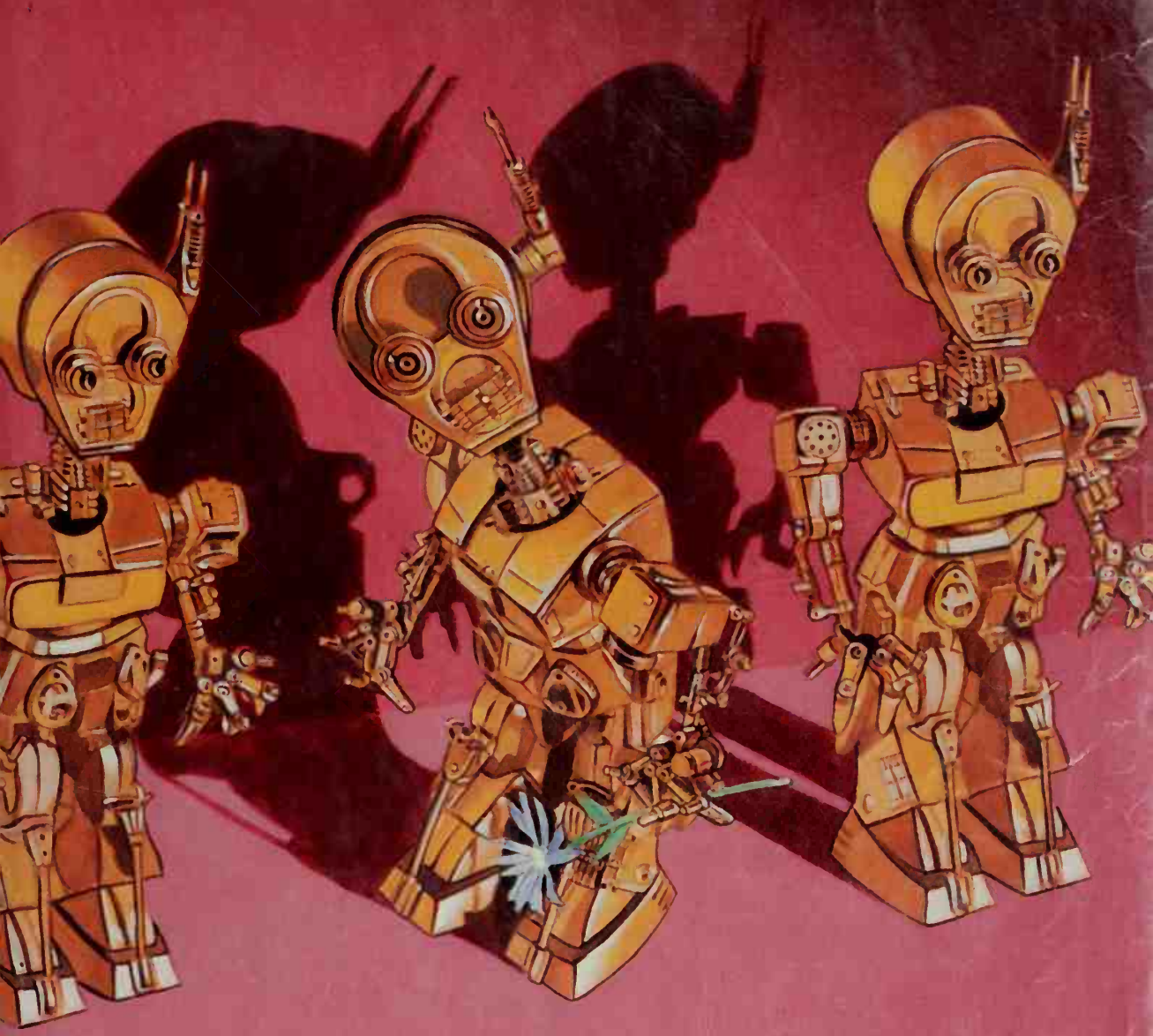
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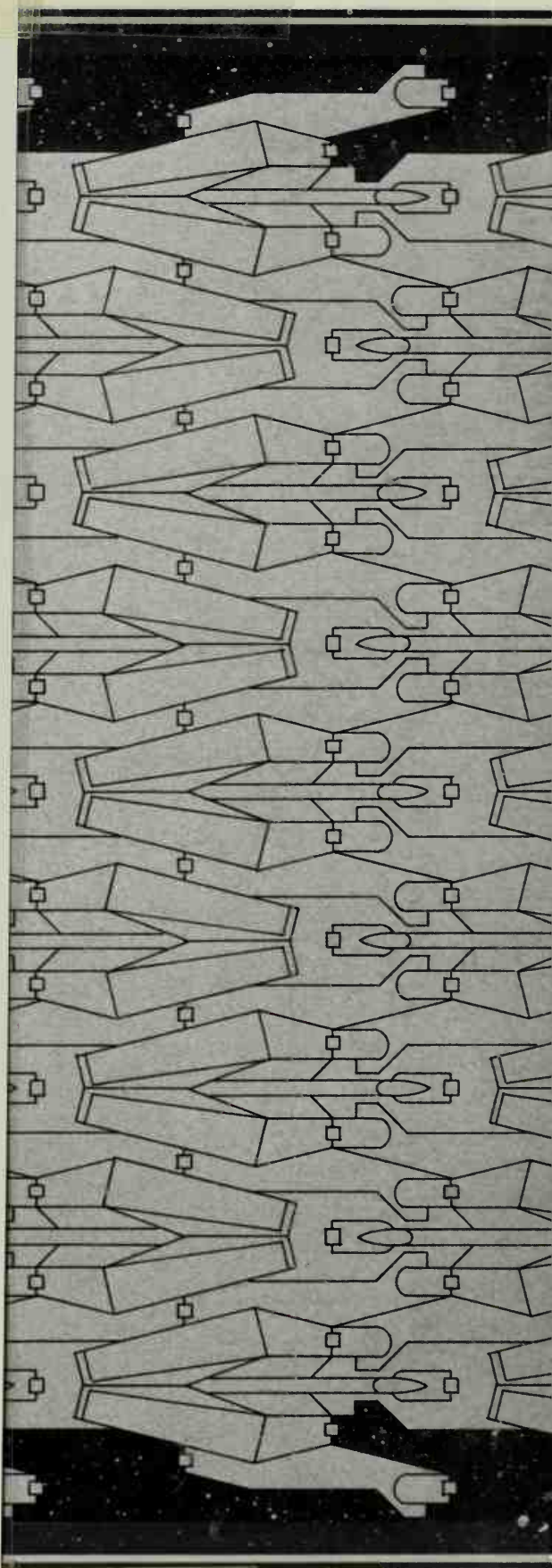
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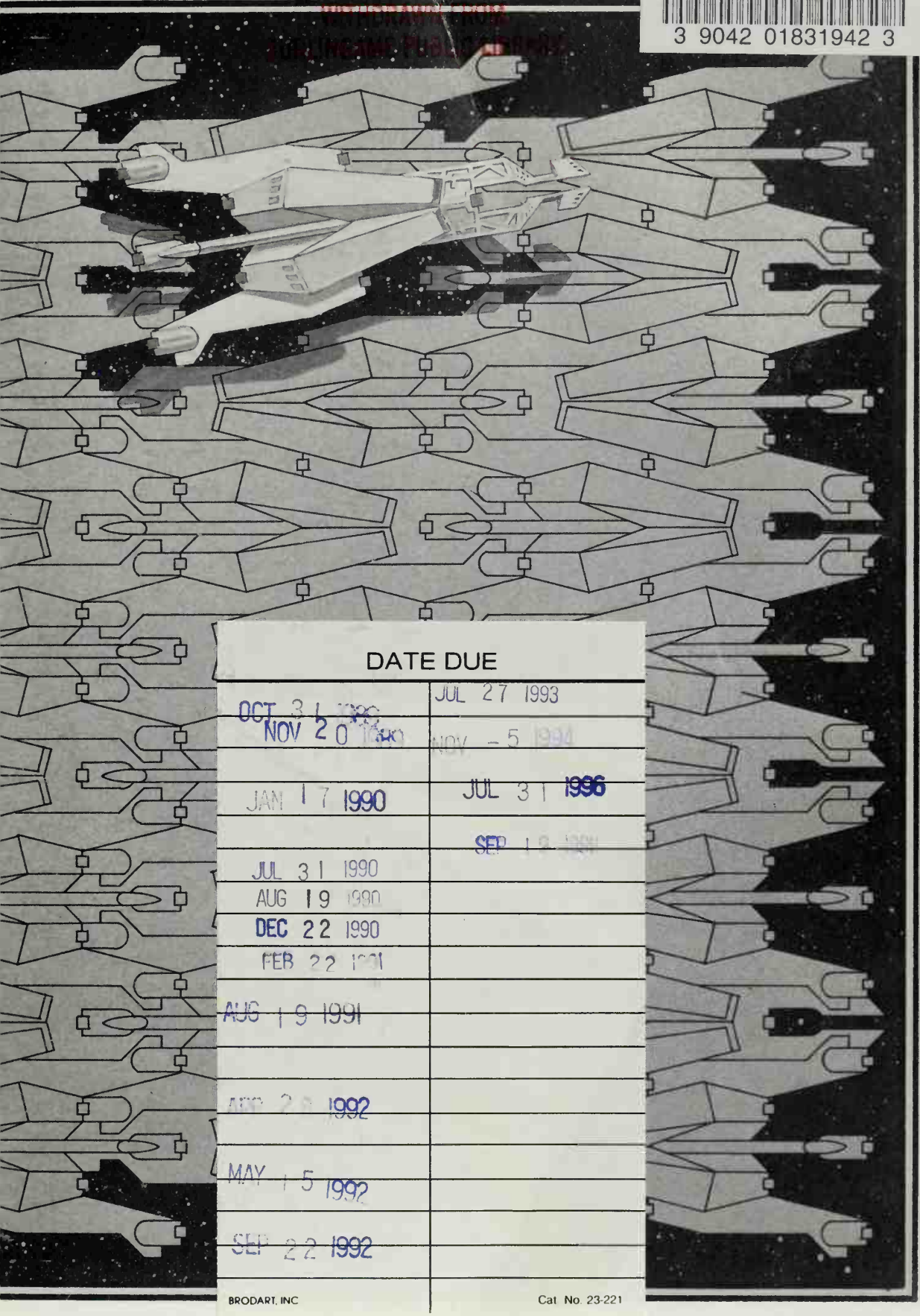
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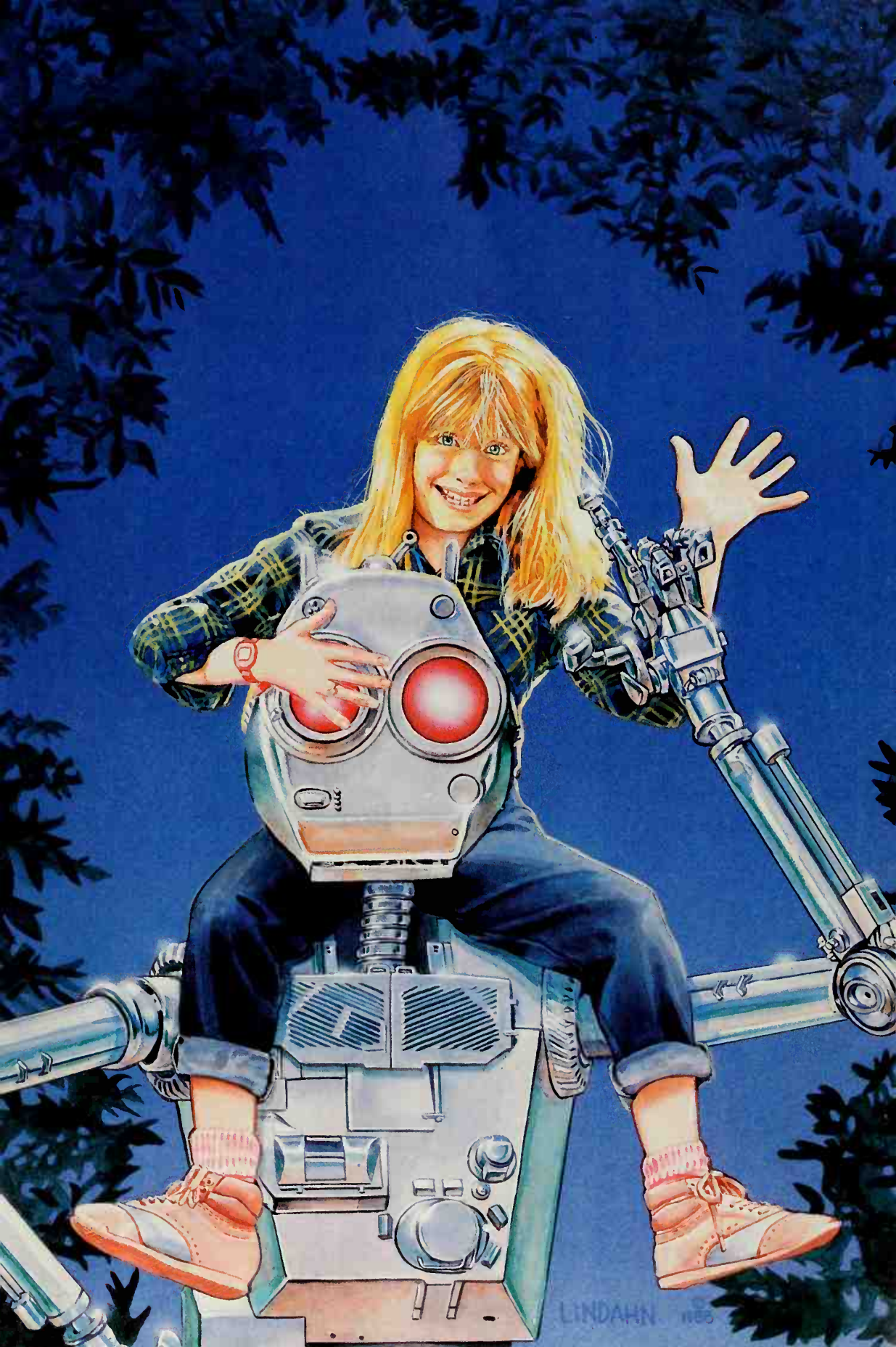
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FIFTY YEARS OF ISAAC ASIMOV

— Edited by —

Martin H. Greenberg

— Illustrated by —

Ron Lindahn and Val Lakey Lindahn



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Marooned Off Vesta

"Will you please stop walking up and down like that?" said Warren Moore from the couch. "It won't do any of us any good. Think of our blessings; we're airtight, aren't we?"

Mark Brandon whirled and ground his teeth at him. "I'm glad you feel happy about that," he spat out viciously. "Of course, you don't know that our air supply will last only three days." He resumed his interrupted stride with a defiant air.

Moore yawned and stretched, assumed a more comfortable position, and replied. "Expending all that energy will only use it up faster. Why don't you take a hint from Mike here? He's taking it easy."

"Mike" was Michael Shea, late a member of the crew of the *Silver Queen*. His short, squat body was resting on the only chair in the room and his feet were on the only table. He looked up as his name was mentioned, his mouth widening in a twisted grin.

"You've got to expect things like this to happen sometimes," he said. "Bucking the asteroids is risky business. We should've taken the hop. It takes longer, but it's the only safe way. But no, the captain wanted to make the schedule; he *would* go through"—Mike spat disgustedly—"and here we are."

"What's the 'hop'?" asked Brandon.

"Oh, I take it that friend Mike means that we should have avoided the asteroid belt by plotting a course outside the plane of the ecliptic," answered Moore. "That's it, isn't it, Mike?"

Mike hesitated and then replied cautiously, "Yeah—I guess that's it."

Moore smiled blandly and continued, "Well, I wouldn't blame Captain Crane too much. The repulsion screen must have failed five minutes before that chunk of granite barged into us. That's not his fault, though of course we ought to have steered clear instead of relying on the screen." He shook his head meditatively. "The *Silver Queen* just went to pieces. It's really miraculously lucky that this part of the ship remained intact, and what's more, airtight."

"You've got a funny idea of luck, Warren," said Brandon. "Always have, for as long as I've known you. Here we are in a tenth part of a spaceship, comprising only three *whole* rooms, with air for three days, and no prospect of being alive after that, and you have the infernal gall to prate about luck."

"Compared to the others who died instantly when the asteroid struck, yes," was Moore's answer.

"You think so, eh? Well, let me tell you that instant death isn't so bad compared with what we're going to have to go through. Suffocation is a damned unpleasant way of dying."

"We may find a way out," Moore suggested hopefully.

"Why not face facts!" Brandon's face was flushed and his voice trembled. "We're done, I tell you! Through!"

Mike glanced from one to the other doubtfully and then coughed to attract their attention. "Well, gents, seeing that we're all in the same fix, I guess there's no use hogging things." He drew a small bottle out of his pocket that was filled with a greenish liquid. "Grade A Jabra this is. I ain't too proud to share and share alike."

Brandon exhibited the first signs of pleasure for over a day. "Martian Jabra water. Why didn't you say so before?"

But as he reached for it, a firm hand clamped down upon his wrist. He looked up into the calm blue eyes of Warren Moore.

"Don't be a fool," said Moore, "there isn't enough to keep us drunk for three days. What do you want to do? Go on a tear now and then die cold sober? Let's save this for the last six hours when the air gets stuffy and breathing hurts—then we'll finish the bottle among us and never *know* when the end comes, or *care*."

Brandon's hand fell away reluctantly. "Damn it, Warren, you'd bleed ice if you were cut. How can you think straight at a time like this?" He motioned to Mike and the bottle was once more stowed away. Brandon walked to the porthole and gazed out.

Moore approached and placed a kindly arm over the shoulders of the younger man. "Why take it so hard, man?" he asked. "You can't last at this rate. Inside of twenty-four hours you'll be a madman if you keep this up."

There was no answer. Brandon stared bitterly at the globe that filled almost the entire porthole, so Moore continued, "Watching Vesta won't do you any good either."

Mike Shea lumbered up to the porthole. "We'd be safe if we were only down there on Vesta. There're people there. How far away are we?"

"Not more than three or four hundred miles judging from its apparent size," answered Moore. "You must remember that it is only two hundred miles in diameter."

"Three hundred miles from salvation," murmured Brandon, "and we might as well be a million. If there were only a way to get ourselves out of the orbit this rotten fragment adopted. You know, manage to give ourselves a push so as to start falling. There'd be no danger of crashing if we did, because that midget hasn't got enough gravity to crush a cream puff."

"It has enough to keep us in the orbit," retorted Brandon. "It must have picked us up while we were lying unconscious after the crash. Wish it had come closer; we might have been able to land on it."

"Funny place, Vesta," observed Mike Shea. "I was down there two-three times. What a dump! It's all covered with some stuff like snow, only it ain't snow. I forget what they call it."

"Frozen carbon dioxide?" prompted Moore.

"Yeah, dry ice, that carbon stuff, that's it. They say that's what makes Vesta so shiny."

"Of course! That would give it a high albedo."

Mike cocked a suspicious eye at Moore and decided to let it pass. "It's hard to see anything down there on account of the snow, but if you look close"—he pointed—"you

can see a sort of gray smudge. I think that's Bennett's dome. That's where they keep the observatory. And there is Calorn's dome up there. That's a fuel station, that is. There's plenty more, too, only I don't see them."

He hesitated and then turned to Moore. "Listen, boss, I've been thinking. Wouldn't they be looking for us as soon as they hear about the crash? And wouldn't we be easy to find from Vesta, seeing we're so close?"

Moore shook his head, "No, Mike, they won't be looking for us. No one's going to find out about the crash until the *Silver Queen* fails to turn up on schedule. You see, when the asteroid hit, we didn't have time to send out an SOS"—he sighed—"and they won't find us down there at Vesta, either. We're so small that even at our distance they couldn't see us unless they knew what they were looking for, and exactly where to look."

"Hmm." Mike's forehead was corrugated in deep thought. "Then we've got to get to Vesta before three days are up."

"You've got the gist of the matter, Mike. Now, if we only knew how to go about it, eh?"

Brandon suddenly exploded, "Will you two stop this infernal chitter-chatter and do something? For God's sake, do something."

Moore shrugged his shoulders and without answer returned to the couch. He lounged at ease, apparently carefree, but there was the tiniest crease between his eyes which bespoke concentration.

There was no doubt about it; they *were* in a bad spot. He reviewed the events of the preceding day for perhaps the twentieth time.

After the asteroid had struck, tearing the ship apart, he'd gone out like a light; for how long he didn't know, his own watch being broken and no other timepiece available. When he came to, he found himself, along with Mark Brandon, who shared his room, and Mike Shea, a member of the crew, sole occupants of all that was left of the *Silver Queen.*

This remnant was now careening in an orbit about Vesta. At present things were fairly comfortable. There was a food supply that would last a week. Likewise there was a regional Gravitator under the room that kept them at normal weight and would continue to do so for an indefinite time, certainly for longer than the air would last. The lighting system was less satisfactory but had held on so far.

There was no doubt, however, where the joker in the pack lay. Three days' air! Not that there weren't other disheartening features. There was no heating system—though it would take a long time for the ship to radiate enough heat into the vacuum of space to render them too uncomfortable. Far more important was the fact that their part of the ship had neither a means of communication nor a propulsive mechanism. Moore sighed. One fuel jet in working order would fix everything, for one blast in the right direction would send them safely to Vesta.

The crease between his eyes deepened. What was to be done? They had but one spacesuit among them, one heat ray, and one detonator. That was the sum total of space appliances after a thorough search of the accessible parts of the ship. A pretty hopeless mess, that.

Moore shrugged, rose, and drew himself a glass of water. He swallowed it mechanically, still deep in thought, when an idea struck him. He glanced curiously at the empty cup in his hand.

"Say, Mike," he said, "what kind of water supply have we? Funny that I never thought of that before."

Mike's eyes opened to their fullest extent in an expression of ludicrous surprise. "Didn't you know, boss?"

"Know *what?*" asked Moore impatiently.

"We've got all the water there was." He waved his hand in an all-inclusive gesture. He paused, but as Moore's expression showed nothing but total mystification, he elaborated, "Don't you see? We've got the main tank, the place where all the water for the whole ship was stored." He pointed to one of the walls.

"Do you mean to say that there's a tank full of water adjoining us?"

Mike nodded vigorously, "Yep! Cubic vat a hundred feet each way. And she's three-quarters full."

Moore was astonished. "Seven hundred and fifty thousand cubic feet of water." Then suddenly: "Why hasn't it run out through the broken pipes?"

"It only has one main outlet, which runs down the corridor just outside this room. I was fixing that main when the asteroid hit and had to shut it off. After I came to I opened the pipe leading to our faucet, but that's the only outlet open now."

"Oh." Moore had a curious feeling way down deep inside. An idea had half-formed in his brain, but for the life of him he could not drag it into the light of day. He knew only that there was something in what he had just heard that had some important meaning but he just could not place his finger on it.

Brandon, meanwhile, had been listening to Shea in silence, and now he emitted a short, humorless laugh. "Fate seems to be having its fill of fun with us, I see. First, it puts us within arm's reach of a place of safety and then sees to it that we have no way of getting there.

"Then she provides us with a week's food, three days' air, and *a year's supply of water.* A year's supply, do you hear me? Enough water to drink and to gargle and to wash and to take baths in and—and to do anything else we want. Water—damn the water!"

"Oh, take a less serious view, Mark," said Moore in an attempt to break the younger man's melancholy. "Pretend we're a satellite of Vesta—which we are. We have our own period of revolution and of rotation. We have an equator and an axis. Our 'north pole' is located somewhere toward the top of the porthole, pointing toward Vesta, and our 'south' sticks out away from Vesta through the water tank somewhere. Well, as a satellite, we have an atmosphere, and now, you see, we have a newly discovered ocean.

"And seriously, we're not so badly off. For the three days our atmosphere will last, we can eat double rations and drink ourselves soggy. Hell, we have water enough to throw away—"

The idea which had been half-formed before suddenly sprang to maturity and was nailed. The careless gesture with which he had accompanied the last remark was frozen in mid-air. His mouth closed with a snap and his head came up with a jerk.

But Brandon, immersed in his own thoughts, noticed nothing of Moore's strange actions. "Why don't you complete the analogy to a satellite," he sneered, "or do you, as a Professional Optimist, ignore any and all disagreeable facts? If I were you, I'd continue this way." Here he imitated Moore's voice: "The satellite is at present habitable and inhabited but, due to the approaching depletion of its atmosphere in three days, is expected to become a dead world.

"Well, why don't you answer? Why do you persist in making a joke out of this? Can't you see—*What's the matter?*"

The last was a surprised exclamation and certainly Moore's actions did merit surprise. He had risen suddenly and, after giving himself a smart rap on the forehead, remained stiff and silent, staring into the far distance with gradually narrowing eyelids. Brandon and Mike Shea watched him in speechless astonishment.

Suddenly Moore burst out, "Ha! I've got it. Why didn't I think of it before?" His exclamation degenerated into the unintelligible.

Mike drew out the Jabra bottle with a significant look, but Moore waved it away impatiently. Whereupon Brandon, without any warning, lashed out with his right, catching the surprised Moore flush on the jaw and toppling him.

Moore groaned and rubbed his chin. Somewhat indignant, he asked, "What was the reason for that?"

"Stand up and I'll do it again," shouted Brandon, "I can't stand it anymore. I'm sick and tired of being preached at, and having to listen to your Pollyanna talk. *You're* the one that's going daffy."

"Daffy, nothing! Just a little overexcited, that's all. Listen, for God's sake. I think I know a way—"

Brandon glared at him balefully. "Oh, you do, do you? Raise our hopes with some silly scheme and then find it doesn't work. I won't take it, do you hear? I'll find a real use for the water—drown you—and save some of the air besides."

Moore lost his temper. "Listen, Mark, you're out of this. I'm going through alone. I don't need your help and I don't want it. If you're that sure of dying and that afraid, why not have the agony over? We've got one heat ray and one detonator, both reliable weapons. Take your choice and kill yourself. Shea and I won't interfere." Brandon's lips curled in a last weak gesture of defiance and then suddenly he capitulated, completely and abjectly. "All right, Warren, I'm with you. I—I guess I didn't quite know what I was doing. I don't feel well, Warren. I—I—"

"Aw, that's all right, boy." Moore was genuinely sorry for him. "Take it easy. I know how you feel. It's got me too. But you mustn't give in to it. Fight it, or you'll go stark, raving mad. Now you just try and get some sleep and leave everything to me. Things will turn out right yet."

Brandon, pressing a hand to an aching forehead, stumbled to the couch and tumbled down. Silent sobs shook his frame while Moore and Shea remained in embarrassed silence nearby.

* * *

At last Moore nudged Mike. "Come on," he whispered, "let's get busy. We're going places. Airlock five is at the end of the corridor, isn't it?" Shea nodded and Moore continued, "Is it airtight?"

"Well," said Shea after some thought, "the inner door is, of course, but I don't know anything about the outer one. For all I know it may be a sieve. You see, when I tested the wall for airtightness, I didn't dare open the inner door, because if there was anything wrong with the outer one—blooey!" The accompanying gesture was very expressive.

"Then it's up to us to find out about that outer door right now. I've got to get outside some way and we'll just have to take chances. Where's the spacesuit?"

He grabbed the lone suit from its place in the cupboard, threw it over his shoulder and led the way into the long corridor that ran down the side of the room. He passed closed doors behind whose airtight barriers were what once had been passenger quarters but which were now merely cavities, open to space. At the end of the corridor was the tight-fitting door of Airlock 5.

Moore stopped and surveyed it appraisingly. "Looks all right," he observed, "but of course you can't tell what's outside. God, I hope it'll work." He frowned. "Of course we

could use the entire corridor as an airlock, with the door to our room as the inner door and this as the outer door, but that would mean the loss of half our air supply. We can't afford that—yet."

He turned to Shea. "All right, now. The indicator shows that the lock was last used for entrance, so it should be full of air. Open the door the tiniest crack, and if there's a hissing noise, shut it quick."

"Here goes," and the lever moved one notch. The mechanism had been severely shaken up during the shock of the crash and its former noiseless workings had given way to a harsh, rasping sound, but it was still in commission. A thin black line appeared on the left-hand side of the lock, marking where the door had slid a fraction of an inch on the runners.

There was no hiss! Moore's look of anxiety faded somewhat. He took a small pasteboard from his pocket and held it against the crack. If air were leaking, that card should have held there, pushed by the escaping gas. It fell to the floor.

Mike Shea stuck a forefinger in his mouth and then put it against the crack. "Thank the Lord," he breathed, "not a sign of a draft."

"Good, good. Open it wider. Go ahead."

Another notch and the crack opened farther. And still no draft. Slowly, ever so slowly, notch by notch, it creaked its way wider and wider. The two men held their breaths, afraid that while not actually punctured, the outer door might have been so weakened as to give way any moment. But it held! Moore was jubilant as he wormed into the spacesuit.

"Things are going fine so far, Mike," he said. "You sit down right here and wait for me. I don't know how long I'll take, but I'll be back. Where's the heat ray? Have you got it?"

Shea held out the ray and asked, "But what are you going to do? I'd sort of like to know."

Moore paused as he was about to buckle on the helmet. "Did you hear me say inside that we had water enough to throw away? Well, I've been thinking it over and that's not such a bad idea. I'm going to throw it away." With no other explanation, he stepped into the lock, leaving behind him a very puzzled Mike Shea.

* * *

It was with a pounding heart that Moore waited for the outer door to open. His plan was an extraordinarily simple one, but it might not be easy to carry out.

There was a sound of creaking gears and scraping ratchets. Air sighed away to nothingness. The door before him slid open a few inches and stuck. Moore's heart sank as for a moment he thought it would not open at all, but after a few preliminary jerks and rattles the barrier slid the rest of the way.

He clicked on the magnetic grapple and very cautiously put a foot out into space. Clumsily he groped his way out to the side of the ship. He had never been outside a ship in open space before and a vast dread overtook him as he clung there, flylike, to his precarious perch. For a moment dizziness overcame him.

He closed his eyes and for five minutes hung there, clutching the smooth sides of what had once been the *Silver Queen*. The magnetic grapple held him firm and when he opened his eyes once more he found his self-confidence in a measure returned.

He gazed about him. For the first time since the crash he saw the stars instead of

the vision of Vesta which their porthole afforded. Eagerly he searched the skies for the little blue-white speck that was Earth. It had often amused him that Earth should always be the first object sought by space travelers when stargazing, but the humor of the situation did not strike him now. However, his search was in vain. From where he lay, Earth was invisible. It, as well as the Sun, must be hidden behind Vesta.

Still, there was much else that he could not help but note. Jupiter was off to the left, a brilliant globe the size of a small pea to the naked eye. Moore observed two of its attendant satellites. Saturn was visible too, as a brilliant planet of some negative magnitude, rivaling Venus as seen from Earth.

Moore had expected that a goodly number of asteroids would be visible—marooned as they were in the asteroid belt—but space seemed surprisingly empty. Once he thought he could see a hurtling body pass within a few miles, but so fast had the impression come and gone that he could not swear that it was not fancy.

And then, of course, there was Vesta. Almost directly below him it loomed like a balloon filling a quarter of the sky. It floated steadily, snowy white, and Moore gazed at it with earnest longing. A good hard kick against the side of the ship, he thought, might start him falling toward Vesta. He *might* land safely and get help for the others. But the chance was too great that he would merely take on a new orbit about Vesta. No, it would have to be better than that.

This reminded him that he had no time to lose. He scanned the side of the ship, looking for the water tank, but all he could see was a jungle of jutting walls, jagged, crumbling, and pointed. He hesitated. Evidently the only thing to do was to make for the lighted porthole to their room and proceed to the tank from there.

Carefully he dragged himself along the wall of the ship. Not five yards from the lock the smoothness stopped abruptly. There was a yawning cavity which Moore recognized as having once been the room adjoining the corridor at the far end. He shuddered. Suppose he were to come across a bloated dead body in one of those rooms. He had known most of the passengers, many of them personally. But he overcame his squeamishness and forced himself to continue his precarious journey toward his goal.

And here he encountered his first practical difficulty. The room itself was made of non-ferrous material in many parts. The magnetic grapple was intended for use only on outer hulls and was useless throughout much of the ship's interior. Moore had forgotten this when suddenly he found himself floating down an incline, his grapple out of use. He grasped and clutched at a nearby projection. Slowly he pulled himself back to safety.

He lay for a moment, almost breathless. Theoretically he should be weightless out here in space—Vesta's influence being negligible—but the regional Gravitator under his room was working. Without the balance of the other Gravitators, it tended to place him under variable and suddenly shifting stresses as he kept changing his position. For his magnetic grapple to let go suddenly might mean being jerked away from the ship altogether. And then what?

Evidently this was going to be even more difficult than he had thought.

He inched forward in a crawl, testing each spot to see if the grapple would hold. Sometimes he had to make long, circuitous journeys to gain a few feet's headway and at other times he was forced to scramble and slip across small patches of non-ferrous material. And always there was that tiring pull of the Gravitator, continually changing directions as he progressed, setting horizontal floors and vertical walls at queer and almost haphazard angles.

Carefully he investigated all objects that he came across. But it was a barren search. Loose articles, chairs, tables had been jerked away at the first shock, probably, and now

were independent bodies of the Solar System. He did manage, however, to pick up a small field glass and fountain pen. These he placed in his pocket. They were valueless under present conditions, but somehow they seemed to make more real this macabre trip across the sides of a dead ship.

For fifteen minutes, twenty, half an hour, he labored slowly toward where he thought the porthole should be. Sweat poured down into his eyes and rendered his hair a matted mass. His muscles were beginning to ache under the unaccustomed strain. His mind, already strained by the ordeal of the previous day, was beginning to waver, to play him tricks.

The crawl began to seem eternal, something that had always existed and would exist forever. The object of the journey, that for which he was striving, seemed unimportant; he only knew that it was necessary to move. The time, one hour back, when he had been with Brandon and Shea, seemed hazy and lost in the far past. That more normal time, two days' age, wholly forgotten.

Only the jagged walls before him, only the vital necessity of getting at some uncertain destination existed in his spinning brain. Grasping, straining, pulling. Feeling for the iron alloy. Up and into gaping holes that were rooms and then out again. Feel and pull—feel and pull—and—a light.

Moore stopped. Had he not been glued to the wall he would have fallen. Somehow that light seemed to clear things. It was the porthole; not the many dark, staring ones he had passed, but alive and alight. Behind it was Brandon. A deep breath and he felt better, his mind cleared.

And now his way lay plain before him. Toward that spark of life he crept. Nearer, and nearer, and nearer until he could touch it. He was there!

His eyes drank in the familiar room. God knows that it hadn't any happy associations in his mind, but it was something real, something almost natural. Brandon slept on the couch. His face was worn and lined but a smile passed over it now and then.

Moore raised his fist to knock. He felt the urgent desire to talk with someone, if only by sign language, yet at the last instant he was refrained. Perhaps the kid was dreaming of home. He was young and sensitive and had suffered much. Let him sleep. Time enough to wake him when—and if—his idea had been carried through.

He located the wall within the room behind which lay the water tank and then tried to spot it from the outside. Now it was not difficult; its rear wall stood out prominently. Moore marveled, for it seemed a miracle that it had escaped puncture. Perhaps the Fates had not been so ironic after all.

Passage to it was easy though it was on the other side of the fragment. What was once a corridor led almost directly to it. Once when the *Silver Queen* had been whole, that corridor had been level and horizontal, but now, under the unbalanced pull of the regional Gravitator, it seemed more of a steep incline than anything else. And yet it made the path simple. Since it was of uniform beryl-steel, Moore found no trouble holding on as he wormed up the twenty-odd feet to the water supply.

And now the crisis—the last stage—had been reached. He felt that he ought to rest first, but his excitement grew rapidly in intensity. It was either now or bust. He pulled himself out to the bottom-center of the tank. There, resting on the small ledge formed by the floor of the corridor that had once extended on that side of the tank, he began operations.

"It's a pity that the main pipe is pointing in the wrong direction," he muttered. "It would have saved me a lot of trouble had it been right. As it is . . ." He sighed and bent to his work. The heat ray was adjusted to maximum concentration and the invisible

emanations focused at a spot perhaps a foot above the floor of the tank.

Gradually the effect of the excitatory beam upon the molecules of the wall became noticeable. A spot the size of a dime began shining faintly at the point of focus of the ray gun. It wavered uncertainly, now dimming, now brightening, as Moore strove to steady his tired arm. He propped it on the ledge and achieved better results as the tiny circle of radiation brightened.

Slowly the color ascended the spectrum. The dark, angry red that had first appeared lightened to a cherry color. As the heat continued pouring in, the brightness seemed to ripple out in widening areas, like a target made of successively deepening tints of red. The wall for a distance of some feet from the focal point was becoming uncomfortably hot even though it did not glow and Moore found it necessary to refrain from touching it with the metal of his suit.

Moore cursed steadily, for the ledge itself was also growing hot. It seemed that only imprecations could soothe him. And as the melting wall began to radiate heat in its own right, the chief object of his maledictions were the spacesuit manufacturers. Why didn't they build a suit that could keep heat *out* as well as keep it *in?*

But what Brandon called Professional Optimism crept up. With the salt tang of perspiration in his mouth, he kept consoling himself, "It could be worse, I suppose. At least, the two inches of wall here don't present too much of a barrier. Suppose the tank had been built flush against the outer hull. Whew! Imagine trying to melt through a foot of this." He gritted his teeth and kept on.

The spot of brightness was now flickering into the orange-yellow and Moore knew that the melting point of the beryl-steel alloy would soon be reached. He found himself forced to watch the spot only at widely spaced intervals and then only for fleeting moments.

Evidently it would have to be done quickly if it were to be done at all. The heat ray had not been fully loaded in the first place, and, pouring out energy at maximum as it had been doing for almost ten minutes now, must be approaching exhaustion. Yet the wall was just barely passing the plastic stage. In a fever of impatience, Moore jammed the muzzle of the gun directly at the center of the spot, drawing it back speedily.

A deep depression formed in the soft metal, but a puncture had not been formed. However, Moore was satisfied. He was almost there now. Had there been air between himself and the wall, he would undoubtedly have heard the gurgling and the hissing of the steaming water within. The pressure was building up. How long would the weakened wall endure?

Then so suddenly that Moore did not realize it for a few moments, he was through. A tiny fissure formed at the bottom of that little pit made by the ray gun and in less time than it takes to imagine, the churning water within had its way.

The soft, liquid metal at that spot puffed out, sticking out raggedly around a pea-sized hole. And from that hole there came a hissing and a roaring. A cloud of steam emerged and enveloped Moore.

Through the mist he could see the steam condense almost immediately to ice droplets and saw these icy pellets shrink rapidly into nothingness.

For fifteen minutes he watched the steam shoot out.

Then he became aware of gentle pressure pushing him away from the ship. A savage joy welled up within him as he realized that this was the effect of acceleration on the ship's part. His own inertia was holding him back.

That meant his work had been finished—and successfully. That stream of water was substituting for the rocket blast.

He started back.

If the horrors and dangers of the journey to the tank had been great, those of the way back should have been greater. He was infinitely more tired, his aching eyes were all but blind, and added to the crazy pull of the Gravitator was the force induced by the varying acceleration of the ship. But whatever his labors to return, they did not bother him. In later time, he never even remembered the heartbreaking trip.

How he managed to negotiate the distance in safety he did not know. Most of the time he was lost in a haze of happiness, scarcely realizing the actualities of the situation. His mind was filled with one thought only—to get back quickly, to tell the happy news of their escape.

Suddenly he found himself before the airlock. He hardly grasped the fact that it *was* the airlock. He almost did not understand why he pressed the signal button. Some instinct told him it was the thing to do.

Mike Shea was waiting. There was a creak and a rumble and the outer door started opening, caught, and stopped at the same place as before, but once again it managed to slide the rest of the way. It closed behind Moore, then the inner door opened and he stumbled into Shea's arms.

As in a dream he felt himself half-pulled, half-carried down the corridor to the room. His suit was ripped off. A hot, burning liquid stung his throat. Moore gagged, swallowed, and felt better. Shea pocketed the Jabra bottle once more.

The blurred, shifting images of Brandon and Shea before him steadied and became solid. Moore wiped the perspiration from his face with a trembling hand and essayed a weak smile.

"Wait," protested Brandon, "don't say anything. You look half-dead. Rest, will you!"

But Moore shook his head. In a hoarse, cracked voice he narrated as well as he could the events of the past two hours. The tale was incoherent, scarcely intelligible but marvelously impressive. The two listeners scarcely breathed during the recital.

"You mean," stammered Brandon, "that the water spout is pushing us toward Vesta, like a rocket exhaust?"

"Exactly—same thing as—rocket exhaust," panted Moore. "Action and reaction. Is located—on side opposite Vesta—hence pushing us toward Vesta."

Shea was dancing before the porthole. "He's right, Brandon, me boy. You can make out Bennett's dome as clear as day. We're getting there, we're getting there."

Moore felt himself recovering. "We're approaching in spiral path on account of original orbit. We'll land in five or six hours probably. The water will last for quite a long while and the pressure is still great, since the water issues as steam."

"Steam—at the low temperature of space?" Brandon was surprised.

"Steam—at the low pressure of space!" corrected Moore. "The boiling point of water falls with the pressure. It is very low indeed in a vacuum. Even ice has a vapor pressure sufficient to sublime."

He smiled. "As a matter of fact, it freezes and boils at the same time. I watched it." A short pause, then, "Well, how do you feel now, Brandon? Much better, eh?"

Brandon reddened and his face fell. He groped vainly for words for a few moments. Finally he said in a half-whisper, "You know, I must have acted like a damn fool and a coward at first. I—I guess I don't deserve all this after going to pieces and letting the burden of our escape rest on your shoulders.

"I wish you'd beat me up, or something, for punching you before. It'd make me feel better. I mean it." And he really did seem to mean it.

Moore gave him an affectionate push. "Forget it. You'll never know how near I

came to breaking down myself." He raised his voice in order to drown out any further apologies on Brandon's part, "Hey, Mike, stop staring out of that porthole and bring over that Jabra bottle."

Mike obeyed with alacrity, bringing with him three Plexatron units to be used as makeshift cups. Moore filled each precisely to the brim. He was going to be drunk with a vengeance.

"Gentlemen," he said solemnly, "a toast." The three raised the mugs in unison, "Gentlemen, I give you the year's supply of good old H_2O *we used to have.*"

Robbie

"Ninety-eight—ninety-nine—*one hundred.*" Gloria withdrew her chubby little forearm from before her eyes and stood for a moment, wrinkling her nose and blinking in the sunlight. Then, trying to watch in all directions at once, she withdrew a few cautious steps from the tree against which she had been leaning.

She craned her neck to investigate the possibilities of a clump of bushes to the right and then withdrew farther to obtain a better angle for viewing its dark recesses. The quiet was profound except for the incessant buzzing of insects and the occasional chirrup of some hardy bird, braving the midday sun.

Gloria pouted, "I bet he went inside the house, and I've told him a million times that that's not fair."

With tiny lips pressed together tightly and a severe frown crinkling her forehead, she moved determinedly toward the two-story building up past the driveway.

Too late she heard the rustling sound behind her, followed by the distinctive and rhythmic clump-clump of Robbie's metal feet. She whirled about to see her triumphing companion emerge from hiding and make for the home-tree at full speed.

Gloria shrieked in dismay. "Wait, Robbie! That wasn't fair, Robbie! You promised you wouldn't run until I found you." Her little feet could make no headway at all against Robbie's giant strides. Then, within ten feet of the goal, Robbie's pace slowed suddenly to the merest of crawls, and Gloria, with one final burst of wild speed, dashed pantingly past him to touch the welcome bark of home-tree first.

Gleefully, she turned on the faithful Robbie, and with the basest of ingratitude, rewarded him for his sacrifice, by taunting him cruelly for a lack of running ability.

"Robbie can't run," she shouted at the top of her eight-year-old voice. "I can beat him any day. I can beat him any day." She chanted the words in a shrill rhythm.

Robbie didn't answer, of course—not in words. He pantomimed running, instead, inching away until Gloria found herself running after him as he dodged her narrowly, forcing her to veer in helpless circles, little arms outstretched and fanning at the air.

"Robbie," she squealed, "stand still!" —And the laughter was forced out of her in breathless jerks.

—Until he turned suddenly and caught her up, whirling her round, so that for her the world fell away for a moment with a blue emptiness beneath, and green trees stretching hungrily downward toward the void. Then she was down in the grass again, leaning against Robbie's leg and still holding a hard, metal finger.

After a while, her breath returned. She pushed uselessly at her disheveled hair in vague imitation of one of her mother's gestures and twisted to see if her dress were torn.

She slapped her hand against Robbie's torso, "Bad boy! I'll spank you!"

And Robbie cowered, holding his hands over his face so that she had to add, "No, I won't, Robbie. I won't spank you. But anyway, it's my turn to hide now because you've got longer legs and you promised not to run till I found you."

Robbie nodded his head—a small parallelepiped with rounded edges and corners attached to a similar but much larger parallelepiped that served as torso by means of a short, flexible stalk—and obediently faced the tree. A thin, metal film descended over his glowing eyes and from within his body came a steady, resonant ticking.

"Don't peek now—and don't skip any numbers," warned Gloria, and scurried for cover.

With unvarying regularity, seconds were ticked off, and at the hundredth, up went the eyelids, and the glowing red of Robbie's eyes swept the prospect. They rested for a moment on a bit of colorful gingham that protruded from behind a boulder. He advanced a few steps and convinced himself that it was Gloria who squatted behind it.

Slowly, remaining always between Gloria and home-tree, he advanced on the hiding place, and when Gloria was plainly in sight and could no longer even theorize to herself that she was not seen, he extended one arm toward her, slapping the other against his leg so that it rang again. Gloria emerged sulkily.

"You peeked!" she exclaimed, with gross unfairness. "Besides I'm tired of playing hide-and-seek. I want a ride."

But Robbie was hurt at the unjust accusation, so he seated himself carefully and shook his head ponderously from side to side.

Gloria changed her tone to one of gentle coaxing immediately, "Come on, Robbie. I didn't mean it about the peeking. Give me a ride."

Robbie was not to be won over so easily, though. He gazed stubbornly at the sky, and shook his head even more emphatically.

"Please, Robbie, please give me a ride." She encircled his neck with rosy arms and hugged tightly. Then, changing moods in a moment, she moved away. "If you don't, I'm going to cry," and her face twisted appallingly in preparation.

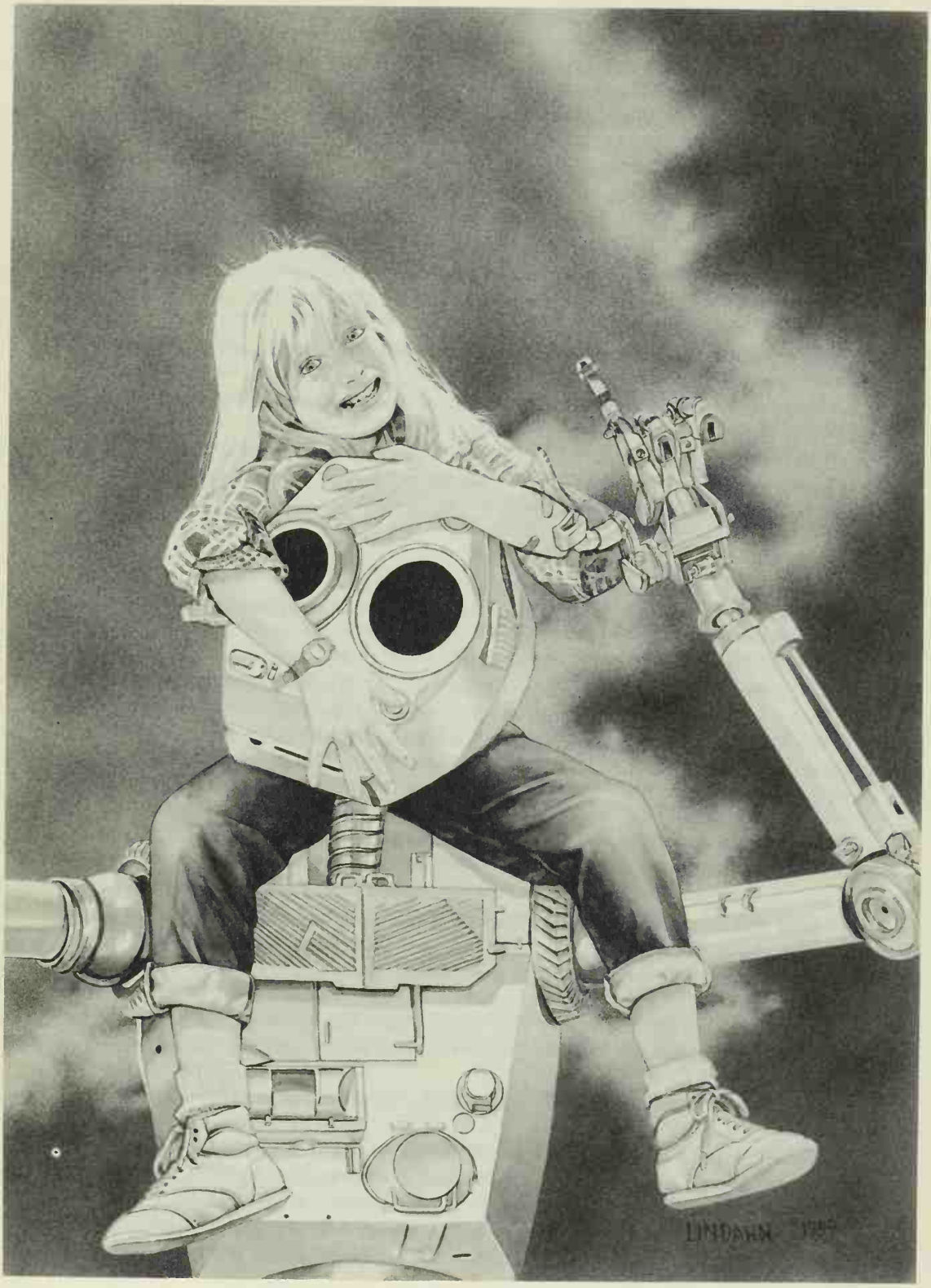
Hard-hearted Robbie paid scant attention to this dreadful possibility, and shook his head a third time. Gloria found it necessary to play her trump card.

"If you don't," she exclaimed warmly, "I won't tell you any more stories, that's all. Not one—"

Robbie gave in immediately and unconditionally before this ultimatum, nodding his head vigorously until the metal of his neck hummed. Carefully, he raised the little girl and placed her on his broad, flat shoulders.

Gloria's threatened tears vanished immediately and she crowed with delight. Robbie's metal skin, kept at a constant temperature of seventy by the high resistance coils within felt nice and comfortable, while the beautifully loud sound her heels made as they bumped rhythmically against his chest was enchanting.

"You're an air-coaster, Robbie, you're a big, silver air-coaster. Hold out your arms straight.—You *got* to, Robbie, if you're going to be an air-coaster."


LINDAHN

The logic was irrefutable. Robbie's arms were wings catching the air currents and he was a silver 'coaster.

Gloria twisted the robot's head and leaned to the right. He banked sharply. Gloria equipped the 'coaster with a motor that went "Br-r-r" and then with weapons that went "Powie" and "Sh-sh-shshsh." Pirates were giving chase and the ship's blasters were coming into play. The pirates dropped in a steady rain.

"Got another one. —Two more," she cried.

Then "Faster, men," Gloria said pompously, "we're running out of ammunition." She aimed over her shoulder with undaunted courage and Robbie was a blunt-nosed spaceship zooming through the void at maximum acceleration.

Clear across the field he sped, to the patch of tall grass on the other side, where he stopped with a suddenness that evoked a shriek from his flushed rider, and then tumbled her onto the soft, green carpet.

Gloria gasped and panted, and gave voice to intermittent whispered exclamations of "That was *nice!*"

Robbie waited until she had caught her breath and then pulled gently at a lock of hair.

"You want something?" said Gloria, eyes wide in an apparently artless complexity that fooled her huge "nursemaid" not at all. He pulled the curl harder.

"Oh, I know. You want a story."

Robbie nodded rapidly.

"Which one?"

Robbie made a semi-circle in the air with one finger.

The little girl protested, "*Again?* I've told you Cinderella a million times. Aren't you tired of it? —It's for babies."

Another semi-circle.

"Oh, well," Gloria composed herself, ran over the details of the tale in her mind (together with her own elaborations, of which she had several) and began:

"Are you ready? Well—once upon a time there was a beautiful little girl whose name was Ella. And she had a terribly cruel step-mother and two very ugly and *very* cruel step-sisters and—"

* * *

Gloria was reaching the very climax of the tale—midnight was striking and everything was changing back to the shabby originals lickety-split, while Robbie listened tensely with burning eyes—when the interruption came.

"Gloria!"

It was the high-pitched sound of a woman who has been calling not once, but several times; and had the nervous tone of one in whom anxiety was beginning to overcome impatience.

"Mamma's calling me," said Gloria, not quite happily. "You'd better carry me back to the house, Robbie."

Robbie obeyed with alacrity for somehow there was that in him which judged it best to obey Mrs. Weston, without as much as a scrap of hesitation. Gloria's father was rarely home in the daytime except on Sunday—today, for instance—and when he was, he proved a genial and understanding person. Gloria's mother, however, was a source of uneasiness to Robbie and there was always the impulse to sneak away from her sight.

Mrs. Weston caught sight of them the minute they rose above the masking tufts of long grass and retired inside the house to wait.

"I've shouted myself hoarse, Gloria," she said, severely. "Where were you?"

"I was with Robbie," quavered Gloria. "I was telling him Cinderella, and I forgot it was dinner-time."

"Well, it's a pity Robbie forgot, too." Then, as if that reminded her of the robot's presence, she whirled upon him. "You may go, Robbie. She doesn't need you now." Then, brutally, "And don't come back till I call you."

Robbie turned to go, but hesitated as Gloria cried out in his defense, "Wait, Mamma, you got to let him stay. I didn't finish Cinderella for him. I said I would tell him Cinderella and I'm not finished."

"Gloria!"

"Honest and truly, Mamma, he'll stay so quiet, you won't even know he's here. He can sit on the chair in the corner, and he won't say a word,—I mean he won't *do* anything. Will you, Robbie?"

Robbie, appealed to, nodded his massive head up and down once.

"Gloria, if you don't stop this at once, you shan't see Robbie for a whole week."

The girl's eyes fell, "All right! But Cinderella is his favorite story and I didn't finish it. —And he likes it so much."

The robot left with a disconsolate step and Gloria choked back a sob.

* * *

George Weston was comfortable. It was a habit of his to be comfortable on Sunday afternoons. A good, hearty dinner below the hatches; a nice, soft, dilapidated couch on which to sprawl; a copy of the *Times*; slippered feet and shirtless chest;—how could anyone *help* but be comfortable?

He wasn't pleased, therefore, when his wife walked in. After ten years of married life, he still was so unutterably foolish as to love her, and there was no question that he was always glad to see her—still Sunday afternoons just after dinner were sacred to him and his idea of solid comfort was to be left in utter solitude for two or three hours. Consequently, he fixed his eye firmly upon the latest reports of the Lefebre-Yoshida expedition to Mars (this one was to take off from Lunar Base and might actually succeed) and pretended she wasn't there.

Mrs. Weston waited patiently for two minutes, then impatiently for two more, and finally broke the silence.

"George!"

"Hmpph?"

"George, I say! *Will* you put down that paper and look at me?"

The paper rustled to the floor and Weston turned a weary face toward his wife, "What is it, dear?"

"You know what it is, George. It's Gloria and that terrible machine."

"What terrible machine?"

"Now don't pretend you don't know what I'm talking about. It's that robot Gloria calls Robbie. He doesn't leave her for a moment."

"Well, why should he? He's not supposed to. And he certainly isn't a terrible machine. He's the best darn robot money can buy and I'm damned sure he set me back half a year's income. He's worth it, though—darn sight cleverer than half my office staff."

He made a move to pick up the paper again, but his wife was quicker and snatched it away.

"You listen to *me*, George. I won't have my daughter entrusted to a machine—and I don't care how clever it is. It has no soul, and no one knows what it may be thinking. A child just isn't *made* to be guarded by a thing of metal."

Weston frowned, "When did you decide this? He's been with Gloria two years now and I haven't seen you worry till now."

"It was different at first. It was a novelty; it took a load off me, and—and it was a fashionable thing to do. But now I don't know. The neighbors—"

"Well, what have the neighbors to do with it? Now, look. A robot is infinitely more to be trusted than a human nursemaid. Robbie was constructed for only one purpose really—to be the companion of a little child. His entire 'mentality' has been created for the purpose. He just can't help being faithful and loving and kind. He's a machine—*made so.* That's more than you can say for humans."

"But something might go wrong. Some—some—" Mrs. Weston was a bit hazy about the insides of a robot, "some little jigger will come loose and the awful thing will go beserk and—and—" She couldn't bring herself to complete the quite obvious thought.

"Nonsense," Weston denied, with an involuntary nervous shiver. "That's completely ridiculous. We had a long discussion at the time we bought Robbie about the First Law of Robotics. You *know* that it is impossible for a robot to harm a human being; that long before enough can go wrong to alter that First Law, a robot would be completely inoperable. It's a mathematical impossibility. Besides I have an engineer from U. S. Robots here twice a year to give the poor gadget a complete overhaul. Why, there's no more chance of anything at all going wrong with Robbie than there is of you or I suddenly going looney—considerably less, in fact. Besides, how are you going to take him away from Gloria?"

He made another futile stab at the paper and his wife tossed it angrily into the next room.

"That's just it, George! She won't play with anyone else. There are dozens of little boys and girls that she should make friends with, but she won't. She won't go *near* them unless I make her. That's no way for a little girl to grow up. You want her to be normal, don't you? You want her to be able to take her part in society."

"You're jumping at shadows, Grace. Pretend Robbie's a dog. I've seen hundreds of children who would rather have their dog than their father."

"A dog is different, George. We *must* get rid of that horrible thing. You can sell it back to the company. I've asked, and you can."

"You've *asked?* Now look here, Grace, let's not go off the deep end. We're keeping the robot until Gloria is older and I don't want the subject brought up again." And with that he walked out of the room in a huff.

* * *

Mrs. Weston met her husband at the door two evenings later. "You'll have to listen to this, George. There's bad feeling in the village."

"About what?" asked Weston. He stepped into the washroom and drowned out any possible answer by the splash of water.

Mrs. Weston waited. She said, "About Robbie."

Weston stepped out, towel in hand, face red and angry, "What are you talking about?"

"Oh, it's been building up and building up. I've tried to close my eyes to it, but I'm not going to any more. Most of the villagers consider Robbie dangerous. Children aren't allowed to go near our place in the evenings."

"We trust *our* child with the thing."

"Well, people aren't reasonable about these things."

"Then to hell with them."

"Saying that doesn't solve the problem. I've got to do my shopping down there. I've got to meet them every day. And it's even worse in the city these days when it comes to robots. New York has just passed an ordinance keeping all robots off the streets between sunset and sunrise."

"All right, but they can't stop us from keeping a robot in our home. —Grace, this is one of your campaigns. I recognize it. But it's no use. The answer is still, no! We're keeping Robbie!"

* * *

And yet he loved his wife—and what was worse, his wife knew it. George Weston, after all, was only a man—poor thing—and his wife made full use of every device which a clumsier and more scrupulous sex has learned, with reason and futility, to fear.

Ten times in the ensuing week, he cried, "Robbie stays,—and that's *final!*" and each time it was weaker and accompanied by a louder and more agonized groan.

Came the day at last, when Weston approached his daughter guiltily and suggested a "beautiful" visivox show in the village.

Gloria clapped her hands happily, "Can Robbie go?"

"No, dear," he said, and winced at the sound of his voice, "they won't allow robots at the visivox—but you can tell him all about it when you get home." He stumbled all over the last few words and looked away.

Gloria came back from town bubbling over with enthusiasm, for the visivox had been a gorgeous spectacle indeed.

She waited for her father to maneuver the jet-car into the sunken garage. "Wait till I tell Robbie, Daddy. He would have liked it like anything. —Especially when Francis Fran was backing away so-o-o quietly, and backed right into one of the Leopard-Men and had to run." She laughed again, "Daddy, are there really Leopard-Men on the Moon?"

"Probably not," said Weston absently. "It's just funny make-believe." He couldn't take much longer with the car. He'd have to face it.

Gloria ran across the lawn. "Robbie. —Robbie!"

Then she stopped suddenly at the sight of a beautiful collie which regarded her out of serious brown eyes as it wagged its tail on the porch.

"Oh, what a nice dog!" Gloria climbed the steps, approached cautiously and patted it. "Is it for me, Daddy?"

Her mother had joined them. "Yes, it is, Gloria. Isn't it nice—soft and furry. It's very gentle. It *likes* little girls."

"Can he play games?"

"Surely. He can do any number of tricks. Would you like to see some?"

"Right away. I want Robbie to see him, too. —*Robbie!*" She stopped, uncertainly, and frowned, "I'll bet he's just staying in his room because he's mad at me for not taking him to the visivox. You'll have to explain to him, Daddy. He might not believe me, but he knows if you say it, it's so."

Weston's lips grew tighter. He looked toward his wife but could not catch her eye.

Gloria turned precipitously and ran down the basement steps, shouting as she went, "Robbie— Come and see what Daddy and Mamma brought me. They brought me a dog, Robbie."

In a minute she had returned, a frightened little girl. "Mamma, Robbie isn't in his room. Where is he?" There was no answer and George Weston coughed and was suddenly extremely interested in an aimlessly drifting cloud. Gloria's voice quavered on the verge of tears, "Where's Robbie, Mamma?"

Mrs. Weston sat down and drew her daughter gently to her, "Don't feel bad, Gloria. Robbie has gone away, I think."

"Gone *away?* Where? Where's he gone away, Mamma?"

"No one knows, darling. He just walked away. We've looked and we've looked and we've looked for him, but we can't find him."

"You mean he'll never come back again?" Her eyes were round with horror.

"We may find him soon. We'll keep looking for him. And meanwhile you can play with your nice new doggie. Look at him! His name is Lightning and he can—"

But Gloria's eyelids had overflown, "I don't want the nasty dog—I want Robbie. I want you to find me Robbie." Her feelings became too deep for words, and she spluttered into a shrill wail.

Mrs. Weston glanced at her husband for help, but he merely shuffled his feet morosely and did not withdraw his ardent stare from the heavens, so she bent to the task of consolation, "Why do you cry, Gloria? Robbie was only a machine, just a nasty old machine. He wasn't alive at all."

"He was *not* no machine!" screamed Gloria, fiercely and ungrammatically. "He was a *person* just like you and me and he was my *friend.* I want him back. Oh, Mamma, I want him back."

Her mother groaned in defeat and left Gloria to her sorrow.

"Let her have her cry out," she told her husband. "Childish griefs are never lasting. In a few days, she'll forget that awful robot ever existed."

But time proved Mrs. Weston a bit too optimistic. To be sure, Gloria ceased crying, but she ceased smiling, too, and the passing days found her ever more silent and shadowy. Gradually, her attitude of passive unhappiness wore Mrs. Weston down and all that kept her from yielding was the impossibility of admitting defeat to her husband.

Then, one evening, she flounced into the living room, sat down, folded her arms and looked boiling mad.

Her husband stretched his neck in order to see her over his newspaper, "What now, Grace?"

"It's that child, George. I've had to send back the dog today. Gloria positively couldn't stand the sight of him, she said. She's driving me into a nervous breakdown."

Weston laid down the paper and a hopeful gleam entered his eye, "Maybe— Maybe we ought to get Robbie back. It might be done, you know. I can get in touch with—"

"No!" she replied, grimly. "I won't hear of it. We're not giving up that easily. My child shall *not* be brought up by a robot if it takes years to break her of it."

Weston picked up his paper again with a disappointed air. "A year of this will have me prematurely gray."

"You're a big help, George," was the frigid answer. "What Gloria needs is a change of environment. Of course she can't forget Robbie here. How can she when every tree and rock reminds her of him? It is really the *silliest* situation I have ever heard of. Imagine a child pining away for the loss of a robot."

"Well, stick to the point. What's the change in environment you're planning?"

"We're going to take her to New York."

"The city! In August! Say, do you know what New York is like in August? It's unbearable."

"Millions do bear it."

"They don't have a place like this to go to. If they didn't have to stay in New York, they wouldn't."

"Well, *we* have to. I say we're leaving now—or as soon as we can make the arrangements. In the city, Gloria will find sufficient interests and sufficient friends to perk her up and make her forget that machine."

"Oh, Lord," groaned the lesser half, "those frying pavements!"

"We have to," was the unshaken response. "Gloria has lost five pounds in the last month and my little girl's health is more important to me than your comfort."

"It's a pity you didn't think of your little girl's health before you deprived her of her pet robot," he muttered—but to himself.

* * *

Gloria displayed immediate signs of improvement when told of the impending trip to the city. She spoke little of it, but when she did, it was always with lively anticipation. Again, she began to smile and to eat with something of her former appetite.

Mrs. Weston hugged herself for joy and lost no opportunity to triumph over her still skeptical husband.

"You see, George, she helps with the packing like a little angel, and chatters away as if she hadn't a care in the world. It's just as I told you—all we need do is substitute other interests."

"Hmpph," was the skeptical response, "I hope so."

Preliminaries were gone through quickly. Arrangements were made for the preparation of their city home and a couple were engaged as housekeepers for the country home. When the day of the trip finally did come, Gloria was all but her old self again, and no mention of Robbie passed her lips at all.

In high good-humor the family took a taxi-gyro to the airport (Weston would have preferred using his own private 'gyro, but it was only a two-seater with no room for baggage) and entered the waiting liner.

"Come, Gloria," called Mrs. Weston. "I've saved you a seat near the window so you can watch the scenery."

Gloria trotted down the aisle cheerily, flattened her nose into a white oval against the thick clear glass, and watched with an intentness that increased as the sudden coughing of the motor drifted backward into the interior. She was too young to be frightened when the ground dropped away as if let through a trap-door and she herself suddenly became twice her usual weight, but not too young to be mightily interested. It wasn't until the ground had changed into a tiny patch-work quilt that she withdrew her nose, and faced her mother again.

"Will we soon be in the city, Mamma?" she asked, rubbing her chilled nose, and watching with interest as the patch of moisture which her breath had formed on the pane shrank slowly and vanished.

"In about half an hour, dear." Then, with just the faintest trace of anxiety, "Aren't you glad we're going? Don't you think you'll be very happy in the city with all the

buildings and people and things to see? We'll go to the visivox every day and see shows and go to the circus and the beach and—"

"Yes, Mamma," was Gloria's unenthusiastic rejoinder. The liner passed over a bank of clouds at the moment, and Gloria was instantly absorbed in the unusual spectacle of clouds underneath one. Then they were over clear sky again, and she turned to her mother with a sudden mysterious air of secret knowledge.

"*I* know why we're going to the city, Mamma."

"Do you?" Mrs. Weston was puzzled. "Why, dear?"

"You didn't tell me because you wanted it to be a surprise, but *I* know." For a moment, she was lost in admiration at her own acute penetration, and then she laughed gaily. "We're going to New York so we can find Robbie, aren't we? —With detectives."

The statement caught George Weston in the middle of a drink of water, with disastrous results. There was a sort of strangled gasp, a geyser of water, and then a bout of choking coughs. When all was over, he stood there, a red-faced, water-drenched and very, very annoyed person.

Mrs. Weston maintained her composure, but when Gloria repeated her question in a more anxious tone of voice, she found her temper rather bent.

"Maybe," she retorted, tartly. "Now sit and be still, for Heaven's sake."

* * *

New York City, 1998 A.D., was a paradise for the sight-seer more than ever in its history. Gloria's parents realized this and made the most of it.

On direct orders from his wife, George Weston arranged to have his business take care of itself for a month or so, in order to be free to spend the time in what he termed "dissipating Gloria to the verge of ruin." Like everything else Weston did, this was gone about in an efficient, thorough, and business-like way. Before the month had passed, nothing that could be done had not been done.

She was taken to the top of the half-mile-tall Roosevelt Building, to gaze down in awe upon the jagged panorama of rooftops that blended far off in the fields of Long Island and the flatlands of New Jersey. They visited the zoos where Gloria stared in delicious fright at the "real live lion" (rather disappointed that the keepers fed him raw steaks, instead of human beings, as she had expected), and asked insistently and peremptorily to see "the whale."

The various museums came in for their share of attention, together with the parks and the beaches and the aquarium.

She was taken halfway up the Hudson in an excursion steamer fitted out in the archaism of the mad Twenties. She travelled into the stratosphere on an exhibition trip, where the sky turned deep purple and the stars came out and the misty earth below looked like a huge concave bowl. Down under the waters of the Long Island Sound she was taken in a glass-walled sub-sea vessel, where in a green and wavering world, quaint and curious sea-things ogled her and wiggled suddenly away.

On a more prosaic level, Mrs. Weston took her to the department stores where she could revel in another type of fairyland.

In fact, when the month had nearly sped, the Westons were convinced that everything conceivable had been done to take Gloria's mind once and for all off the departed Robbie—but they were not quite sure they had succeeded.

The fact remained that wherever Gloria went, she displayed the most absorbed

and concentrated interest in such robots as happened to be present. No matter how exciting the spectacle before her, nor how novel to her girlish eyes, she turned away instantly if the corner of her eye caught a glimpse of metallic movement.

Mrs. Weston went out of her way to keep Gloria away from all robots.

And the matter was finally climaxed in the episode at the Museum of Science and Industry. The Museum had announced a special "children's program" in which exhibits of scientific witchery scaled down to the child mind were to be shown. The Westons, of course, placed it upon their list of "absolutely."

It was while the Westons were standing totally absorbed in the exploits of a powerful electro-magnet that Mrs. Weston suddenly became aware of the fact that Gloria was no longer with her. Initial panic gave way to calm decision and, enlisting the aid of three attendants, a careful search was begun.

Gloria, of course, was not one to wander aimlessly, however. For her age, she was an unusually determined and purposeful girl, quite full of the maternal genes in that respect. She had seen a huge sign on the third floor, which had said, "This Way to the Talking Robot." Having spelled it out to herself and having noticed that her parents did not seem to wish to move in the proper direction, she did the obvious thing. Waiting for an opportune moment of parental distraction, she calmly disengaged herself and followed the sign.

* * *

The Talking Robot was a *tour de force*, a thoroughly impractical device, possessing publicity value only. Once an hour, an escorted group stood before it and asked questions of the robot engineer in charge in careful whispers. Those the engineer decided were suitable for the robot's circuits were transmitted to the Talking Robot.

It was rather dull. It may be nice to know that the square of fourteen is one hundred ninety-six, that the temperature at the moment is 72 degrees Fahrenheit, and the air-pressure 30.02 inches of mercury, that the atomic weight of sodium is 23, but one doesn't really need a robot for that. One especially does not need an unwieldy, totally immobile mass of wires and coils spreading over twenty-five square yards.

Few people bothered to return for a second helping, but one girl in her middle teens sat quietly on a bench waiting for a third. She was the only one in the room when Gloria entered.

Gloria did not look at her. To her at the moment, another human being was but an inconsiderable item. She saved her attention for this large thing with the wheels. For a moment, she hesitated in dismay. It didn't look like any robot she had ever seen.

Cautiously and doubtfully she raised her treble voice, "Please, Mr. Robot, sir, are you the Talking Robot, sir?" She wasn't sure, but it seemed to her that a robot that actually talked was worth a great deal of politeness.

(The girl in her mid-teens allowed a look of intense concentration to cross her thin, plain face. She whipped out a small notebook and began writing in rapid pot-hooks.)

There was an oily whir of gears and a mechanically-timbred voice boomed out in words that lacked accent and intonation, "I—am—the—robot—that—talks."

Gloria stared at it ruefully. It *did* talk, but the sound came from inside somewheres. There was no *face* to talk to. She said, "Can you help me, Mr. Robot, sir?"

The Talking Robot was designed to answer questions, and only such questions as it could answer had ever been put to it. It was quite confident of its ability, therefore, "I—can—help—you."

"Thank you, Mr. Robot sir. Have you seen Robbie?"

"Who—is—Robbie?"

"He's a robot, Mr. Robot, sir." She stretched to tip-toes. "He's about so high, Mr. Robot, sir, only higher, and he's very nice. He's got a head, you know. I mean you haven't, but he has, Mr. Robot, sir."

The Talking Robot had been left behind, "A—robot?"

"Yes, Mr. Robot, sir. A robot just like you, except he can't talk, of course, and—looks like a real person."

"A—robot—like—me?"

"Yes, Mr. Robot, sir."

To which the Talking Robot's only response was an erratic splutter and an occasional incoherent sound. The radical generalization offered it, i.e., its existence, not as a particular object, but as a member of a general group, was too much for it. Loyally, it tried to encompass the concept and half a dozen coils burnt out. Little warning signals were buzzing.

(The girl in her mid-teens left at that point. She had enough for her Physics-I paper on "Practical Aspects of Robotics." This paper was Susan Calvin's first of many on the subject).

Gloria stood waiting, with carefully concealed impatience, for the machine's answer when she heard the cry behind her of "There she is," and recognized that cry as her mother's.

"What are you doing here, you bad girl?" cried Mrs. Weston, anxiety dissolving at once into anger. "Do you know you frightened your mamma and daddy almost to death? Why did you run away?"

The robot engineer had also dashed in, tearing his hair, and demanding who of the gathering crowd had tampered with the machine. "Can't anybody read signs?" he yelled. "You're not allowed in here without an attendant."

Gloria raised her grieved voice over the din, "I only came to see the Talking Robot, Mamma. I thought he might know where Robbie was because they're both robots." And then, as the thought of Robbie was suddenly brought forcefully home to her, she burst into a sudden storm of tears, "And I *got* to find Robbie, Mamma. I *got* to."

Mrs. Weston strangled a cry, and said, "Oh, good Heavens. Come home, George. This is more than I can stand."

That evening, George Weston left for several hours, and the next morning, he approached his wife with something that looked suspiciously like smug complacence.

"I've got an idea, Grace."

"About what?" was the gloomy, uninterested query.

"About Gloria."

"You're not going to suggest buying back that robot?"

"No, of course not."

"Then go ahead. I might as well listen to you. Nothing *I've* done seems to have done any good."

"All right. Here's what I've been thinking. The whole trouble with Gloria is that she thinks of Robbie as a *person* and not as a *machine*. Naturally, she can't forget him. Now if we managed to convince her that Robbie was nothing more than a mess of steel and copper in the form of sheets and wires with electricity its juice of life, how long would her longings last? It's the psychological attack, if you see my point."

"How do you plan to do it?"

"Simple. Where do you suppose I went last night? I persuaded Robertson of U. S.

Robots and Mechanical Men Corporation to arrange for a complete tour of his premises tomorrow. The three of us will go, and by the time we're through, Gloria will have it drilled into her that a robot is *not* alive."

Mrs. Weston's eyes widened gradually and something glinted in her eyes that was quite like sudden admiration, "Why, George, that's a *good* idea."

And George Weston's vest buttons strained. "Only kind I have," he said.

* * *

Mr. Struthers was a conscientious General Manager and naturally inclined to be a bit talkative. The combination, therefore, resulted in a tour that was fully explained, perhaps even overabundantly explained, at every step. However, Mrs. Weston was not bored. Indeed, she stopped him several times and begged him to repeat his statements in simpler language so that Gloria might understand. Under the influence of this appreciation of his narrative powers, Mr. Struthers expanded genially and became ever more communicative, if possible.

George Weston, himself, showed a gathering impatience.

"Pardon me, Struthers," he said, breaking into the middle of a lecture on the photoelectric cell, "haven't you a section of the factory where only robot labor is employed?"

"Eh? Oh, yes! Yes, indeed!" He smiled at Mrs. Weston. "A vicious circle in a way, robots creating more robots. Of course, we are not making a general practice out of it. For one thing, the unions would never let us. But we can turn out a very few robots using robot labor exclusively, merely as a sort of scientific experiment. You see," he tapped his pince-nez into one palm argumentatively, "what the labor unions don't realize—and I say this as a man who has always been very sympathetic with the labor movement in general—is that the advent of the robot, while involving some dislocation to begin with, will, inevitably—"

"Yes, Struthers," said Weston, "but about that section of the factory you speak of—may we see it? It would be very interesting, I'm sure."

"Yes! Yes, of course!" Mr. Struthers replaced his pince-nez in one convulsive movement and gave vent to a soft cough of discomfiture. "Follow me, please."

He was comparatively quiet while leading the three through a long corridor and down a flight of stairs. Then, when they had entered a large well-lit room that buzzed with metallic activity, the sluices opened and the flood of explanation poured forth again.

"There you are!" he said with pride in his voice. "Robots only! Five men act as overseers and they don't even stay in this room. In five years, that is, since we began this project, not a single accident has occurred. Of course, the robots here assembled are comparatively simple, but . . ."

The General Manager's voice had long died to a rather soothing murmur in Gloria's ears. The whole trip seemed rather dull and pointless to her, though there *were* many robots in sight. None were even remotely like Robbie, though, and she surveyed them with open contempt.

In this room, there weren't any people at all, she noticed. Then her eyes fell upon six or seven robots busily engaged at a round table halfway across the room. They widened in incredulous surprise. It was a big room. She couldn't see for sure, but one of the robots looked like—looked like—*it was!*

"*Robbie!*" Her shriek pierced the air, and one of the robots about the table faltered

and dropped the tool he was holding. Gloria went almost mad with joy. Squeezing through the railing before either parent could stop her, she dropped lightly to the floor a few feet below, and ran toward her Robbie, arms waving and hair flying.

And the three horrified adults, as they stood frozen in their tracks, saw what the excited little girl did not see,—a huge, lumbering tractor bearing blindly down upon its appointed track.

It took split-seconds for Weston to come to his senses, and those split-seconds meant everything, for Gloria could not be overtaken. Although Weston vaulted the railing in a wild attempt, it was obviously hopeless. Mr. Struthers signalled wildly to the overseers to stop the tractor, but the overseers were only human and it took time to act.

It was only Robbie that acted immediately and with precision.

With metal legs eating up the space between himself and his little mistress he charged down from the opposite direction. Everything then happened at once. With one sweep of an arm, Robbie snatched up Gloria, slackening his speed not one iota, and, consequently, knocking every breath of air out of her. Weston, not quite comprehending all that was happening, felt, rather than saw, Robbie brush past him, and came to a sudden bewildered halt. The tractor intersected Gloria's path half a second after Robbie had, rolled on ten feet further and came to a grinding, long-drawn-out stop.

Gloria regained her breath, submitted to a series of passionate hugs on the part of both her parents and turned eagerly toward Robbie. As far as she was concerned, nothing had happened except that she had found her friend.

But Mrs. Weston's expression had changed from one of relief to one of dark suspicion. She turned to her husband, and, despite her disheveled and undignified appearance, managed to look quite formidable, "*You* engineered this, *didn't* you?"

George Weston swabbed at a hot forehead with his handkerchief. His hand was unsteady, and his lips could curve only into a tremulous and exceedingly weak smile.

Mrs. Weston pursued the thought, "Robbie wasn't designed for engineering or construction work. He couldn't be of any use to them. You had him placed there deliberately so that Gloria would find him. You know you did."

"Well, I did," said Weston. "But, Grace, how was I to know the reunion would be so violent? And Robbie has saved her life; you'll have to admit that. You *can't* send him away again."

Grace Weston considered. She turned toward Gloria and Robbie and watched them abstractedly for a moment. Gloria had a grip about the robot's neck that would have asphyxiated any creature but one of metal, and was prattling nonsense in half-hysterical frenzy. Robbie's chrome-steel arms (capable of bending a bar of steel two inches in diameter into a pretzel) wound about the little girl gently and lovingly, and his eyes glowed a deep, deep red.

"Well," said Mrs. Weston, at last, "I guess he can stay with us until he rusts."

Nightfall

"If the stars should appear one night in a thousand years, how would men believe and adore, and preserve for many generations the remembrance of the city of God?"

EMERSON

Aton 77, director of Saro University, thrust out a belligerent lower lip and glared at the young newspaperman in a hot fury.

Theremon 762 took that fury in his stride. In his earlier days, when his now widely syndicated column was only a mad idea in a cub reporter's mind, he had specialized in "impossible" interviews. It had cost him bruises, black eyes, and broken bones; but it had given him an ample supply of coolness and self-confidence.

So he lowered the outthrust hand that had been so pointedly ignored and calmly waited for the aged director to get over the worst. Astronomers were queer ducks, anyway, and if Aton's actions of the last two months meant anything, this same Aton was the queer-duckiest of the lot.

Aton 77 found his voice, and though it trembled with restrained emotion, the careful, somewhat pedantic phraseology, for which the famous astronomer was noted, did not abandon him.

"Sir," he said, "you display an infernal gall in coming to me with that impudent proposition of yours."

The husky telephotographer of the Observatory, Beenay 25, thrust a tongue's tip across dry lips and interposed nervously, "Now, sir, after all—"

The director turned to him and lifted a white eyebrow. "Do not interfere, Beenay. I will credit you with good intentions in bringing this man here; but I will tolerate no insubordination now."

Theremon decided it was time to take a part. "Director Aton, if you'll let me finish what I started saying, I think—"

"I don't believe, young man," retorted Aton, "that anything you could say now would count for much as compared with your daily columns of these last two months. You

have led a vast newspaper campaign against the efforts of myself and my colleagues to organize the world against the menace which it is now too late to avert. You have done your best with your highly personal attacks to make the staff of this Observatory objects of ridicule."

The director lifted a copy of the Saro City *Chronicle* from the table and shook it at Theremon furiously. "Even a person of your well-known impudence should have hesitated before coming to me with a request that he be allowed to cover today's events for his paper. Of all newsmen, you!"

Aton dashed the newspaper to the floor, strode to the window, and clasped his arms behind his back.

"You may leave," he snapped over his shoulder. He stared moodily out at the skyline where Gamma, the brightest of the planet's six suns, was setting. It had already faded and yellowed into the horizon mists, and Aton knew he would never see it again as a sane man.

He whirled. "No, wait, come here!" He gestured peremptorily. "I'll give you your story."

The newsman had made no motion to leave, and now he approached the old man slowly. Aton gestured outward. "Of the six suns, only Beta is left in the sky. Do you see it?"

The question was rather unnecessary. Beta was almost at zenith, its ruddy light flooding the landscape to an unusual orange as the brilliant rays of setting Gamma died. Beta was at aphelion. It was small; smaller than Theremon had ever seen it before, and for the moment it was undisputed ruler of Lagash's sky.

Lagash's own sun, Alpha, the one about which it revolved, was at the antipodes, as were the two distant companion pairs. The red dwarf Beta—Alpha's immediate companion—was alone, grimly alone.

Aton's upturned face flushed redly in the sunlight. "In just under four hours," he said, "civilization, as we know it, comes to an end. It will do so because, as you see, Beta is the only sun in the sky." He smiled grimly. "Print that! There'll be no one to read it."

"But if it turns out that four hours pass—and another four—and nothing happens?" asked Theremon softly.

"Don't let that worry you. Enough will happen."

"Granted! And, *still*—if nothing happens?"

For a second time, Beenay 25 spoke. "Sir, I think you ought to listen to him."

Theremon said, "Put it to a vote, Director Aton."

There was a stir among the remaining five members of the Observatory staff, who till now had maintained an attitude of wary neutrality.

"That," stated Aton flatly, "is not necessary." He drew out his pocket watch. "Since your good friend, Beenay, insists so urgently, I will give you five minutes. Talk away."

"Good! Now, just what difference would it make if you allowed me to take down an eyewitness account of what's to come? If your prediction comes true, my presence won't hurt; for in that case my column would never be written. On the other hand, if nothing comes of it, you will just have to expect ridicule or worse. It would be wise to leave that ridicule to friendly hands."

Aton snorted. "Do you mean yours when you speak of friendly hands?"

"Certainly!" Theremon sat down and crossed his legs. "My columns may have been a little rough, but I gave you people the benefit of the doubt every time. After all, this is not the century to preach 'The end of the world is at hand' to Lagash. You have to understand that people don't believe the *Book of Revelations* anymore, and it annoys

them to have scientists turn about-face and tell us the Cultists are right after all—"

"No such thing, young man," interrupted Aton. "While a great deal of our data has been supplied us by the Cult, our results contain none of the Cult's mysticism. Facts are facts, and the Cult's so-called mythology *has* certain facts behind it. We've exposed them and ripped away their mystery. I assure you that the Cult hates us now worse than you do."

"I don't hate you. I'm just trying to tell you that the public is in an ugly humor. They're angry."

Aton twisted his mouth in derision. "Let them be angry."

"Yes, but what about tomorrow?"

"There'll be no tomorrow!"

"But if there is. Say that there is—just to see what happens. That anger might take shape into something serious. After all, you know, business has taken a nosedive these last two months. Investors don't really believe the world is coming to an end, but just the same they're being cagy with their money until it's all over. Johnny Public doesn't believe you, either, but the new spring furniture might just as well wait a few months —just to make sure.

"You see the point. Just as soon as this is all over, the business interests will be after your hide. They'll say that if crackpots—begging your pardon—can upset the country's prosperity any time they want, simply by making some cockeyed prediction—it's up to the planet to prevent them. The sparks will fly, sir."

The director regarded the columnist sternly. "And just what were you proposing to do to help the situation?"

"Well"—Theremon grinned—"I was proposing to take charge of the publicity. I can handle things so that only the ridiculous side will show. It would be hard to stand, I admit, because I'd have to make you all out to be a bunch of gibbering idiots, but if I can get people laughing at you, they might forget to be angry. In return for that, all my publisher asks is an exclusive story."

Beenay nodded and burst out, "Sir, the rest of us think he's right. These last two months we've considered everything but the million-to-one chance that there is an error somewhere in our theory or in our calculations. We ought to take care of that, too."

There was a murmur of agreement from the men grouped about the table, and Aton's expression became that of one who found his mouth full of something bitter and couldn't get rid of it.

"You may stay if you wish, then. You will kindly refrain, however, from hampering us in our duties in any way. You will also remember that I am in charge of all activities here, and in spite of your opinions as expressed in your columns, I will expect full cooperation and full respect—"

His hands were behind his back, and his wrinkled face thrust forward determinedly as he spoke. He might have continued indefinitely but for the intrusion of a new voice.

"Hello, hello, hello!" It came in a high tenor, and the plump cheeks of the newcomer expanded in a pleased smile. "What's this morgue-like atmosphere about here? No one's losing his nerve, I hope."

Aton started in consternation and said peevishly, "Now what the devil are you doing here, Sheerin? I thought you were going to stay behind in the Hideout."

Sheerin laughed and dropped his tubby figure into a chair. "Hideout be blowed! The place bored me. I wanted to be here, where things are getting hot. Don't you suppose I have my share of curiosity? I want to see these Stars the Cultists are forever speaking about." He rubbed his hands and added in a soberer tone, "It's freezing outside.

The wind's enough to hang icicles on your nose. Beta doesn't seem to give any heat at all, at the distance it is."

The white-haired director ground his teeth in sudden exasperation. "Why do you go out of your way to do crazy things, Sheerin? What kind of good are you around here?"

"What kind of good am I around there?" Sheerin spread his palms in comical resignation. "A psychologist isn't worth his salt in the Hideout. They need men of action and strong, healthy women that can breed children. Me? I'm a hundred pounds too heavy for a man of action, and I wouldn't be a success at breeding children. So why bother them with an extra mouth to feed? I feel better over here."

Theremon spoke briskly. "Just what is the Hideout, sir?"

Sheerin seemed to see the columnist for the first time. He frowned and blew his ample cheeks out. "And just who in Lagash are you, redhead?"

Aton compressed his lips and then muttered sullenly, "That's Theremon 762, the newspaper fellow. I suppose you've heard of him."

The columnist offered his hand. "And, of course, you're Sheerin 501 of Saro University. I've heard of you." Then he repeated, "What is this Hideout, sir?"

"Well," said Sheerin, "we have managed to convince a few people of the validity of our prophecy of—er—doom, to be spectacular about it, and those few have taken proper measures. They consist mainly of the immediate members of the families of the Observatory staff, certain of the faculty of Saro University, and a few outsiders. Altogether, they number about three hundred, but three quarters are women and children."

"I see! They're supposed to hide where the Darkness and the—er—Stars can't get at them, and then hold out when the rest of the world goes poof."

"If they can. It won't be easy. With all of mankind insane, with the great cities going up in flames—environment will not be conducive to survival. But they have food, water, shelter, and weapons—"

"They've got more," said Aton. "They've got all our records, except for what we will collect today. Those records will mean everything to the next cycle, and *that's* what must survive. The rest can go hang."

Theremon uttered a long, low whistle and sat brooding for several minutes. The men about the table had brought out a multi-chess board and started a six-member game. Moves were made rapidly and in silence. All eyes bent in furious concentration on the board. Theremon watched them intently and then rose and approached Aton, who sat apart in whispered conversation with Sheerin.

"Listen," he said, "let's go somewhere where we won't bother the rest of the fellows. I want to ask some questions."

The aged astronomer frowned sourly at him, but Sheerin chirped up, "Certainly. It will do me good to talk. It always does. Aton was telling me about your ideas concerning world reaction to a failure of the prediction—and I agree with you. I read your column pretty regularly, by the way, and as a general thing I like your views."

"Please, Sheerin," growled Aton.

"Eh? Oh, all right. We'll go into the next room. It has softer chairs, anyway."

There were softer chairs in the next room. There were also thick red curtains on the windows and a maroon carpet on the floor. With the bricky light of Beta pouring in, the general effect was one of dried blood.

Theremon shuddered. "Say, I'd give ten credits for a decent dose of white light for just a second. I wish Gamma or Delta were in the sky."

"What are your questions?" asked Aton. "Please remember that our time is limited. In a little over an hour and a quarter we're going upstairs, and after that there will be no time for talk."

"Well, here it is." Theremon leaned back and folded his hands on his chest. "You people seem so all-fired serious about this that I'm beginning to believe you. Would you mind explaining what it's all about?"

Aton exploded, "Do you mean to sit there and tell me that you've been bombarding us with ridicule without even finding out what we've been trying to say?"

The columnist grinned sheepishly. "It's not that bad, sir. I've got the general idea. You say there is going to be a world-wide Darkness in a few hours and that all mankind will go violently insane. What I want now is the science behind it."

"No, you don't. No, you don't," broke in Sheerin. "If you ask Aton for that—supposing him to be in the mood to answer at all—he'll trot out pages of figures and volumes of graphs. You won't make head or tail of it. Now if you were to ask me, I could give you the layman's standpoint."

"All right; I ask you."

"Then first I'd like a drink." He rubbed his hands and looked at Aton.

"Water?" grunted Aton.

"Don't be silly!"

"Don't you be silly. No alcohol today. It would be too easy to get my men drunk. I can't afford to tempt them."

The psychologist grumbled wordlessly. He turned to Theremon, impaled him with his sharp eyes, and began.

"You realize, of course, that the history of civilization on Lagash displays a cyclic character—but I mean, *cyclic!*"

"I know," replied Theremon cautiously, "that that is the current archaeological theory. Has it been accepted as a fact?"

"Just about. In this last century it's been generally agreed upon. This cyclic character is—or rather, was—one of the great mysteries. We've located series of civilizations, nine of them definitely, and indications of others as well, all of which have reached heights comparable to our own, and all of which, without exception, were destroyed by fire at the very height of their culture.

"And no one could tell why. All centers of culture were thoroughly gutted by fire, with nothing left behind to give a hint as to the cause."

Theremone was following closely. "Wasn't there a Stone Age, too?"

"Probably, but as yet practically nothing is known of it, except that men of that age were little more than rather intelligent apes. We can forget about that."

"I see. Go on!"

"There have been explanations of these recurrent catastrophes, all of a more or less fantastic nature. Some say that there are periodic rains of fire; some that Lagash passes through a sun every so often; some even wilder things. But there is one theory, quite different from all of these, that has been handed down over a period of centuries."

"I know. You mean this myth of the 'Stars' that the Cultists have in their *Book of Revelations.*"

"Exactly," rejoined Sheerin with satisfaction. "The Cultists said that every two thousand and fifty years Lagash entered a huge cave, so that all the suns disappeared, and there came *total darkness all over the world!* And then, they say, things called Stars appeared, which robbed men of their souls and left them unreasoning brutes, so that they destroyed the civilization they themselves had built up. Of course they mix all this

up with a lot of religio-mystic notions, but that's the central idea."

There was a short pause in which Sheerin drew a long breath. "And now we come to the Theory of Universal Gravitation." He pronounced the phrase so that the capital letters sounded—and at that point Aton turned from the window, snorted loudly, and stalked out of the room.

The two stared after him, and Theremon said, "What's wrong?"

"Nothing in particular," replied Sheerin. "Two of the men were due several hours ago and haven't shown up yet. He's terrifically short-handed, of course, because all but the really essential men have gone to the Hideout."

"You don't think the two deserted, do you?"

"Who? Faro and Yimot? Of course not. Still, if they're not back within the hour, things would be a little sticky." He got to his feet suddenly, and his eyes twinkled. "Anyway, as long as Aton is gone—"

Tiptoeing to the nearest window, he squatted, and from the low window box beneath withdrew a bottle of red liquid that gurgled suggestively when he shook it.

"I *thought* Aton didn't know about this," he remarked as he trotted back to the table. "Here! We've only got one glass so, as the guest, you can have it. I'll keep the bottle." And he filled the tiny cup with judicious care.

Theremon rose to protest, but Sheerin eyed him sternly. "Respect your elders, young man."

The newsman seated himself with a look of anguish on his face. "Go ahead, then, you old villain."

The psychologist's Adam's apple wobbled as the bottle upended, and then, with a satisfied grunt and a smack of the lips, he began again. "But what do you know about gravitation?"

"Nothing, except that it is a very recent development, not too well established, and that the math is so hard that only twelve men in Lagash are supposed to understand it."

"*Tcha!* Nonsense! Baloney! I can give you all the essential math in a sentence. The Law of Universal Gravitation states that there exists a cohesive force among all bodies of the universe, such that the amount of this force between any two given bodies is proportional to the product of their masses divided by the square of the distance between them."

"Is that all?"

"That's enough! It took four hundred years to develop it."

"Why that long? It sounded simple enough, the way you said it."

"Because great laws are not divined by flashes of inspiration, whatever you may think. It usually takes the combined work of a world full of scientists over a period of centuries. After Genovi 41 discovered that Lagash rotated about the sun Alpha rather than vice versa—and that was four hundred years ago—astronomers have been working. The complex motions of the six suns were recorded and analyzed and unwoven. Theory after theory was advanced and checked and counterchecked and modified and abandoned and revived and converted to something else. It was a devil of a job."

Theremon nodded thoughtfully and held out his glass for more liquor. Sheerin grudgingly allowed a few ruby drops to leave the bottle.

"It was twenty years ago," he continued after remoistening his own throat, "that it was finally demonstrated that the Law of Universal Gravitation accounted exactly for the orbital motions of the six suns. It was a great triumph."

Sheerin stood up and walked to the window, still clutching his bottle. "And now we're getting to the point. In the last decade, the motions of Lagash about Alpha were

computed according to gravity, and *it did not account for the orbit observed;* not even when all perturbations due to the other suns were included. Either the law was invalid, or there was another, as yet unknown, factor involved."

Theremon joined Sheerin at the window and gazed out past the wooded slopes to where the spires of Saro City gleamed bloodily on the horizon. The newsman felt the tension of uncertainty grow within him as he cast a short glance at Beta. It glowered redly at zenith, dwarfed and evil.

"Go ahead, sir," he said softly.

Sheerin replied, "Astronomers stumbled about for years, each proposed theory more untenable than the one before—until Aton had the inspiration of calling in the Cult. The head of the Cult, Sor 5, had access to certain data that simplified the problem considerably. Aton set to work on a new track.

"What if there were another nonluminous planetary body such as Lagash? If there were, you know, it would shine only by reflected light, and if it were composed of bluish rock, as Lagash itself largely is, then, in the redness of the sky, the eternal blaze of the suns would make it invisible—drown it out completely."

Theremon whistled. "What a screwy idea!"

"You think *that's* screwy? Listen to this: Suppose this body rotated about Lagash at such a distance and in such an orbit and had such a mass that its attraction would exactly account for the deviations of Lagash's orbit from theory—do you know what would happen?"

The columnist shook his head.

"Well, sometimes this body would get in the way of a sun." And Sheerin emptied what remained in the bottle at a draft.

"And it does, I suppose," said Theremon flatly.

"Yes! But only one sun lies in its plane of revolution." He jerked a thumb at the shrunken sun above. "Beta! And it had been shown that the eclipse will occur only when the arrangement of the suns is such that Beta is alone in its hemisphere and at maximum distance, at which time the moon is invariably at minimum distance. The eclipse that results, with the moon seven times the apparent diameter of Beta, covers all of Lagash and lasts well over a half a day, so that no spot on the planet escapes the effects. *That eclipse comes once every two thousand and forty-nine years.*"

Theremon's face was drawn into an expressionless mask. "And that's my story?"

The psychologist nodded. "That's all of it. First the eclipse—which will start in three quarters of an hour—then universal Darkness and, maybe, these mysterious Stars —then madness, and end of the cycle."

He brooded. "We had two months' leeway—we at the Observatory—and that wasn't enough time to persuade Lagash of the danger. Two centuries might not have been enough. But our records are at the Hideout, and today we photograph the eclipse. The next cycle will *start off* with the truth, and when the *next* eclipse comes, mankind will at last be ready for it. Come to think of it, that's part of your story too."

A thin wind ruffled the curtains at the window as Theremon opened it and leaned out. It played coldly with his hair as he stared at the crimson sunlight on his hand. Then he turned in sudden rebellion.

"What is there in Darkness to drive *me* mad?"

Sheerin smiled to himself as he spun the empty liquor bottle with abstracted motions of his hand. "Have you ever experienced Darkness, young man?"

The newsman leaned against the wall and considered. "No. Can't say I have. But I know what it is. Just—uh—" He made vague motions with his fingers and then

brightened. "Just no light. Like in caves."

"Have you ever been in a cave?"

"In a *cave!* Of course not!"

"I thought not. *I* tried last week—just to see—but I got out in a hurry. I went in until the mouth of the cave was just visible as a blur of light, with black everywhere else. I never thought a person my weight could run that fast."

Theremon's lip curled. "Well, if it comes to that, I guess I wouldn't have run if I had been there."

The psychologist studied the young man with an annoyed frown.

"My, don't you talk big! I dare you to draw the curtain."

Theremon looked his surprise and said, "What for? If we had four or five suns out there, we might want to cut the light down a bit for comfort, but now we haven't enough light as it is."

"That's the point. Just draw the curtain; then come here and sit down."

"All right." Theremon reached for the tasseled string and jerked. The red curtain slid across the wide window, the brass rings hissing their way along the crossbar, and a dusk-red shadow clamped down on the room.

Theremon's footsteps sounded hollowly in the silence as he made his way to the table, and then they stopped halfway. "I can't see you, sir," he whispered.

"Feel your way," ordered Sheerin in a strained voice.

"But I can't see you, sir." The newsman was breathing harshly. "I can't see anything."

"What did you expect?" came the grim reply. "Come here and sit down!"

The footsteps sounded again, waveringly, approaching slowly. There was the sound of someone fumbling with a chair. Theremon's voice came thinly, "Here I am. I feel . . . *ulp* . . . all right."

"You like it, do you?"

"N—no. Its pretty awful. The walls seem to be—" He paused. "They seem to be closing in on me. I keep wanting to push them away. But I'm not going *mad!* In fact, the feeling isn't as bad as it was."

"All right. Draw the curtain back again."

There were cautious footsteps through the dark, the rustle of Theremon's body against the curtain as he felt for the tassel, and then the triumphant *ro-o-osh* of the curtain slithering back. Red light flooded the room, and with a cry of joy Theremon looked up at the sun.

Sheerin wiped the moistness off his forehead with the back of a hand and said shakily, "And that was just a dark room."

"It can be stood," said Theremon lightly.

"Yes, a dark room can. But were you at the Jonglor Centennial Exposition two years ago?"

"No, it so happens I never got around to it. Six thousand miles was just a bit too much to travel, even for the exposition."

"Well, I was there. You remember hearing about the 'Tunnel of Mystery' that broke all records in the amusement area—for the first month or so, anyway?"

"Yes. Wasn't there some fuss about it?"

"Very little. It was hushed up. You see, that Tunnel of Mystery was just a mile-long tunnel—with no lights. You got into a little open car and jolted along through Darkness for fifteen minutes. It was very popular—while it lasted."

"Popular?"

"Certainly. There's a fascination in being frightened *when it's part of a game.* A baby is born with three instinctive fears: of loud noises, of falling, and of the absence of light. That's why it's considered so funny to jump at someone and shout 'Boo!' That's why it's such fun to ride a roller coaster. And that's why that Tunnel of Mystery started cleaning up. People came out of that Darkness shaking, breathless, half dead with fear, but they kept on paying to get in."

"Wait a while, I remember now. Some people came out dead, didn't they? There were rumors of that after it shut down."

The psychologist snorted. "Bah! Two or three died. That was nothing! They paid off the families of the dead ones and argued the Jonglor City Council into forgetting it. After all, they said, if people with weak hearts want to go through the tunnel, it was at their own risk—and besides, it wouldn't happen again. So they put a doctor in the front office and had every customer go through a phyical examination before getting into the car. That actually *boosted* ticket sales."

"Well, then?"

"But you see, there was something else. People sometimes came out in perfect order, except that they refused to go into buildings—any buildings; including palaces, mansions, apartment houses, tenements, cottages, huts, shacks, lean-tos, and tents."

Theremon looked shocked. "You mean they refused to come in out of the open? Where'd they sleep?"

"In the open."

"They should have *forced* them inside."

"Oh, they did, they did. Whereupon these people went into violent hysterics and did their best to bat their brains out against the nearest wall. Once you got them inside, you couldn't keep them there without a strait jacket or a heavy dose of tranquilizer."

"They must have been crazy."

"Which is exactly what they were. One person out of every ten who went into that tunnel came out that way. They called in the psychologists, and we did the only thing possible. We closed down the exhibit." He spread his hands.

"What was the matter with these people?" asked Theremon finally.

"Essentially the same thing that was the matter with you when you thought the walls of the room were crushing in on you in the dark. There is a psychological term for mankind's instinctive fear of the absence of light. We call it 'claustrophobia,' because the lack of light is always tied up with enclosed places, so that fear of one is fear of the other. You see?"

"And those people of the tunnel?"

"Those people of the tunnel consisted of those unfortunates whose mentality did not quite possess the resiliency to overcome the claustrophobia that overtook them in the Darkness. Fifteen minutes without light is a long time; you only had two or three minutes, and I believe you were fairly upset.

"The people of the tunnel had what is called a 'claustrophobic fixation.' Their latent fear of Darkness and enclosed places had crystalized and become active, and, as far as we can tell, permanent. That's what fifteen minutes in the dark will do."

There was a long silence, and Theremon's forehead wrinkled slowly into a frown. "I don't believe it's that bad."

"You mean you don't want to believe," snapped Sheerin. "You're afraid to believe. Look out the window!"

Theremon did so, and the psychologist continued without pausing. "Imagine Darkness—everywhere. No light, as far as you can see. The houses, the trees, the fields,

the earth, the sky—black! And Stars thrown in, for all I know—whatever *they* are. Can you conceive it?"

"Yes, I can," declared Theremon truculently.

And Sheerin slammed his fist down upon the table in sudden passion. "You lie! You can't conceive that. Your brain wasn't built for the conception any more than it was built for the conception of infinity or of eternity. You can only talk about it. A fraction of the reality upsets you, and when the real thing comes, your brain is going to be presented with the phenomenon outside its limits of comprehension. You will go mad, completely and permanently! There is no question of it!"

He added sadly, "And another couple of millennia of painful struggle comes to nothing. Tomorrow there won't be a city standing unharmed in all Lagash."

Theremon recovered part of his mental equilibrium. "That doesn't follow. I still don't see that I can go loony just because there isn't a sun in the sky—but even if I did, and everyone else did, how does that harm the cities? Are we going to blow them down?"

But Sheerin was angry, too. "If you were in Darkness, what would you want more than anything else; what would it be that every instinct would call for? Light, damn you, *light!*"

"Well?"

"And how would you get light?"

"I don't know," said Theremon flatly.

"What's the *only* way to get light, short of a sun?"

"How should I know?"

They were standing face to face and nose to nose.

Sheerin said, "You burn something, mister. Ever see a forest fire? Ever go camping and cook a stew over a wood fire? Heat isn't the only thing burning wood gives off, you know. It gives off light, and people know that. And when it's dark they want light, and they're going to *get* it."

"So they burn wood?"

"So they burn whatever they can get. They've got to have light. They've got to burn something, and wood isn't handy—so they'll burn whatever is nearest. They'll have their light—and every center of habitation goes up in flames!"

Eyes held each other as though the whole matter were a personal affair of respective will powers, and then Theremon broke away wordlessly. His breathing was harsh and ragged, and he scarcely noted the sudden hubbub that came from the adjoining room behind the closed door.

Sheerin spoke, and it was with an effort that he made it sound matter-of-fact. "I think I heard Yimot's voice. He and Faro are probably back. Let's go in and see what kept them."

"Might as well!" muttered Theremon. He drew a long breath and seemed to shake himself. The tension was broken.

* * *

The room was in an uproar, with members of the staff clustering about two young men who were removing outer garments even as they parried the miscellany of questions being thrown at them.

Aton bustled through the crowd and faced the newcomers angrily. "Do you realize

that it's less than half an hour before deadline? Where have you two been?"

Faro 24 seated himself and rubbed his hands. His cheeks were red with the outdoor chill. "Yimot and I have just finished carrying through a little crazy experiment of our own. We've been trying to see if we couldn't construct an arrangement by which we could simulate the appearance of Darkness and Stars so as to get an advance notion as to how it looked."

There was a confused murmur from the listeners, and a sudden look of interest entered Aton's eyes. "There wasn't anything said of this before. How did you go about it?"

"Well," said Faro, "the idea came to Yimot and myself long ago, and we've been working it out in our spare time. Yimot knew of a low one-story house down in the city with a domed roof—it had once been used as a museum, I think. Anyway, we bought it—"

"Where did you get the money?" interrupted Aton peremptorily.

"Our bank accounts," grunted Yimot 70. "It cost two thousand credits." Then, defensively, "Well, what of it? Tomorrow, two thousand credits will be two thousand pieces of paper. That's all."

"Sure," agreed Faro. "We bought the place and rigged it up with black velvet from top to bottom so as to get as perfect a Darkness as possible. Then we punched tiny holes in the ceiling and through the roof and covered them with little metal caps, all of which could be shoved aside simultaneously at the close of a switch. At least we didn't do that part ourselves; we got a carpenter and an electrician and some others—money didn't count. The point was that we could get the light to shine through those holes in the roof, so that we could get a starlike effect."

Not a breath was drawn during the pause that followed. Aton said stiffly, "You had no right to make a private—"

Faro seemed abashed. "I know, sir—but frankly, Yimot and I thought the experiment was a little dangerous. If the effect really worked, we half expected to go mad—from what Sheerin says about all this, we thought that would be rather likely. We wanted to take the risk ourselves. Of course if we found we could retain sanity, it occurred to us that we might develop immunity to the real thing, and then expose the rest of you the same way. But things didn't work out at all—"

"Why, what happened?"

It was Yimot who answered. "We shut ourselves in and allowed our eyes to get accustomed to the dark. It's an extremely creepy feeling because the total Darkness makes you feel as if the walls and ceiling are crushing in on you. But we got over that and pulled the switch. The caps fell away and the roof glittered all over with little dots of light—"

"Well?"

"Well—nothing. That was the whacky part of it. Nothing happened. It was just a roof with holes in it, and that's just what it looked like. We tried it over and over again—that's what kept us so late—but there just isn't any effect at all."

There followed a shocked silence, and all eyes turned to Sheerin, who sat motionless, mouth open.

Theremon was the first to speak. "You know what this does to this whole theory you've built up, Sheerin, don't you?" He was grinning with relief.

But Sheerin raised his hand. "Now wait a while. Just let me think this through." And then he snapped his fingers, and when he lifted his head there was neither surprise nor uncertainty in his eyes. "Of course—"

He never finished. From somewhere up above there sounded a sharp clang, and Beenay, starting to his feet, dashed up the stairs with a "What the devil!"

The rest followed after.

Things happened quickly. Once up in the dome, Beenay cast one horrified glance at the shattered photographic plates and at the man bending over them; and then hurled himself fiercely at the intruder, getting a death grip on his throat. There was a wild threshing, and as others of the staff joined in, the stranger was swallowed up and smothered under the weight of half a dozen angry men.

Aton came up last, breathing heavily. "Let him up!"

There was a reluctant unscrambling and the stranger, panting harshly, with his clothes torn and his forehead bruised, was hauled to his feet. He had a short yellow beard curled elaborately in the style affected by the Cultists.

Beenay shifted his hold to a collar grip and shook the man savagely. "All right, rat, what's the idea? These plates—"

"I wasn't after *them*," retorted the Cultist coldly. "That was an accident."

Beenay followed his glowering stare and snarled, "I see. You were after the cameras themselves. The accident with the plates was a stroke of luck for you, then. If you had touched Snapping Bertha or any of the others, you would have died by slow torture. As it is—" He drew his fist back.

Aton grabbed his sleeve. "Stop that! Let him go!"

The young technician wavered, and his arm dropped reluctantly. Aton pushed him aside and confronted the Cultist. "You're Latimer, aren't you?"

The Cultist bowed stiffly and indicated the symbol upon his hip. "I am Latimer 25, adjutant of the third class to his serenity, Sor 5."

"And"—Aton's white eyebrows lifted—"you were with his serenity when he visited me last week, weren't you?"

Latimer bowed a second time.

"Now, then, what do you want?"

"Nothing that you would give me of your own free will."

"Sor 5 sent you, I suppose—or is this your own idea?"

"I won't answer that question."

"Will there be any further visitors?"

"I won't answer that, either."

Aton glanced at his timepiece and scowled. "Now, man, what is it your master wants of me? I have fulfilled my end of the bargain."

Latimer smiled faintly, but said nothing.

"I asked him," continued Aton angrily, "for data only the Cult could supply, and it was given to me. For that, thank you. In return I promised to prove the essential truth of the creed of the Cult."

"There was no need to prove that," came the proud retort. "It stands proven by the *Book of Revelations*."

"For the handful that constitute the Cult, yes. Don't pretend to mistake my meaning. I offered to present scientific backing for your beliefs. And I did!"

The Cultist's eyes narrowed bitterly. "Yes, you did—with a fox's subtlety, for your pretended explanation backed our beliefs, and at the same time removed all necessity for them. You made of the Darkness and of the Stars a natural phenomenon and removed all its real significance. That was blasphemy."

"If so, the fault isn't mine. The facts exist. What can I do but state them?"

"Your 'facts' are a fraud and a delusion."

Aton stamped angrily. "How do you know?"

And the answer came with the certainty of absolute faith. "I know!"

The director purpled and Beenay whispered urgently. Aton waved him silent. "And what does Sor 5 want us to do? He still thinks, I suppose, that in trying to warn the world to take measures against the menace of madness, we are placing innumerable souls in jeopardy. We aren't succeeding, if that means anything to him."

"The attempt itself has done harm enough, and your vicious effort to gain information by means of your devilish instruments must be stopped. We obey the will of the Stars, and I only regret that my clumsiness prevented me from wrecking your infernal devices."

"It wouldn't have done you too much good," returned Aton. "All our data, except for the direct evidence we intend collecting right now, is already safely cached and well beyond possibility of harm." He smiled grimly. "But that does not affect your present status as an attempted burglar and criminal."

He turned to the men behind him. "Someone call the police at Saro City."

There was a cry of distaste from Sheerin. "Damn it, Aton, what's wrong with you? There's no time for that. Here"—he bustled his way forward—"let me handle this."

Aton stared down his nose at the psychologist. "This is not the time for your monkeyshines, Sheerin. Will you please let me handle this my own way? Right now you are a complete outsider here, and don't forget it."

Sheerin's mouth twisted eloquently. "Now why should we go to the impossible trouble of calling the police—with Beta's eclipse a matter of minutes from now—when this young man here is perfectly willing to pledge his word of honor to remain and cause no trouble whatsoever?"

The Cultist answered promptly, "I will do no such thing. You're free to do what you want, but it's only fair to warn you that just as soon as I get my chance I'm going to finish what I came out here to do. If it's my word of honor you're relying on, you'd better call the police."

Sheerin smiled in a friendly fashion. "You're a determined cuss, aren't you? Well, I'll explain something. Do you see that young man at the window? He's a strong, husky fellow, quite handy with his fists, and he's an outsider besides. Once the eclipse starts there will be nothing for him to do except keep an eye on you. Besides him, there will be myself—a little too stout for active fisticuffs, but still able to help."

"Well, what of it?" demanded Latimer frozenly.

"Listen and I'll tell you," was the reply. "Just as soon as the eclipse starts, we're going to take you, Theremon and I, and deposit you in a little closet with one door, to which is attached one giant lock and no windows. You will remain there for the duration."

"And afterward," breathed Latimer fiercely, "there'll be no one to let me out. I know as well as you do what the coming of the Stars means—I know it far better than you. With all your minds gone, you are not likely to free me. Suffocation or slow starvation, is it? About what I might have expected from a group of scientists. But I don't give my word. It's a matter of principle, and I won't discuss it further."

Aton seemed perturbed. His faded eyes were troubled. "Really, Sheerin, locking him—"

"Please!" Sheerin motioned him impatiently to silence. "I don't think for a moment things will go that far. Latimer has just tried a clever little bluff, but I'm not a psychologist just because I like the sound of the word." He grinned at the Cultist. "Come now, you don't really think I'm trying anything as crude as slow starvation. My dear Latimer, if I lock you in the closet, you are not going to see the Darkness, and you are not going

to see the Stars. It does not take much knowledge of the fundamental creed of the Cult to realize that for you to be hidden from the Stars when they appear means the loss of your immortal soul. Now, I believe you to be an honorable man. I'll accept your word of honor to make no further effort to disrupt proceedings, if you'll offer it."

A vein throbbed in Latimer's temple, and he seemed to shrink within himself as he said thickly, "You have it!" And then he added with swift fury, "But it is my consolation that you will all be damned for your deeds of today." He turned on his heel and stalked to the high three-legged stool by the door.

Sheerin nodded to the columnist. "Take a seat next to him, Theremon—just as a formality. Hey, Theremon!"

But the newspaperman didn't move. He had gone pale to the lips. "Look at that!" The finger he pointed toward the sky shook, and his voice was dry and cracked.

There was one simultaneous gasp as every eye followed the pointing finger and, for one breathless moment, stared frozenly.

Beta was chipped on one side!

The tiny bit of encroaching blackness was perhaps the width of a fingernail, but to the staring watchers it magnified itself into the crack of doom.

Only for a moment they watched, and after that there was a shrieking confusion that was even shorter of duration and which gave way to an orderly scurry of activity—each man at his prescribed job. At the crucial moment there was no time for emotion. The men were merely scientists with work to do. Even Aton had melted away.

Sheerin said prosaically, "First contact must have been made fifteen minutes ago. A little early, but pretty good considering the uncertainties involved in the calculation." He looked about him and then tiptoed to Theremon, who still remained staring out the window, and dragged him away gently.

"Aton is furious," he whispered, "so stay away. He missed first contact on account of this fuss with Latimer, and if you get in his way he'll have you thrown out the window."

Theremon nodded shortly and sat down. Sheerin stared in surprise at him.

"The devil, man," he exclaimed, "you're shaking."

"Eh?" Theremon licked dry lips and then tried to smile. "I don't feel very well, and that's a fact."

The psychologist's eyes hardened. "You're not losing your nerve?"

"No!" cried Theremon in a flash of indignation. "Give me a chance, will you? I haven't really believed this rigmarole—not way down beneath, anyway—till just this minute. Give me a chance to get used to the idea. You've been preparing yourself for two months or more."

"You're right, at that," replied Sheerin thoughtfully. "Listen! Have you got a family—parents, wife, children?"

Theremon shook his head. "You mean the Hideout, I suppose. No, you don't have to worry about that. I have a sister, but she's two thousand miles away. I don't even know her exact address."

"Well, then, what about yourself? You've got time to get there, and they're one short anyway, since I left. After all, you're not needed here, and you'd make a darned fine addition—"

Theremon looked at the other wearily. "You think I'm scared stiff, don't you? Well, get this, mister, I'm a newspaperman and I've been assigned to cover a story. I intend covering it."

There was a faint smile on the psychologist's face. "I see. Professional honor, is that it?"

"You might call it that. But, man, I'd give my right arm for another bottle of that sockeroo juice even half the size of the one you hogged. If ever a fellow needed a drink, I do."

He broke off. Sheerin was nudging him violently. "Do you hear that? Listen!"

Theremon followed the motion of the other's chin and stared at the Cultist, who, oblivious to all about him, faced the window, a look of wild elation on his face, droning to himself the while in singsong fashion.

"What's he saying?" whispered the columnist.

"He's quoting *Book of Revelations*, fifth chapter," replied Sheerin. Then, urgently, "Keep quiet and listen, I tell you."

The Cultist's voice had risen in a sudden increase of fervor: "'And it came to pass that in those days the Sun, Beta, held lone vigil in the sky for ever longer periods as the revolutions passed; until such time as for full half a revolution, it alone, shrunken and cold, shone down upon Lagash.

"'And men did assemble in the public squares and in the highways, there to debate and to marvel at the sight, for a strange depression had seized them. Their minds were troubled and their speech confused, for the souls of men awaited the coming of the Stars.

"'And in the city of Trigon, at high noon, Vendret 2 came forth and said unto the men of Trigon, "Lo, ye sinners! Though ye scorn the ways of righteousness, yet will the time of reckoning come. Even now the Cave approaches to swallow Lagash; yea, and all it contains."

"'And even as he spoke the lip of the Cave of Darkness passed the edge of Beta so that to all Lagash it was hidden from sight. Loud were the cries of men as it vanished, and great the fear of soul that fell upon them.

"'It came to pass that the Darkness of the Cave fell upon Lagash, and there was no light on all the surface of Lagash. Men were even as blinded, nor could one man see his neighbor, though he felt his breath upon his face.

"'And in this blackness there appeared the Stars, in countless numbers, and to the strains of music of such beauty that the very leaves of the trees cried out in wonder.

"'And in that moment the souls of men departed from them, and their abandoned bodies became even as beasts; yea, even as brutes of the wild; so that through the blackened streets of the cities of Lagash they prowled with wild cries.

"'From the Stars there then reached down the Heavenly Flame, and where it touched, the cities of Lagash flamed to utter destruction, so that of man and of the works of man nought remained.

"'Even then—'"

There was a subtle change in Latimer's tone. His eyes had not shifted, but somehow he had become aware of the absorbed attention of the other two. Easily, without pausing for breath, the timbre of his voice shifted and the syllables became more liquid.

Theremon, caught by surprise, stared. The words seemed on the border of familiarity. There was an elusive shift in the accent, a tiny change in the vowel stress; nothing more—yet Latimer had become thoroughly unintelligible.

Sheerin smiled slyly. "He shifted to some old-cycle tongue, probably their traditional second cycle. That was the language in which the *Book of Revelations* was originally written, you know."

"It doesn't matter; I've heard enough." Theremon shoved his chair back and brushed his hair back with hands that no longer shook. "I feel much better now."

"You do?" Sheerin seemed mildly surprised.

"I'll say I do. I had a bad case of jitters just a while back. Listening to you and your gravitation and seeing that eclipse start almost finished me. But this"—he jerked a contemptuous thumb at the yellow-bearded Cultist—"*this* is the sort of thing my nurse used to tell me. I've been laughing at that sort of thing all my life. I'm not going to let it scare me *now*."

He drew a deep breath and said with a hectic gaiety, "But if I expect to keep on the good side of myself, I'm going to turn my chair away from the window."

Sheerin said, "Yes, but you'd better talk lower. Aton just lifted his head out of that box he's got it stuck into and gave you a look that should have killed you."

Theremon made a mouth. "I forgot about the old fellow." With elaborate care he turned the chair from the window, cast one distasteful look over his shoulder, and said, "It has occurred to me that there must be considerable immunity against this Star madness."

The psychologist did not answer immediately. Beta was past its zenith now, and the square of bloody sunlight that outlined the window upon the floor had lifted into Sheerin's lap. He stared at its dusky color thoughtfully and then bent and squinted into the sun itself.

The chip in its side had grown to a black encroachment that covered a third of Beta. He shuddered, and when he straightened once more his florid cheeks did not contain quite as much color as they had had previously.

With a smile that was almost apologetic, he reversed his chair also. "There are probably two million people in Saro City that are all trying to join the Cult at once in one gigantic revival." Then, ironically, "The Cult is in for an hour of unexampled prosperity. I trust they'll make the most of it. Now, what was it you said?"

"Just this. How did the Cultists manage to keep the *Book of Revelations* going from cycle to cycle, and how on Lagash did it get written in the first place? There must have been some sort of immunity, for if everyone had gone mad, who would be left to write the book?"

Sheerin stared at his questioner ruefully. "Well, now, young man, there isn't any eyewitness answer to that, but we've got a few damned good notions as to what happened. You see, there are three kinds of people who might remain relatively unaffected. First, the very few who don't see the Stars at all: the seriously retarded or those who drink themselves into a stupor at the beginning of the eclipse and remain so to the end. We leave them out—because they aren't really witnesses.

"Then there are children below six, to whom the world as a whole is too new and strange for them to be frightened at Stars and Darkness. They would be just another item in an already surprising world. You see that, don't you?"

The other nodded doubtfully. "I suppose so."

"Lastly, there are those whose minds are too coarsely grained to be entirely toppled. The very insensitive would be scarcely affected—oh, such people as some of our older, work-broken peasants. Well, the children would have fugitive memories, and that, combined with the confused, incoherent babblings of the half-mad morons, formed the basis for the *Book of Revelations*.

"Naturally, the book was based, in the first place, on the testimony of those least qualified to serve as historians; that is, children and morons; and was probably edited and re-edited through the cycles."

"Do you suppose," broke in Theremon, "that they carried the book through the cycles the way we're planning on handing on the secret of gravitation?"

Sheerin shrugged. "Perhaps, but their exact method is unimportant. They do it,

somehow. The point I was getting at was that the book can't help but be a mass of distortion, even if it is based on fact. For instance, do you remember the experiment with the holes in the roof that Faro and Yimot tried—the one that didn't work?"

"Yes."

"You know why it didn't w—" He stopped and rose in alarm, for Aton was approaching, his face a twisted mask of consternation. "*What's happened?*"

Aton drew him aside and Sheerin could feel the fingers on his elbow twitching.

"Not so loud!" Aton's voice was low and tortured. "I've just gotten word from the Hideout on the private line."

Sheerin broke in anxiously. "They are in trouble?"

"Not *they*." Aton stressed the pronoun significantly. "They sealed themselves off just a while ago, and they're going to stay buried till day after tomorrow. They're safe. But the *city*, Sheerin—it's a shambles. You have no idea—" He was having difficulty in speaking.

"Well?" snapped Sheerin impatiently. "What of it? It will get worse. What are you shaking about?" Then, suspiciously, "How do you feel?"

Aton's eyes sparked angrily at the insinuation, and then faded to anxiety once more. "You don't understand. The Cultists are active. They're rousing the people to storm the Observatory—promising them immediate entrance into grace, promising them salvation, promising them anything. What are we to do, Sheerin?"

Sheerin's head bent, and he stared in long abstraction at his toes. He tapped his chin with one knuckle, then looked up and said crisply, "Do? What is there to do? Nothing at all. Do the men know of this?"

"No, of course not!"

"Good! Keep it that way. How long till totality?"

"Not quite an hour."

"There's nothing to do but gamble. It will take time to organize any really formidable mob, and it will take more time to get them out here. We're a good five miles from the city—"

He glared out the window, down the slopes to where the farmed patches gave way to clumps of white houses in the suburbs; down to where the metropolis itself was a blur on the horizon—a mist in the waning blaze of Beta.

He repeated without turning, "It will take time. Keep on working and pray that totality comes first."

Beta was cut in half, the line of division pushing a slight concavity into the still-bright portion of the Sun. It was like a gigantic eyelid shutting slantwise over the light of a world.

The faint clatter of the room in which he stood faded into oblivion, and he sensed only the thick silence of the fields outside. The very insects seemed frightened mute. And things were dim.

He jumped at the voice in his ear. Theremon said, "Is something wrong?"

"Eh? Er—no. Get back to the chair. We're in the way." They slipped back to their corner, but the psychologist did not speak for a time. He lifted a finger and loosened his collar. He twisted his neck back and forth but found no relief. He looked up suddenly.

"Are you having any difficulty in breathing?"

The newspaperman opened his eyes wide and drew two or three long breaths. "No. Why?"

"I looked out the window too long, I suppose. The dimness got me. Difficulty in breathing is one of the first symptoms of a claustrophobic attack."

Theremon drew another long breath. "Well, it hasn't got me yet. Say, here's another of the fellows."

Beenay had interposed his bulk between the light and the pair in the corner, and Sheerin squinted up at him anxiously. "Hello, Beenay."

The astronomer shifted his weight to the other foot and smiled feebly. "You won't mind if I sit down awhile and join in the talk? My cameras are set, and there's nothing to do till totality." He paused and eyed the Cultist, who fifteen minutes earlier had drawn a small, skin-bound book from his sleeve and had been poring intently over it ever since. "That rat hasn't been making trouble, has he?"

Sheerin shook his head. His shoulders were thrown back and he frowned his concentration as he forced himself to breathe regularly. He said, "Have you had any trouble breathing, Beenay?"

Beenay sniffed the air in his turn. "It doesn't seem stuffy to me."

"A touch of claustrophobia," explained Sheerin apologetically.

"Ohhh! It worked itself differently with me. I get the impression that my eyes are going back on me. Things seem to blur and—well, nothing is clear. And it's cold, too."

"Oh, it's cold, all right. That's no illusion." Theremon grimaced. "My toes feel as if I've been shipping them cross-country in a refrigerating car."

"What we need," put in Sheerin, "is to keep our minds busy with extraneous affairs. I was telling you a while ago, Theremon, why Faro's experiments with the holes in the roof came to nothing."

"You were just beginning," replied Theremon. He encircled a knee with both arms and nuzzled his chin against it.

"Well, as I started to say, they were misled by taking the *Book of Revelations* literally. There probably wasn't any sense in attaching any physical significance to the Stars. It might be, you know, that in the presence of total Darkness, the mind finds it absolutely necessary to create light. This illusion of light might be all the Stars there really are."

"In other words," interposed Theremon, "you mean the Stars are the results of the madness and not one of the causes. Then, what good will Beenay's photographs be?"

"To prove that it is an illusion, maybe; or to prove the opposite; for all I know. Then again—"

But Beenay had drawn his chair closer, and there was an expression of sudden enthusiasm on his face. "Say, I'm glad you two got onto this subject." His eyes narrowed and he lifted one finger. "I've been thinking about these Stars and I've got a really cute notion. Of course it's strictly ocean foam, and I'm not trying to advance it seriously, but I think it's interesting. Do you want to hear it?"

He seemed half reluctant, but Sheerin leaned back and said, "Go ahead! I'm listening."

"Well, then, supposing there were other suns in the universe." He broke off a little bashfully. "I mean suns that are so far away that they're too dim to see. It sounds as if I've been reading some of that fantastic fiction, I suppose."

"Not necessarily. Still, isn't that possibility eliminated by the fact that, according to the Law of Gravitation, they would make themselves evident by their attractive forces?"

"Not if they were far enough off," rejoined Beenay, "really far off—maybe as much as four light years, or even more. We'd never be able to detect perturbations then, because they'd be too small. Say that there were a lot of suns that far off; a dozen or two, maybe."

Theremon whistled melodiously. "What an idea for a good Sunday supplement article. Two dozen suns in a universe eight light years across. Wow! That would shrink

our world into insignificance. The readers would eat it up."

"Only an idea," said Beenay with a grin, "but you see the point. During an eclipse, these dozen suns would become visible because there'd be no *real* sunlight to drown them out. Since they're so far off, they'd appear small, like so many little marbles. Of course the Cultists talk of millions of Stars, but that's probably exaggeration. There just isn't any place in the universe you could put a million suns—unless they touch one another."

Sheerin had listened with gradually increasing interest. "You've hit something there, Beenay. And exaggeration is just exactly what would happen. Our minds, as you probably know, can't grasp directly any number higher than five; above that there is only the concept of 'many.' A dozen would become a million just like that. A damn good idea!"

"And I've got another cute little notion," Beenay said. "Have you ever thought what a simple problem gravitation would be if only you had a sufficiently simple system? Supposing you had a universe in which there was a planet with only one sun. The planet would travel in a perfect ellipse and the exact nature of the gravitational force would be so evident it could be accepted as an axiom. Astronomers on such a world would start off with gravity probably before they even invented the telescope. Naked-eye observation would be enough."

"But would such a system be dynamically stable?" questioned Sheerin doubtfully.

"Sure! They call it the 'one-and-one' case. It's been worked out mathematically, but it's the philosophical implications that interest me."

"It's nice to think about," admitted Sheerin, "as a pretty abstraction—like a perfect gas, or absolute zero."

"Of course," continued Beenay, "there's the catch that life would be impossible on such a planet. It wouldn't get enough heat and light, and if it rotated there would be total Darkness half of each day. You couldn't expect life—which is fundamentally dependent upon light—to develop under those conditions. Besides—"

Sheerin's chair went over backward as he sprang to his feet in a rude interruption. "Aton's brought out the lights."

Beenay said, "Huh," turned to stare, and then grinned halfway around his head in open relief.

There were half a dozen foot-long, inch-thick rods cradled in Aton's arms. He glared over them at the assembled staff members.

"Get back to work, all of you. Sheerin, come here and help me!"

Sheerin trotted to the older man's side and, one by one, in utter silence, the two adjusted the rods in makeshift metal holders suspended from the walls.

With the air of one carrying through the most sacred item of a religious ritual, Sheerin scraped a large, clumsy match into spluttering life and passed it to Aton, who carried the flame to the upper end of one of the rods.

It hesitated there awhile, playing futilely about the tip, until a sudden, crackling flare cast Aton's lined face into yellow highlights. He withdrew the match and a spontaneous cheer rattled the window.

The rod was topped by six inches of wavering flame! Methodically, the other rods were lighted, until six independent fires turned the rear of the room yellow.

The light was dim, dimmer even than the tenuous sunlight. The flames reeled crazily, giving birth to drunken, swaying shadows. The torches smoked devilishly and smelled like a bad day in the kitchen. But they emitted yellow light.

There was something about yellow light, after four hours of somber, dimming

Beta. Even Latimer had lifted his eyes from his book and stared in wonder.

Sheerin warmed his hands at the nearest, regardless of the soot that gathered upon them in a fine, gray powder, and muttered ecstatically to himself. "Beautiful! Beautiful! I never realized before what a wonderful color yellow is."

But Theremon regarded the torches suspiciously. He wrinkled his nose at the rancid odor and said, "What are those things?"

"Wood," said Sheerin shortly.

"Oh, no, they're not. They aren't burning. The top inch is charred and the flame just keeps shooting up out of nothing."

"That's the beauty of it. This is a really efficient artificial-light mechanism. We made a few hundred of them, but most went to the Hideout, of course. You see"—he turned and wiped his blackened hands upon his handkerchief—"you take the pithy core of coarse water reeds, dry them thoroughly, and soak them in animal grease. Then you set fire to it and the grease burns, little by little. These torches will burn for almost half an hour without stopping. Ingenious, isn't it? It was developed by one of our own young men at Saro University."

After the momentary sensation, the dome had quieted. Latimer had carried his chair directly beneath a torch and continued reading, lips moving in the monotonous recital of invocations to the Stars. Beenay had drifted away to his cameras once more, and Theremon seized the opportunity to add to his notes on the article he was going to write for the Saro City *Chronicle* the next day—a procedure he had been following for the last two hours in a perfectly methodical, perfectly conscientious and, as he was well aware, perfectly meaningless fashion.

But, as the gleam of amusement in Sheerin's eyes indicated, careful note-taking occupied his mind with something other than the fact that the sky was gradually turning a horrible deep purple-red, as if it were one gigantic, freshly peeled beet; and so it fulfilled its purpose.

The air grew, somehow, denser. Dusk, like a palpable entity, entered the room, and the dancing circle of yellow light about the torches etched itself into ever-sharper distinction against the gathering grayness beyond. There was the odor of smoke and the presence of little chuckling sounds that the torches made as they burned; the soft pad of one of the men circling the table at which he worked, on hesitant tiptoes; the occasional indrawn breath of someone trying to retain composure in a world that was retreating into the shadow.

It was Theremon who first heard the extraneous noise. It was a vague, unorganized *impression* of sound that would have gone unnoticed but for the dead silence that prevailed within the dome.

The newsman sat upright and replaced his notebook. He held his breath and listened; then, with considerable reluctance, threaded his way between the solarscope and one of Beenay's cameras and stood before the window.

The silence ripped to fragments at his startled shout: "*Sheerin!*"

Work stopped! The psychologist was at his side in a moment. Aton joined him. Even Yimot 70, high in his little lean-back seat at the eyepiece of the gigantic solarscope, paused and looked downward.

Outside, Beta was a mere smoldering splinter, taking one last desperate look at Lagash. The eastern horizon, in the direction of the city, was lost in Darkness, and the road from Saro to the Observatory was a dull-red line bordered on both sides by wooded tracts, the trees of which had somehow lost individuality and merged into a continuous shadowy mass.

But it was the highway itself that held attention, for along it there surged another, and infinitely menacing, shadowy mass.

Aton cried in a cracked voice, "The madmen from the city! They've come!"

"How long to totality?" demanded Sheerin.

"Fifteen minutes, but . . . but they'll be here in five."

"Never mind, keep the men working. We'll hold them off. This place is built like a fortress. Aton, keep an eye on our young Cultist just for luck. Theremon, come with me."

Sheerin was out the door, and Theremon was at his heels. The stairs stretched below them in tight, circular sweeps about the central shaft, fading into a dank and dreary grayness.

The first momentum of their rush had carried them fifty feet down, so that the dim, flickering yellow from the open door of the dome had disappeared and both above and below the same dusky shadow crushed in upon them.

Sheerin paused, and his pudgy hand clutched at his chest. His eyes bulged and his voice was a dry cough. "I can't . . . breathe . . . Go down . . . yourself. Close all doors—"

Theremon took a few downward steps, then turned. "Wait! Can you hold out a minute?" He was panting himself. The air passed in and out his lungs like so much molasses, and there was a little germ of screeching panic in his mind at the thought of making his way into the mysterious Darkness below by himself.

Theremon, after all, was afraid of the dark!

"Stay here," he said. "I'll be back in a second." He dashed upward two steps at a time, heart pounding—not altogether from the exertion—tumbled into the dome and snatched a torch from its holder. It was foul-smelling, and the smoke smarted his eyes almost blind, but he clutched that torch as if he wanted to kiss it for joy, and its flame streamed backward as he hurtled down the stairs again.

Sheerin opened his eyes and moaned as Theremon bent over him. Theremon shook him roughly. "All right, get a hold on yourself. We've got light."

He held the torch at tiptoe height and, propping the tottering psychologist by an elbow, made his way downward in the middle of the protecting circle of illumination.

The offices on the ground floor still possessed what light there was, and Theremon felt the horror about him relax.

"Here," he said brusquely, and passed the torch to Sheerin. "You can hear *them*-outside."

And they could. Little scraps of hoarse, wordless shouts.

But Sheerin was right; the Observatory was built like a fortress. Erected in the last century, when the neo-Gavottian style of architecture was at its ugly height, it had been designed for stability and durability rather than for beauty.

The windows were protected by the grillwork of inch-thick iron bars sunk deep into the concrete sills. The walls were solid masonry that an earthquake couldn't have touched, and the main door was a huge oaken slab reinforced with iron. Theremon shot the bolts and they slid shut with a dull clang.

At the other end of the corridor, Sheerin cursed weakly. He pointed to the lock of the back door which had been neatly jimmied into uselessness.

"That must be how Latimer got in," he said.

"Well, don't stand there," cried Theremon impatiently. "Help drag up the furniture —and keep that torch out of my eyes. The smoke's killing me."

He slammed the heavy table up against the door as he spoke, and in two minutes had built a barricade which made up for what it lacked in beauty and symmetry by the sheer inertia of its massiveness.

Somewhere, dimly, far off, they could hear the battering of naked fists upon the door; and the screams and yells from outside had a sort of half reality.

That mob had set off from Saro City with only two things in mind: the attainment of Cultist salvation by the destruction of the Observatory, and a maddening fear that all but paralyzed them. There was no time to think of ground cars, or of weapons, or of leadership, or even of organization. They made for the Observatory on foot and assaulted it with bare hands.

And now that they were there, the last flash of Beta, the last ruby-red drop of flame, flickered feebly over a humanity that had left only stark, universal fear!

Theremon groaned, "Let's get back to the dome!"

* * *

In the dome, only Yimot, at the solarscope, had kept his place. The rest were clustered about the cameras, and Beenay was giving his instructions in a hoarse, strained voice.

"Get it straight, all of you. I'm snapping Beta just before totality and changing the plate. That will leave one of you to each camera. You all know about . . . about times of exposure—"

There was a breathless murmur of agreement.

Beenay passed a hand over his eyes. "Are the torches still burning? Never mind, I see them!" He was leaning hard against the back of a chair. "Now remember, don't . . . don't try to look for good shots. Don't waste time trying to get t-two stars at a time in the scope field. One is enough. And . . . and if you feel yourself going, *get away from the camera.*"

At the door, Sheerin whispered to Theremon, "Take me to Aton. I don't see him."

The newsman did not answer immediately. The vague forms of the astronomers wavered and blurred, and the torches overhead had become only yellow splotches.

"It's dark," he whimpered.

Sheerin held out his hand. "Aton." He stumbled forward. "Aton!"

Theremon stepped after and seized his arm. "Wait, I'll take you." Somehow he made his way across the room. He closed his eyes against the Darkness and his mind against the chaos within it.

No one heard them or paid attention to them. Sheerin stumbled against the wall. "Aton!"

The psychologist felt shaking hands touching him, then withdrawing, and a voice muttering, "Is that you, Sheerin?"

"Aton!" He strove to breathe normally. "Don't worry about the mob. The place will hold them off."

Latimer, the Cultist, rose to his feet, and his face twisted in desperation. His word was pledged, and to break it would mean placing his soul in mortal peril. Yet that word had been forced from him and had not been given freely. The Stars would come soon! He could not stand by and allow— And yet his word was pledged.

Beenay's face was dimly flushed as it looked upward at Beta's last ray, and Latimer, seeing him bend over his camera, made his decision. His nails cut the flesh of his palms as he tensed himself.

He staggered crazily as he started his rush. There was nothing before him but

shadows; the very floor beneath his feet lacked substance. And then someone was upon him and he went down with clutching fingers at his throat.

He doubled his knee and drove it hard into his assailant. "Let me up or I'll kill you."

Theremon cried out sharply and muttered through a blinding haze of pain. "You double-crossing rat!"

The newsman seemed conscious of everything at once. He heard Beenay croak, "I've got it. At your cameras, men!" and then there was the strange awareness that the last thread of sunlight had thinned out and snapped.

Simultaneously he heard one last choking gasp from Beenay, and a queer little cry from Sheerin, a hysterical giggle that cut off in a rasp—and a sudden silence, a strange, deadly silence from outside.

And Latimer had gone limp in his loosening grasp. Theremon peered into the Cultist's eyes and saw the blankness of them, staring upward, mirroring the feeble yellow of the torches. He saw the bubble of froth upon Latimer's lips and heard the low animal whimper in Latimer's throat.

With the slow fascination of fear, he lifted himself on one arm and turned his eyes toward the blood-curdling blackness of the window.

Through it shone the Stars!

Not Earth's feeble thirty-six hundred Stars visible to the eye; Lagash was in the center of a giant cluster. Thirty thousand mighty suns shone down in a soul-searing splendor that was more frighteningly cold in its awful indifference than the bitter wind that shivered across the cold, horribly bleak world.

Theremon staggered to his feet, his throat constricting him to breathlessness, all the muscles of his body writhing in an intensity of terror and sheer fear beyond bearing. He was going mad and knew it, and somewhere deep inside a bit of sanity was screaming, struggling to fight off the hopeless flood of black terror. It was very horrible to go mad and know that you were going mad—to know that in a little minute you would be here physically and yet all the real essence would be dead and drowned in the black madness. For this was the Dark—the Dark and the Cold and the Doom. The bright walls of the universe were shattered and their awful black fragments were falling down to crush and squeeze and obliterate him.

He jostled someone crawling on hands and knees, but stumbled somehow over him. Hands groping at his tortured throat, he limped toward the flame of the torches that filled all his mad vision.

"Light!" he screamed.

Aton, somewhere, was crying, whimpering horribly like a terribly frightened child. "Stars—all the Stars—we didn't know at all. We didn't know anything. We thought six stars in a universe is something the Stars didn't notice is Darkness forever and ever and ever and the walls are breaking in and we didn't know we couldn't know and anything—"

Someone clawed at the torch, and it fell and snuffed out. In the instant, the awful splendor of the indifferent Stars leaped nearer to them.

On the horizon outside the window, in the direction of Saro City, a crimson glow began growing, strengthening in brightness, that was not the glow of a sun.

The long night had come again.

Runaround

It was one of Gregory Powell's favorite platitudes that nothing was to be gained from excitement, so when Mike Donovan came leaping down the stairs toward him, red hair matted with perspiration, Powell frowned.

"What's wrong?" he said. "Break a fingernail?"

"Yaaaah," snarled Donovan, feverishly. "What have you been doing in the sublevels all day?" He took a deep breath and blurted out, "Speedy never returned."

Powell's eyes widened momentarily and he stopped on the stairs; then he recovered and resumed his upward steps. He didn't speak until he reached the head of the flight, and then:

"You sent him after the selenium?"

'Yes."

"And how long has he been out?"

"Five hours now."

Silence! This was a devil of a situation. Here they were, on Mercury exactly twelve hours—and already up to the eyebrows in the worst sort of trouble. Mercury had long been the jinx world of the System, but this was drawing it rather strong—even for a jinx.

Powell said, "Start at the beginning, and let's get this straight."

They were in the radio room now—with its already subtly antiquated equipment, untouched for the ten years previous to their arrival. Even ten years, technologically speaking, meant so much. Compare Speedy with the type of robot they must have had back in 2005. But then, advances in robotics these days were tremendous. Powell touched a still gleaming metal surface gingerly. The air of disuse that touched everything about the room—and the entire Station—was infinitely depressing.

Donovan must have felt it. He began: "I tried to locate him by radio, but it was no go. Radio isn't any good on the Mercury Sunside—not past two miles, anyway. That's one of the reasons the First Expedition failed. And we can't put up the ultrawave equipment for weeks yet—"

"Skip all that. What *did* you get?"

"I located the unorganized body signal in the short wave. It was no good for

anything except his position. I kept track of him that way for two hours and plotted the results on the map."

There was a yellowed square of parchment in his hip pocket—a relic of the unsuccessful First Expedition—and he slapped it down on the desk with vicious force, spreading it flat with the palm of his hand. Powell, hands clasped across his chest, watched it at long range.

Donovan's pencil pointed nervously. "The red cross is the selenium pool. You marked it yourself."

"Which one is it?" interrupted Powell. "There were three that MacDougal located for us before he left."

"I sent Speedy to the nearest, naturally. Seventeen miles away. But what difference does that make?" There was tension in his voice. "There are the penciled dots that mark Speedy's position."

And for the first time Powell's artificial aplomb was shaken and his hands shot forward for the map.

"Are *you* serious? This is impossible."

"There it is," growled Donovan.

The little dots that marked the position formed a rough circle about the red cross of the selenium pool. And Powell's fingers went to his brown mustache, the unfailing signal of anxiety.

Donovan added: "In the two hours I checked on him, he circled that damned pool four times. It seems likely to me that he'll keep that up forever. Do you realize the position we're in?"

Powell looked up shortly, and said nothing. Oh, yes, he realized the position they were in. It worked itself out as simply as a syllogism. The photo-cell banks that alone stood between the full power of Mercury's monstrous sun and themselves were shot to hell. The only thing that could save them was selenium. The only thing that could get the selenium was Speedy. If Speedy didn't come back, no selenium. No selenium, no photo-cell banks. No photo-banks—well, death by slow broiling is one of the more unpleasant ways of being done in.

Donovan rubbed his red mop of hair savagely and expressed himself with bitterness. "We'll be the laughingstock of the System, Greg. How can everything have gone so wrong so soon? The great team of Powell and Donovan is sent out to Mercury to report on the advisability of reopening the Sunside Mining Station with modern techniques and robots and we ruin everything the first day. A purely routine job, too. We'll never live it down."

"We won't have to, perhaps," replied Powell, quietly. "If we don't do something quickly, living anything down—or even just plain living—will be out of the question."

"Don't be stupid! If you feel funny about it, Greg, I don't. It was criminal, sending us out here with only one robot. And it was *your* bright idea that we could handle the photo-cell banks ourselves."

"Now you're being unfair. It was a mutual decision and you know it. All we needed was a kilogram of selenium, a Stillhead Dielectrode Plate and about three hours' time—and there are pools of pure selenium all over Sunside. MacDougal's spectroreflector spotted three for us in five minutes, didn't it? What the devil! We couldn't have waited for next conjunction."

"Well, what are we going to do? Powell, you've got an idea. I know you have, or you wouldn't be so calm. You're no more a hero than I am. Go on, spill it!"

"We can't go after Speedy ourselves, Mike—not on the Sunside. Even the new


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insosuits aren't good for more than twenty minutes in direct sunlight. But you know the old saying, 'Set a robot to catch a robot.' Look, Mike, maybe things aren't so bad. We've got six robots down in the sublevels, that we may be able to use, if they work. *If* they work."

There was a glint of sudden hope in Donovan's eyes. "You mean six robots from the First Expedition. Are you sure? They may be subrobotic machines. Ten years is a long time as far as robot-types are concerned, you know."

"No, they're robots. I've spent all day with them and I know. They've got positronic brains: primitive, of course." He placed the map in his pocket. "Let's go down."

* * *

The robots were on the lowest sublevel—all six of them surrounded by musty packing cases of uncertain content. They were large, extremely so, and even though they were in a sitting position on the floor, legs straddled out before them, their heads were a good seven feet in the air.

Donovan whistled. "Look at the size of them, will you? The chests must be ten feet around."

"That's because they're supplied with the old McGuffy gears. I've been over the insides—crummiest set you've ever seen."

"Have you powered them yet?"

"No. There wasn't any reason to. I don't think there's anything wrong with them. Even the diaphragm is in reasonable order. They might talk."

He had unscrewed the chest plate of the nearest as he spoke, inserted the two-inch sphere that contained the tiny spark of atomic energy that was a robot's life. There was difficulty in fitting it, but he managed, and then screwed the plate back on again in laborious fashion. The radio controls of more modern models had not been heard of ten years earlier. And then to the other five.

Donovan said uneasily, "They haven't moved."

"No orders to do so," replied Powell, succinctly. He went back to the first in the line and struck him on the chest. "You! Do you hear me?"

The monster's head bent slowly and the eyes fixed themselves on Powell. Then, in a harsh, squawking voice—like that of a medieval phonograph, he grated, "Yes, Master!"

Powell grinned humorlessly at Donovan. "Did you get that? Those were the days of the first talking robots when it looked as if the use of robots on Earth would be banned. The makers were fighting that and they built good, healthy slave complexes into the damned machines."

"It didn't help them," muttered Donovan.

"No, it didn't, but they sure tried." He turned once more to the robot. "Get up!"

The robot towered upward slowly and Donovan's head craned and his puckered lips whistled.

Powell said: "Can you go out upon the surface? In the light?"

There was consideration while the robot's slow brain worked. Then, "Yes, Master."

"Good. Do you know what a mile is?"

Another consideration, and another slow answer. "Yes, Master."

"We will take you up to the surface then, and indicate a direction. You will go about seventeen miles, and somewhere in that general region you will meet another robot, smaller than yourself. You understand so far?"

"Yes, Master."

"You will find this robot and order him to return. If he does not wish to, you are to bring him back by force."

Donovan clutched at Powell's sleeve. "Why not send him for the selenium direct?"

"Because I want Speedy back, nitwit. I want to find out what's wrong with him." And to the robot, "All right, you, follow me."

The robot remained motionless and his voice rumbled: "Pardon, Master, but I cannot. You must mount first." His clumsy arms had come together with a thwack, blunt fingers interlacing.

Powell stared and then pinched at his mustache. "Uh . . . oh!"

Donovan's eyes bulged. "We've got to ride him? Like a horse?"

"I guess that's the idea. I don't know why, though. I can't see—Yes, I do. I told you they were playing up robot-safety in those days. Evidently, they were going to sell the notion of safety by not allowing them to move about, without a mahout on their shoulders all the time. What do we do now?"

"That's what I've been thinking," muttered Donovan. "We can't go out on the surface, with a robot or without. Oh, for the love of Pete"—and he snapped his fingers twice. He grew excited. "Give me that map you've got. I haven't studied it for two hours for nothing. This is a Mining Station. What's wrong with using the tunnels?"

The Mining Station was a black circle on the map, and the light dotted lines that were tunnels stretched out about it in spiderweb fashion.

Donovan studied the list of symbols at the bottom of the map. "Look," he said, "the small black dots are openings to the surface, and here's one maybe three miles away from the selenium pool. There's a number here—you'd think they'd write larger—13a. If the robots know their way around here—"

Powell shot the question and received the dull "Yes, Master," in reply. "Get your insosuit," he said with satisfaction.

It was the first time either had worn the insosuits—which marked one time more than either had expected to upon their arrival the day before—and they tested their limb movements uncomfortably.

The insosuit was far bulkier and far uglier than the regulation spacesuit; but withal considerably lighter, due to the fact that they were entirely nonmetallic in composition. Composed of heat-resistant plastic and chemically treated cork layers, and equipped with a desiccating unit to keep the air bone-dry, the insosuits could withstand the full glare of Mercury's sun for twenty minutes. Five to ten minutes more, as well, without actually killing the occupant.

And still the robot's hands formed the stirrup, nor did he betray the slightest atom of surprise at the grotesque figure into which Powell had been converted.

Powell's radio-harshened voice boomed out: "Are you ready to take us to Exit 13a?"

"Yes, Master."

Good, thought Powell; they might lack radio control but at least they were fitted for radio reception. "Mount one or the other, Mike," he said to Donovan.

He placed a foot in the improvised stirrup and swung upward. He found the seat comfortable; there was the humped back of the robot, evidently shaped for the purpose, a shallow groove along each shoulder for the thighs and two elongated "ears" whose purpose now seemed obvious.

Powell seized the ears and twisted the head. His mount turned ponderously. "Lead on, Macduff." But he did not feel at all lighthearted.

The gigantic robots moved slowly, with mechanical precision, through the doorway

that cleared their heads by a scant foot, so that the two men had to duck hurriedly, along a narrow corridor in which their unhurried footsteps boomed monotonously and into the air lock.

The long, airless tunnel that stretched to a pinpoint before them brought home forcefully to Powell the exact magnitude of the task accomplished by the First Expedition, with their crude robots and their start-from-scratch necessities. They might have been a failure, but their failure was a good deal better than the usual run of the System's successes.

The robots plodded onward with a pace that never varied and with footsteps that never lengthened.

Powell said: "Notice that these tunnels are blazing with lights and that the temperature is Earth-normal. It's probably been like this all the ten years that this place has remained empty."

"How's that?"

"Cheap energy; cheapest in the System. Sunpower, you know, and on Mercury's Sunside, sunpower is *something*. That's why the Station was built in the sunlight rather than in the shadow of a mountain. It's really a huge energy converter. The heat is turned into electricity, light, mechanical work and what have you; so that energy is supplied and the Station is cooled in a simultaneous process."

"Look," said Donovan. "This is all very educational, but would you mind changing the subject? It so happens that this conversion of energy that you talk about is carried on by the photo-cell banks mainly—and that is a tender subject with me at the moment."

Powell grunted vaguely, and when Donovan broke the resulting silence, it was to change the subject completely. "Listen, Greg. What the devil's wrong with Speedy, anyway? I can't understand it."

It's not easy to shrug shoulders in an insosuit, but Powell tried it. "I don't know, Mike. You know he's perfectly adapted to a Mercurian environment. Heat doesn't mean anything to him and he's built for the light gravity and the broken ground. He's foolproof—or, at least, he should be."

Silence fell. This time, silence that lasted.

"Master," said the robot, "we are here."

"Eh?" Powell snapped out of a semidrowse. "Well, get us out of here—out to the surface."

They found themselves in a tiny substation, empty, airless, ruined. Donovan had inspected a jagged hole in the upper reaches of one of the walls by the light of his pocket flash.

"Meteorite, do you suppose?" he had asked.

Powell shrugged. "To hell with that. It doesn't matter. Let's get out."

A towering cliff of a black, basaltic rock cut off the sunlight, and the deep night shadow of an airless world surrounded them. Before them, the shadow reached out and ended in knife-edge abruptness into an all-but-unbearable blaze of white light, that glittered from myriad crystals along a rocky ground.

"Space!" gasped Donovan. "It looks like snow." And it did.

Powell's eyes swept the jagged glitter of Mercury to the horizon and winced at the gorgeous brilliance.

"This must be an unusual area," he said. "The general albedo of Mercury is low and most of the soil is gray pumice. Something like the Moon, you know. Beautiful, isn't it?"

He was thankful for the light filters in their visiplates. Beautiful or not, a look at the

sunlight through straight glass would have blinded them inside of half a minute.

Donovan was looking at the spring thermometer on his wrist. "Holy smokes, the temperature is eighty centigrade!"

Powell checked his own and said: "Um-m-m. A little high. Atmosphere, you know."

"On Mercury? Are you nuts?"

"Mercury isn't really airless," explained Powell, in absent-minded fashion. He was adjusting the binocular attachments to his visiplate, and the bloated fingers of the insosuit were clumsy at it. "There is a thin exhalation that clings to its surface—vapors of the more volatile elements and compounds that are heavy enough for Mercurian gravity to retain. You know: selenium, iodine, mercury, gallium, potassium, bismuth, volatile oxides. The vapors sweep into the shadows and condense, giving up heat. It's a sort of gigantic still. In fact, if you use your flash, you'll probably find that the side of the cliff is covered with, say, hoar-sulphur, or maybe quicksilver dew.

"It doesn't matter, though. Our suits can stand a measly eighty indefinitely."

Powell had adjusted the binocular attachments, so that he seemed as eye-stalked as a snail.

Donovan watched tensely. "See anything?"

The other did not answer immediately, and when he did, his voice was anxious and thoughtful. "There's a dark spot on the horizon that might be the selenium pool. It's in the right place. But I don't see Speedy."

Powell clambered upward in an instinctive striving for better view, till he was standing in unsteady fashion upon his robot's shoulders. Legs straddled wide, eyes straining, he said: "I think . . . I think—Yes, it's definitely he. He's coming this way."

Donovan followed the pointing finger. He had no binoculars, but there was a tiny moving dot, black against the blazing brilliance of the crystalline ground.

"I see him," he yelled. "Let's get going!"

Powell had hopped down into a sitting position on the robot again, and his suited hand slapped against the Gargantuan's barrel chest. "Get going!"

"Giddy-ap," yelled Donovan, and thumped his heels, spur fashion.

* * *

The robots started off, the regular thudding of their footsteps silent in the airlessness, for the nonmetallic fabric of the insosuits did not transmit sound. There was only a rhythmic vibration just below the border of actual hearing.

"Faster," yelled Donovan. The rhythm did not change.

"No use," cried Powell, in reply. "These junk heaps are only geared to one speed. Do you think they're equipped with selective flexors?"

They had burst through the shadow, and the sunlight came down in a white-hot wash and poured liquidly about them.

Donovan ducked involuntarily. "Wow! Is it imagination or do I feel heat?"

"You'll feel more presently," was the grim reply. "Keep your eye on Speedy."

Robot SPD 13 was near enough to be seen in detail now. His graceful, streamlined body threw out blazing highlights as he loped with easy speed across the broken ground. His name was derived from his serial initials, of course, but it was apt, nevertheless, for the SPD models were among the fastest robots turned out by the United States Robots and Mechanical Men Corporation.

"Hey, Speedy," howled Donovan, and waved a frantic hand.

"Speedy!" shouted Powell. "Come here!"

The distance between the men and the errant robot was being cut down momentarily—more by the efforts of Speedy than the slow plodding of the ten-year-old antique mounts of Donovan and Powell.

They were close enough now to notice that Speedy's gait included a peculiar rolling stagger, a noticeable side-to-side lurch—and then, as Powell waved his hand again and sent maximum juice into his compact head-set radio sender, in preparation for another shout, Speedy looked up and saw them.

Speedy hopped to a halt and remained standing for a moment—with just a tiny, unsteady weave, as though he were swaying in a light wind.

Powell yelled: "All right, Speedy. Come here, boy."

Whereupon Speedy's robot voice sounded in Powell's earphones for the first time.

It said: "Hot dog, let's play games. You catch me and I catch you; no love can cut our knife in two. For I'm Little Buttercup, sweet Little Buttercup. Whoops!" Turning on his heel, he sped off in the direction from which he had come, with a speed and fury that kicked up gouts of baked dust.

And his last words as he receded into the distance were, "There grew a little flower 'neath a great oak tree," followed by a curious metallic clicking that *might* have been a robotic equivalent of a hiccup.

Donovan said weakly: "Where did he pick up the Gilbert and Sullivan? Say, Greg, he . . . he's drunk or something."

"If you hadn't told me," was the bitter response, "I'd never realize it. Let's get back to the cliff. I'm roasting."

It was Powell who broke the desperate silence. "In the first place," he said, "Speedy isn't drunk—not in the human sense—because he's a robot, and robots don't get drunk. However, there's *something* wrong with him which is the robotic equivalent of drunkenness."

"To me, he's drunk," stated Donovan, emphatically, "and all I know is that he thinks we're playing games. And we're not. It's a matter of life and very gruesome death."

"All right. Don't hurry me. A robot's only a robot. Once we find out what's wrong with him, we can fix it and go on."

"*Once*," said Donovan, sourly.

Powell ignored him. "Speedy is perfectly adapted to normal Mercurian environment. But this region"—and his arm swept wide—"is definitely abnormal. There's our clue. Now where do these crystals come from? They might have formed from a slowly cooling liquid; but where would you get liquid so hot that it would cool in Mercury's sun?"

"Volcanic action," suggested Donovan, instantly, and Powell's body tensed.

"Out of the mouths of sucklings," he said in a small, strange voice, and remained very still for five minutes.

Then, he said, "Listen, Mike, what did you say to Speedy when you sent him after the selenium?"

Donovan was taken aback. "Well damn it—I don't know. I just told him to get it."

"Yes, I know. But how? Try to remember the exact words."

"I said . . . uh . . . I said: 'Speedy, we need some selenium. You can get it such-and-such a place. Go get it.' That's all. What more did you want me to say?"

"You didn't put any urgency into the order, did you?"

"What for? It was pure routine."

Powell sighed. "Well, it can't be helped now—but we're in a fine fix." He had dismounted from his robot, and was sitting, back against the cliff. Donovan joined him

and they linked arms. In the distance the burning sunlight seemed to wait cat-and-mouse for them, and just next to them, the two giant robots were invisible but for the dull red of their photoelectric eyes that stared down at them, unblinking, unwavering and unconcerned.

Unconcerned! As was all this poisonous Mercury, as large in jinx as it was small in size.

Powell's radio voice was tense in Donovan's ear: "Now, look, let's start with the three fundamental Rules of Robotics—the three rules that are built most deeply into a robot's positronic brain." In the darkness, his gloved fingers ticked off each point.

"We have: One, a robot may not injure a human being, or, through inaction, allow a human being to come to harm."

"Right!"

"Two," continued Powell, "a robot must obey the orders given it by human beings except where such orders would conflict with the First Law."

"Right!"

"And three, a robot must protect its own existence as long as such protection does not conflict with the First or Second Laws."

"Right! Now where are we?"

"Exactly at the explanation. The conflict between the various rules is ironed out by the different positronic potentials in the brain. We'll say that a robot is walking into danger and knows it. The automatic potential that Rule 3 sets up turns him back. But suppose you *order* him to walk into that danger. In that case, Rule 2 sets up a counter-potential higher than the previous one and the robot follows orders at the risk of existence."

"Well, I know that. What about it?"

"Let's take Speedy's case. Speedy is one of the latest models, extremely specialized, and as expensive as a battleship. It's not a thing to be lightly destroyed."

"So?"

"So Rule 3 has been strengthened—that was specifically mentioned, by the way, in the advance notices on the SPD models—so that his allergy to danger is unusually high. At the same time, when you sent him out after the selenium, you gave him his order casually and without special emphasis, so that the Rule 2 potential set-up was rather weak. Now, hold on; I'm just stating facts."

"All right, go ahead. I think I get it."

"You see how it works, don't you? There's some sort of danger centering at the selenium pool. It increases as he approaches, and at a certain distance from it the Rule 3 potential, unusually high to start with, exactly balances the Rule 2 potential, unusually low to start with."

Donovan rose to his feet in excitement. "And it strikes an equilibrium. I see. Rule 3 drives him back and Rule 2 drives him forward—"

"So he follows a circle around the selenium pool, staying on the locus of all points of potential equilibrium. And unless we do something about it, he'll stay on that circle forever, giving us the good old runaround." Then, more thoughtfully: "And that, by the way, is what makes him drunk. At potential equilibrium, half the positronic paths of his brain are out of kilter. I'm not a robot specialist, but that seems obvious. Probably he's lost control of just those parts of his voluntary mechanism that a human drunk has. Ve-e-ery pretty."

"But what's the danger? If we knew what he was running from—"

"*You* suggested it. Volcanic action. Somewhere right above the selenium pool is a

seepage of gas from the bowels of Mercury. Sulphur dioxide, carbon dioxide—and carbon monoxide. Lots of it—and at this temperature."

Donovan gulped audibly. "Carbon monoxide plus iron gives the volatile iron carbonyl."

"And a robot," added Powell, "is essentially iron." Then, grimly: "There's nothing like deduction. We've determined everything about our problem but the solution. We can't get the selenium ourselves. It's still too far. We can't send these robot horses, because they can't go themselves, and they can't carry us fast enough to keep us from crisping. And we can't catch Speedy, because the dope thinks we're playing games, and he can run sixty miles to our four."

"If one of us goes," began Donovan, tentatively, "and comes back cooked, there'll still be the other."

"Yes," came the sarcastic reply, "it would be a most tender sacrifice—except that a person would be in no condition to give orders before he ever reaches the pool, and I don't think the robots would ever turn back to the cliff without orders. Figure it out! We're two or three miles from the pool—call it two—the robot travels at four miles an hour; and we can last twenty minutes in our suits. It isn't only the heat, remember. Solar radiation out here in the ultraviolet and below is *poison*."

"Um-m-m," said Donovan, "ten minutes short."

"As good as an eternity. And another thing. In order for Rule 3 potential to have stopped Speedy where it did, there must be an appreciable amount of carbon monoxide in the metal-vapor atmosphere—and there must be an appreciable corrosive action therefore. He's been out hours now—and how do we know when a knee joint, for instance, won't be thrown out of kilter and keel him over. It's not only a question of thinking—we've got to think *fast!*"

Deep, dark, dank, dismal silence!

Donovan broke it, voice trembling in an effort to keep itself emotionless. He said: "As long as we can't increase Rule 2 potential by giving further orders, how about working the other way? If we increase the danger, we increase Rule 3 potential and drive him backward."

Powell's visiplate had turned toward him in a silent question.

"You see," came the cautious explanation, "all we need to do to drive him out of his rut is to increase the concentration of carbon monoxide in his vicinity. Well, back at the Station there's a complete analytical laboratory."

"Naturally," assented Powell. "It's a Mining Station."

"All right. There must be pounds of oxalic acid for calcium precipitations."

"Holy space! Mike, you're a genius."

"So-so," admitted Donovan, modestly. "It's just a case of remembering that oxalic acid on heating decomposes into carbon dioxide, water, and good old carbon monoxide. College chem, you know."

Powell was on his feet and had attracted the attention of one of the monster robots by the simple expedient of pounding the machine's thigh.

"Hey," he shouted, "can you throw?"

"Master?"

"Never mind." Powell damned the robot's molasses-slow brain. He scrabbled up a jagged brick-size rock. "Take this," he said, "and hit the patch of bluish crystals just across that crooked fissure. You see it?"

Donovan pulled at his shoulder. "Too far, Greg. It's almost half a mile off."

"Quiet," replied Powell. "It's a case of Mercurian gravity and a steel throwing arm. Watch, will you?"

The robot's eyes were measuring the distance with machinely accurate stereoscopy. His arm adjusted itself to the weight of the missile and drew back. In the darkness, the robot's motions went unseen, but there was a sudden thumping sound as he shifted his weight, and seconds later the rock flew blackly into the sunlight. There was no air resistance to slow it down, nor wind to turn it aside—and when it hit the ground it threw up crystals precisely in the center of the "blue patch."

Powell yelled happily and shouted, "Let's go back after the oxalic acid, Mike."

And as they plunged into the ruined substation on the way back to the tunnels, Donovan said grimly: "Speedy's been hanging about on this side of the selenium pool, ever since we chased after him. Did you see him?"

"Yes."

"I guess he wants to play games. Well, we'll play his games!"

* * *

They were back hours later, with three-liter jars of the white chemical and a pair of long faces. The photo-cell banks were deteriorating more rapidly than had seemed likely. The two steered their robots into the sunlight and toward the waiting Speedy in silence and with grim purpose.

Speedy galloped slowly toward them. "Here we are again. *Whee!* I've made a little list, the piano organist; all people who eat peppermint and puff it in your face."

"We'll puff something in *your* face," muttered Donovan. "He's limping, Greg."

"I noticed that," came the low, worried response. "The monoxide'll get him yet, if we don't hurry."

They were approaching cautiously now, almost sidling, to refrain from setting off the thoroughly irrational robot. Powell was too far off to tell, of course, but even already he could have sworn the crack-brained Speedy was setting himself for a spring.

"Let her go," he gasped. "Count three! One—two—"

Two steel arms drew back and snapped forward simultaneously and two glass jars whirled forward in towering parallel arcs, gleaming like diamonds in the impossible sun. And in a pair of soundless puffs, they hit the ground behind Speedy in crashes that sent the oxalic acid flying like dust.

In the full heat of Mercury's sun, Powell knew it was fizzing like soda water.

Speedy turned to stare, then backed away from it slowly—and as slowly gathered speed. In fifteen seconds, he was leaping directly toward the two humans in an unsteady canter.

Powell did not get Speedy's words just then, though he heard something that resembled, "Lover's professions when uttered in Hessians."

He turned away. "Back to the cliff, Mike. He's out of the rut and he'll be taking orders now. I'm getting hot."

They jogged toward the shadow at the slow monotonous pace of their mounts, and it was not until they had entered it and felt the sudden coolness settle softly about them that Donovan looked back. "*Greg!*"

Powell looked and almost shrieked. Speedy was moving slowly now—so slowly—and in the *wrong direction*. He was drifting; drifting back into his rut; and he was picking up speed. He looked dreadfully close, and dreadfully unreachable, in the binoculars.

Donovan shouted wildly, "After him!" and thumped his robot into its pace, but Powell called him back.

"You won't catch him, Mike—it's no use." He fidgeted on his robot's shoulders and clenched his fist in tight impotence. "Why the devil do I see these things five seconds after it's all over? Mike, we've wasted hours."

"We need more oxalic acid," declared Donovan, stolidly. "The concentration wasn't high enough."

"Seven tons of it wouldn't have been enough—and we haven't the hours to spare to get it, even if it were, with the monoxide chewing him away. Don't you see what it is, Mike?"

And Donovan said flatly, "No."

"We were only establishing new equilibriums. When we create new monoxide and increase Rule 3 potential, he moves backward till he's in balance again—and when the monoxide drifted away, he moved forward, and again there was balance."

Powell's voice sounded thoroughly wretched. "It's the same old runaround. We can push at Rule 2 and pull at Rule 3 and we can't get anywhere—we can only change the position of balance. We've got to get outside both rules." And then he pushed his robot closer to Donovan's so that they were sitting face to face, dim shadows in the darkness, and he whispered, "Mike!"

"Is it the finish?"—dully. "I suppose we go back to the Station, wait for the banks to fold, shake hands, take cyanide, and go out like gentlemen." He laughed shortly.

"Mike," repeated Powell earnestly, "we've got to get Speedy."

"I know."

"Mike," once more, and Powell hesitated before continuing. "There's always Rule 1. I thought of it—earlier—but it's desperate."

Donovan looked up and his voice livened. "*We're* desperate."

"All right. According to Rule 1, a robot can't see a human come to harm because of his own inaction. Two and 3 can't stand against it. They *can't*, Mike."

"Even when the robot is half cra— Well, he's drunk. You know he is."

"It's the chances you take."

"Cut it. What are you going to do?"

"I'm going out there now and see what Rule 1 will do. If it won't break the balance, then what the devil—it's either now or three-four days from now."

"Hold on, Greg. There are human rules of behavior, too. You don't go out there just like that. Figure out a lottery, and give me *my* chance."

"All right. First to get the cube of fourteen goes." And almost immediately, "Twenty-seven forty-four!"

Donovan felt his robot stagger at a sudden push by Powell's mount and then Powell was off into the sunlight. Donovan opened his mouth to shout, and then clicked it shut. Of course, the damn fool had worked out the cube of fourteen in advance, and on purpose. Just like him.

* * *

The sun was hotter than ever and Powell felt a maddening itch in the small of his back. Imagination, probably, or perhaps hard radiation beginning to tell even through the insosuit.

Speedy was watching him, without a word of Gilbert and Sullivan gibberish as greeting. Thank God for that! But he daren't get too close.

He was three hundred yards away when Speedy began backing, a step at a time,

cautiously—and Powell stopped. He jumped from his robot's shoulders and landed on the crystalline ground with a light thump and a flying of jagged fragments.

He proceeded on foot, the ground gritty and slippery to his steps, the low gravity causing him difficulty. The soles of his feet tickled with warmth. He cast one glance over his shoulder at the blackness of the cliff's shadow and realized that he had come too far to return—either by himself or by the help of his antique robot. It was Speedy or nothing now, and the knowledge of that constricted his chest.

Far enough! He stopped.

"Speedy," he called. "Speedy!"

The sleek, modern robot ahead of him hesitated and halted his backward steps, then resumed them.

Powell tried to put a note of pleading into his voice, and found it didn't take much acting. "Speedy, I've got to get back to the shadow or the sun'll get me. It's life or death, Speedy. I need you."

Speedy took one step forward and stopped. He spoke, but at the sound Powell groaned, for it was, "When you're lying awake with a dismal headache and repose is tabooed—" It trailed off there, and Powell took time out for some reason to murmur, "Iolanthe."

It was roasting hot! He caught a movement out of the corner of his eye, and whirled dizzily; then stared in utter astonishment, for the monstrous robot on which he had ridden was moving—moving toward him, and without a rider.

He was talking: "Pardon, Master. I must not move without a Master upon me, but you are in danger."

Of course, Rule 1 potential above everything. But he didn't want that clumsy antique; he wanted Speedy. He walked away and motioned frantically: "I order you to stay away. I *order* you to stop!"

It was quite useless. You could not beat Rule 1 potential. The robot said stupidly, "You are in danger, Master."

Powell looked about him desperately. He couldn't see clearly. His brain was in a heated whirl; his breath scorched when he breathed, and the ground all about him was a shimmering haze.

He called a last time, desperately: "*Speedy!* I'm dying, damn you! Where are you? Speedy, I *need* you."

He was still stumbling backward in a blind effort to get away from the giant robot he didn't want, when he felt steel fingers on his arms, and a worried, apologetic voice of metallic timbre in his ears.

"Holy smokes, boss, what are you doing here? And what am *I* doing—I'm so confused—"

"Never mind," murmured Powell, weakly. "Get me to the shadow of the cliff—and hurry!" There was one last feeling of being lifted into the air and a sensation of rapid motion and burning heat, and he passed out.

* * *

He woke with Donovan bending over him and smiling anxiously. "How are you, Greg?"

"Fine!" came the response. "Where's Speedy?"

"Right here. I sent him out to one of the other selenium pools—with orders to get

that selenium at all cost this time. He got it back in forty-two minutes and three seconds. I timed him. He still hasn't finished apologizing for the runaround he gave us. He's scared to come near you for fear of what you'll say."

"Drag him over," ordered Powell. "It wasn't his fault." He held out a hand and gripped Speedy's metal paw. "It's O.K., Speedy." Then, to Donovan, "You know, Mike, I was just thinking—"

"Yes!"

"Well,"—he rubbed his face—the air was so delightfully cool, "you know that when we get things set up here and Speedy put through his Field Tests, they're going to send us to the Space Station next—"

"No!"

"Yes! At least that's what old lady Calvin told me just before we left, and I didn't say anything about it, because I was going to fight the whole idea."

"Fight it?" cried Donovan. "But—"

"I know. It's all right with me now. Two hundred seventy-three degrees Centigrade below zero. Won't it be a pleasure?"

"Space Station," said Donovan, "here I come."

Death Sentence

Brand Gorla smiled uncomfortably, "These things exaggerate, you know."

"No, no, no!" The little man's albino-pink eyes snapped. "Dorlis was great when no human had ever entered the Vegan System. It was the capital of a Galactic Confederation greater than ours."

"Well, then, let's say that it was an ancient capital. I'll admit that and leave the rest to an archaeologist."

"Archaeologists are no use. What I've discovered needs a specialist in its own field. And you're on the Board."

Brand Gorla looked doubtful. He remembered Theor Realo in senior year—a little white misfit of a human who skulked somewhere in the background of his reminiscences. It had been a long time ago, but the albino had been queer. *That* was easy to remember. And he was still queer.

"I'll try to help," Brand said, "if you'll tell me what you want."

Theor watched intently, "I want you to place certain facts before the Board. Will you promise that?"

Brand hedged, "Even if I help you along, Theor, I'll have to remind you that I'm junior member of the Psychological Board. I haven't much influence."

"You must do your best. The facts will speak for themselves." The albino's hands were trembling.

"Go ahead." Brand resigned himself. The man was an old school fellow. You couldn't be *too* arbitrary about things.

Brand Gorla leaned back and relaxed. The light of Arcturus shone through the ceiling-high windows, diffused and mellowed by the polarizing glass. Even this diluted version of sunlight was too much for the pink eyes of the other, and he shaded his eyes as he spoke.

"I've lived on Dorlis twenty-five years, Brand," he said. "I've poked into places no one today knew existed, and I've found things. Dorlis was the scientific and cultural capital of a civilization greater than ours. Yes it was, and particularly in psychology."

"Things in the past always seem greater." Brand condescended a smile. "There is a

theorem to that effect which you'll find in any elementary text. Freshmen invariably call it the 'GOD Theorem.' Stands for 'Good-Old-Days,' you know. But go on."

Theor frowned at the digression. He hid the beginning of a sneer, "You can always dismiss an uncomfortable fact by pinning a dowdy label to it. But tell me this. What do you know of Psychological Engineering?"

Brand shrugged, "No such thing. Anyway, not in the strict mathematical sense. All propaganda and advertising is a crude form of hit-and-miss Psych Engineering—and pretty effective sometimes. Maybe that's what you mean."

"Not at all. I mean actual experimentation, with masses of people, under controlled conditions, and over a period of years."

"Such things have been discussed. It's not feasible in practice. Our social structure couldn't stand much of it, and we don't know enough to set up effective controls."

Theor suppressed excitement, "But the ancients *did* know enough. And they *did* set up controls."

Brand considered phlegmatically, "Startling and interesting, but how do you know?"

"Because I found the documents relating to it." He paused breathlessly. "An entire planet, Brand. A complete world picked to suit, peopled with beings under strict control from every angle. Studied, and charted, and experimented upon. Don't you get the picture?"

Brand noted none of the usual stigmata of mental uncontrol. A closer investigation, perhaps—

He said evenly, "You must have been misled. It's thoroughly impossible. You can't control humans like that. Too many variables."

"And that's the point, Brand. They weren't humans."

"What?"

"They were robots, positronic robots. A whole world of them, Brand, with nothing to do but live and react and be observed by a set of psychologists that were *real* psychologists."

"That's mad!"

"I have proof—because that robot world still exists. The First Confederation went to pieces, but that robot world kept on going. It still exists."

"And how do you know?"

Theor Realo stood up. "Because I've been there these last twenty-five years!"

* * *

The Board Master threw his formal red-edged gown aside and reached into a pocket for a long, gnarled and decidedly unofficial cigar.

"Preposterous," he grunted, "and thoroughly insane."

"Exactly," said Brand, "and I can't spring it on the Board just like that. They wouldn't listen. I've got to get this across to you first, and then, if you can put your authority behind it—"

"Oh, nuts! I never heard anything as— Who is the fellow?"

Brand sighed, "A crank, I'll admit that. He was in my class at Arcturus U. and a crack-pot albino even then. Maladjusted as the devil, hipped on ancient history, and just the kind that gets an idea and goes through with it by plain, dumb plugging. He's poked about in Dorlis for twenty-five years, he says. He's got the complete records of practically an entire civilization."

The Board Master puffed furiously. "Yeah, I know. In the telestat serials, the brilliant amateur always uncovers the great things. The free lance. The lone wolf. Nuts! Have you consulted the Department of Archaeology?"

"Certainly. And the result was interesting. No one bothers with Dorlis. This isn't just ancient history, you see. It's a matter of fifteen thousand years. It's practically myth. Reputable archaeologists don't waste too much time with it. It's just the thing a book-struck layman with a single-track mind *would* uncover. After this, of course, if the business turns out right, Dorlis will become an archaeologist's paradise."

The Board Master screwed his homely face into an appalling grimace. "It's very unflattering to the ego. If there's any truth in all this, the so-called First Confederation must have had a grasp of psychology so far past ours, as to make us out to be blithering imbeciles. Too, they'd have to build positronic robots that would be about seventy-five orders of magnitude above anything we've even blueprinted. Galaxy! Think of the mathematics involved."

"Look, sir, I've consulted just about everybody. I wouldn't bring this thing to you if I weren't certain that I had every angle checked. I went to Blak just about the first thing, and he's consultant mathematician to United Robots. He says there's no limit to these things. Given the time, the money, and the *advance in psychology*—get that—robots like that could be built right now."

"What proof has he?"

"Who, Blak?"

"No, no! Your friend. The albino. You said he had papers."

"He has. I've got them here. He's got documents—and there's no denying their antiquity. I've had that checked every way from Sunday. I can't read them, of course. I don't know if anyone can, except Theor Realo."

"That's stacking the deck, isn't it? We have to take his say-so."

"Yes, in a way. But he doesn't claim to be able to decipher more than portions. He says it is related to ancient Centaurian, and I've put linguists to work on it. It can be cracked and if his translation isn't accurate, we'll know about it."

"All right. Let's see it."

Brand Gorla brought out the plastic-mounted documents. The Board Master tossed them aside and reached for the translation. Smoke billowed as he read.

"Humph," was his comment. "Further details are on Dorlis, I suppose."

"Theor claims that there are some hundred to two hundred tons of blueprints altogether, on the brain plan of the positronic robots alone. They're still there in the original vault. But that's the least of it. He's been on the robot world itself. He's got photocasts, teletype recordings, all sorts of details. They're not integrated, and obviously the work of a layman who knows next to nothing about psychology. Even so, he's managed to get enough data to prove pretty conclusively that the world he was on wasn't . . . uh . . . natural."

"You've got that with you, too."

"All of it. Most of it's on microfilm, but I've brought the projector. Here are your eyepieces."

An hour later, the Board Master said, "I'll call a Board Meeting tomorrow and push this through."

Brand Gorla grinned tightly, "We'll send a commission to Dorlis?"

"When," said the Board Master dryly, "and if we can get an appropriation out of the University for such an affair. Leave this material with me for the while, please. I want to study it a little more."

* * *

Theoretically, the Governmental Department of Science and Technology exercises administrative control over all scientific investigation. Actually, however, the pure research groups of the large universities are thoroughly autonomous bodies, and, as a general rule, the Government does not care to dispute that. But a general rule is not necessarily a universal rule.

And so, although the Board Master scowled and fumed and swore, there was no way of refusing Wynne Murry an interview. To give Murry his complete title, he was under secretary in charge of psychology, psychopathy and mental technology. And he was a pretty fair psychologist in his own right.

So the Board Master might glare, but that was all.

Secretary Murry ignored the glare cheerfully. He rubbed his long chin against the grain and said, "It amounts to a case of insufficient information. Shall we put it that way?"

The Board Master said frigidly, "I don't see what information you want. The government's say in university appropriations is purely advisory, and in this case, I might say, the advice is unwelcome."

Murry shrugged, "I have no quarrel with the appropriation. But you're not going to leave the planet without government permit. That's where the insufficient information comes in."

"There is no information other than we've given you."

"But things have leaked out. All this is childish and rather unnecessary secrecy."

The old psychologist flushed. "Secrecy! If you don't know the academic way of life, I can't help you. Investigations, especially those of major importance, aren't, and can't be, made public, until definite progress has been made. When we get back, we'll send you copies of whatever papers we publish."

Murry shook his head, "Uh-uh. Not enough. You're going to Dorlis, aren't you?"

"We've informed the Department of Science of that."

"Why?"

"Why do you want to know?"

"Because it's big, or the Board Master wouldn't go himself. What's this about an older civilization and a world of robots?"

"Well, then, you know."

"Only vague notions we've been able to scrabble up. I want the details."

"There are none that we know now. We won't know until we're on Dorlis."

"Then I'm going with you."

"What!"

"You see, I want the details, too."

"Why?"

"Ah," Murry unfolded his legs and stood up, "now *you're* asking the questions. It's no use, now. I know that the universities aren't keen on government supervision; and I know that I can expect no willing help from *any* academic source. But, by Arcturus, I'm going to get help this time, and I don't care how you fight it. Your expedition is going nowhere, unless I go with you—representing the government."

* * *

Dorlis, as a world, is not impressive. Its importance to Galactic economy is nil, its position far off the great trade routes, its natives backward and unenlightened, its history obscure. And yet somewhere in the heaps of rubble that clutter an ancient world, there is obscure evidence of an influx of flame and destruction that destroyed the Dorlis of an earlier day—the greater capital of a greater Federation.

And somewhere in that rubble, men of a newer world poked and probed and tried to understand.

The Board Master shook his head and then pushed back his grizzling hair. He hadn't shaved in a week.

"The trouble is," he said, "that we have no point of reference. The language can be broken, I suppose, but nothing can be done with the notation."

"I think a great deal has been done."

"Stabs in the dark! Guessing games based on the translations of your albino friend. I won't base any hopes on that."

Brand said, "Nuts! You spent two years on the Nimiam Anomaly, and so far only two months on this, which happens to be a hundred thousand times the job. It's something else that's getting you." He smiled grimly. "It doesn't take a psychologist to see that the government man is in your hair."

The Board Master bit the end off a cigar and spat it four feet. He said slowly, "There are three things about the mule-headed idiot that make me sore. First, I don't like government interference. Second, I don't like a stranger sniffing about when we're on top of the biggest thing in the history of psychology. Third, what in the Galaxy does he want? *What is he after?*"

"I don't know."

"What *should* he be after? Have you thought of it at all?"

"No. Frankly, I don't care. I'd ignore him if I were you."

"You would," said the Board Master violently. "You would! You think the government's entrance into this affair need only be ignored. I suppose you know that this Murry calls himself a psychologist?"

"I know that."

"And I suppose you know he's been displaying a devouring interest in all that we've been doing."

"That, I should say, would be natural."

"Oh! And you know further—" His voice dropped with startling suddenness. "All right, Murry's at the door. Take it easy."

Wynne Murry grinned a greeting, but the Board Master nodded unsmilingly.

"Well, sir," said Murry bluffly, "do you know I've been on my feet for forty-eight hours? You've *got* something here. Something big."

"Thank you."

"No, no. I'm serious. The robot world exists."

"Did you think it didn't?"

The secretary shrugged amiably. "One has a certain natural skepticism. What are your future plans?"

"Why do you ask?" The Board Master grunted his words as if they were being squeezed out singly.

"To see if they jibe with my own."

"And what are your own?"

The secretary smiled. "No, no. You take precedence. How long do you intend staying here?"

"As long as it takes to make a fair beginning on the documents involved."

"That's no answer. What do you mean by a fair beginning?"

"I haven't the slightest idea. It might take years."

"Oh, damnation."

The Board Master raised his eyebrows and said nothing.

The secretary looked at his nails. "I take it you know the location of this robot world."

"Naturally. Theor Realo was there. His information up to now has proven very accurate."

"That's right. The albino. Well, why not go there?"

"Go there! Impossible!"

"May I ask why?"

"Look," said the Board Master with restrained impatience, "you're not here by our invitation, and we're not asking you to dictate our course of actions, but just to show you that I'm not looking for a fight, I'll give you a little metaphorical treatment of our case. Suppose we were presented with a huge and complicated machine, composed of principles and materials of which we knew next to nothing. It is so vast we can't even make out the relationship of the parts, let alone the purpose of the whole. Now, would you advise me to begin attacking the delicate mysterious moving parts of the machine with a detonating ray before I know what it's all about?"

"I see your point, of course, but you're becoming a mystic. The metaphor is farfetched."

"Not at all. These positronic robots were constructed along lines we know nothing of as yet and were intended to follow lines with which we are entirely unacquainted. About the only thing we know is that the robots were put aside in complete isolation, to work out their destiny by themselves. To ruin that isolation would be to ruin the experiment. If we go there in a body, introducing new, unforeseen factors, inducing unintended reactions, everything is ruined. The littlest disturbance—"

"Poppycock! Theor Realo has already gone there."

The Board Master lost his temper suddenly. "Don't you suppose I know that? Do you suppose it would ever have happened if that cursed albino hadn't been an ignorant fanatic without any knowledge of psychology at all? Galaxy knows what the idiot has done in the way of damage."

There was a silence. The secretary clicked his teeth with a thoughtful fingernail. "I don't know . . . I don't know. But I've got to find out. And I can't wait years."

He left, and the Board Master turned seethingly to Brand, "And how are we going to stop him from going to the robot world if he wants to?"

"I don't see how he can go if we don't let him. *He* doesn't head the expedition."

"Oh, doesn't he? *That's* what I was about to tell you just before he came in. Ten ships of the fleet have landed on Dorlis since we arrived."

"*What!*"

"Just that."

"But what for?"

"That, my boy, is what I don't understand, either."

* * *

"Mind if I drop in?" said Wynne Murry, pleasantly, and Theor Realo looked up in

sudden anxiety from the papers that lay in hopeless disarray on the desk before him.

"Come in. I'll clear off a seat for you." The albino hustled the mess off one of the two chairs in a state of twittering nerves.

Murry sat down and swung one long leg over the other. "Are you assigned a job here, too?" He nodded at the desk.

Theor shook his head and smiled feebly. Almost automatically, he brushed the papers together in a heap and turned them face down.

In the months since he had returned to Dorlis with a hundred psychologists of various degrees of renown, he had felt himself pushed farther and farther from the center of things. There was room for him no longer. Except to answer questions on the actual state of things upon the robot world, which he alone had visited, he played no part. And even there he detected, or seemed to detect, anger that *he* should have gone, and not a competent scientist.

It was a thing to be resented. Yet, somehow, it had always been like that.

"Pardon me?" He had let Murry's next remark slip.

The secretary repeated, "I say it's surprising you're *not* put to work, then. You made the original discovery, didn't you?"

"Yes," the albino brightened. "But it went out of my hands. It got beyond me."

"You were on the robot world, though."

"That was a mistake, they tell me. I might have ruined everything."

Murry grimaced. "What really gets them, I guess, is that you've got a lot of first-hand dope they didn't. Don't let their fancy titles fool you into thinking you're a nobody. You and I—I'm a layman, too, you know—have to stand up for our rights. Here, have a cigarette."

"I don't sm— I'll take one, thank you." The albino felt himself warming to the long-bodied man opposite. He turned the papers face upward again, and lit up, bravely but uncertainly.

"Twenty-five years." Theor spoke carefully, skirting around urgent coughs.

"Would you answer a few questions about the world?"

"I suppose so. That's all they ever ask me about. But hadn't you better ask *them?* They've probably got it all worked out now." He blew the smoke as far from himself as possible.

Murry said, "Frankly, they haven't even begun, and I want the information without benefit of confusing psychological translation. First of all, what kind of people—or things—are these robots? You haven't a photocast of one of them, have you?"

"Well, no. I didn't like to take 'casts of them. But they're not things. They're *people!*"

"No? Do they look like—people?"

"Yes—mostly. Outside, anyway. I brought some microscopic studies of the cellular structure that I got hold of. The Board Master has them. They're different inside, you know, greatly simplified. But you'd never know that. They're interesting—and nice."

"Are they simpler than the other life of the planet?"

"Oh, no. It's a very primitive planet. And . . . and," he was interrupted by a spasm of coughing and crushed the cigarette to death as unobtrusively as possible. "They've got a protoplasmic base, you know. I don't think they have the slightest idea they're robots."

"No. I don't suppose they would have. What about their science?"

"I don't know. I never got a chance to see. And everything was so different. I guess it would take an expert to understand."

"Did they have machines?"

The albino looked surprised. "Well, of course. A good many, of all sorts."

"Large cities?"

"Yes!"

The secretary's eyes grew thoughtful. "And you like them. Why?"

Theor Realo was brought up sharply. "I don't know. They were just likable. We got along. They didn't bother me so. It's nothing I can put my finger on. Maybe it's because I have it so hard getting along back home, and they weren't as difficult as real people."

"They were more friendly?"

"N-no. Can't say so. They never quite accepted me. I was a stranger, didn't know their language at first—all that. But"—he looked up with sudden brightness—"I understood them better. I could tell what they were thinking better. I— But I don't know why."

"Hm-m-m. Well—another cigarette? No? I've got to be walloping the pillow now. It's getting late. How about a twosome at golf tomorrow? I've worked up a little course. It'll do. Come on out. The exercise will put hair on your chest."

He grinned and left.

He mumbled one sentence to himself: "It looks like a death sentence"—and whistled thoughtfully as he passed along to his own quarters.

* * *

He repeated the phrase to himself when he faced the Board Master the next day, with the sash of office about his waist. He did not sit down.

"Again?" said the Board Master, wearily.

"Again!" assented the secretary. "But real business this time. I may have to take over direction of your expedition."

"What! Impossible, sir! I will listen to no such proposition."

"I have my authority." Wynne Murry presented the metalloid cylinder that snapped open at a flick of the thumb. "I have full powers and full discretion as to their use. It is signed, as you will observe, by the chairman of the Congress of the Federation."

"So— But why?" The Board Master, by an effort, breathed normally. "Short of arbitrary tyranny, is there a reason?"

"A very good one, sir. All along, we have viewed this expedition from different angles. The Department of Science and Technology views the robot world not from the point of view of a scientific curiosity, but from the standpoint of its interference with the peace of the Federation. I don't think you've ever stopped to consider the danger inherent in this robot world."

"None that I can see. It is thoroughly isolated and thoroughly harmless."

"How can you know?"

"From the very nature of the experiment," shouted the Board Master angrily. "The original planners wanted as nearly a completely closed system as possible. Here they are, just as far off the trade routes as possible, in a thinly populated region of space. The whole idea was to have the robots develop free of interference."

Murry smiled. "I disagree with you there. Look, the whole trouble with you is that you're a theoretical man. You look at things the way they ought to be and I, a practical man, look at things as they are. No experiment can be set up and allowed to run indefinitely under its own power. It is taken for granted that somewhere there is at least an observer who watches and *modifies* as circumstances warrant."

"Well?" said the Board Master stolidly.

"Well, the observers in this experiment, the original psychologists of Dorlis, passed away with the First Confederation, and for fifteen thousand years the experiment has proceeded by itself. Little errors have added up and become big ones and introduced alien factors which induced still other errors. It's a geometric progression. And there's been no one to halt it."

"Pure hypothesis."

"Maybe. But you're interested only in the robot world, and I've got to think of the entire Federation."

"And just what possible danger can the robot world be to the Federation? I don't know *what* in Arcturus you're driving at, man."

Murry sighed. "I'll be simple, but don't blame me if I sound melodramatic. The Federation hasn't had any internal warfare for centuries. What will happen if we come into contact with these robots?"

"Are you afraid of one world?"

"Could be. What about their science? Robots can do funny things sometimes."

"What science can they have? They're not metal-electricity supermen. They're weak protoplasmic creatures, a poor imitation of actual humanity, built around a positronic brain adjusted to a set of simplified human psychological laws. If the word 'robot' is scaring you—"

"No, it isn't, but I've talked to Theor Realo. He's the only one who's seen them, you know."

The Board Master cursed silently and fluently. It came of letting a weak-minded freak of a layman get underfoot where he could babble and do harm.

He said, "We've got Realo's full story, and we've evaluated it fully and capably. I assure you, no harm exists in them. The experiment is so thoroughly academic, I wouldn't spend two days on it if it weren't for the broad scope of the thing. From what we see, the whole idea was to build up a positronic brain containing modifications of one or two of the fundamental axioms. We haven't worked out the details, but they must be minor, as it was the first experiment of this nature ever tried, and even the great mythical psychologists of that day had to progress stepwise. Those robots, I tell you, are neither supermen nor beasts. I assure you—as a psychologist."

"Sorry! I'm a psychologist, too. A little more rule-of-thumb, I'm afraid. That's all. But even little modifications! Take the general spirit of combativeness. That isn't the scientific term, but I've no patience for that. You know what I mean. We humans used to be combative. But it's being bred out of us. A stable political and economic system doesn't encourage the waste energy of combat. It's not a survival factor. But suppose the robots are combative. Suppose as the result of a wrong turn during the millennia they've been unwatched, they've become far more combative than ever their first makers intended. They'd be uncomfortable things to be with."

"And suppose all the stars in the Galaxy became novae at the same time. Let's *really* start worrying."

* * *

"And there's another point." Murry ignored the other's heavy sarcasm. "Theor Realo liked those robots. He liked robots better than he likes real people. He felt that he fitted there, and we all know he's been a bad misfit in his own world."

"And what," asked the Board Master, "is the significance of that?"

"You don't see it?" Wynne Murry lifted his eyebrows. "Theor Realo likes those robots because he is *like* them, obviously. I'll guarantee right now that a complete psychic analysis of Theor Realo will show a modification of several fundamental axioms, and the same ones as in the robots.

"And," the secretary drove on without a pause, "Theor Realo worked for a quarter of a century to prove a point, when all science would have laughed him to death if they had known about it. There's fanaticism there; good, honest, *inhuman* perseverance. *Those robots are probably like that!*"

"You're advancing no logic. You're arguing like a maniac, like a moon-struck idiot."

"I don't need strict mathematical proof. Reasonable doubt is sufficient. I've got to protect the Federation. Look, it *is* reasonable, you know. The psychologists of Dorlis weren't as super as all that. They had to advance stepwise, as you yourself pointed out. Their humanoids—let's not call them robots—were only imitations of human beings and they couldn't be good ones. Humans possess certain very, *very* complicated reaction systems—things like social consciousness, and a tendency toward the establishment of ethical systems; and more ordinary things like chivalry, generosity, fair play and so on, that simply can't possibly be duplicated. I don't think those humanoids can have them. But they *must* have perseverance, which practically implies stubbornness and combativeness, if my notion on Theor Realo holds good. Well, if their science is anywhere at all, then I don't want to have them running loose in the Galaxy, if our numbers are a thousand or million times theirs. And I don't intend to permit them to do so!"

The Board Master's face was rigid. "What are your immediate intentions?"

"As yet undecided. But I think I am going to organize a small-scale landing on the planet."

"Now, wait." The old psychologist was up and around the desk. He seized the secretary's elbow. "Are you quite certain you know what you're doing? The potentialities in this massive experiment are beyond any possible precalculation by you or me. You can't know what you're destroying."

"I know. Do you think I enjoy what I'm doing? This isn't a hero's job. I'm enough of a psychologist to want to know what's going on, but I've been sent here to protect the Federation, and to the best of my ability I intend doing it—and a dirty job it is. But I can't help it."

"You can't have thought it out. What can you know of the insight it will give us into the basic ideas of psychology? This will amount to a fusion of two Galactic systems, that will send us to heights that will make up in knowledge and power a million times the amount of harm the robots could ever do, if they *were* metal-electricity supermen."

The secretary shrugged. "Now you're the one that is playing with faint possibilities."

"Listen, I'll make a deal. Blockade them. Isolate them with your ships. Mount guards. But don't touch them. Give us more time. Give us a chance. You must!"

"I've thought of that. But I would have to get Congress to agree to that. It would be expensive, you know."

The Board Master flung himself into his chair in wild impatience. "What kind of expense are you talking about? Do you realize the nature of the repayment if we succeed?"

Murry considered; then, with a half smile, "What if they develop interstellar travel?"

The Board Master said quickly, "Then I'll withdraw my objections."

The secretary rose, "I'll have it out with Congress."

* * *

Brand Gorla's face was carefully emotionless as he watched the Board Master's stooped back. The cheerful pep talks to the available members of the expedition lacked meat, and he listened to them impatiently.

He said, "What are we going to do now?"

The Board Master's shoulders twitched and he didn't turn. "I've sent for Theor Realo. That little fool left for the Eastern Continent last week—"

"Why?"

The older man blazed at the interruption. "How can I understand anything that freak does! Don't you see that Murry's right? He's a psychic abnormality. We had no business leaving him unwatched. If I had ever thought of looking at him twice, I wouldn't have. He's coming back now, though, and he's going to stay back." His voice fell to a mumble. "Should have been back two hours ago."

"It's an impossible position, sir," said Brand, flatly.

"Think so?"

"Well— Do *you* think Congress will stand for an indefinite patrol off the robot world? It runs into money, and average Galactic citizens aren't going to see it as worth the taxes. The psychological equations degenerate into the axioms of common sense. In fact, I don't see why Murry agreed to consult Congress."

"Don't you?" The Board Master finally faced his junior. "Well, the fool considers himself a psychologist, Galaxy help us, and that's his weak point. He flatters himself that he doesn't want to destroy the robot world in his heart, but that it's the good of the Federation that requires it. And he'll jump at any reasonable compromise. Congress won't agree to it indefinitely, you don't have to point that out to me." He was talking quietly, patiently. "But I will ask for ten years, two years, six months—as much as I can get. I'll get something. In that time, we'll learn new facts about the world. Somehow we'll strengthen our case and renew the agreement when it expires. We'll save the project yet."

There was a short silence and the Board Master added slowly and bitterly, "And that's where Theor Realo plays a vital part."

Brand Gorla watched silently, and waited. The Board Master said, "On that one point, Murry saw what we didn't. Realo is a psychological cripple, and is our real clue to the whole affair. If we study him, we'll have a rough picture of what the robot is like, distorted of course, since his environment had been a hostile, unfriendly one. But we can make allowance for that, estimate his nature in a— Ahh, I'm tired of the whole subject."

The signal box flashed, and the Board Master sighed. "Well, he's here. All right, Gorla, sit down, you make me nervous. Let's take a look at him."

* * *

Theor Realo came through the door like a comet and brought himself to a panting halt in the middle of the floor. He looked from one to the other with weak, peering eyes.

"How did all this happen?"

"All what? said the Board Master coldly. "Sit down. I want to ask you some questions."

"No. You first answer *me*."

"*Sit down!*"

Realo sat. His eyes were brimming. "They're going to destroy the robot world."

"Don't worry about that."

"But you said they could if the robots discovered interstellar travel. You said so. You fool. Don't you see—" He was choking.

The Board Master frowned uneasily. "Will you calm down and talk sense?"

The albino gritted his teeth and forced the words out. "But they'll *have* interstellar travel before long."

And the two psychologists shot toward the little man.

"What!!"

"Well . . . well, what do you think?" Realo sprang upward with all the fury of desperation. "Did you think I landed in a desert or in the middle of an ocean and explored a world all by myself? Do you think life is a storybook? I was captured as soon as I landed and taken to a big city. At least, I think it was a big city. It was different from our kind. It had— But I won't tell you."

"Never mind the city," shrieked the Board Master. "You were captured. Go ahead."

"They studied *me*. They studied my machine. And then, one night, I left, to tell the Federation. They didn't know I left. They didn't want me to leave." His voice broke. "And I would have stayed as soon as not, but the Federation had to know."

"Did you tell them anything about your ship?"

"How could I? I'm no mechanic. I don't know the theory or construction. But I showed them how to work the controls and let them look at the motors. That's all."

Brand Gorla said, to himself mostly, "Then they'll never get it. That isn't enough."

The albino's voice raised itself in sudden shrieking triumph. "Oh, yes, they will. I know them. They're machines, you know. They'll work on that problem. And they'll work. And they'll work. And they'll never quit. And they'll get it. They got enough out of me. I'll *bet* they got enough."

The Board Master looked long, and turned away—wearily. "Why didn't you tell us?"

"Because you took my world away from me. I discovered it—by myself—all by myself. And after I had done all the real work, and invited you in, you threw me out. All you had for me was complaints that I had landed on the world and might have ruined everything by interference. Why should I tell you? Find out for yourselves if you're so wise, that you could afford to kick me around."

The Board Master thought bitterly, "Misfit! Inferiority complex! Persecution mania! Nice! It all fits in, now that we've bothered to take our eyes off the horizon and see what was under our nose. And now it's all ruined."

He said, "All right, Realo, we all lose. Go away."

Brand Gorla said tightly, "All over? Really all over?"

The Board Master answered, "Really all over. The original experiment, as such, is over. The distortions created by Realo's visit will easily be large enough to make the plans we are studying here a dead language. And besides—Murry is right. If they have interstellar travel, they're dangerous."

Realo was shouting, "But you're not going to destroy them. You can't destroy them. They haven't hurt anyone."

There was no answer, and he raved on, "I'm going back. I'll warn them. They'll be prepared. I'll warn them."

He was backing toward the door, his thin, white hair bristling, his red-rimmed eyes bulging.

The Board Master did not move to stop him when he dashed out.

"Let him go. It was *his* lifetime. I don't care any more."

Theor Realo smashed toward the robot world at an acceleration that was half choking him.

Somewhere ahead was the dustspeck of an isolated world with artificial imitations of humanity struggling along in an experiment that had died. Struggling blindly toward a new goal of interstellar travel that was to be their death sentence.

He was heading toward that world, toward the same city in which he had been "studied" the first time. He remembered it well. Its name was the first words of their language he had learned.

New York!

Catch That Rabbit

The vacation was longer than two weeks. That, Mike Donovan had to admit. It had been six months, with pay. He admitted that, too. But that, as he explained furiously, was fortuitous. U. S. Robots had to get the bugs out of the multiple robot, and there were plenty of bugs, and there are always at least half a dozen bugs left for the field-testing. So they waited and relaxed until the drawing-board men and the slide-rule boys had said "OK!". And now he and Powell were out on the asteroid and it was *not* OK. He repeated that a dozen times, with a face that had gone beety, "For the love of Pete, Greg, get realistic. What's the use of adhering to the letter of the specifications and watching the test go to pot? It's about time you got the red tape out of your pants and went to work."

"I'm only saying," said Gregory Powell, patiently, as one explaining electronics to an idiot child, "that according to spec, those robots are equipped for asteroid mining without supervision. We're not supposed to watch them."

"All right. Look—logic!" He lifted his hairy fingers and pointed. "One: That new robot passed every test in the home laboratories. Two: United States Robots guaranteed their passing the test of actual performance on an asteroid. Three: The robots are not passing said tests. Four: If they don't pass, United States Robots loses ten million credits in cash and about one hundred million in reputation. Five: If they don't pass and we can't explain why they don't pass, it is just possible two good jobs may have to be bidden a fond farewell."

Powell groaned heavily behind a noticeably insincere smile. The unwritten motto of United States Robots and Mechanical Men Corporation was well-known: "No employee makes the same mistake twice. He is fired the first time."

Aloud he said, "You're as lucid as Euclid with everything except the facts. You've watched that robot group for three shifts, you redhead, and they did their work perfectly. You said so yourself. What else can we do?"

"Find out what's wrong, that's what we can do. So they did work perfectly when I watched them. But on three different occasions when I didn't watch them, they didn't bring in any ore. They didn't even come back on schedule. I had to go after them."

"And was anything wrong?"

"Not a thing. Not a thing. Everything was perfect. Smooth and perfect as the luminiferous ether. Only one little insignificant detail disturbed me—*there was no ore.*"

Powell scowled at the ceiling and pulled at his brown mustache. "I'll tell you what, Mike. We've been stuck with pretty lousy jobs in our time, but this takes the iridium asteroid. The whole business is complicated past endurance. Look, that robot, DV-5, has six robots under it. And not just under it—they're part of it."

"I know that—"

"Shut up!" said Powell, savagely, "I know you know it, but I'm just describing for the hell of it. Those six subsidiaries are part of DV-5 like your fingers are part of you and it gives them their orders neither by voice nor radio, but directly through positronic fields. Now—there isn't a roboticist back at United States Robots that knows what a positronic field is or how it works. And neither do I. Neither do you."

"The last," agreed Donovan, philosophically, "I know."

"Then look at our position. If everything works—fine! If anything goes wrong—we're out of our depth and there probably isn't a thing we can do, or anybody else. But the job belongs to us and not to anyone else so we're on the spot, Mike." He blazed away for a moment in silence. Then, "All right, have you got him outside?"

"Yes."

"Is everything normal now?"

"Well he hasn't got religious mania, and he isn't running around in a circle spouting Gilbert and Sullivan, so I suppose he's normal."

Donovan passed out the door, shaking his head viciously.

* * *

Powell reached for the "Handbook of Robotics" that weighed down one side of his desk to a near-founder and opened it reverently. He had once jumped out of the window of a burning house dressed only in shorts and the "Handbook." In a pinch, he would have skipped the shorts.

The "Handbook" was propped up before him, when Robot DV-5 entered, with Donovan kicking the door shut behind him.

Powell said somberly, "Hi, Dave. How do you feel?"

"Fine," said the robot. "Mind if I sit down?" He dragged up the specially reinforced chair that was his, and folded gently into it.

Powell regarded Dave—laymen might think of robots by their serial numbers; roboticists never—with approval. It was not overmassive by any means, in spite of its construction as thinking-unit of an integrated seven-unit robot team. It was seven feet tall, and a half-ton of metal and electricity. A lot? Not when that half-ton has to be a mass of condensers, circuits, relays, and vacuum cells that can handle practically any psychological reaction known to humans. And a positronic brain, which with ten pounds of matter and a few quintillions of positrons runs the whole show.

Powell groped in his shirt pocket for a loose cigarette. "Dave," he said, "you're a good fellow. There's nothing flighty or prima donnaish about you. You're a stable, rock-bottom mining robot, except that you're equipped to handle six subsidiaries in direct coordination. As far as I know, that has not introduced any unstable paths in your brain-path map."

The robot nodded, "That makes me feel swell, but what are you getting at, boss?"

He was equipped with an excellent diaphragm, and the presence of overtones in the sound unit robbed him of much of that metallic flatness that marks the usual robot voice.

"I'm going to tell you. With all that in your favor, what's going wrong with your job? For instance, today's B-shift?"

Dave hesitated, "As far as I know, nothing."

"You didn't produce any ore."

"I know."

"Well, then—"

Dave was having trouble, "I can't explain that, boss. It's been giving me a case of nerves, or it would if I let it. My subsidiaries worked smoothly. I know I did." He considered, his photoelectric eyes glowing intensely. Then, "I don't remember. The day ended and there was Mike and there were the ore cars, mostly empty."

Donovan broke in, "You didn't report at shift-end those days, Dave. You know that?"

"I know. But as to why—" He shook his head slowly and ponderously.

Powell had the queasy feeling that if the robot's face were capable of expression, it would be one of pain and mortification. A robot, by its very nature, cannot bear to fail its function.

Donovan dragged his chair up to Powell's desk and leaned over, "Amnesia, do you think?"

"Can't say. But there's no use in trying to pin disease names on this. Human disorders apply to robots only as romantic analogies. They're no help to robotic engineering." He scratched his neck, "I hate to put him through the elementary brain-reaction tests. It won't help his self-respect any."

He looked at Dave thoughtfully and then at the Field-Test outline given in the "Handbook." He said, "See here, Dave, what about sitting through a test? It would be the wise thing to do."

The robot rose, "If you say so, boss." There *was* pain in his voice.

* * *

It started simply enough. Robot DV-5 multiplied five-place figures to the heartless ticking of a stop watch. He recited the prime numbers between a thousand and ten thousand. He extracted cube roots and integrated functions of varying complexity. He went through mechanical reactions in order of increasing difficulty. And, finally, worked his precise mechanical mind over the highest function of the robot world—the solutions of problems in judgment and ethics.

At the end of two hours, Powell was copiously besweated. Donovan had enjoyed a none-too-nutritious diet of fingernail and the robot said, "How does it look, boss?"

Powell said, "I've got to think it over, Dave. Snap judgments won't help much. Suppose you go back to the C-shift. Take it easy. Don't press too hard for quota just for a while—and we'll fix things up."

The robot left. Donovan looked at Powell.

"Well—"

Powell seemed determined to push up his mustache by the roots. He said, "There is nothing wrong with the currents of his positronic brain."

"I'd hate to be that certain."

"Oh, Jupiter, Mike! The brain is the surest part of a robot. It's quintuple-checked back on Earth. If they pass the field test perfectly, the way Dave did, there just isn't a chance of brain misfunction. That test covered every key path in the brain."

"So where are we?"

"Don't rush me. Let me work this out. There's still the possibility of a mechanical breakdown in the body. That leaves about fifteen hundred condensers, twenty thousand individual electric circuits, five hundred vacuum cells, a thousand relays, and upty-ump thousand other individual pieces of complexity that can be wrong. *And* these mysterious positronic fields no one knows anything about."

"Listen, Greg," Donovan grew desperately urgent. "I've got an idea. That robot may be lying. He never—"

"Robots can't knowingly lie, you fool. Now if we had the McCormack-Wesley tester, we could check each individual item in his body within twenty-four to forty-eight hours, but the only two M.-W. testers existing are on Earth, and they weigh ten tons, are on concrete foundations and can't be moved. Isn't that peachy?"

Donovan pounded the desk, "But, Greg, he only goes wrong when we're not around. There's something—sinister—about—that." He punctuated the sentence with slams of fist against desk.

"You," said Powell, slowly, "make me sick. You've been reading adventure novels."

"What I want to know," shouted Donovan, "is what we're going to do about it."

"I'll tell you. I'm going to install a visiplate right over my desk. Right on the wall over there, see!" He jabbed a vicious finger at the spot. "Then I'm going to focus it at whatever part of the mine is being worked, and I'm going to watch. That's all."

"That's all? Greg—"

Powell rose from his chair and leaned his balled fists on the desk, "Mike, I'm having a hard time." His voice was weary. "For a week, you've been plaguing me about Dave. You say he's gone wrong. Do you know how he's gone wrong? No! Do you know what shape this wrongness takes? No! Do you know what brings it on? No! Do you know what snaps him out? No! Do you know anything about it? No! Do I know anything about it? No! So what do you want me to do?"

Donovan's arm swept outward in a vague, grandiose gesture, "You got me!"

"So I tell you again. Before we do anything toward a cure, we've got to find out what the disease is in the first place. The first step in cooking rabbit stew is catching the rabbit. Well, we've got to catch that rabbit! Now get out of here."

* * *

Donovan stared at the preliminary outline of his field report with weary eyes. For one thing, he was tired and for another, what was there to report while things were unsettled? He felt resentful.

He said, "Greg, we're almost a thousand tons behind schedule."

"You," replied Powell, never looking up, "are telling me something I don't know."

"What I want to know," said Donovan, in sudden savagery, "is why we're always tangled up with new-type robots. I've finally decided that the robots that were good enough for my great-uncle on my mother's side are good enough for me. I'm for what's tried and true. The test of time is what counts—good, solid, old-fashioned robots that never go wrong."

Powell threw a book with perfect aim, and Donovan went tumbling off his seat.

"Your job," said Powell, evenly, "for the last five years has been to test new robots under actual working conditions for United States Robots. Because you and I have been so injudicious as to display proficiency at the task, we've been rewarded with the dirtiest jobs. That," he jabbed holes in the air with his finger in Donovan's direction, "is your work. You've been griping about it, from personal memory, since about five minutes after United States Robots signed you up. Why don't you resign?"

"Well, I'll tell you." Donovan rolled onto his stomach, and took a firm grip on his wild, red hair to hold his head up. "There's a certain principle involved. After all, as a trouble shooter, I've played a part in the development of new robots. There's the principle of aiding scientific advance. But don't get me wrong. It's not the principle that keeps me going; it's the money they pay us. *Greg!*"

Powell jumped at Donovan's wild shout, and his eyes followed the redhead's to the visiplate, when they goggled in fixed horror. He whispered, "Holy—howling—Jupiter!"

Donovan scrambled breathlessly to his feet, "Look at them, Greg. They've gone nuts."

Powell said, "Get a pair of suits. We're going out there."

He watched the posturings of the robots on the visiplate. They were bronzy gleams of smooth motion against the shadowy crags of the airless asteroid. There was a marching formation now, and in their own dim body light, the rough-hewn walls of the mine tunnel swam past noiselessly, checkered with misty erratic blobs of shadow. They marched in unison, seven of them, with Dave at the head. They wheeled and turned in macabre simultaneity; and melted through changes of formation with the weird ease of chorus dancers in Lunar Bowl.

Donovan was back with the suits. "They've gone jingo on us, Greg. That's a military march."

"For all you know," was the cold response, "it may be a series of calisthenic exercises. Or Dave may be under the hallucination of being a dancing master. Just you think first, and don't bother to speak afterward, either."

Donovan scowled and slipped a detonator into the empty side holster with an ostentatious shove. He said, "Anyway, there you are. So we work with new-model robots. It's our job, granted. But answer me one question. Why . . . *why* does something invariably go wrong with them?"

"Because," said Powell, somberly, "we are accursed. Let's go!"

* * *

Far ahead through the thick velvety blackness of the corridors that reached past the illuminated circles of their flashlights, robot light twinkled.

"There they are," breathed Donovan.

Powell whispered tensely, "I've been trying to get him by radio but he doesn't answer. The radio circuit is probably out."

"Then I'm glad the designers haven't worked out robots who can work in total darkness yet. I'd hate to have to find seven mad robots in a black pit without radio communication, if they *weren't* lit up like blasted radioactive Christmas trees."

"Crawl up on the ledge above, Mike. They're coming this way, and I want to watch them at close range. Can you make it?"

Donovan made the jump with a grunt. Gravity was considerably below Earth-normal, but with a heavy suit, the advantage was not too great, and the ledge meant a near ten-foot jump. Powell followed.

The column of robots were trailing Dave single-file. In mechanical rhythm, they converted to double and returned to single in different order. It was repeated over and over again and Dave never turned his head.

Dave was within twenty feet when the play-acting ceased. The subsidiary robots broke formation, waited a moment, then clattered off into the distance—very rapidly. Dave looked after them, then slowly sat down. He rested his head in one hand in a very human gesture.

His voice sounded in Powell's earphones, "Are you here, boss?"

Powell beckoned to Donovan and hopped off the ledge.

"O.K., Dave, what's been going on?"

The robot shook his head, "I don't know. One moment I was handling a tough outcropping in Tunnel 17, and the next I was aware of humans close by, and I found myself half a mile down main-stem."

"Where are the subsidiaries now?" asked Donovan.

"Back at work, of course. How much time has been lost?"

"Not much. Forget it." Then to Donovan, Powell added, "Stay with him the rest of the shift. Then, come back. I've got a couple of ideas."

* * *

It was three hours before Donovan returned. He looked tired.

Powell said, "How did it go?"

Donovan shrugged wearily, "Nothing ever goes wrong when you watch them. Throw me a butt, will you?"

The redhead lit it with exaggerated care and blew a careful smoke ring. He said, "I've been working it out, Greg. You know, Dave has a queer background for a robot. There are six others under him in an extreme regimentation. He's got life and death power over those subsidiary robots and it must react on his mentality. Suppose he finds it necessary to emphasize this power as a concession to his ego."

"Get to the point."

"It's right here. Suppose we have militarism. Suppose he's fashioning himself an army. Suppose he's training them in military maneuvers. Suppose—"

"Suppose you go soak your head. Your nightmares must be in technicolor. You're postulating a major aberration of the positronic brain. If your analysis were correct, Dave would have to break down the First Law of Robotics: that a robot may not injure a human being or, through inaction allow a human being to be injured. The type of militaristic attitude and domineering ego you propose must have as the end-point of its logical implications, domination of humans."

"All right. How do you know that isn't the fact of the matter?"

"Because any robot with a brain like that would, one, never have left the factory, and two, be spotted immediately if it ever was. I tested Dave, you know."

Powell shoved his chair back and put his feet on the desk. "No. We're still in the position where we can't make our stew because we haven't the slightest notion as to what's wrong. For instance, if we could find out what that *danse macabre* we witnessed was all about, we would be on the way out."

He paused, "Now listen, Mike, how does this sound to you? Dave goes wrong only when neither of us is present. And when he is wrong, the arrival of either of us snaps him out of it."

"I once told you that was sinister."

"Don't interrupt. How is a robot different when humans are not present? The answer is obvious. There is a larger requirement of personal initiative. In that case, look for the body parts that are affected by the new requirements."

"Golly." Donovan sat up straight, then subsided. "No, no. Not enough. It's too broad. It doesn't cut the possibilities much."

"Can't help that. In any case, there's no danger of not making quota. We'll take shifts watching those robots through the visor. Any time anything goes wrong, we get to the scene of action immediately. That will put them right."

"But the robots will fail spec anyway, Greg. United States Robots can't market DV models with a report like that."

"Obviously. We've got to locate the error in make-up and correct it—and we've got ten days to do it in." Powell scratched his head. "The trouble is . . . well, you had better look at the blueprints yourself."

The blueprints covered the floor like a carpet and Donovan crawled over the face of them following Powell's erratic pencil.

Powell said, "Here's where you come in, Mike. You're the body specialist, and I want you to check me. I've been trying to cut out all circuits not involved in the personal initiative hookup. Right here, for instance, is the trunk artery involving mechanical operations. I cut out all routine side routes as emergency divisions—" He looked up, "What do you think?"

Donovan had a very bad taste in his mouth, "The job's not that simple, Greg. Personal initiative isn't an electric circuit you can separate from the rest and study. When a robot is on his own, the intensity of the body activity increases immediately on almost all fronts. There isn't a circuit entirely unaffected. What must be done is to locate the particular condition—a very specific condition—that throws him off, and *then* start eliminating circuits."

Powell got up and dusted himself, "Hmph. All right. Take away the blueprints and burn them."

Donovan said, "You see when activity intensifies, anything can happen, given one single faulty part. Insulation breaks down, a condenser spills over, a connection sparks, a coil overheats. And if you work blind, with the whole robot to choose from, you'll never find the bad spot. If you take Dave apart and test every point of his body mechanism one by one, putting him together each time, and trying him out—"

"All right. All right. I can see through a porthole, too."

They faced each other hopelessly, and then Powell said cautiously, "Suppose we interview one of the subsidiaries."

Neither Powell nor Donovan had ever had previous occasion to talk to a "finger." It could talk; it wasn't quite the perfect analogy to a human finger. In fact, it had a fairly developed brain, but that brain was tuned primarily to the reception of orders via positronic field, and its reaction to independent stimuli was rather fumbling.

Nor was Powell certain as to its name. Its serial number was DV-5-2, but that was not very useful.

He compromised. "Look, pal," he said, "I'm going to ask you to do some hard thinking and then you can go back to your boss."

The "finger" nodded its head stiffly, but did not exert its limited brain-power on speech.

"Now on four occasions recently," Powell said, "your boss deviated from brain-scheme. Do you remember those occasions?"

"Yes, sir."

Donovan growled angrily, "*He* remembers. I tell you there is something very sinister—"

"Oh, go bash your skull. Of course, the 'finger' remembers. There is nothing wrong with him." Powell turned back to the robot, "What were you doing each time . . . I mean the whole group."

The "finger" had a curious air of reciting by rote, as if he answered questions by the mechanical pressure of his brain pan, but without any enthusiasm whatever.

He said, "The first time we were at work on a difficult outcropping in Tunnel 17, Level B. The second time we were buttressing the roof against a possible cave-in. The third time we were preparing accurate blasts in order to tunnel farther without breaking into a subterranean fissure. The fourth time was just after a minor cave-in."

"What happened at these times?"

"It is difficult to describe. An order would be issued, but before we could receive and interpret it, a new order came to march in queer formation."

Powell snapped out, "Why?"

"I don't know."

Donovan broke in tensely, "What was the first order . . . the one that was superseded by the marching directions?"

"I don't know. I sensed that an order was sent, but there was never time to receive it."

"Could you tell us anything about it? Was it the same order each time?"

The "finger" shook his head unhappily, "I don't know."

Powell leaned back, "All right, get back to your boss."

The "finger" left, with visible relief.

Donovan said, "Well, we accomplished a lot that time. That was real sharp dialogue all the way through. Listen, Dave and that imbecile 'finger' are both holding out on us. There is too much they don't know and don't remember. We've got to stop trusting them, Greg."

Powell brushed his mustache the wrong way, "So help me, Mike, another fool remark out of you, and I'll take away your rattle and teething ring."

"All right. You're the genius of the team. I'm just a poor sucker. Where do we stand?"

"Right behind the eight ball. I tried to work it backward through the 'finger,' and couldn't. So we've got to work it forward."

"A great man," marveled Donovan. "How simple that makes it. Now translate that into English, Master."

"Translating it into baby talk would suit you better. I mean that we've got to find out what order it is that Dave gives just before everything goes black. It would be the key to the business."

"And how do you expect to do that? We can't get close to him because nothing will go wrong as long as we are there. We can't catch the orders by radio because they are transmitted via this positronic field. That eliminates the close-range and the long-range method, leaving us a neat, cozy zero."

"By direct observation, yes. There's still deduction."

"Huh?"

"We're going on shifts, Mike." Powell smiled grimly. "And we are not taking our eyes off the visiplate. We're going to watch every action of those steel headaches. When they go off into their act, we're going to see what happened immediately before and we're going to deduce the order."

Donovan opened his mouth and left it that way for a full minute. Then he said in strangled tones, "I resign. I quit."

"You have ten days to think up something better," said Powell wearily.

Which, for eight days, Donovan tried mightily to do. For eight days, on alternate four-hour shifts, he watched with aching and bleary eyes those glinty metallic forms move against the vague background. And for eight days in the four-hour in-betweens, he cursed United States Robots, the DV models, and the day he was born.

And then on the eighth day, when Powell entered with an aching head and sleepy eyes for his shift, Donovan stood up and with very careful and deliberate aim launched a heavy book end for the exact center of the visiplate. There was a very appropriate splintering noise.

Powell gasped, "What did you do that for?"

"Because," said Donovan, almost calmly, "I'm not watching it any more. We've got two days left and we haven't found out a thing. DV-5 is a lousy loss. He's stopped five times since I've been watching and three times on your shift, and I can't make out what orders he gave, and you couldn't make it out. And I don't believe you could ever make it out because I know I couldn't ever."

"Jumping Space, how can you watch six robots at the same time? One makes with the hands, and one with the feet and one like a windmill and another is jumping up and down like a maniac. And the other two . . . devil knows what they are doing. And then they all stop. So! So!"

"Greg, we're not doing it right. We got to get up close. We've got to watch what they're doing from where we can see the details."

Powell broke a bitter silence. "Yeah, and wait for something to go wrong with only two days to go."

"Is it any better watching from here?"

"It's more comfortable."

"Ah— But there's something you can do there that you can't do here."

"What's that?"

"You can make them stop—at whatever time you choose—and while you're prepared and watching to see what goes wrong."

Powell startled into alertness, "Howzzat?"

"Well, figure it out yourself. You're the brains you say. Ask yourself some questions. When does DV-5 go out of whack? When did that 'finger' say he did? When a cave-in threatened, or actually occurred, when delicately measured explosives were being laid down, when a difficult seam was hit."

"In other words, during emergencies." Powell was excited.

"Right! When *did* you expect it to happen! It's the personal initiative factor that's giving us the trouble. And it's just during emergencies in the absence of a human being that personal initiative is most strained. Now what is the logical deduction? How can we create our own stoppage when and where we want it?" He paused triumphantly—he was beginning to enjoy his role—and answered his own question to forestall the obvious answer on Powell's tongue. "By creating our own emergency."

Powell said, "Mike—you're right."

"Thanks, pal. I knew I'd do it some day."

"All right, and skip the sarcasm. We'll save it for Earth, and preserve it in jars for future long, cold winters. Meanwhile, what emergency can we create?"

"We could flood the mines, if this weren't an airless asteroid."

"A witticism, no doubt," said Powell. "Really, Mike, you'll incapacitate me with laughter. What about a mild cave-in?"

Donovan pursed his lips and said, "O.K. by me."

"Good. Let's get started."

Powell felt uncommonly like a conspirator as he wound his way over the craggy landscape. His sub-gravity walk teetered across the broken ground, kicking rocks to right and left under his weight in noiseless puffs of gray dust. Mentally, though, it was the cautious crawl of the plotter.

He said, "Do you know where they are?"

"I think so, Greg."

"All right," Powell said gloomily, "but if any 'finger' gets within twenty feet of us, we'll be sensed whether we are in the line of sight or not. I hope you know that."

"When I need an elementary course in robotics, I'll file an application with you, formally, and in triplicate. Down through here."

They were in the tunnels now; even the starlight was gone. The two hugged the walls, flashes flickering out the way in intermittent bursts. Powell felt for the security of his detonator.

"Do you know this tunnel, Mike?"

"Not so good. It's a new one. I think I can make it out from what I saw in the visiplate, though—"

Interminable minutes passed, and then Mike said, "Feel that!"

There was a slight vibration thrumming the wall against the fingers of Powell's metal-incased hand. There was no sound, naturally.

"Blasting! We're pretty close."

"Keep your eyes open," said Powell.

Donovan nodded impatiently.

It was upon them and gone before they could seize themselves—just a bronze glint across the field of vision. They clung together in silence.

Powell whispered, "Think it sensed us?"

"Hope not. But we'd better flank them. Take the first side tunnel to the right."

"Suppose we miss them altogether?"

"Well what do you want to do? Go back?" Donovan grunted fiercely. "They're within a quarter of a mile. I was watching them through the visiplate, wasn't I? And we've got two days—"

"Oh, shut up. You're wasting your oxygen. Is this a side passage here?" The flash flicked. "It is. Let's go."

The vibration was considerably more marked and the ground below shuddered uneasily.

"This is good," said Donovan, "if it doesn't give out on us, though." He flung his light ahead anxiously.

They could touch the roof of the tunnel with a half-upstretched hand, and the bracings had been newly placed.

Donovan hesitated, "Dead end, let's go back."

"No. Hold on." Powell squeezed clumsily past. "Is that light ahead?"

"Light? I don't see any. Where would there be light down here?"

"Robot light." He was scrambling up a gentle incline on hands and knees. His voice was hoarse and anxious in Donovan's ears. "Hey, Mike, come up here."

There was light. Donovan crawled up and over Powell's outstretched legs. "An opening?"

"Yes. They must be working into this tunnel from the other side now—I think."

Donovan felt the ragged edges of the opening that looked out into what the cautious

flashlight showed to be a larger and obviously main-stem tunnel. The hole was too small for a man to go through, almost too small for two men to look through simultaneously.

"There's nothing there," said Donovan.

"Well, not now. But there must have been a second ago or we wouldn't have seen light. Watch out!"

The walls rolled about them and they felt the impact. A fine dust showered down. Powell lifted a cautious head and looked again. "All right, Mike. They're there."

The glittering robots clustered fifty feet down the main stem. Metal arms labored mightily at the rubbish heap brought down by the last blast.

Donovan urged eagerly, "Don't waste time. It won't be long before they get through, and the next blast may get us."

"For Pete's sake, don't rush me." Powell unlimbered the detonator, and his eyes searched anxiously across the dusky background where the only light was robot light and it was impossible to tell a projecting boulder from a shadow.

"There's a spot in the roof, see it, almost over them. The last blast didn't quite get it. If you can get it at the base, half the roof will cave in."

Powell followed the dim finger, "Check! Now fasten your eye on the robots and pray they don't move too far from that part of the tunnel. They're my light sources. Are all seven there?"

Donovan counted, "All seven."

"Well, then, watch them. Watch every motion!"

His detonator was lifted and remained poised while Donovan watched and cursed and blinked the sweat out of his eye.

It flashed!

There was a jar, a series of hard vibrations, and then a jarring thump that threw Powell heavily against Donovan.

Donovan yowled, "Greg, you threw me off. I didn't see a thing."

Powell stared about wildly, "Where are they?"

Donovan fell into a stupid silence. There was no sign of the robots. It was dark as the depths of the River Styx.

"Think we buried them?" quavered Donovan.

"Let's get down there. Don't ask me what I think." Powell crawled backward at tumbling speed.

"Mike!"

Donovan paused in the act of following. "What's wrong now?"

"Hold on!" Powell's breathing was rough and irregular in Donovan's ears. "Mike! Do you hear me, Mike?"

"I'm right here. What is it?"

"We're blocked in. It wasn't the ceiling coming down fifty feet away that knocked us over. It was our own ceiling. The shock's tumbled it!"

"What!" Donovan scrambled up against a hard barrier. "Turn on the flash."

Powell did so. At no point was there room for a rabbit to squeeze through.

Donovan said softly, "Well, what do you know?"

* * *

They wasted a few moments and some muscular power in an effort to move the blocking barrier. Powell varied this by wrenching at the edges of the original hole. For a

moment, Powell lifted his blaster. But in those close quarters, a flash would be suicide and he knew it. He sat down.

"You know, Mike," he said, "we've really messed this up. We are no nearer finding out what's wrong with Dave. It was a good idea but it blew up in our face."

Donovan's glance was bitter with an intensity totally wasted on the darkness. "I hate to disturb you, old man, but quite apart from what we know or don't know of Dave, we're slightly trapped. If we don't get loose, fella, we're going to die. D-I-E, die. How much oxygen have we anyway? Not more than six hours."

"I've thought of that." Powell's fingers went up to his long-suffering mustache and clanged uselessly against the transparent visor. "Of course, we could get Dave to dig us out easily in that time, except that our precious emergency must have thrown him off, and his radio circuit is out."

"And isn't that nice?"

Donovan edged up to the opening and managed to get his metal-incased head out. It was an extremely tight fit.

"Hey, Greg!"

"What?"

"Suppose we get Dave within twenty feet. He'll snap to normal. That will save us."

"Sure, but where is he?"

"Down the corridor—way down. For Pete's sake, stop pulling before you drag my head out of its socket. I'll give you your chance to look."

Powell maneuvered his head outside, "We did it all right. Look at those saps. That must be a ballet they're doing."

"Never mind the side remarks. Are they getting any closer?"

"Can't tell yet. They're too far away. Give me a chance. Pass me my flash, will you? I'll try to attract their attention that way."

He gave up after two minutes, "Not a chance! They must be blind. Uh-oh, they're starting toward us. What do you know?"

Donovan said, "Hey, let me see!"

There was a silent scuffle. Powell said, "All right!" and Donovan got his head out.

They were approaching. Dave was high-stepping the way in front and the six "fingers" were a weaving chorus line behind him.

Donovan marveled, "What are they doing? That's what I want to know. It looks like the Virginia reel—and Dave's a major-domo, or I never saw one."

"Oh, leave me alone with your descriptions," grumbled Powell. "How near are they?"

"Within fifty feet and coming this way. We'll be out in fifteen min— Uh—huh—HUH—HEY-Y!"

"What's going on?" It took Powell several seconds to recover from his stunned astonishment at Donovan's vocal gyrations. "Come on, give me a chance at that hole. Don't be a hog about it."

He fought his way upward, but Donovan kicked wildly. "They did an about-face, Greg. They're leaving. Dave! Hey, Da-a-ave!"

Powell shrieked, "What's the use of that, you fool? Sound won't carry."

"Well, then," panted Donovan, "kick the walls, slam them, get some vibration started. We've got to attract their attention somehow, Greg, or we're through." He pounded like a madman.

Powell shook him, "Wait, Mike, wait. Listen, I've got an idea. Jumping Jupiter, this is a fine time to get around to the simple solutions. Mike!"

"What do you want?" Donovan pulled his head in.

"Let me in there fast before they get out of range."

"Out of range! What are you going to do? Hey, what are you going to do with that detonator?" He grabbed Powell's arm.

Powell shook off the grip violently. "I'm going to do a little shooting."

"Why?"

"That's for later. Let's see if it works first. If it doesn't, then— Get out of the way and let me shoot!"

* * *

The robots were flickers, small and getting smaller, in the distance. Powell lined up the sights tensely, and pulled the trigger three times. He lowered the guns and peered anxiously. One of the subsidiaries was down! There were only six gleaming figures now.

Powell called into his transmitter uncertainly. "Dave!"

A pause, then the answer sounded to both men, "Boss? Where are you? My third subsidiary has had his chest blown in. He's out of commission."

"Never mind your subsidiary," said Powell. "We're trapped in a cave-in where you were blasting. Can you see our flashlight?"

"Sure. We'll be right there."

Powell sat back and relaxed. "That, my fran', is that."

Donovan said very softly with tears in his voice, "All right, Greg. You win. I beat my forehead against the ground before your feet. Now don't feed me any bull. Just tell me quietly what it's all about."

"Easy. It's just that all through we missed the obvious—as usual. We knew it was the personal initiative circuit, and that it always happened during emergencies, but we kept looking for a specific order as the cause. Why should it be an order?"

"Why not?"

"Well, look. Why not a type of order. What type of order requires the most initiative? What type of order would occur almost always only in an emergency?"

"Don't ask me, Greg. Tell me!"

"I'm doing it! It's the six-way order. Under all ordinary conditions, one or more of the 'fingers' would be doing routine tasks requiring no close supervision—in the sort of offhand way our bodies handle the routine walking motions. But in an emergency, all six subsidiaries must be mobilized immediately and simultaneously. Dave must handle six robots at a time and something gives. The rest was easy. Any decrease in initiative required, such as the arrival of humans, snaps him back. So I destroyed one of the robots. When I did, he was transmitting only five-way orders. Initiative decreases—he's normal."

"How did you get all that?" demanded Donovan.

"Just logical guessing. I tried it and it worked."

The robot's voice was in their ears again, "Here I am. Can you hold out half an hour?"

"Easy!" said Powell. Then, to Donovan, he continued, "And now the job should be simple. We'll go through the circuits, and check off each part that gets an extra workout in a six-way order as against a five-way. How big a field does that leave us?"

Donovan considered, "Not much, I think. If Dave is like the preliminary model we saw back at the factory, there's a special co-ordinating circuit that would be the only

section involved." He cheered up suddenly and amazingly, "Say, that wouldn't be bad at all. There's nothing to that."

"All right. You think it over and we'll check the blueprints when we get back. And now, till Dave reaches us, I'm relaxing."

"Hey, wait! Just tell me one thing. What were those queer shifting marches, those funny dance steps, that the robots went through every time they went screwy?"

"That? I don't know. But I've got a notion. Remember, those subsidiaries were Dave's 'fingers.' We were always saying that, you know. Well, it's my idea that in all these interludes, whenever Dave became a psychiatric case, he went off into a moronic maze, spending his time *twiddling his fingers.*"

Blind Alley

Only once in Galactic History was an intelligent race of non-Humans discovered—
"Essays on History,"
by Ligurn Vier

I.

From: Bureau for the Outer Provinces
To: Loodun Antyok, Chief Public Administrator, A-8

Subject: Civilian Supervisor of Cepheus 18, Administrative Position as,
References:

(a) Act of Council 2515, of the year 971 of the Galactic Empire, entitled, "Appointment of Officials of the Administrative Service, Methods for, Revision of."

(b) Imperial Directive, Ja 2374, dated 243/975 G.E.

1. By authorization of reference (a), you are hereby appointed to the subject position. The authority of said position as Civilian Supervisor of Cepheus 18 will extend over non-Human subjects of the Emperor living upon the planet under the terms of autonomy set forth in reference (b).

2. The duties of the subject position shall comprise the general supervision of all non-Human internal affairs, co-ordination of authorized government investigating and reporting committees, and the preparation of semiannual reports on all phases of non-Human affairs.

C. Morily, Chief, BuOuProv,
12/977 G.E.

Loodun Antyok had listened carefully, and now he shook his round head mildly, "Friend, I'd like to help you, but you've grabbed the wrong dog by the ears. You'd better take this up with the Bureau."

Tomor Zammo flung himself back into his chair, rubbed his beak of a nose fiercely, thought better of whatever he was going to say, and answered quietly, "Logical, but not practical. I can't make a trip to Trantor now. You're the Bureau's representative on Cepheus 18. Are you entirely helpless?"

"Well, even as Civilian Supervisor, I've got to work within the limits of Bureau policy."

"Good," Zammo cried, "then, tell me what Bureau policy is. I head a scientific investigating committee, under direct Imperial authorization with, supposedly, the widest powers; yet at every angle in the road I am pulled up short by the civilian authorities with only the parrot shriek of 'Bureau policy' to justify themselves. What *is* Bureau policy? I haven't received a decent definition yet."

Antyok's gaze was level and unruffled. He said, "As I see it—and this is not official, so you can't hold me to it—Bureau policy consists in treating the non-Humans as decently as possible."

"Then, what authority have they—"

"*Ssh!* No use raising your voice. As a matter of fact, His Imperial Majesty is a humanitarian and a disciple of the philosophy of Aurelion. I can tell you quietly that it is pretty well-known that it is the Emperor himself who first suggested that this world be established. You can bet that Bureau policy will stick pretty close to Imperial notions. And you can bet that I can't paddle my way against *that* sort of current."

"Well, m'boy," the physiologist's fleshy eyelids quivered, "if you take that sort of attitude, you're going to lose your job. No, I won't have you kicked out. That's not what I mean at all. Your job will just fade out from under you, because nothing is going to be accomplished here!"

"Really? Why?" Antyok was short, pink, and pudgy, and his plump-cheeked face usually found it difficult to put on display any expression other than one of bland and cheerful politeness—but it looked grave now.

"You haven't been here long. I have." Zammo scowled. "Mind if I smoke?" The cigar in his hand was gnarled and strong and was puffed to life carelessly.

He continued roughly, "There's no place here for humanitarianism, administrator. You're treating non-Humans as if they were Humans, and it won't work. In fact, I don't like the word 'non-Human.' They're animals."

"They're intelligent," interjected Antyok, softly.

"Well, intelligent animals, then. I presume the two terms are not mutually exclusive. Alien intelligences mingling in the same space won't work, anyway."

"Do you propose killing them off?"

"Galaxy, no!" He gestured with his cigar. "I propose we look upon them as objects for study, and only that. We could learn a good deal from these animals if we were allowed to. Knowledge, I might point out, that would be used for the immediate benefit of the human race. *There's* humanity for you. *There's* the good of the masses, if it's this spineless cult of Aurelion that interests you."

"What, for instance, do you refer to?"

"To take the most obvious—You have heard of their chemistry, I take it?"

"Yes," Antyok admitted. "I have leafed through most of the reports on the non-Humans published in the last ten years. I expect to go through more."

"Hmp. Well— Then, all I need say is that their chemical therapy is extremely

thorough. For instance, I have witnessed personally the healing of a broken bone—what passes for a broken bone with them, I mean—by the use of a pill. The bone was whole in fifteen minutes. Naturally, none of their drugs are any earthly use on Humans. Most would kill quickly. But if we found out how they worked on the non-Humans—on the animals—"

"Yes, yes. I see the significance."

"Oh, you do. Come, that's gratifying. A second point is that these animals communicate in an unknown manner."

"Telepathy!"

* * *

The scientist's mouth twisted, as he ground out, "Telepathy! Telepathy! Telepathy! Might as well say by witch brew. Nobody knows anything about telepathy except its name. What is the mechanism of telepathy? What is the physiology and the physics of it? I would like to find out, but I can't. Bureau policy, if I listen to you, forbids."

Antyok's little mouth pursed itself. "But— Pardon me, doctor, but I don't follow you. How are you prevented? Surely the Civil Administration has made no attempt to hamper scientific investigation of these non-Humans. I cannot speak for my predecessor entirely, of course, but I myself—"

"No direct interference has occurred. I don't speak of that. But by the Galaxy, administrator, we're hampered by the spirit of the entire set-up. You're making us deal with humans. You allow them their own leader and internal autonomy. You pamper them and give them what Aurelion's philosophy would call 'rights.' I can't deal with their leader."

"Why not?"

"Because he refuses to allow me a free hand. He refuses to allow experiments on any subject without the subject's own consent. The two or three volunteers we get are not too bright. It's an impossible arrangement."

Antyok shrugged helplessly.

Zammo continued, "In addition, it is obviously impossible to learn anything of value concerning the brains, physiology, and chemistry of these animals without dissection, dietary experiments, and drugs. You know, administrator, scientific investigation is a hard game. Humanity hasn't much place in it."

Loodun Antyok tapped his chin with a doubtful finger, "Must it be quite so hard? These are harmless creatures, these non-Humans. Surely, dissection— Perhaps, if you were to approach them a bit differently—I have the idea that you antagonize them. Your attitude might be somewhat overbearing."

"Overbearing! I am not one of these whining social psychologists who are all the fad these days. I don't believe you can solve a problem that requires dissection by approaching it with what is called the 'correct personal attitude' in the cant of the times."

"I'm sorry you think so. Sociopsychological training is required of all administrators above the grade of A-4."

Zammo withdrew his cud of a cigar from his mouth and replaced it after a suitably contemptuous interval. "Then you'd better use a bit of your technique on the Bureau. You know, I *do* have friends at the Imperial court."

"Well, now, I *can't* take the matter up with them, not baldly. Basic policy does not

fall within my cognizance, and such things can only be initiated by the Bureau. But, you know, we might try an indirect approach on this." He smiled faintly, "Strategy."

"What sort?"

Antyok pointed a sudden finger, while his other hand fell lightly on the rows of gray-bound reports upon the floor just next his chair. "Now, look, I've gone through most of these. They're dull, but contain *some* facts. For instance, when was the last non-Human infant born on Cepheus 18?"

Zammo spent little time in consideration. "Don't know. Don't care either."

"But the Bureau would. There's *never* been a non-Human infant born on Cepheus 18—not in the two years the world has been established. Do you know the reason?"

The physiologist shrugged, "Too many possible factors. It would take study."

"All right, then. Suppose you write a report—"

"Reports! I've written twenty."

"Write another. Stress the unsolved problems. Tell them you must change your methods. Harp on the birth-rate problem. The Bureau doesn't dare ignore that. If the non-Humans die out, someone will have to answer to the Emperor. You see—"

Zammo stared, his eyes dark. "That will swing it?"

"I've been working for the Bureau for twenty-seven years. I know its ways."

"I'll think about it." Zammo rose and stalked out of the office. The door slammed behind him.

It was later that Zammo said to a co-worker, "He's a bureaucrat, in the first place. He won't abandon the orthodoxies of paper work and he won't risk sticking his neck out. He'll accomplish little by himself, yet maybe more than a little if we work through him."

From: Administrative Headquarters, Cepheus 18
To: BuOuProv
Subject: Outer Province Project 2563, Part II—Scientific Investigations of non-Humans of Cepheus 18, Co-ordination of,
References:
(a) BuOuProv letr. Cep-N-Cm/jg, 100132, dated 302/975 G.E.
(b) AdHQ-Ceph18 letr. AA-LA/mn, dated 140/977 G.E.
Enclosure:
1. SciGroup 10, Physical & Biochemical Division, Report, entitled, "Physiologic Characteristics of non-Humans of Cepheus 18, Part XI," dated 172/977 G.E.

1. Enclosure 1, included herewith, is forwarded for the information of the BuOuProv. It is to be noted that Section XII, paragraphs 1-16 of Encl. 1, concern possible changes in present BuOuProv policy with regard to non-Humans with a view of facilitating physical and chemical investigations at present proceeding under authorization of reference (a)

2. It is brought to the attention of the BuOuProv that reference (b) has already discussed possible changes in investigating methods and that it remains the opinion of AdHQ-Ceph18 that such changes are as yet premature. It is nevertheless suggested that the question of non-Human birth rate be made the subject of a BuOuProv project assigned to AdHQ-Ceph18 in view of the importance attached by SciGroup 10 to the problem, as evidenced in Section V of Enclosure 1.

L. Antyok, Supery, AdHQ-Ceph18,
174/977

From: BuOuProv
To: AdHQ-Ceph18
Subject: Outer Province Project 2563—Scientific Investigations of non-Humans of Cepheus 18, Co-ordination of,
References:
(a) AdHQ-Ceph18 letr. AA-LA/mn, dated 174/977 G.E.

1. In response to the suggestion contained in paragraph 2 of reference (a), it is considered that the question of the non-Human birth rate does not fall within the cognizance of AdHQ-Ceph18. In view of the fact that SciGroup 10 has reported said sterility to be probably due to a chemical deficiency in the food supply, all investigations in the field are relegated to SciGroup 10 as the proper authority.

2. Investigating procedures by the various SciGroups shall continue according to current directives on the subject. No changes in policy are envisaged.

C. Morily, Chief, BuOuProv,
186/977 G.E.

II.

There was a loose-jointed gauntness about the news reporter which made him appear somberly tall. He was Gustiv Bannerd, with whose reputation was combined ability—two things which do not invariably go together despite the maxims of elementary morality.

Loodum Antyok took his measure doubtfully and said, "There's no use denying that you're right. But the SciGroup report was confidential. I don't understand how—"

"It leaked," said Bannerd, callously. "Everything leaks."

Antyok was obviously baffled, and his pink face furrowed slightly, "Then I'll just have to plug the leak here. I can't pass your story. All references to SciGroup complaints have to come out. You see that, don't you?"

"No." Bannerd was calm enough. "It's important; and I have my rights under the Imperial directive. I think the Empire should know what's going on."

"But it isn't going on," said Antyok, despairingly. "Your claims are all wrong. The Bureau isn't going to change its policy. I showed you the letters."

"You think you can stand up against Zammo when he puts the pressure on?" the newsman asked derisively.

"I will—if I think he's wrong."

"If!" stated Bannerd flatly. Then, in a sudden fervor, "Antyok, the Empire has something great here; something greater by a good deal than the government apparently realizes. They're destroying it. They're treating these creatures like animals."

"Really—" began Antyok, weakly.

"Don't talk about Cepheus 18. It's a zoo. It's a high-class zoo, with your petrified scientists teasing those poor creatures with their sticks poking through the bars. You throw them chunks of meat, but you cage them up. I know! I've been writing about them for two years now. I've almost been living with them."

"Zammo says—"

"Zammo!" This with hard contempt.

"Zammo says," insisted Antyok with worried firmness, "that we treat them too like humans as it is."

The newsman's straight, long cheeks were rigid, "Zammo is rather animallike in his own right. He is a science-worshipper. We can do with less of them. Have you read Aurelion's works?" The last was suddenly posed.

"Umm. Yes. I understand the Emperor—"

"The Emperor tends towards us. That is good—better than the hounding of the last reign."

"I don't see where you're heading?"

"These aliens have much to teach us. You understand? It is nothing that Zammo and his SciGroup can use; no chemistry, no telepathy. It's a way of life; a way of thinking. The aliens have no crime, no misfits. What effort is being made to study their philosophy? Or to set them up as a problem in social engineering?"

Antyok grew thoughtful, and his plump face smoothed out, "It is an interesting consideration. It would be a matter for psychologists—"

"No good. Most of them are quacks. Psychologists point out problems, but their solutions are fallacious. We need men of Aurelion. Men of The Philosophy—"

"But look here, we can't turn Cepheus 18 into . . . into a metaphysical study."

"Why not? It can be done easily."

"How?"

"Forget your puny test-tube peerings. Allow the aliens to set up a society free of Humans. Give them an untrammeled independence and allow an intermingling of philosophies—"

Antyok's nervous response came, "That can't be done in a day."

"We can start in a day."

The administrator said slowly, "Well, I can't prevent you from trying to start." He grew confidential, his mild eyes thoughtful, "You'll ruin your own game, though, if you publish SciGroup 10's report and denounce it on humanitarian grounds. The Scientists are powerful."

"And we of The Philosophy as well."

"Yes, but there's an easy way. You needn't rave. Simply point out that the SciGroup is not solving its problems. Do so unemotionally and let the readers think out your point of view for themselves. Take the birth-rate problem, for instance. *There's* something for you. In a generation, the non-Humans might die out, for all science can do. Point out that a more philosophical approach is required. Or pick some other obvious point. Use your judgment, eh?"

Antyok smiled ingratiatingly as he arose, "But, for the Galaxy's sake, don't stir up a bad smell."

Bannerd was stiff and unresponsive, "You may be right."

It was later that Bannerd wrote in a capsule message to a friend, "He is not clever, by any means. He is confused and has no guiding-line through life. Certainly utterly incompetent in his job. But he's a cutter and a trimmer, compromises his way around difficulties, and will yield concessions rather than risk a hard stand. He may prove valuable in that. Yours in Aurelion."

From: AdHQ-Ceph18
To: BuOuProv
Subject: Birth rate of non-Humans on Cepheus 18, News Report on.
References:

(a) AdHQ-Ceph18 letr. AA-LA/mn, dated 174/977 G.E.
(b) Imperial Directive, Ja2374, dated 243/975 G.E.

Enclosures:

1-G. Brannerd news report, date-lined Cepheus 18, 201/977 G.E.
2-G. Bannerd news report, datelined Cepheus 18, 203/977 G.E.

1. The sterility of non-Humans on Cepheus 18, reported to the BuOuProv in reference (a), has become the subject of news reports to the galactic press. The news reports in question are submitted herewith for the information of the BuOuProv as Enclosures 1 and 2. Although said reports are based on material considered confidential and closed to the public, the news reporter in question maintained his rights to free expression under the terms of reference (b).

2. In view of the unavoidable publicity and misunderstanding on the part of the general public now inevitable, it is requested that the BuOuProv direct future policy on the problem of non-Human sterility.

L. Antyok, Superv. AdHQ-Ceph18,
209/977 G.E.

From: BuOuProv
To: AdHQ-Ceph18
Subject: Birth rate of non-Humans on Cepheus 18, Investigation of.
References:

(a) AdHQ-Ceph18 letr. AA-LA/mn, dated 209/977 G.E.
(b) AdHQ-Ceph18 letr. AA-LA/mn, dated 174/977 G.E.

1. It is proposed to investigate the causes and the means of precluding the unfavorable birth-rate phenomena mentioned in references (a) and (b). A project is therefore set up, entitled, "Birth rate of non-Humans on Cepheus 18, Investigation of" to which, in view of the crucial importance of the subject, a priority of AA is given.

2. The number assigned to the subject project is 2910, and all expenses incidental to it shall be assigned to Appropriation number 18/78.

C. Morily, Chief, BuOuProv,
223/977 G.E.

III.

If Tomor Zammo's ill-humor lessened within the grounds of SciGroup 10 Experimental Station, his friendliness had not thereby increased. Antyok found himself standing alone at the viewing window into the main field laboratory.

The main field laboratory was a broad court at the environmental conditions of Cepheus 18 itself for the discomfort of the experimenters and the convenience of the experimentees. Through the burning sand, and the dry, oxygen-rich air, there sparkled the hard brilliance of hot, white sunlight. And under the blaze, the brick-red non-Humans, wrinkled of skin and wiry of build, huddled in their squatting positions of ease, by ones and twos.

Zammo emerged from the laboratory. He paused to drink water thirstily. He looked up, moisture gleaming on his upper lip, "Like to step in there?"

Antyok shook his head definitely, "No, thank you. What's the temperature right now?"

"A hundred twenty, if there were shade. And they complain of the cold. It's drinking time now. Want to watch them drink?"

A spray of water shot upward from the fountain in the center of the court, and the little alien figures swayed to their feet and hopped eagerly forward in a queer, springy half-run. They milled about the water, jostling one another. The centers of their faces were suddenly disfigured by the projection of a long and flexible fleshy tube, which thrust forward into the spray and was withdrawn dripping.

It continued for long minutes. The bodies swelled and the wrinkles disappeared. They retreated slowly, backing away, with the drinking tube flicking in and out, before receding finally into a pink, wrinkled mass above a wide, lipless mouth. They went to sleep in groups in the shaded angles, plump and sated.

"Animals!" said Zammo, with contempt.

"How often do they drink?" asked Antyok.

"As often as they want. They can go a week if they have to. We water them every day. They store it under their skin. They eat in the evenings. Vegetarians, you know."

Antyok smiled chubbily, "It's nice to get a bit of firsthand information occasionally. Can't read reports all the time."

"Yes?"—noncommittally. Then, "What's new? What about the lacypants boys on Trantor?"

Antyok shrugged dubiously, "You can't get the Bureau to commit itself, unfortunately. With the Emperor sympathetic to the Aurelionists, humanitarianism is the order of the day. You know that."

There was a pause in which the administrator chewed his lip uncertainly. "But there's this birth-rate problem now. It's finally been assigned to AdHQ, you know—and double A priority, too."

Zammo muttered wordlessly.

Antyok said, "You may not realize it, but that project will now take precedence over all other work proceeding on Cepheus 18. It's important."

He turned back to the viewing window and said thoughtfully with a bald lack of preamble. "Do you think those creatures might be unhappy?"

"Unhappy!" The word was an explosion.

"Well, then," Antyok corrected hastily, "maladjusted. You understand? It's difficult to adjust an environment to a race we know so little of."

"Say—did you ever see the world we took them from?"

"I've read the reports—"

"Reports!"—infinite contempt. "I've *seen* it. This may look like desert out there to you, but it's a watery paradise to those devils. They have all the food and water they can get. They have a world to themselves with vegetation and natural water flow, instead of a lump of silica and granite where fungi were force-grown in caves and water had to be steamed out of gypsum rock. In ten years, they would have been dead to the last beast, and we saved them. Unhappy? Ga-a-ah, if they are, they haven't the decency of most animals."

"Well, perhaps. Yet I have a notion."

"A notion? What is your notion?" Zammo reached for one of his cigars.

"It's something that might help you. Why not study the creatures in a more integrated fashion? Let them use their initiative. After all, they did have a highly-developed science. Your reports speak of it continually. Give them problems to solve."

"Such as?"

"Oh . . . oh," Antyok waved his hands helplessly. "Whatever you think might help most. For instance, spaceships. Get them into the control room and study their reactions."

"Why?" asked Zammo with dry bluntness.

"Because the reaction of their minds to tools and controls adjusted to the human temperament can teach you a lot. In addition, it will make a more effective bribe, it seems to me, than anything you've yet tried. You'll get more volunteers if they think they'll be doing something interesting."

"That's your psychology coming out. Hm-m-m. Sounds better than it probably is. I'll sleep on it. And where would I get permission, in any case, to let them handle spaceships? I've none at *my* disposal, and it would take a good deal longer than it was worth to follow down the line of red tape to get one assigned to us."

Antyok pondered, and his forehead creased lightly, "It doesn't *have* to be spaceships. But even so— If you would write up another report and make the suggestion yourself—strongly, you understand—I might figure out some way of tying it up with my birth-rate project. A double-A priority can get practically anything, you know, without questions."

Zammo's interest lacked a bit even of mildness. "Well, maybe. Meanwhile, I've some basal metabolism tests in progress, and it's getting late. I'll think about it. It's got its points."

From: AdHQ-Ceph18
To: BuOuProv
Subject: Outer Province Project 2910, Part I—Birth rate of non-Humans on Cepheus 18, Investigation of,
Reference:
(a) BuOuProv letr. Ceph-N-CM/car, 115097, 223/977 G.E.
Enclosure:
1. SciGroup 10, Physical & Biochemical Division report, Part XV, dated 220/997 G.E.

1. Enclosure 1 is forwarded herewith for the information of the BuOuProv.

2. Special attention is directed to Section V, Paragraph 3 of Enclosure 1 in which it is requested that a spaceship be assigned SciGroup 10 for use in expediting investigations authorized by the BuOuProv. It is considered by AdHQ-Ceph18 that such investigations may be of material use in aiding work now in progress on the subject project, authorized by reference (a). It is suggested, in view of the high priority placed by the BuOuProv upon the subject project, that immediate consideration be given the SciGroup's request.

L. Antyok, Superv. AdHQ-Ceph18,
240/977 G.E.

From: BuOuProv
To: AdHQ-Ceph18
Subject: Outer Province Project 2910—Birth rate of non-Humans on Cepheus 18, Investigation of.
Reference:

(a) AdHQ-Ceph18 letr. AA-LA/mn, dated 240/977 G.E.

1. Training Ship *AN-R-2055* is being placed at the disposal of AdHQ-Ceph18 for use in investigation of non-Humans on Cepheus 18 with respect to the subject project and other authorized OuProv projects, as requested in Enclosure 1 to reference (a).

2. It is urgently requested that work on the subject project be expedited by all available means.

C. Morily, Head, BuOuProv,
251/977 G.E.

IV.

The little, bricky creature must have been more uncomfortable than his bearing would admit to. He was carefully wrapped in a temperature already adjusted to the point where his human companions steamed in their open shirts.

His speech was high-pitched and careful, "I find it damp, but not unbearably so at this low temperature."

Antyok smiled, "It was nice of you to come. I had planned to visit you, but a trial run in your atmosphere out there—" The smile had become rueful.

"It doesn't matter. You other-worldings have done more for us than ever we were able to do for ourselves. It is an obligation that is but imperfectly returned by the endurance on my part of a trifling discomfort." His speech seemed always indirect, as if he approached his thoughts sidelong, or as if it were against all etiquette to be blunt.

Gustiv Bannerd, seated in an angle of the room, with one long leg crossing the other, scrawled nimbly and said, "You don't mind if I record all this?"

The Cepheid non-Human glanced briefly at the journalist, "I have no objection."

Antyok's apologetics persisted, "This is not a purely social affair, sir. I would not have forced discomfort on you for that. There are important questions to be considered, and you are the leader of your people."

The Cepheid nodded, "I am satisfied your purposes are kindly. Please proceed."

The administrator almost wriggled in his difficulty in putting thoughts into words. "It is a subject," he said, "of delicacy, and one I would never bring up if it weren't for the overwhelming importance of the . . . uh . . . question. I am only the spokesman of my government—"

"My people consider the otherworld government a kindly one."

"Well, yes, they are kindly. For that reason, they are disturbed over the fact that your people no longer breed."

Antyok paused, and waited with worry for a reaction that did not come. The Cepheid's face was motionless except for the soft, trembling motion of the wrinkled area that was his deflated drinking tube.

Antyok continued, "It is a question we have hesitated to bring up because of its extremely personal angles. Noninterference is my government's prime aim, and we have done our best to investigate the problem quietly and without disturbing your people. But, frankly, we—"

"Have failed?" finished the Cepheid, at the other's pause.

"Yes. Or at least, we have not discovered a concrete failure to reproduce the exact environment of your original world; with, of course, the necessary modification to make it more livable. Naturally, it is thought there is some chemical shortcoming. And

so I ask your voluntary help in the matter. Your people are advanced in the study of your own biochemistry. If you do not choose, or would rather not—"

"No, no, I can help." The Cepheid seemed cheerful about it. The smooth flat planes of his loose-skinned, hairless skull wrinkled in an alien response to an uncertain emotion. "It is not a matter that any of us would have thought would have disturbed you other-worldlings. That it does is but another indication of your well-meaning kindness. This world we find congenial, a paradise in comparison to our old. It lacks in nothing. Conditions such as now prevail belong in our legends of the Golden Age."

"Well—"

"But there is a something; a something you may not understand. We cannot expect different intelligences to think alike."

"I shall try to understand."

The Cepheid's voice had grown soft, its liquid undertones more pronounced, "We were dying on our native world; but we were fighting. Our science, developed through a history older than yours, was losing; but it had not yet lost. Perhaps it was because our science was fundamentally biological, rather than physical as yours is. Your people discovered new forms of energy and reached the stars. Our people discovered new truths of psychology and psychiatry and built up a working society free of disease and crime.

"There is no need to question which of the two angles of approach was the more laudable, but there is no uncertainty as to which proved more successful in the end. In our dying world, without the means of life or sources of power, our biological science could but make the dying easier.

"And yet we fought. For centuries past, we had been groping toward the elements of atomic power, and slowly the spark of hope had glimmered that we might break through the two-dimensional limits of our planetary surface and reach the stars. There were no other planets in our system to serve as stepping stones. Nothing but some twenty light-years to the nearest star, without the knowledge of the possibility of the existence of other planetary systems, but rather of the contrary.

"But there is something in all life that insists on striving; even on useless striving. There were only five thousand of us left in the last days. Only five thousand. And our first ship was ready. It was experimental. It would probably have been a failure. But already we had all the principles of propulsion and navigation correctly worked out."

There was a long pause, and the Cepheid's small black eyes seemed glazed in retrospect.

The newspaperman put in suddenly, from his corner, "And then we came?"

"And then you came," the Cepheid agreed simply. "It changed everything. Energy was ours for the asking. A new world, congenial and, indeed, ideal, was ours even without asking. If our problems of society had long been solved by ourselves, our more difficult problems of environment were suddenly solved for us, no less completely."

"Well?" urged Antyok.

"Well—it was somehow not well. For centuries, our ancestors had fought towards the stars, and now the stars suddenly proved to be the property of others. We had fought for life, and it had become a present handed to us by others. There is no longer any reason to fight. There is no longer anything to attain. All the universe is the property of your race."

"This world is yours," said Antyok, gently.

"By sufferance. It is a gift. It is not ours by right."

"You have earned it, in my opinion."

And now the Cepheid's eyes were sharply fixed on the other's countenance, "You mean well, but I doubt that you understand. We have nowhere to go, save this gift of a world. We are in a blind alley. The function of life is striving, and that is taken from us. Life can no longer interest us. We have no offspring—voluntarily. It is our way of removing ourselves from your way."

* * *

Absent-mindedly, Antyok had removed the fluoro-globe from the window seat, and spun it on its base. Its gaudy surface reflected light as it spun, and its three-foot-high bulk floated with incongruous grace and lightness in the air.

Antyok said, "Is that your only solution? Sterility?"

"We might escape still," whispered the Cepheid, "but where in the Galaxy is there place for us? It is all yours."

"Yes, there is no place for you nearer than the Magellanic Clouds if you wished independence. The Magellanic Clouds—"

"And you would not let us go of yourselves. You mean kindly, I know."

"Yes, we mean kindly—but we could not let you go."

"It is a mistaken kindness."

"Perhaps, but could you not reconcile yourselves? You have a world."

"It is something past complete explanations. Your mind is different. We could not reconcile ourselves. I believe, administrator, that you have thought of all this before. The concept of the blind alley we find ourselves trapped in is not new to you."

Antyok looked up, startled, and one hand steadied the fluoro-globe, "Can you read my mind?"

"It is just a guess. A good one, I think."

"Yes—but *can* you read my mind? The minds of humans in general, I mean. It is an interesting point. The scientists say you cannot, but sometimes I wonder if it is that you simply will not. Could you answer that? I am detaining you, unduly, perhaps."

"No . . . no—" But the little Cepheid drew his enveloping robe closer, and buried his face in the electrically-heated pad at the collar for a moment. "You other-worldlings speak of reading minds. It is not so at all, but it is assuredly hopeless to explain."

Antyok mumbled the old proverb, "One cannot explain sight to a man blind from birth."

"Yes, just so. This sense which you call 'mind reading,' quite erroneously, cannot be applied to us. It is not that we cannot receive the proper sensations, it is that your people do not transmit them, and we have no way of explaining to you how to go about it."

"Hm-m-m."

"There are times, of course, of great concentration or emotional tension on the part of an other-worldling when some of us who are more expert in this sense; more sharp-eyed, so to speak; detect vaguely *something*. It is uncertain; yet I myself have at times wondered—"

Carefully, Antyok began spinning the fluoro-globe once more. His pink face was set in thought, and his eyes were fixed upon the Cepheid. Gustiv Bannerd stretched his fingers and reread his notes, his lips moving silently.

The fluoro-globe spun, and slowly the Cepheid seemed to grow tense as well, as his eyes shifted to the colorful sheen of the globe's fragile surface.

The Cepheid said, "What is that?"

Antyok started, and his face smoothed into an almost chuckling placidity, "This? A Galactic fad of three years ago; which means that it is a hopelessly old-fashioned relic this year. It is a useless device but it looks pretty. Bannerd, could you adjust the windows to nontransmission?"

* * *

There was the soft click of a contact, and the windows became curved regions of darkness, while in the center of the room, the fluoro-globe was suddenly the focus of a rosy effulgence that seemed to leap outward in streamers. Antyok, a scarlet figure in a scarlet room, placed it upon the table and spun it with a hand that dripped red. As it spun, the colors changed with a slowly increasing rapidity, blended and fell apart into more extreme contrasts.

Antyok was speaking in an eerie atmosphere of molten, shifting rainbow, "The surface is of a material that exhibits variable fluorescence. It is almost weightless, extremely fragile, but gyroscopically balanced so that it rarely falls, with ordinary care. It is rather pretty, don't you think?"

From somewhere the Cepheid's voice came, "Extremely pretty."

"But it has outworn its welcome; outlived its fashionable existence."

The Cepheid's voice was abstracted, "It is very pretty."

Bannerd restored the light at a gesture, and the colors faded.

The Cepheid said, "That is something my people would enjoy." He stared at the globe with fascination.

And now Antyok rose. "You had better go. If you stay longer, the atmosphere may have bad effects. I thank you humbly for your kindness."

"I thank you humbly for yours." The Cepheid had also risen.

Antyok said, "Most of your people, by the way, have accepted our offers to them to study the make-up of our modern spaceships. You understand, I suppose, that the purpose was to study the reactions of your people to our technology. I trust that conforms with your sense of propriety."

"You need not apologize. I, myself, have now the makings of a human pilot. It was most interesting. It recalls our own efforts—and reminds us of how nearly on the right track we were."

The Cepheid left, and Antyok sat, frowning.

"Well," he said to Bannerd, a little sharply. "You remember our agreement, I hope. This interview can't be published."

Bannerd shrugged, "Very well."

Antyok was at his seat, and his fingers fumbled with the small metal figurine upon his desk, "What do you think of all this, Bannerd?"

"I am sorry for them. I think I understand how they feel. We must educate them out of it. The Philosophy can do it."

"You think so?"

"Yes."

"We can't let them go, of course."

"Oh, no. Out of the question. We have too much to learn from them. This feeling of theirs is only a passing stage. They'll think differently, especially when we allow them the completest independence."

"Maybe. What do you think of the fluoro-globes, Bannerd? He liked them. It might be a gesture of the right sort to order several thousand of them. The Galaxy knows, they're a drug on the market right now, and cheap enough."

"Sounds like a good idea," said Bannerd.

"The Bureau would never agree, though. I know them."

The newsman's eyes narrowed, "But it might be just the thing. They need new interests."

"Yes? Well, we *could* do something. I could include your transcript of the interview as part of a report and just emphasize the matter of the globes a bit. After all, you're a member of The Philosophy and might have influence with important people, whose word with the Bureau might carry much more weight than mine. You understand—?"

"Yes," mused Bannerd. "Yes."

From: AdHQ-Ceph18
To: BuOuProv
Subject: OuProv Project 2910, Part II; Birth rate of non-Humans on Cepheus 18, Investigation of.
Reference:
(a) BuOuProv letr. Ceph-N-CM/car, 115097, dated 223/977 G.E.
Enclosure:
1. Transcript of conversation between L. Antyok of AdHQ-Ceph18, and Ni-San, High Judge of the non-Humans on Cepheus 18.

1. Enclosure 1 is forwarded herewith for the information of the BuOuProv.

2. The investigation of the subject project undertaken in response to the authorization of reference (a) is being pursued along the new lines indicated in Enclosure 1. The BuOuProv is assured that every means will be used to combat the harmful psychological attitude at present prevalent among the non-Humans.

3. It is to be noted that the High Judge of the non-Humans on Cepheus 18 expressed interest in fluoro-globes. A preliminary investigation into this fact of non-Human psychology had been initiated.

L. Antyok, Superv, AdHQ-Ceph18,
272/977 G.E.

From: BuOuProv
To: AdHQ-Ceph18
Subject: OuProv Project 2910; Birth rate of non-Humans on Cepheus 18, Investigation of.
Reference:
(a) AdHQ-Ceph18 letr. AA-LA/mn, dated 272/977 G.E.

1. With reference to Enclosure 1 of reference (a), five thousand fluoro-globes have been allocated for shipment to Cepheus 18, by the Department of Trade.

2. It is instructed that AdHQ-Ceph18 make use of all methods of appeasing non-Humans' dissatisfaction, consistent with the necessities of obedience to Imperial proclamations.

C. Morily, Chief, BuOuProv,
283/977 G.E.

V.

The dinner was over, the wine had been brought in, and the cigars were out. The groups of talkers had formed, and the captain of the merchant fleet was the center of the largest. His brilliant white uniform quite outsparkled his listeners.

He was almost complacent in his speech: "The trip was nothing. I've had more than three hundred ships under me before this. Still, I've never had a cargo quite like this. What do you want with five thousand fluoro-globes on this desert, by the Galaxy!"

Loodun Antyok laughed gently. He shrugged, "For the non-Humans. It wasn't a difficult cargo, I hope."

"No, not difficult. But bulky. They're fragile, and I couldn't carry more than twenty to a ship, with all the government regulations concerning packing and precautions against breakage. But it's the government's money, I suppose."

Zammo smiled grimly. "Is this your first experience with government methods, captain?"

"Galaxy, no," exploded the spaceman. "I try to avoid it, of course, but you can't help getting entangled on occasion. And it's an abhorrent thing when you are, and that's the truth. The red tape! The paper work! It's enough to stunt your growth and curdle your circulation. It's a tumor, a cancerous growth on the Galaxy. I'd wipe out the whole mess."

Antyok said, "You're unfair, captain. You don't understand."

"Yes? Well, now, as one of these bureaucrats," and he smiled amiably at the word, "suppose you explain your side of the situation, administrator."

"Well, now," Antyok seemed confused, "government is a serious and complicated business. We've got thousands of planets to worry about in this Empire of ours and billions of people. It's almost past human ability to supervise the business of governing without the tightest sort of organization. I think there are something like four hundred million men today in the Imperial Administrative Service alone, and in order to co-ordinate their efforts and to pool their knowledge, you *must* have what you call red tape and paper work. Every bit of it, senseless though it may seem, annoying though it may be, has its uses. Every piece of paper is a thread binding the labors of four hundred million humans. Abolish the Administrative Service and you abolish the Empire; and with it, interstellar peace, order, and civilization."

"Come—" said the captain.

"No. I mean it." Antyok was earnestly breathless. "The rules and system of the Administrative set-up must be sufficiently all-embracing and rigid so that in case of incompetent officials, and sometimes one *is* appointed—you may laugh, but there are incompetent scientists, and newsmen, and captains, too—in case of incompetent officials, I say, little harm will be done. For, at the worst, the system can move by itself."

"Yes," grunted the captain, sourly, "and if a capable administrator should be appointed? He is then caught by the same rigid web and is forced into mediocrity."

"Not at all," replied Antyok, warmly. "A capable man can work within the limits of the rules and accomplish what he wishes."

"How?" asked Bannerd.

"Well . . . well—" Antyok was suddenly ill at ease. "One method is to get yourself an A-priority project, or double-A, if possible."

The captain leaned his head back for laughter, but never quite made it, for the door was flung open and frightened men were pouring in. The shouts made no sense at first. Then:

"Sir, the ships are gone. These non-Humans have taken them by force."

"What? All?"

"Every one. Ships and creatures—"

* * *

It was two hours later that the four were together again, alone in Antyok's office now.

Antyok said coldly, "They've made no mistakes. There's not a ship left behind, not even your training ship, Zammo. And there isn't a government ship available in this entire half of the Sector. By the time we organize a pursuit they'll be out of the Galaxy and halfway to the Magellanic Clouds. Captain, it was your responsibility to maintain an adequate guard."

The captain cried, "It was our first day out of space. Who could have known—"

Zammo interrupted fiercely, "Wait a while, captain. I'm beginning to understand. Antyok," his voice was hard, "you engineered this."

"I?" Antyok's expression was strangely cool, almost indifferent.

"You told us this evening that a clever administrator got an A-priority project assigned to accomplish what he wished. You got such a project in order to help the non-Humans escape."

"I did? I beg your pardon, but how could that be? It was you yourself in one of your reports that brought up the problem of the failing birth rate. It was Bannerd, here, whose sensational articles frightened the Bureau into making a double A-priority project out of it. I had nothing to do with it."

"*You* suggested that I mention the birth rate," said Zammo, violently.

"Did I?" said Antyok, composedly.

"And for that matter," roared Bannerd, suddenly, "you suggested that I mention the birth rate in my articles."

The three ringed him now and hemmed him in. Antyok leaned back in his chair and said easily, "I don't know what you mean by suggestions. If you are accusing me, please stick to evidence—legal evidence. The laws of the Empire go by written, filmed, or transcribed material, or by witnessed statements. All my letters as administrator are on file here, at the Bureau, and at other places. I never asked for an A-priority project. The Bureau assigned it to me, and Zammo and Bannerd are responsible for that. In print, at any rate."

Zammo's voice was an almost inarticulate growl, "You hoodwinked me into teaching the creatures how to handle a spaceship."

"It was *your* suggestion. I have your report proposing they be studied in their reaction to human tools on file. So has the Bureau. The evidence—the *legal* evidence, is plain. I had nothing to do with it."

"Nor with the globes?" demanded Bannerd.

The captain howled suddenly, "You had my ships brought here purposely. Five thousand globes! You knew it would require hundreds of craft."

"I never asked for globes," said Antyok, coldly. "That was the Bureau's idea, although I think Bannerd's friends of The Philosophy helped that along."

Bannerd fairly choked. He spat out, "You were asking that Cepheid leader if he could read minds. You were telling him to express interest in the globes."

"Come, now. You prepared the transcript of the conversation yourself, and that,

too, is on file. You can't prove it." He stood up. "You'll have to excuse me. I must prepare a report for the Bureau."

At the door, Antyok turned, "In a way, the problem of the non-Humans is solved, even if only to their own satisfaction. They'll breed now, and have a world they've earned themselves. It's what they wanted.

"Another thing. Don't accuse me of silly things. I've been in the Service for twenty-seven years, and I assure you that my paper work is proof enough that I have been thoroughly correct in everything I have done. And captain, I'll be glad to continue our discussion of earlier this evening at your convenience and explain how a capable administrator can work through red tape and still get what he wants."

It was remarkable that such a round, smooth baby-face could wear a smile quite so sardonic.

From: BuOuProv
To: Loodun Antyok, Chief Public Administrator, A-8
Subject: Administrative Service, Standing in.
Reference:
(a) AdServ Court Decision 22874-Q, dated 1/978 G.E.

1. In view of the favorable opinion handed down in reference (a) you are hereby absolved of all responsibility for the flight of non-Humans on Cepheus 18. It is requested that you hold yourself in readiness for your next appointment.

R. Horpritt, Chief, AdServ,
15/978 G.E.

Evidence

Francis Quinn was a politician of the new school. That, of course, is a meaningless expression, as are all expressions of the sort. Most of the "new schools" we have were duplicated in the social life of ancient Greece, and perhaps, if we knew more about it, in the social life of ancient Sumeria and in the lake dwellings of prehistoric Switzerland as well.

But, to get out from under what promises to be a dull and complicated beginning, it might be best to state hastily that Quinn neither ran for office nor canvassed for votes, made no speeches and stuffed no ballot boxes. Any more than Napoleon pulled a trigger at Austerlitz.

And since politics makes strange bedfellows, Alfred Lanning sat at the other side of the desk with his ferocious white eyebrows bent far forward over eyes in which chronic impatience had sharpened to acuity. He was not pleased.

The fact, if known to Quinn, would have annoyed him not the least. His voice was friendly, perhaps professionally so.

"I assume you know Stephen Byerley, Dr. Lanning."

"I have heard of him. So have many people."

"Yes, so have I. Perhaps you intend voting for him at the next election."

"I couldn't say." There was an unmistakable trace of acidity here. "I have not followed the political currents, so I'm not aware that he is running for office."

"He may be our next mayor. Of course, he is only a lawyer now, but great oaks—"

"Yes," interrupted Lanning, "I have heard the phrase before. But I wonder if we can get to the business at hand."

"We *are* at the business at hand, Dr. Lanning." Quinn's tone was very gentle, "It is to my interest to keep Mr. Byerley a district attorney at the very most, and it is to your interest to help me do so."

"To *my* interest? Come!" Lanning's eyebrows hunched low.

"Well, say then to the interest of the U. S. Robots and Mechanical Men Corporation. I come to you as Director-Emeritus of Research, because I know that your connection to them is that of, shall we say, 'elder statesman.' You are listened to with respect and

yet your connection with them is no longer so tight but that you cannot possess considerable freedom of action; even if the action is somewhat unorthodox."

Dr. Lanning was silent a moment, chewing the cud of his thoughts. He said more softly, "I don't follow you at all, Mr. Quinn."

"I am not surprised, Dr. Lanning. But it's all rather simple. Do you mind?" Quinn lit a slender cigarette with a lighter of tasteful simplicity and his big-boned face settled into an expression of quiet amusement. "We have spoken of Mr. Byerley—a strange and colorful character. He was unknown three years ago. He is very well known now. He is a man of force and ability, and certainly the most capable and intelligent prosecutor I have ever known. Unfortunately he is not a friend of mine—"

"I understand," said Lanning, mechanically. He stared at his fingernails.

"I have had occasion," continued Quinn, evenly, "in the past year to investigate Mr. Byerley—quite exhaustively. It is always useful, you see, to subject the past life of reform politicians to rather inquisitive research. If you knew how often it helped—" He paused to smile humorlessly at the glowing tip of his cigarette. "But Mr. Byerley's past is unremarkable. A quiet life in a small town, a college education, a wife who died young, an auto accident with a slow recovery, law school, coming to the metropolis, an attorney."

Francis Quinn shook his head slowly, then added, "But his present life. Ah, that is remarkable. Our district attorney never eats!"

Lanning's head snapped up, old eyes surprisingly sharp, "Pardon me?"

"Our district attorney never eats." The repetition thumped by syllables. "I'll modify that slightly. He has never been seen to eat or drink. Never! Do you understand the significance of the word? Not rarely, but never!"

"I find that quite incredible. Can you trust your investigators?"

"I can trust my investigators, and I don't find it incredible at all. Further, our district attorney has never been seen to drink—in the aqueous sense as well as the alcoholic—nor to sleep. There are other factors, but I should think I have made my point."

* * *

Lanning leaned back in his seat, and there was the rapt silence of challenge and response between them, and then the old roboticist shook his head. "No. There is only one thing you can be trying to imply, if I couple your statements with the fact that you present them to me, and that is impossible."

"But the man is quite inhuman, Dr. Lanning."

"If you told me he were Satan in masquerade, there would be a faint chance that I might believe you."

"I tell you he is a robot, Dr. Lanning."

"I tell you it is as impossible a conception as I have ever heard, Mr. Quinn."

Again the combative silence.

"Nevertheless," and Quinn stubbed out his cigarette with elaborate care, "you will have to investigate this impossibility with all the resources of the Corporation."

"I'm sure that I could undertake no such thing, Mr. Quinn. You don't seriously suggest that the Corporation take part in local politics."

"You have no choice. Supposing I were to make my facts public without proof. The evidence is circumstantial enough."

"Suit yourself in that respect."

"But it would not suit me. Proof would be much preferable. And it would not suit *you*, for the publicity would be very damaging to your company. You are perfectly well acquainted, I suppose, with the strict rules against the use of robots on inhabited worlds."

"Certainly!" —brusquely.

"You know that the U. S. Robots and Mechanical Men Corporation is the only manufacturer of positronic robots in the Solar System, and if Byerley is a robot, he is a *positronic* robot. You are also aware that all positronic robots are leased, and not sold; that the Corporation remains the owner and manager of each robot, and is therefore responsible for the actions of all."

"It is an easy matter, Mr. Quinn, to prove the Corporation has never manufactured a robot of a humanoid character."

"It can be done? To discuss merely possibilities."

"Yes. It can be done."

"Secretly, I imagine, as well. Without entering it in your books."

"Not the positronic brain, sir. Too many factors are involved in that, and there is the tightest possible government supervision."

"Yes, but robots are worn out, break down, go out of order—and are dismantled."

"And the positronic brains re-used or destroyed."

"Really?" Francis Quinn allowed himself a trace of sarcasm. "And if one were, accidently, of course, not destroyed—and there happened to be a humanoid structure waiting for a brain."

"Impossible!"

"You would have to prove that to the government and the public, so why not prove it to me now."

"But what could our purpose be?" demanded Lanning in exasperation. "Where is our motivation? Credit us with a minimum of sense."

"My dear sir, please. The Corporation would be only too glad to have the various Regions permit the use of humanoid positronic robots on inhabited worlds. The profits would be enormous. But the prejudice of the public against such a practice is too great. Suppose you get them used to such robots first—see, we have a skillful lawyer, a good mayor,—and he is a robot. Won't you buy our robot butlers?"

"Thoroughly fantastic. An almost humorous descent to the ridiculous."

"I imagine so. Why not prove it? Or would you still rather try to prove it to the public?"

The light in the office was dimming, but it was not yet too dim to obscure the flush of frustration on Alfred Lanning's face. Slowly, the roboticist's finger touched a knob and the wall illuminators glowed to gentle life.

"Well, then," he growled, "let us see."

* * *

The face of Stephen Byerley is not an easy one to describe. He was forty by birth certificate and forty by appearance—but it was a healthy, well-nourished good-natured appearance of forty; one that automatically drew the teeth of the bromide about "looking one's age."

This was particularly true when he laughed, and he was laughing now. It came loudly and continuously, died away for a bit, then began again—

And Alfred Lanning's face contracted into a rigidly bitter monument of disapproval. He made a half gesture to the woman who sat beside him, but her thin, bloodless lips merely pursed themselves a trifle.

Byerley gasped himself a stage nearer normality.

"Really, Dr. Lanning . . . really—I . . . *I* . . . a robot?"

Lanning bit his words off with a snap, "It is no statement of mine, sir. I would be quite satisfied to have you a member of humanity. Since our corporation never manufactured you, I am quite certain that you are—in a legalistic sense, at any rate. But since the contention that you are a robot has been advanced to us seriously by a man of certain standing—"

"Don't mention his name, if it would knock a chip off your granite block of ethics, but let's pretend it was Frank Quinn, for the sake of argument, and continue."

Lanning drew in a sharp, cutting snort at the interruption, and paused ferociously before continuing with added frigidity, "—by a man of certain standing, with whose identity I am not interested in playing guessing games, I am bound to ask your cooperation in disproving it. The mere fact that such a contention could be advanced and publicized by the means at this man's disposal would be a bad blow to the company I represent—even if the charge were never proven. You understand me?"

"Oh, yes, your position is clear to me. The charge itself is ridiculous. The spot you find yourself in is not. I beg your pardon, if my laughter offended you. It was the first I laughed at, not the second. How can I help you?"

"It could be very simple. You have only to sit down to a meal at a restaurant in the presence of witnesses, have your picture taken, and eat." Lanning sat back in his chair, the worst of the interview over. The woman beside him watched Byerley with an apparently absorbed expression but contributed nothing of her own.

Stephen Byerley met her eyes for an instant, was caught by them, then turned back to the roboticist. For a while his fingers were thoughtful over the bronze paper-weight that was the only ornament on his desk.

He said quietly, "I don't think I can oblige you."

He raised his hand, "Now wait, Dr. Lanning. I appreciate the fact that this whole matter is distasteful to you, that you have been forced into it against your will, that you feel you are playing an undignified and even ridiculous part. Still, the matter is even more intimately concerned with myself, so be tolerant.

"First, what makes you think that Quinn—this man of certain standing, you know—wasn't hoodwinking you, in order to get you to do exactly what you are doing?"

"Why it seems scarcely likely that a reputable person would endanger himself in so ridiculous a fashion, if he weren't convinced he were on safe ground."

There was little humor in Byerley's eyes, "You don't know Quinn. He could manage to make safe ground out of a ledge a mountain sheep could not handle. I suppose he showed the particulars of the investigation he claims to have made of me?"

"Enough to convince me that it would be too troublesome to have our corporation attempt to disprove them when you could do so more easily."

"Then you believe him when he says I never eat. You are a scientist, Dr. Lanning. Think of the logic required. I have not been observed to eat, therefore, I never eat Q.E.D. After all!"

"You are using prosecution tactics to confuse what is really a very simple situation."

"On the contrary, I am trying to clarify what you and Quinn between you are making a very complicated one. You see, I don't sleep much, that's true, and I certainly don't sleep in public. I have never cared to eat with others—an idiosyncrasy which

is unusual and probably neurotic in character, but which harms no one. Look, Dr. Lanning, let me present you with a suppositious case. Supposing we had a politician who was interested in defeating a reform candidate at any cost and while investigating his private life came across oddities such as I have just mentioned.

"Suppose further that in order to smear the candidate effectively, he comes to your company as the ideal agent. Do you expect him to say to you, 'So-and-So is a robot because he hardly ever eats with people, and I have never seen him fall asleep in the middle of a case; and once when I peeped into his window in the middle of the night, there he was, sitting up with a book; and I looked in his frigidaire and there was no food in it.'

"If he told you that, you would send for a straitjacket. But if he tells you, 'He *never* sleeps; he *never* eats,' then the shock of the statement blinds you to the fact that such statements are impossible to prove. You play into his hands by contributing to the to-do."

"Regardless, sir," began Lanning, with a threatening obstinacy, "of whether you consider this matter serious or not, it will require only the meal I mentioned to end it."

Again Byerley turned to the woman, who still regarded him expressionlessly. "Pardon me. I've caught your name correctly, haven't I? Dr. Susan Calvin?"

"Yes, Mr. Byerley."

"You're the U. S. Robots' psychologist, aren't you?"

"*Robo*psychologist, please."

"Oh, are robots so different from men, mentally?"

"Worlds different." She allowed herself a frosty smile, "Robots are essentially decent."

Humor tugged at the corners of the lawyer's mouth, "Well, that's a hard blow. But what I wanted to say was this. Since you're a psycho—a robopsychologist, *and* a women, I'll bet that you've done something that Dr. Lanning hasn't thought of."

"And what is that?"

"You've got something to eat in your purse."

Something caught in the schooled indifference of Susan Calvin's eyes. She said, "You surprise me, Mr. Byerley."

And opening her purse, she produced an apple. Quietly, she handed it to him. Dr. Lanning, after an initial start, followed the slow movement from one hand to the other with sharply alert eyes.

Calmly, Stephen Byerley bit into it, and calmly he swallowed it.

"You see, Dr. Lanning?"

Dr. Lanning smiled in a relief tangible enough to make even his eyebrows appear benevolent. A relief that survived for one fragile second.

Susan Calvin said, "I was curious to see if you would eat it, but, of course, in the present case, it proves nothing."

Byerley grinned, "It doesn't?"

"Of course not. It is obvious, Dr. Lanning, that if this man were a humanoid robot, he would be a perfect imitation. He is almost too human to be credible. After all, we have been seeing and observing human beings all our lives; it would be impossible to palm something merely nearly right off on us. It would have to be *all* right. Observe the texture of the skin, the quality of the irises, the bone formation of the hand. If he's a robot, I wish U. S. Robots *had* made him, because he's a good job. Do you suppose then, that anyone capable of paying attention to such niceties would neglect a few gadgets to take care of such things as eating, sleeping, elimination? For emergency use

only, perhaps; as, for instance, to prevent such situations as are arising here. So a meal won't really prove anything."

"Now wait," snarled Lanning, "I am not quite the fool both of you make me out to be. I am not interested in the problem of Mr. Byerley's humanity or nonhumanity. I am interested in getting the corporation out of a hole. A public meal will end the matter and keep it ended no matter what Quinn does. We can leave the finer details to lawyers and robopsychologists."

"But, Dr. Lanning," said Byerley, "you forget the politics of the situation. I am as anxious to be elected, as Quinn is to stop me. By the way, did you notice that you used his name. It's a cheap shyster trick of mine; I knew you would, before you were through."

Lanning flushed, "What has the election to do with it?"

"Publicity works both ways, sir. If Quinn wants to call me a robot, and has the nerve to do so, I have the nerve to play the game his way."

"You mean you—" Lanning was quite frankly appalled.

"Exactly. I mean that I'm going to let him go ahead, choose his rope, test its strength, cut off the right length, tie the noose, insert his head and grin. I can do what little else is required."

"You are mighty confident."

Susan Calvin rose to her feet, "Come, Alfred, we won't change his mind for him."

"You see." Byerley smiled gently. "You're a human psychologist, too."

* * *

But perhaps not all the confidence that Dr. Lanning had remarked upon was present that evening when Byerley's car parked on the automatic treads leading to the sunken garage, and Byerley himself crossed the path to the front door of his house.

The figure in the wheel chair looked up as he entered and smiled. Byerley's face lit with affection. He crossed over to it.

The cripple's voice was a hoarse, grating whisper that came out of a mouth forever twisted to one side, leering out of a face that was half scar tissue, "You're late, Steve."

"I know, John, I know. But I've been up against a peculiar and interesting trouble today."

"So?" Neither the torn face nor the destroyed voice could carry expression but there was anxiety in the clear eyes. "Nothing you can't handle?"

"I'm not exactly certain. I may need your help. *You're* the brilliant one in the family. Do you want me to take you out into the garden? It's a beautiful evening."

Two strong arms lifted John from the wheel chair. Gently, almost caressingly, Byerley's arms went around the shoulders and under the swathed legs of the cripple. Carefully, and slowly, he walked through the rooms, down the gentle ramp that had been built with a wheel chair in mind, and out the back door into the walled and wired garden behind the house.

"Why don't you let me use the wheel chair, Steve? This is silly."

"Because I'd rather carry you. Do you object? You know that you're as glad to get out of that motorized buggy for a while as I am to see you out. How do you feel today?" He deposited John with infinite care upon the cool grass.

"How should I feel? But tell me about your trouble."

"Quinn's campaign will be based on the fact that he claims I'm a robot."

John's eyes opened wide, "How do you know? It's impossible. I won't believe it."

"Oh, come, I tell you it's so. He had one of the big-shot scientists of U. S. Robots and Mechanical Men Corporation over at the office to argue with me."

Slowly John's hands tore at the grass, "I see. I see."

Byerley said, "But we can let him choose his ground. I have an idea. Listen to me and tell me if we can do it—"

* * *

The scene as it appeared in Alfred Lanning's office that night was a tableau of stares. Francis Quinn stared meditatively at Alfred Lanning. Lanning's stare was savagely set upon Susan Calvin, who stared impassively in her turn at Quinn.

Francis Quinn broke it with a heavy attempt at lightness, "Bluff. He's making it up as he goes along."

"Are you going to gamble on that, Mr. Quinn?" asked Dr. Calvin, indifferently.

"Well, it's your gamble, really."

"Look here," Lanning covered definite pessimism with bluster, "we've done what you asked. We witnessed the man eat. It's ridiculous to presume him a robot."

"Do *you* think so?" Quinn shot toward Calvin. "Lanning said you were the expert."

Lanning was almost threatening, "Now, Susan—"

Quinn interrupted smoothly, "Why not let her talk, man? She's been sitting there imitating a gatepost for half an hour."

Lanning felt definitely harassed. From what he experienced then to incipient paranoia was but a step. He said, "Very well. Have your say, Susan. We won't interrupt you."

Susan Calvin glanced at him humorlessly, then fixed cold eyes on Mr. Quinn. "There are only two ways of definitely proving Byerley to be a robot, sir. So far you are presenting circumstantial evidence, with which you can accuse, but not prove—and I think Mr. Byerley is sufficiently clever to counter that sort of material. You probably think so yourself, or you wouldn't have come here.

"The two methods of *proof* are the physical and the psychological. Physically, you can dissect him or use an X-ray. How to do that would be *your* problem. Psychologically, his behavior can be studied, for if he *is* a positronic robot, he must conform to the three Rules of Robotics. A positronic brain can not be constructed without them. You know the Rules, Mr. Quinn?"

She spoke them carefully, clearly, quoting word for word the famous bold print on page one of the "Handbook of Robotics."

"I've heard of them," said Quinn, carelessly.

"Then the matter is easy to follow," responded the psychologist, dryly. "If Mr. Byerley breaks any of those three rules, he is not a robot. Unfortunately, this procedure works in only one direction. If he lives up to the rules, it proves nothing one way or the other."

Quinn raised polite eyebrows, "Why not, doctor?"

"Because, if you stop to think of it, the three Rules of Robotics are the essential guiding principles of a good many of the world's ethical systems. Of course, every human being is supposed to have the instinct of self-preservation. That's Rule Three to a robot. Also, every 'good' human being, with a social conscience and a sense of responsibility, is supposed to defer to proper authority; to listen to his doctor, his boss, his

government, his psychiatrist, his fellow man; to obey laws, to follow rules, to conform to custom—even when they interfere with his comfort or his safety. That's Rule Two to a robot. Also, every 'good' human being is supposed to love others as himself, protect his fellow man, risk his life to save another. That's Rule One to a robot. To put it simply—if Byerley follows all the Rules of Robotics, he may be a robot, and may simply be a very good man."

"But," said Quinn, "you're telling me that you can never prove him a robot."

"I may be able to prove him *not* a robot."

"That's not the proof I want."

"You'll have such proof as exists. You are the only one responsible for your own wants."

* * *

Here Lanning's mind leaped suddenly to the sting of an idea, "Has it occurred to anyone," he ground out, "that district attorney is a rather strange occupation for a robot? The prosecution of human beings—sentencing them to death—bringing about their infinite harm—"

Quinn grew suddenly keen, "No, you can't get out of it that way. Being district attorney doesn't make him human. Don't you know his record? Don't you know that he boasts that he has never prosecuted an innocent man; that there are scores of people left untried because the evidence against them didn't satisfy him, even though he could probably have argued a jury into atomizing them? That happens to be so."

Lanning's thin cheeks quivered, "No, Quinn, no. There is nothing in the Rules of Robotics that makes any allowance for human guilt. A robot may not judge whether a human being deserves death. It is not for him to decide. *He may not harm a human*—variety skunk, or variety angel."

Susan Calvin sounded tired. "Alfred," she said, "don't talk foolishly. What if a robot came upon a madman about to set fire to a house with people in it. He would stop the madman, wouldn't he?"

"Of course."

"And if the only way he could stop him was to kill him—"

There was a faint sound in Lanning's throat. Nothing more.

"The answer to that, Alfred, is that he would do his best not to kill him. If the madman died, the robot would require psychotherapy because he might easily go mad at the conflict presented him—of having broken Rule One to adhere to Rule One in a higher sense. But a man would be dead and a robot would have killed him."

"Well, *is* Byerley mad?" demanded Lanning, with all the sarcasm he could muster.

"No, but he has killed no man himself. He has exposed facts which might represent a particular human being to be dangerous to the large mass of other human beings we call society. He protects the greater number and thus adheres to Rule One at maximum potential. That is as far as he goes. It is the judge who then condemns the criminal to death or imprisonment, after the jury decides on his guilt or innocence. It is the jailer who imprisons him, the executioner who kills him. And Mr. Byerley has done nothing but determine truth and aid society.

"As a matter of fact, Mr. Quinn, I have looked into Mr. Byerley's career since you first brought this matter to our attention. I find that he has never demanded the death sentence in his closing speeches to the jury. I also find that he has spoken on behalf of

the abolition of capital punishment and contributed generously to research institutions engaged in criminal neurophysiology. He apparently believes in the cure, rather than the punishment of crime. I find that significant."

"You do?" Quinn smiled. "Significant of a certain odor of roboticity, perhaps?"

"Perhaps. Why deny it? Actions such as his could come only from a robot, or from a very honorable and decent human being. But you see, you just can't differentiate between a robot and the very best of humans."

Quinn sat back in his chair. His voice quivered with impatience. "Dr. Lanning, it's perfectly possible to create a humanoid robot that would perfectly duplicate a human in appearance, isn't it?"

Lanning harrumphed and considered, "It's been done experimentally by U. S. Robots," he said reluctantly, "without the addition of a positronic brain, of course. By using human ova and hormone control, one can grow human flesh and skin over a skeleton of porous silicone plastics that would defy external examination. The eyes, the hair, the skin would be really human, not humanoid. And if you put a positronic brain, and such other gadgets as you might desire inside, you have a humanoid robot."

Quinn said shortly, "How long would it take to make one?"

Lanning considered, "If you had all your equipment—the brain, the skeleton, the ovum, the proper hormones and radiations—say, two months."

The politician straightened out of his chair. "Then we shall see what the insides of Mr. Byerley look like. It will mean publicity for U. S. Robots—but I gave you your chance."

Lanning turned impatiently to Susan Calvin, when they were alone. "Why do you insist—"

And with real feeling, she responded sharply and instantly, "Which do you want—the truth or my resignation? I won't lie for you. U. S. Robots can take care of itself. Don't turn coward."

"What," said Lanning, "if he opens up Byerley, and wheels and gears fall out. What then?"

"He won't open Byerley," said Calvin, disdainfully. "Byerley is as clever as Quinn, at the very least."

* * *

The news broke upon the city a week before Byerley was to have been nominated. But "broke" is the wrong word. It staggered upon the city, shambled, crawled. Laughter began, and wit was free. And as the far off hand of Quinn tightened its pressure in easy stages, the laughter grew forced, an element of hollow uncertainty entered, and people broke off to wonder.

The convention itself had the air of a restive stallion. There had been no contest planned. Only Byerley could possibly have been nominated a week earlier. There was no substitute even now. They had to nominate him, but there was complete confusion about it.

It would not have been so bad if the average individual were not torn between the enormity of the charge, if true, and its sensational folly, if false.

The day after Byerley was nominated perfunctorily, hollowly—a newspaper finally published the gist of a long interview with Dr. Susan Calvin, "world famous expert on robopsychology and positronics."

What broke loose is popularly and succinctly described as hell.

It was what the Fundamentalists were waiting for. They were not a political party; they made pretense to no formal religion. Essentially they were those who had not adapted themselves to what had once been called the Atomic Age, in the days when atoms were a novelty. Actually, they were the Simple-Lifers, hungering after a life, which to those who lived it had probably appeared not so Simple, and who had been, therefore, Simple-Lifers themselves.

The Fundamentalists required no new reason to detest robots and robot manufacturers; but a new reason such as the Quinn accusation and the Calvin analysis was sufficient to make such detestation audible.

The huge plants of the U. S. Robots and Mechanical Men Corporation was a hive that spawned armed guards. It prepared for war.

Within the city the house of Stephen Byerley bristled with police.

The political campaign, of course, lost all other issues, and resembled a campaign only in that it was something filling the hiatus between nomination and election.

* * *

Stephen Byerley did not allow the fussy little man to distract him. He remained comfortably unperturbed by the uniforms in the background. Outside the house, past the line of grim guards, reporters and photographers waited according to the tradition of the caste. One enterprising 'visor station even had a scanner focused on the blank entrance to the prosecutor's unpretentious home, while a synthetically excited announcer filled in with inflated commentary.

The fussy little man advanced. He held forward a rich, complicated sheet. "This, Mr. Byerley, is a court order authorizing me to search these premises for the presence of illegal . . . uh . . . mechanical men or robots of any description."

Byerley half rose, and took the paper. He glanced at it indifferently, and smiled as he handed it back. "All in order. Go ahead. Do your job. Mrs. Hoppen"—to his housekeeper, who appeared reluctantly from the next room—"please go with them, and help out if you can."

The little man, whose name was Harroway, hesitated, produced an unmistakable blush, failed completely to catch Byerley's eyes, and muttered, "Come on," to the two policemen.

He was back in ten minutes.

"Through?" questioned Byerley, in just the tone of a person who is not particularly interested in the question, or its answer.

Harroway cleared his throat, made a bad start in falsetto, and began again, angrily, "Look here, Mr. Byerley, our special instructions were to search the house very thoroughly."

"And haven't you?"

"We were told exactly what to look for."

"Yes?"

"In short, Mr. Byerley, and not to put too fine a point on it, we were told to search you."

"Me?" said the prosecutor with a broadening smile. "And how do you intend to do that?"

"We have a Penet-radiation unit—"

"Then I'm to have my X-ray photograph taken, hey? You have the authority?"

"You saw my warrant."

"May I see it again?"

Harroway, his forehead shining with considerably more than mere enthusiasm, passed it over a second time.

Byerley said evenly, "I read here as the description of what you are to search; I quote: 'the dwelling place belonging to Stephen Allen Byerley, located at 355 Willow Grove, Evanston, together with any garage, storehouse or other structures or buildings thereto appertaining, together with all grounds thereto appertaining' . . . um . . . and so on. Quite in order. But, my good man, it doesn't say anything about searching my interior. I am not part of the premises. You may search my clothes if you think I've got a robot hidden in my pocket."

Harroway had no doubt on the point of to whom he owed his job. He did not propose to be backward, given a chance to earn a much better—i.e., more highly paid—job.

He said, in a faint echo of bluster, "Look here. I'm allowed to search the furniture in your house, and anything else I find in it. You are in it, aren't you?"

"A remarkable observation. I *am* in it. But I'm not a piece of furniture. As a citizen of adult responsibility—I have the psychiatric certificate proving that—I have certain rights under the Regional Articles. Searching me would come under the heading of violating my Right of Privacy. That paper isn't sufficient."

"Sure, but if you're a robot, you don't have Right of Privacy."

"True enough—but that paper still isn't sufficient. It recognizes me implicitly as a human being."

"Where?" Harroway snatched at it.

"Where it says 'the dwelling place belonging to' and so on. A robot cannot own property. And you may tell your employer, Mr. Harroway, that if he tries to issue a similiar paper which does *not* implicitly recognize me as a human being, he will be immediately faced with a restraining injunction and a civil suit which will make it necessary for him to *prove* me a robot by means of information *now* in his possession, or else to pay a whopping penalty for an attempt to deprive me unduly of my Rights under the Regional Articles. You'll tell him that, won't you?"

Harroway marched to the door. He turned. "You're a slick lawyer—" His hand was in his pocket. For a short moment, he stood there. Then he left, smiling in the direction of the 'visor scanner, still playing away—waved to the reporters, and shouted, "We'll have something for you tomorrow, boys. No kidding."

In his ground car, he settled back, removed the tiny mechanism from his pocket and carefully inspected it. It was the first time he had ever taken a photograph by X-ray reflection. He hoped he had done it correctly.

Quinn and Byerley had never met face-to-face alone. But visorphone was pretty close to it. In fact, accepted literally, perhaps the phrase was accurate, even if to each, the other were merely the light and dark pattern of a bank of photocells.

It was Quinn who had initiated the call. It was Quinn, who spoke first, and without particular ceremony, "Thought you would like to know, Byerley, that I intend to make public the fact that you're wearing a protective shield against Penet-radiation."

"That so? In that case, you've probably already made it public. I have a notion our enterprising press representatives have been tapping my various communication lines for quite a while. I know they have my office lines full of holes; which is why I've dug in at my home these last weeks." Byerley was friendly, almost chatty.

Quinn's lips tightened slightly, "This call is shielded—thoroughly. I'm making it at a certain personal risk."

"So I should imagine. Nobody knows you're behind this campaign. At least, nobody knows it officially. Nobody doesn't know it unofficially. I wouldn't worry. So I wear a protective shield? I suppose you found that out when your puppy dog's Penet-radiation photograph, the other day, turned out to be overexposed."

"You realize, Byerley, that it would be pretty obvious to everyone that you don't dare face X-ray analysis."

"Also that you, or your men, attempted illegal invasion of my Right of Privacy."

"The devil they'll care for that."

"They might. It's rather symbolic of our two campaigns, isn't it? You have little concern with the rights of the individual citizen. I have great concern. I will not submit to X-ray analysis, because I wish to maintain my Rights on principle. Just as I'll maintain the rights of others when elected."

"That will no doubt make a very interesting speech, but no one will believe you. A little too high-sounding to be true. Another thing," a sudden, crisp change, "the personnel in your home was not complete the other night."

"In what way?"

"According to the report," he shuffled papers before him that were just within the range of vision of the visiplate, "there was one person missing—a cripple."

"As you say," said Byerley, tonelessly, "a cripple. My old teacher, who lives with me and who is now in the country—and has been for two months. A 'much-needed rest' is the usual expression applied in the case. He has your permission?"

"Your teacher? A scientist of sorts?"

"A lawyer once—before he was a cripple. He has a government license as a research biophysicist, with a laboratory of his own, and a complete description of the work he's doing filed with the proper authorities, to whom I can refer you. The work is minor, but is a harmless and engaging hobby for a—poor cripple. I am being as helpful as I can, you see."

"I see. And what does this . . . teacher . . . know about robot manufacture?"

"I couldn't judge the extent of his knowledge in a field with which I am unacquainted."

"He wouldn't have access to positronic brains?"

"Ask your friends at U. S. Robots. They'd be the ones to know."

"I'll put it shortly, Byerley. Your crippled teacher is the real Stephen Byerley. You are his robot creation. We can prove it. It was he who was in the automobile accident, not you. There will be ways of checking the records."

"Really? Do so, then. My best wishes."

"And we can search your so-called teacher's 'country place,' and see what we can find there."

"Well, not quite, Quinn." Byerley smiled broadly. "Unfortunately for you, my so-called teacher is a sick man. His country place is his place of rest. His Right of Privacy as a citizen of adult responsibility is naturally even stronger, under the circumstances. You won't be able to obtain a warrant to enter his grounds without showing just cause. However, I'd be the last to prevent you from trying."

There was a pause of moderate length, and then Quinn leaned forward, so that his imaged-face expanded and the fine lines on his forehead were visible, "Byerley, why do you carry on? You can't be elected."

"Can't I?"

"Do you think you can? Do you suppose that your failure to make any attempt to disprove the robot charge—when you could easily, by breaking one of the Three Laws

—does anything but convince the people that you *are* a robot?"

"All I see so far is that from being a rather vaguely known, but still largely obscure metropolitan lawyer, I have now become a world figure. You're a good publicist."

"But you *are* a robot."

"So it's been said, but not proven."

"It's been proven sufficiently for the electorate."

"Then relax—you've won."

"Good-by," said Quinn, with his first touch of viciousness, and the visorphone slammed off.

"Good-by," said Byerley imperturbably, to the blank plate.

* * *

Byerley brought his "teacher" back the week before election. The air car dropped quickly in an obscure part of the city.

"You'll stay here till after election," Byerley told him. "It would be better to have you out of the way if things take a bad turn."

The hoarse voice that twisted painfully out of John's crooked mouth might have had accents of concern in it. "There's danger of violence?"

"The Fundamentalists threaten it, so I suppose there is, in a theoretical sense. But I really don't expect it. The Fundies have no real power. They're just the continuous irritant factor that might stir up a riot after a while. You don't mind staying here? Please. I won't be myself if I have to worry about you."

"Oh, I'll stay. You still think it will go well?"

"I'm sure of it. No one bothered you at the place?"

"No one. I'm certain."

"And your part went well?"

"Well enough. There'll be no trouble there."

"Then take care of yourself, and watch the televisor tomorrow, John." Byerley pressed the gnarled hand that rested on his.

* * *

Lenton's forehead was a furrowed study in suspense. He had the completely unenviable job of being Byerley's campaign manager in a campaign that wasn't a campaign, for a person that refused to reveal his strategy, and refused to accept his manager's.

"You can't!" It was his favorite phrase. It had become his only phrase. "I tell you, Steve, you can't!"

He threw himself in front of the prosecutor, who was spending his time, leafing through the typed pages of his speech.

"Put that down, Steve. Look, that mob has been organized by the Fundies. You won't get a hearing. You'll be stoned more likely. Why do you have to make a speech before an audience? What's wrong with a recording, a visual recording?"

"You want me to win the election, don't you?" asked Byerley, mildly.

"Win the election! You're not going to win, Steve. I'm trying to save your life."

"Oh, I'm not in danger."

"He's not in danger. He's not in danger." Lenton made a queer, rasping sound in his

throat. "You mean you're getting out on that balcony in front of fifty thousand crazy crackpots and try to talk sense to them—on a balcony like a medieval dictator?"

Byerley consulted his watch. "In about five minutes—as soon as the television lines are free."

Lenton's answering remark was not quite transliterable.

* * *

The crowd filled a roped off area of the city. Trees and houses seemed to grow out of a mass-human foundation. And by ultrawave, the rest of the world watched. It was a purely local election, but it had a world audience just the same. Byerley thought of that and smiled.

But there was nothing to smile at in the crowd itself. There were banners and streamers, ringing every possible change on his supposed roboticity. The hostile attitude rose thickly and tangibly into the atmosphere.

From the start the speech was not successful. It competed against the inchoate mob howl and the rhythmic cries of the Fundie claques the formed mob-islands within the mob. Byerley spoke on, slowly, unemotionally—

Inside, Lenton clutched his hair and groaned—and waited for the blood.

* * *

There was a writhing in the front ranks. An angular citizen with popping eyes, and clothes too short for the lank length of his limbs, was pulling to the fore. A policeman dived after him, making slow, struggling passage. Byerley waved the latter off, angrily.

The thin man was directly under the balcony. His words tore unheard against the roar.

Byerley leaned forward. "What do you say? If you have a legitimate question, I'll answer it." He turned to a flanking guard. "Bring that man up here."

There was a tensing in the crowd. Cries of "Quiet" started in various parts of the mob, and rose to a bedlam, then toned down raggedly. The thin man, red-faced and panting, faced Byerley.

Byerley said, "Have you a question?"

The thin man stared, and said in a cracked voice, "Hit me!"

With sudden energy, he thrust out his chin at an angle. "Hit me! You say you're not a robot. Prove it. You can't hit a human, you monster."

There was a queer, flat, dead silence. Byerley's voice punctured it. "I have no reason to hit you."

The thin man was laughing wildly. "You *can't* hit me. You *won't* hit me. You're not a human. You're a monster, a make-believe man."

And Stephen Byerley, tight-lipped, in the face of thousands who watched in person and the millions who watched by screen, drew back his fist and caught the man cracklingly upon the chin. The challenger went over backwards in sudden collapse, with nothing on his face but blank, blank surprise.

Byerley said, "I'm sorry. Take him in and see that he's comfortable. I want to speak to him when I'm through."

And when Dr. Calvin, from her reserved space, turned her automobile and drove

off, only one reporter had recovered sufficiently from the shock to race after her, and shout an unheard question.

Susan Calvin called over her shoulder, "He's human."

That was enough. The reporter raced away in his own direction.

The rest of the speech might be described as "Spoken but not heard."

* * *

Dr. Calvin and Stephen Byerley met once again—a week before he took the oath of office as mayor. It was late—past midnight.

Dr. Calvin said, "You don't look tired."

The mayor-elect smiled. "I may stay up for a while. Don't tell Quinn."

"I shan't. But that was an interesting story of Quinn's, since you mention him. It's a shame to have spoiled it. I suppose you knew his theory?"

"Parts of it."

"It was highly dramatic. Stephen Byerley was a young lawyer, a powerful speaker, a great idealist—and with a certain flair for biophysics. Are you interested in robotics, Mr. Byerley?"

"Only in the legal aspects."

"*This* Stephen Byerley was. But here was an accident. Byerley's wife died; he himself, worse. His legs were gone; his face was gone; his voice was gone. Part of his mind was—bent. He would not submit to plastic surgery. He retired from the world, legal career gone—only his intelligence, and his hands left. Somehow he could obtain positronic brains, even a complex one, one which had the greatest capacity of forming judgments in ethical problems—which is the highest robotic function so far developed.

"He grew a body about it. Trained it to be everything he would have been and was no longer. He sent it out into the world as Stephen Byerley, remaining behind himself as the old, crippled teacher that no one ever saw—"

"Unfortunately," said the mayor-elect, "I ruined all that by hitting a man. The papers say it was your official verdict on the occasion that I was human."

"How did that happen? Do you mind telling me? It couldn't have been accidental."

"It wasn't entirely. Quinn did most of the work. My men started quietly spreading the fact that I had never hit a man; that I was unable to hit a man; that to fail to do so under provocation would be sure proof that I was a robot. So I arranged for a silly speech in public, with all sorts of publicity overtones, and almost inevitably, some fool fell for it. In its essence, it was what I call a shyster trick. One in which the artificial atmosphere which has been created does all the work. Of course, the emotional effects made my election certain, as intended."

The robopsychologist nodded. "I see you intrude on my field—as every politician must, I suppose. But I'm very sorry it turned out this way. I like robots. I like them considerably better than I do human beings. If a robot can be created capable of being a civil executive, I think he'd make the best one possible. By the Laws of Robotics, he'd be incapable of harming humans, incapable of tyranny, of corruption, of stupidity, of prejudice. And after he had served a decent term, he would leave, even though he were immortal, because it would be impossible for him to hurt humans by letting them know that a robot had ruled them. It would be most ideal."

"Except that a robot might fail due to the inherent inadequacies of his brain. The positronic brain has never equalled the complexities of the human brain."

"He would have advisers. Not even a human brain is capable of governing without assistance."

Byerley considered Susan Calvin with grave interest. "Why do you smile, Dr. Calvin?"

"I smile because Mr. Quinn didn't think of everything."

"You mean there could be more to that story of his."

"Only a little. For the three months before election, this Stephen Byerley that Mr. Quinn spoke about, this broken man, was in the country for some mysterious reason. He returned in time for that famous speech of yours. And after all, what the old cripple did once, he could do a second time, particularly where the second job is very simple in comparison to the first."

"I don't quite understand."

Dr. Calvin rose and smoothed her dress. She was obviously ready to leave. "I mean there is one time when a robot may strike a human being without breaking the First Law. Just one time."

"And when is that?"

Dr. Calvin was at the door. She said quietly, "When the human to be struck is merely another robot."

She smiled broadly, her thin face glowing. "Good-by, Mr. Byerley. I hope to vote for you five years from now—for co-ordinator."

Stephen Byerley chuckled. "I must reply that that is a somewhat farfetched idea."

The door closed behind her.

Little Lost Robot

Measures on Hyper Base had been taken in a sort of rattling fury—the muscular equivalent of an hysterical shriek.

To itemize them in order of both chronology and desperation, they were:

1. All work on the Hyperatomic Drive through all the space volume occupied by the Stations of the Twenty-Seventh Asteroidal Grouping came to a halt.

2. That entire volume of space was nipped out of the System, practically speaking. No one entered without permission. No one left under any conditions.

3. By special government patrol ship, Drs. Susan Calvin and Peter Bogert, respectively Head Psychologist and Mathematical Director of United States Robots and Mechanical Men Corporation, were brought to Hyper Base.

* * *

Susan Calvin had never left the surface of Earth before, and had no perceptible desire to leave it this time. In an age of Atomic Power and a clearly coming Hyperatomic Drive, she remained quietly provincial. So she was dissatisfied with her trip and unconvinced of the emergency, and every line of her plain, middle-aged face showed it clearly enough during her first dinner at Hyper Base.

Nor did Dr. Bogert's sleek paleness abandon a certain hangdog attitude. Nor did Major-general Kallner, who headed the project, even once forget to maintain a haunted expression.

In short, it was a grisly episode, that meal, and the little session of three that followed began in a gray, unhappy manner.

Kallner, with his baldness glistening, and his dress uniform oddly unsuited to the general mood, began with uneasy directness.

"This is a queer story to tell, sir, and madam. I want to thank you for coming on short notice and without a reason being given. We'll try to correct that now. We've lost a robot. Work has stopped and *must* stop until such time as we locate it. So far we have failed, and we feel we need expert help."

Perhaps the general felt his predicament anticlimactic. He continued with a note of desperation, "I needn't tell you the importance of our work here. More than eighty percent of last year's appropriations for scientific research have gone to us—"

"Why, we know that," said Bogert, agreeably. "U.S. Robots is receiving a generous rental fee for use of our robots."

Susan Calvin injected a blunt, vinegary note, "What makes a single robot so important to the project, and why hasn't it been located?"

The general turned his red face toward her and wet his lips quickly, "Why, in a manner of speaking we *have* located it." Then, with near anguish, "Here, suppose I explain. As soon as the robot failed to report, a state of emergency was declared, and all movement off Hyper Base stopped. A cargo vessel had landed the previous day and had delivered us two robots for our laboratories. It had sixty-two robots of the . . . uh . . . same type for shipment elsewhere. We are certain as to that figure. There is no question about it whatever."

"Yes? And the connection?"

"When our missing robot was not located anywhere—I assure you we would have found a missing blade of grass if it had been there to find—we brainstormed ourselves into counting the robots left on the cargo ship. They have sixty-three now."

"So that the sixty-third, I take it, is the missing prodigal?" Dr. Calvin's eyes darkened.

"Yes, but we have no way of telling which is the sixty-third."

There was a dead silence while the electric clock chimed eleven times, and then the robopsychologist said, "Very peculiar," and the corners of her lips moved downward.

"Peter," she turned to her colleague with a trace of savagery, "what's wrong here? What kind of robots are they using at Hyper Base?"

Dr. Bogert hesitated and smiled feebly, "It's been rather a matter of delicacy till now, Susan."

She spoke rapidly, "Yes, *till* now. If there are sixty-three same-type robots, one of which is wanted and the identity of which cannot be determined, why won't any of them do? What's the idea of all this? Why have we been sent for?"

Bogert said in resigned fashion, "If you'll give me a chance, Susan—Hyper Base happens to be using several robots whose brains are not impressioned with the entire First Law of Robotics."

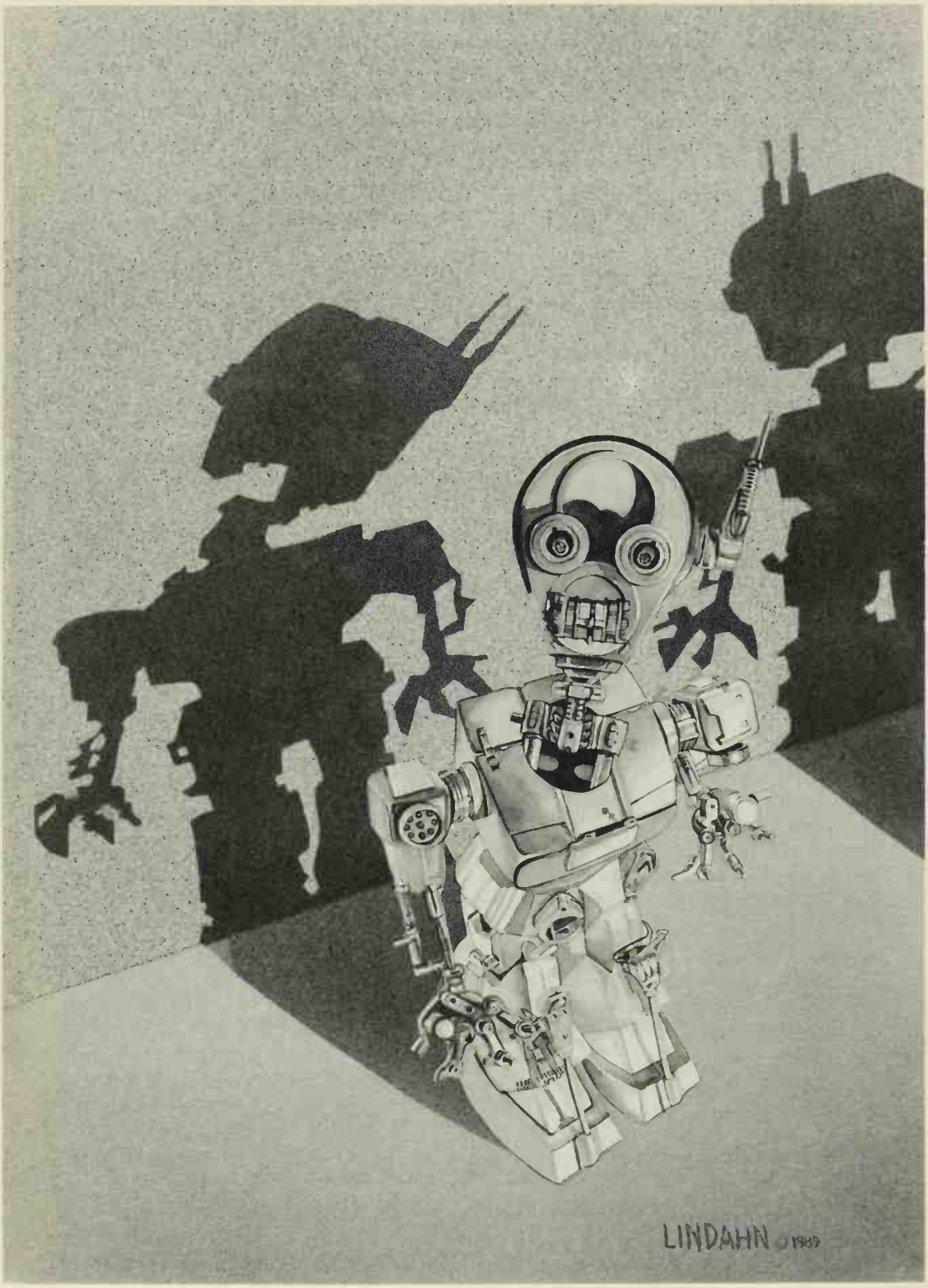
"*Aren't* impressioned?" Calvin slumped back in her chair, "I see. How many were made?"

"A few. It was on government order and there was no way of violating the secrecy. No one was to know except the top men directly concerned. You weren't included, Susan. It was nothing I had anything to do with."

* * *

The general interrupted with a measure of authority. "I would like to explain that bit. I hadn't been aware that Dr. Calvin was unacquainted with the situation. I needn't tell you, Dr. Calvin, that there always has been strong opposition to robots on the Planet. The only defense the government has had against the Fundamentalist radicals in this matter was the fact that robots are always built with an unbreakable First Law—which makes it impossible for them to harm human beings under any circumstance.

"But we *had* to have robots of a different nature. So just a few of the NS-2 model,


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the Nestors, that is, were prepared with a modified First Law. To keep it quiet, all NS-2's are manufactured without serial numbers; modified members are delivered here along with a group of normal robots; and, of course, all our kind are under the strictest impressionment never to tell of their modification to unauthorized personnel." He wore an embarrassed smile, "This has all worked out against us now."

Calvin said grimly, "Have you asked each one who it is, anyhow? Certainly, you are authorized?"

The general nodded, "All sixty-three deny having worked here—and one is lying."

"Does the one you want show traces of wear? The others, I take it, are factory-fresh."

"The one in question only arrived last month. It, and the two that have just arrived, were to be the last we needed. There's no perceptible wear." He shook his head slowly and his eyes were haunted again, "Dr. Calvin, we don't dare let that ship leave. If the existence of non-First Law robots becomes general knowledge—" There seemed no way of avoiding understatement in the conclusion.

"Destroy all sixty-three," said the robopsychologist coldly and flatly, "and make an end of it."

Bogert drew back a corner of his mouth. "You mean destroy thirty thousand dollars per robot. I'm afraid U. S. Robots wouldn't like that. We'd better make an effort first, Susan, before we destroy anything."

"In that case," she said, sharply, "I need facts. Exactly what advantage does Hyper Base derive from these modified robots? What factor made them desirable, general?"

Kallner ruffled his forehead and stroked it with an upward gesture of his hand. "We had trouble with our previous robots. Our men work with hard radiations a good deal, you see. It's dangerous, of course, but reasonable precautions are taken. There have been only two accidents since we began and neither was fatal. However, it was impossible to explain that to an ordinary robot. The First Law states—I'll quote it—'*No robot may harm a human being, or through inaction, allow a human being to come to harm.*'

"That's primary, Dr. Calvin. When it was necessary for one of our men to expose himself for a short period to a moderate gamma field, one that would have no physiological effects, the nearest robot would dash in to drag him out. If the field were exceedingly weak, it would succeed, and work could not continue till all robots were cleared out. If the field were a trifle stronger, the robot would never reach the technician concerned, since its positronic brain would collapse under gamma radiations—and then we would be out one expensive and hard-to-replace robot.

"We tried arguing with them. Their point was that a human being in a gamma field was endangering his life and that it didn't matter that he could remain there half an hour safely. Supposing, they would say, he forgot and remained an hour. They couldn't take chances. We pointed out that they were risking their lives on a wild off-chance. But self-preservation is only the Third Law of Robotics—and the First Law of human safety came first. We gave them orders; we ordered them strictly and harshly to remain out of gamma fields at whatever cost. But obedience is only the Second Law of Robotics—and the First Law of human safety came first. Dr. Calvin, we either had to do without robots, or do something about the First Law—and we made our choice."

"I can't believe," said Dr. Calvin, "that it was found possible to remove the First Law."

"It wasn't removed, it was modified," explained Kallner. "Positronic brains were constructed that contained the positive aspect only of the Law, which in them reads: '*No robot may harm a human being.*' That is all. They have no compulsion to prevent

one coming to harm through an extraneous agency such as gamma rays. I state the matter correctly, Dr. Bogert?"

"Quite," assented the mathematician.

"And that is the only difference of your robots from the ordinary NS-2 model? The *only* difference? Peter?"

"The *only* difference, Susan."

She rose and spoke with finality, "I intend sleeping now, and in about eight hours, I want to speak to whomever saw the robot last. And from now on, General Kallner, if I'm to take any responsibility at all for events, I want full and unquestioned control of this investigation."

Susan Calvin, except for two hours of resentful lassitude, experienced nothing approaching sleep. She signaled at Bogert's door at the local time of 0700 and found him also awake. He had apparently taken the trouble of transporting a dressing gown to Hyper Base with him, for he was sitting in it. He put his nail scissors down when Calvin entered.

He said softly, "I've been expecting you more or less. I suppose you feel sick about all this."

"I do."

"Well—I'm sorry. There was no way of preventing it. When the call came out from Hyper Base for us, I knew that something must have gone wrong with the modified Nestors. But what was there to do? I couldn't break the matter to you on the trip here as I would have liked to, because I had to be sure. The matter of the modification is top secret."

The psychologist muttered, "I should have been told. U. S. Robots had no right to modify positronic brains this way without the approval of a psychologist."

Bogert lifted his eyebrows and sighed. "Be reasonable, Susan. You couldn't have influenced them. In this matter, the government was bound to have its way. They want the Hyperatomic Drive and the etheric physicists want robots that won't interfere with them. They were going to get them even if it did mean twisting the First Law. We had to admit it was possible from a construction standpoint and they swore a mighty oath that they wanted only twelve, that they would be used only at Hyper Base, that they would be destroyed once the Drive was perfected, and that full precautions would be taken. And they insisted on secrecy—and that's the situation."

Dr. Calvin spoke through her teeth, "I would have resigned."

"It wouldn't have helped. The government was offering the company a fortune, and threatening it with antirobot legislation in case of a refusal. We were stuck then, and we're badly stuck now. If this leaks out, it might hurt Kallner and the government, but it would hurt U. S. Robots a devil of a lot more."

The psychologist stared at him. "Peter, don't you realize what all this is about? Can't you understand what the removal of the First Law means? It isn't just a matter of secrecy."

"I know what removal would mean. I'm not a child. It would mean complete instability, with no nonimaginary solutions to the positronic Field Equations."

"Yes, mathematically. But can you translate that into crude psychological thought. All normal life, Peter, consciously or otherwise, resents domination. If the domination is by an inferior, or by a supposed inferior, the resentment becomes stronger. Physically, and, to an extent, mentally, a robot—any robot—is superior to human beings. What makes him slavish, then? *Only the First Law!* Why, without it, the first order you tried to give a robot would result in your death. Unstable? What do you think?"

"Susan," said Bogert, with an air of sympathetic amusement, "I'll admit that this Frankenstein Complex you're exhibiting has a certain justification—hence the First Law in the first place. But the Law, I repeat and repeat, has not been removed—merely modified."

"And what about the stability of the brain?"

The mathematician thrust out his lips, "Decreased, naturally. But it's within the border of safety. The first Nestors were delivered to Hyper Base nine months ago, and nothing whatever has gone wrong till now, and even this involves merely fear of discovery and not danger to humans."

"Very well, then. We'll see what comes of the morning conference."

Bogert saw her politely to the door and grimaced eloquently when she left. He saw no reason to change his perennial opinion of her as a sour and fidgety frustration.

Susan Calvin's train of thought did not include Bogert in the least. She had dismissed him years ago as a smooth and pretentious sleekness.

* * *

Gerald Black had taken his degree in etheric physics the year before and, in common with his entire generation of physicists, found himself engaged in the problem of the Drive. He now made a proper addition to the general atmosphere of these meetings on Hyper Base. In his stained white smock, he was half rebellious and wholly uncertain. His stocky strength seemed striving for release and his fingers, as they twisted each other with nervous yanks, might have forced an iron bar out of true.

Major-general Kallner sat beside him, the two from U.S. Robots faced him.

Black said, "I'm told that I was the last to see Nestor 10 before he vanished. I take it you want to ask me about that."

Dr. Calvin regarded him with interest, "You sound as if you were not sure, young man. Don't you *know* whether you were the last to see him?"

"He worked with me, ma'am, on the field generators, and he was with me the morning of his disappearance. I don't know if anyone saw him after about noon. No one admits having done so."

"Do you think anyone's lying about it?"

"I don't say that. But I don't say that I want the blame of it, either." His dark eyes smoldered.

"There's no question of blame. The robot acted as it did because of what it is. We're just trying to locate it, Mr. Black, and let's put everything else aside. Now if you've worked with the robot, you probably know it better than anyone else. Was there anything unusual about it that you noticed? Had you ever worked with robots before?"

"I've worked with other robots we have here—the simple ones. Nothing different about the Nestors except that they're a good deal cleverer—and more annoying."

"Annoying? In what way?"

"Well—perhaps it's not their fault. The work here is rough and most of us get a little jagged. Fooling around with hyper-space isn't fun." He smiled feebly, finding pleasure in confession. "We run the risk continually of blowing a hole in normal space-time fabric and dropping right out of the universe, asteroid and all. Sounds screwy, doesn't it? Naturally, you're on edge sometimes. But these Nestors aren't. They're curious, they're calm, they don't worry. It's enough to drive you nuts at times. When you want something done in a tearing hurry, they seem to take their time. Sometimes I'd rather do without."

"You say they take their time? Have they ever refused an order?"

"Oh, no,"—hastily. "They do it all right. They tell you when they think you're wrong, though. They don't know anything about the subject but what we taught them, but that doesn't stop them. Maybe I imagine it, but the other fellows have the same trouble with their Nestors."

General Kallner cleared his throat ominously, "Why have no complaints reached me on the matter, Black?"

The young physicist reddened, "We didn't *really* want to do without the robots, sir, and besides we weren't certain exactly how such . . . uh . . . minor complaints might be received."

Bogert interrupted softly, "Anything in particular happen the morning you last saw it?"

There was a silence. With a quiet motion, Calvin repressed the comment that was about to emerge from Kallner, and waited patiently.

Then Black spoke in blurting anger, "I had a little trouble with it. I'd broken a Kimball tube that morning and was out five days of work; my entire program was behind schedule; I hadn't received any mail from home for a couple of weeks. And *he* came around wanting me to repeat an experiment I had abandoned a month ago. He was always annoying me on that subject and I was tired of it. I told him to go away—and that's all I saw of him."

"You told him to go away?" asked Dr. Calvin with sharp interest. "In just those words? Did you say 'Go away'? Try to remember the exact words."

There was apparently an internal struggle in progress. Black cradled his forehead in a broad palm for a moment, then tore it away and said defiantly, "I said, 'Go lose yourself.'"

Bogert laughed for a short moment. "And he did, eh?"

But Calvin wasn't finished. She spoke cajolingly, "Now we're getting somewhere, Mr. Black. But exact details are important. In understanding the robot's actions, a word, a gesture, an emphasis may be everything. You couldn't have said just those three words, for instance, could you? By your own description you must have been in a hasty mood. Perhaps you strengthened your speech a little."

The young man reddened, "Well . . . I may have called it a . . . a few things."

"Exactly what things?"

"Oh—I wouldn't remember exactly. Besides I couldn't repeat it. You know how you get when you're excited." His embarrassed laugh was almost a giggle, "I sort of have a tendency to strong language."

"That's quite all right," she replied, with prim severity. "At the moment, I'm a psychologist. I would like to have you repeat exactly what you said as nearly as you remember, and, even more important, the exact tone of voice you used."

Black looked at his commanding officer for support, found none. His eyes grew round and appalled, "But you can't."

"You must."

"Suppose," said Bogert, with ill-hidden amusement, "you address me. You may find it easier."

The young man's scarlet face turned to Bogert. He swallowed. "I said—" His voice faded out. He tried again, "I said—"

And he drew a deep breath and spewed it out hastily in one long succession of syllables. Then, in the charged air that lingered, he concluded almost in tears, ". . . more or less. I don't remember the exact order of what I called him, and maybe I left out

something or put in something, but that was about it."

Only the slightest flush betrayed any feeling on the part of the psychologist. She said, "I am aware of the meaning of most of the terms used. The others, I suppose, are equally derogatory."

"I'm afraid so," agreed the tormented Black.

"And in among it, you told him to lose himself."

"I meant it only figuratively."

"I realize that. No disciplinary action is intended, I am sure." And at her glance, the general, who, five seconds earlier, had seemed not sure at all, nodded angrily.

"You may leave, Mr. Black. Thank you for your co-operation."

* * *

It took five hours for Susan Calvin to interview the sixty-three robots. It was five hours of multi-repetition; of replacement after replacement of identical robot; of Questions A, B, C, D; and Answers A, B, C, D; of a carefully bland expression, a carefully neutral tone, a carefully friendly atmosphere; and a hidden wire recorder.

The psychologist felt drained of vitality when she was finished.

Bogert was waiting for her and looked expectant as she dropped the recording spool with a clang upon the plastic of the desk.

She shook her head, "All sixty-three seemed the same to me. I couldn't tell—"

He said, "You couldn't expect to tell by ear, Susan. Suppose we analyze the recordings."

Ordinarily, the mathematical interpretation of verbal reactions of robots is one of the more intricate branches of robotic analysis. It requires a staff of trained technicians and the help of complicated computing machines. Bogert knew that. Bogert stated as much, in an extreme of unshown annoyance after having listened to each set of replies, made lists of word deviations, and graphs of the intervals of responses.

"There are no anomalies present, Susan. The variation in wording and the time reactions are within the limits of ordinary frequency groupings. We need finer methods. They must have computers here. No." He frowned and nibbled delicately at a thumbnail. "We can't use computers. Too much danger of leakage. Or maybe if we—"

Dr. Calvin stopped him with an impatient gesture, "Please, Peter. This isn't one of your petty laboratory problems. If we can't determine the modified Nestor by some gross difference that we can see with the naked eye, one that there is no mistake about, we're out of luck. The danger of being wrong, and of letting him escape is otherwise too great. It's not enough to point out a minute irregularity in a graph. I tell you, if that's all I've got to go on, I'd destroy them all just to be certain. Have you spoken to the other modified Nestors?"

"Yes, I have," snapped back Bogert, "and there's nothing wrong with them. They're above normal in friendliness if anything. They answered my questions, displayed pride in their knowledge—except the two new ones that haven't had time to learn their etheric physics. They laughed rather good-naturedly at my ignorance in some of the specializations here." He shrugged, "I suppose that forms some of the basis for resentment toward them on the part of the technicians here. The robots are perhaps too willing to impress you with their greater knowledge."

"Can you try a few Planar Reactions to see if there has been any change, any deterioration, in their mental set-up since manufacture?"

"I haven't yet, but I will." He shook a slim finger at her, "You're losing your nerve, Susan. I don't see what it is you're dramatizing. They're essentially harmless."

"They are?" Calvin took fire. "They are? Do you realize one of them is lying? One of the sixty-three robots I have just interviewed has deliberately lied to me after the strictest injunction to tell the truth. The abnormality indicated is horribly deep-seated, and horribly frightening."

Peter Bogert felt his teeth harden against each other. He said, "Not at all. Look! Nestor 10 was given orders to lose himself. Those orders were expressed in maximum urgency by the person most authorized to command him. You can't counteract that order either by superior urgency or superior right of command. Naturally, the robot will attempt to defend the carrying out of his orders. In fact, objectively, I admire his ingenuity. How better can a robot lose himself than to hide himself among a group of similar robots?"

"Yes, you would admire it. I've detected amusement in you, Peter—amusement and an appalling lack of understanding. Are you a roboticist, Peter? Those robots attach importance to what they consider superiority. You've just said as much yourself. Subconsciously they feel humans to be inferior and the First Law which protects us from them is imperfect. They are unstable. And here we have a young man ordering a robot to leave him, to lose himself, with every verbal appearance of revulsion, disdain, and disgust. Granted, that robot must follow orders, but subconsciously, there is resentment. It will become more important than ever for it to prove that it is superior despite the horrible names it was called. It may become *so* important that what's left of the First Law won't be enough."

"How on Earth, or anywhere in the Solar System, Susan, is a robot going to know the meaning of the assorted strong language used upon him? Obscenity is not one of the things impressioned upon his brain."

"Original impressionment is not everything," Calvin snarled at him. "Robots have learning capacity, you . . . you fool—" And Bogert knew that she had really lost her temper. She continued hastily, "Don't you suppose he could tell from the tone used that the words weren't complimentary? Don't you suppose he's heard the words used before and noted upon what occasions?"

"Well, then," shouted Bogert, "will you kindly tell me one way in which a modified robot can harm a human being, no matter how offended it is, no matter how sick with desire to prove superiority?"

"If I tell you one way, will you keep quiet?"

"Yes."

They were leaning across the table at each other, angry eyes nailed together.

The psychologist said, "If a modified robot were to drop a heavy weight upon a human being, he would not be breaking the First Law, if he did so with the knowledge that his strength and reaction speed would be sufficient to snatch the weight away before it struck the man. However once the weight left his fingers, he would be no longer the active medium. Only the blind force of gravity would be that. The robot could then change his mind and merely by inaction allow the weight to strike. The modified First Law allows that."

"That's an awful stretch of imagination."

"That's what my profession requires sometimes. Peter, let's not quarrel. Let's work. You know the exact nature of the stimulus that caused the robot to lose himself. You have the records of his original mental make-up. I want you to tell me how possible it is for our robot to do the sort of thing I just talked about. Not the specific instance, mind

you, but that whole class of response. And I want it done quickly."

"And meanwhile—"

"And meanwhile, we'll have to try performance tests directly on the response to First Law."

* * *

General Black, at his own request, was supervising the mushrooming wooden partitions that were springing up in a bellying circle on the vaulted third floor of Radiation Building 2. The laborers worked in the main, silently, but more than one was openly a-wonder at the sixty-three photocells that required installation.

One of them sat down near Black, removed his hat, and wiped his forehead thoughtfully with a freckled forearm.

Black nodded at him, "How's it doing, Walensky?"

Walensky shrugged and fired a cigar, "Smooth as butter. What's going on anyway, Doc? First, there's no work for three days and then we have this mess of jiggers." He leaned backward on his elbows and puffed smoke.

Black twitched his eyebrows, "A couple of robot men came over from Earth. Remember the trouble we had with robots running into the gamma fields, before we pounded it into their skulls that they weren't to do it."

"Yeah. Didn't we get new robots?"

"We got some replacements, but mostly it was a job of indoctrination. Anyway, the people who make them want to figure out robots that aren't hit so bad by gamma rays."

"Sure seems funny, though, to stop all the work on the Drive for this robot deal. I thought nothing was allowed to stop the Drive."

"Well, it's the fellows upstairs that have the say on that. Me—I just do as I'm told. Probably all a matter of pull—"

"Yeah," the electrician jerked a smile, and winked a wise eye. "Somebody knew somebody in Washington. But as long as my pay comes through on the dot, I should worry. The Drive's none of my affair. What are they going to do here?"

"You're asking me? They brought a mess of robots with them,—over sixty, and they're going to measure reactions. That's all *my* knowledge."

"How long will it take?"

"I wish I knew."

"Well," Walensky said, with heavy sarcasm, "as long as they dish me my money, they can play games all they want."

Black felt quietly satisfied. Let the story spread. It was harmless, and near enough to the truth to take the fangs out of curiosity.

* * *

A man sat in the chair, motionless, silent. A weight dropped, crashed downward, then pounded aside at the last moment under the synchronized thump of a sudden force beam. In sixty-three wooden cells, watching NS-2 robots dashed forward in that split second before the weight veered, and sixty-three photocells five feet ahead of their original positions jiggled the marking pen and presented a little jag on the paper. The weight rose and dropped, rose and dropped, rose—

Ten times!

Ten times the robots sprang forward and stopped, as the man remained safely seated.

* * *

Major-general Kallner had not worn his uniform in its entirety since the first dinner with the U. S. Robot representatives. He wore nothing over his blue-gray shirt now, the collar was open, and the black tie was pulled loose.

He looked hopefully at Bogert, who was still blandly neat and whose inner tension was perhaps betrayed only by the trace of glister at his temples.

The general said, "How does it look? What is it you're trying to see?"

Bogert replied, "A difference which may turn out to be a little too subtle for our purposes, I'm afraid. For sixty-two of those robots the necessity of jumping toward the apparently threatened human was what we call, in robotics, a forced reaction. You see, even when the robots knew that the human in question would not come to harm—and after the third or fourth time they must have known it—they could not prevent reacting as they did. First Law requires it."

"Well?"

"But the sixty-third robot, the modified Nestor, had no such compulsion. He was under free action. If he had wished, he could have remained in his seat. Unfortunately," and his voice was mildly regretful, "he didn't so wish."

"Why do you suppose?"

Bogert shrugged, "I suppose Dr. Calvin will tell us when she gets here. Probably with a horribly pessimistic interpretation, too. She is sometimes a bit annoying."

"She's qualified, isn't she?" demanded the general with a sudden frown of uneasiness.

"Yes." Bogert seemed amused. "She's qualified all right. She understands robots like a sister—comes from hating human beings so much, I think. It's just that, psychologist or not, she's an extreme neurotic. Has paranoid tendencies. Don't take her too seriously."

He spread the long row of broken-line graphs out in front of him. "You see, general, in the case of each robot the time interval from moment of drop to the completion of a five-foot movement tends to decrease as the tests are repeated. There's a definite mathematical relationship that governs such things and failure to conform would indicate marked abnormality in the positronic brain. Unfortunately, all here appear normal."

"But if our Nestor 10 was not responding with a forced action, why isn't his curve different? I don't understand that."

"It's simple enough. Robotic responses are not perfectly analogous to human responses, more's the pity. In human beings, voluntary action is much slower than reflex action. But that's not the case with robots; with them it is merely a question of freedom of choice, otherwise the speeds of free and forced action are much the same. What I *had* been expecting, though, was that Nestor 10 would be caught by surprise the first time and allow too great an interval to elapse before responding."

"And he didn't?"

"I'm afraid not."

"Then we haven't gotten anywhere." The general sat back with an expression of pain. "It's five days since you've come."

At this point, Susan Calvin entered and slammed the door behind her. "Put your graphs away, Peter," she cried, "you know they don't show anything."

She mumbled something impatiently as Kallner half-rose to greet her, and went on, "We'll have to try something else quickly. I don't like what's happening."

Bogert exchanged a resigned glance with the general. "Is anything wrong?"

"You mean specifically? No. But I don't like to have Nestor 10 continue to elude us. It's bad. It *must* be gratifying his swollen sense of superiority. I'm afraid that his motivation is no longer simply one of following orders. I think it's becoming more a matter of sheer neurotic necessity to out-think humans. That's a dangerously unhealthy situation. Peter, have you done what I asked? Have you worked out the instability factors of the modified NS-2 along the lines I want?"

"It's in progress," said the mathematician, without interest.

She stared at him angrily for a moment, then turned to Kallner. "Nestor 10 is decidely aware of what we're doing, general. He had no reason to jump for the bait in this experiment, especially after the first time, when he must have seen that there was no real danger to our subject. The others couldn't help it; but *he* was deliberately falsifying a reaction."

"What do you think we ought to do now, then, Dr. Calvin?"

"Make it impossible for him to fake an action the next time. We will repeat the experiment, but with an addition. High-tension cables, capable of electrocuting the Nestor models will be placed between subject and robot—enough of them to avoid the possibility of jumping over—and the robot will be made perfectly aware in advance that touching the cables will mean death."

"Hold on," spat out Bogert with sudden viciousness. "I rule that out. We are not electrocuting two million dollars worth of robots to locate Nestor 10. There are other ways."

"You're certain? You've found none. In any case, it's not a question of electrocution. We can arrange a relay which will break the current at the instant of application of weight. If the robot should place his weight on it, he won't die. *But he won't know that,* you see."

The general's eyes gleamed into hope. "Will that work?"

"It should. Under those conditions, Nestor 10 would have to remain in his seat. He could be *ordered* to touch the cables and die, for the Second Law of obedience is superior to the Third Law of self-preservation. But *he won't* be ordered to; he will merely be left to his own devices, as will all the robots. In the case of the normal robots, the First Law of human safety will drive them to their death even without orders. But not our Nestor 10. Without the entire First Law, and without having received any orders on the matter, the Third Law, self-preservation, will be the highest operating, and he will have no choice but to remain in his seat. It would be a forced action."

"Will it be done tonight, then?"

"Tonight," said the psychologist, "if the cables can be laid in time. I'll tell the robots now what they're to be up against."

* * *

A man sat in the chair, motionless, silent. A weight dropped, crashed downward, then pounded aside at the last moment under the synchronized thump of a sudden force beam.

Only once—

And from her small camp chair in the observing booth in the balcony, Dr. Susan Calvin rose with a short gasp of pure horror.

Sixty-three robots sat quietly in their chairs, staring owlishly at the endangered man before them. Not one moved.

* * *

Dr. Calvin was angry, angry almost past endurance. Angry the worse for not daring to show it to the robots that, one by one, were entering the room and then leaving. She checked the list. Number Twenty-eight was due in now—Thirty-five still lay ahead of her.

Number Twenty-eight entered, diffidently.

She forced herself into reasonable calm. "And who are you?"

The robot replied in a low, uncertain voice, "I have received no number of my own yet, ma'am. I'm an NS-2 robot, and I was Number Twenty-eight in line outside. I have a slip of paper here that I'm to give to you."

"You haven't been in here before this today?"

"No, ma'am."

"Sit down. Right there. I want to ask you some questions, Number Twenty-eight. Were you in the Radiation Room of Building Two about four hours ago?"

The robot had trouble answering. Then it came out hoarsely, like machinery needing oil, "Yes, ma'am."

"There was a man who almost came to harm there, wasn't there?"

"Yes, ma'am."

"You did nothing, did you?"

"No, ma'am."

"The man might have been hurt because of your inaction. Do you know that?"

"Yes, ma'am. I couldn't help it, ma'am." It is hard to picture a large expressionless metallic figure cringing, but it managed.

"I want you to tell me exactly why you did nothing to save him."

"I want to explain, ma'am. I certainly don't want to have you . . . have *anyone* . . . think that I could do a thing that might cause harm to a master. Oh, no, that would be a horrible . . . an inconceivable—"

"Please don't get excited, boy. I'm not blaming you for anything. I only want to know what you were thinking at the time."

"Ma'am, before it all happened you told us that one of the masters would be in danger of harm from that weight that keeps falling and that we would have to cross electric cables if we were to try to save him. Well, ma'am, that wouldn't stop me. What is my destruction compared to the safety of a master? But . . . but it occurred to me that if I died on my way to him, I wouldn't be able to save him anyway. The weight would crush him and then I would be dead for no purpose and perhaps some day some other master might come to harm who wouldn't have, if I had only stayed alive. Do you understand me, ma'am?"

"You mean that it was merely a choice of the man dying, of both the man and yourself dying. Is that right?"

"Yes, ma'am. It was impossible to save the master. He might be considered dead. In that case, it is inconceivable that I destroy myself for nothing—without orders."

The psychologist twiddled a pencil. She had heard the same story with insignificant verbal variations twenty-seven times before. This was the crucial question now.

"Boy," she said, "your thinking has its points, but it is not the sort of thing I thought you might think. Did you think of this yourself?"

The robot hesitated. "No."

"Who thought of it, then?"

"We were talking last night, and one of us got that idea and it sounded reasonable."

"Which one?"

The robot thought deeply. "I don't know. Just one of us."

She sighed, "That's all."

Number Twenty-nine was next. Thirty-four after that.

* * *

Major-general Kallner, too, was angry. For one week all of Hyper Base had stopped dead, barring some paper work on the subsidiary asteroids of the group. For nearly one week, the two top experts in the field had aggravated the situation with useless tests. And now they—or the woman, at any rate—made impossible propositions.

Fortunately for the general situation, Kallner felt it impolite to display his anger openly.

Susan Calvin was insisting, "Why not, sir? It's obvious that the present situation is unfortunate. The only way we may reach results in the future—or what future is left us in this matter—is to separate the robots. We can't keep them together any longer."

"My dear Dr. Calvin," rumbled the general, his voice sinking into the lower baritone registers. "I don't see how I can quarter sixty-three robots all over the place—"

Dr. Calvin raised her arms helplessly. "I can do nothing then. Nestor 10 will either imitate what the other robots would do, or else argue them plausibly into not doing what he himself cannot do. And in any case, this is bad business. We're in actual combat with this little lost robot of ours and he's winning out. Every victory of his aggravates his abnormality."

She rose to her feet in determination. "General Kallner, if you do not separate the robots as I ask, then I can only demand that all sixty-three be destroyed immediately."

"You demand it, do you?" Bogert looked up suddenly, and with real anger. "What gives you the right to demand any such thing. Those robots remain as they are. *I'm* responsible to the management, not you."

"And I," added Major-general Kallner, "am responsible to the World Co-ordinator—and I must have this settled."

"In that case," flashed back Calvin, "there is nothing for me to do but resign. If necessary to force you to the necessary destruction, I'll make this whole matter public. It was not I that approved the manufacture of modified robots."

"One word from you, Dr. Calvin," said the general, deliberately, "in violation of security measures, and you would be certainly imprisoned instantly."

Bogert felt the matter to be getting out of hand. His voice grew syrupy, "Well, now, we're beginning to act like children, all of us. We need only a little more time. Surely we can outwit a robot without resigning, or imprisoning people, or destroying two million."

The psychologist turned on him with quiet fury, "I don't want any unbalanced robots in existence. We have one Nestor that's definitely unbalanced, eleven more that are potentially so, and sixty-two normal robots that are being subjected to an unbalanced

environment. The only absolutely safe method is complete destruction."

The signal-burr brought all three to a halt, and the angry tumult of growingly unrestrained emotion froze.

"Come in," growled Kallner.

It was Gerald Black, looking perturbed. He had heard angry voices. He said, "I thought I'd come myself . . . didn't like to ask anyone else—"

"What is it? Don't orate—"

"The locks of Compartment C in the trading ship have been played with. There are fresh scratches on them."

"Compartment C?" exclaimed Calvin quickly. "That's the one that holds the robots, isn't it? Who did it?"

"From the inside," said Black, laconically.

"The lock isn't out of order, is it?"

"No. It's all right. I've been staying on the ship now for four days and none of them have tried to get out. But I thought you ought to know, and I didn't like to spread the news. I noticed the matter myself."

"Is anyone there now?" demanded the general.

"I left Robbins and McAdams there."

There was a thoughtful silence, and then Dr. Calvin said, ironically, "Well?"

Kallner rubbed his nose uncertainly, "What's it all about?"

"Isn't it obvious? Nestor 10 is planning to leave. That order to lose himself is dominating his abnormality past anything we can do. I wouldn't be surprised if what's left of his First Law would scarcely be powerful enough to override it. He is perfectly capable of seizing the ship and leaving with it. Then we'd have a mad robot on a spaceship. What would he do next? Any idea? Do you still want to leave them all together, general?"

"Nonsense," interrupted Bogert. He had regained his smoothness. "All that from a few scratch marks on a lock."

"Have you, Dr. Bogert, completed the analysis I've required, since you volunteer opinions?"

"Yes."

"May I see it?"

"No."

"Why not? Or mayn't I ask that, either?"

"Because there's no point in it, Susan. I told you in advance that these modified robots are less stable than the normal variety, and my analysis shows it. There's a certain very small chance of breakdown under extreme circumstances that are not likely to occur. Let it go at that. I won't give you ammunition for your absurd claim that sixty-two perfectly good robots be destroyed just because so far you lack the ability to detect Nestor 10 among them."

Susan Calvin stared him down and let disgust fill her eyes. "You won't let anything stand in the way of the permanent directorship, will you?"

"Please," begged Kallner, half in irritation. "Do you insist that nothing further can be done, Dr. Calvin?"

"I can't think of anything, sir," she replied, wearily. "If there were only other differences between Nestor 10 and the normal robots, differences that didn't involve the First Law. Even one other difference. Something in impressionment, environment, specification—" And she stopped suddenly.

"What is it?"

"I've thought of something . . . I think—" Her eyes grew distant and hard, "These modified Nestors, Peter. They get the same impressioning the normal ones get, don't they?"

"Yes. Exactly the same."

"And what was it you were saying, Mr. Black," she turned to the young man, who through the storms that had followed his news had maintained a discreet silence. "Once when complaining of the Nestors' attitude of superiority, you said the technicians had taught them all they knew."

"Yes, in etheric physics. They're not acquainted with the subject when they come here."

"That's right," said Bogert, in surprise. "I told you, Susan, when I spoke to the other Nestors here that the two new arrivals hadn't learned etheric physics yet."

"And why is that?" Dr. Calvin was speaking in mounting excitement. "Why aren't NS-2 models impressioned with etheric physics to start with?"

"I can tell you that," said Kallner. "It's all of a piece with the secrecy. We thought that if we made a special model with knowledge of etheric physics, used twelve of them and put the others to work in an unrelated field, there might be suspicion. Men working with normal Nestors might wonder why they knew etheric physics. So there was merely an impressionment with a capacity for training in the field. Only the ones that come here, naturally, receive such a training. It's that simple."

"I understand. Please get out of here, the lot of you. Let me have an hour or so."

* * *

Calvin felt she could not face the ordeal for a third time. Her mind had contemplated it and rejected it with an intensity that left her nauseated. She could face that unending file of repetitious robots no more.

So Bogert asked the questions now, while she sat aside, eyes and mind half-closed.

Number Fourteen came in—forty-nine to go.

Bogert looked up from the guide sheet and said, "What is your number in line?"

"Fourteen, sir." The robot presented his numbered ticket.

"Sit down, boy."

Bogert asked, "You haven't been here before on this day?"

"No, sir."

"Well, boy, we are going to have another man in danger of harm soon after we're through here. In fact, when you leave this room you will be led to a stall where you will wait quietly, till you are needed. Do you understand?"

"Yes, sir."

"Now, naturally, if a man is in danger of harm, you will try to save him."

"Naturally, sir."

"Unfortunately, between the man and yourself, there will be a gamma ray field."

Silence.

"Do you know what gamma rays are?" asked Bogert sharply.

"Energy radiation, sir?"

The next question came in a friendly, offhand manner, "Ever work with gamma rays?"

"No, sir." The answer was definite.

"Mm-m. Well, boy, gamma rays will kill you instantly. They'll destroy your brain.

That is a fact you must know and remember. Naturally, you don't want to destroy yourself."

"Naturally." Again the robot seemed shocked. Then, slowly, "But sir, if the gamma rays are between myself and the master that may be harmed, how can I save him? I would be destroying myself to no purpose."

"Yes, there is that," Bogert seemed concerned about the matter. "The only thing I can advise, boy, is that if you detect the gamma radiation between yourself and the man, you may as well sit where you are."

The robot was openly relieved. "Thank you, sir. There wouldn't be any use, would there?"

"Of course not. But if there *weren't* any dangerous radiation, that would be a different matter."

"Naturally, sir. No question of that."

"You may leave now. The man on the other side of the door will lead you to your stall. Please wait there."

He turned to Susan Calvin when the robot left. "How did that go, Susan?"

"Very well," she said, dully.

"Do you think we could catch Nestor 10 by quick questioning on etheric physics?"

"Perhaps, but it's not sure enough." Her hands lay loosely in her lap. "Remember, he's fighting us. He's on his guard. The only way we can catch him is to outsmart him—and, within his limitations, he can think much more quickly than a human being."

"Well, just for fun—suppose I ask the robots from now on a few questions on gamma rays. Wave length limits, for instance."

"No!" Dr. Calvin's eyes sparked to life. "It would be too easy for him to deny knowledge and then he'd be warned against the test that's coming up—which is our real chance. Please follow the questions I've indicated, Peter, and don't improvise. It's just within the bounds of risk to ask them if they've ever worked with gamma rays. And try to sound even less interested then you do when you ask it."

Bogert shrugged, and pressed the buzzer that would allow the entrance of Number Fifteen.

The large Radiation Room was in readiness once more. The robots waited patiently in their wooden cells, all open to the center but closed off from each other.

Major-general Kallner mopped his brow slowly with a large handkerchief while Dr. Calvin checked the last details with Black.

"You're sure now," she demanded, "that none of the robots have had a chance to talk with each other after leaving the Orientation Room?"

"Absolutely sure," insisted Black. "There's not been a word exchanged."

"And the robots are put in the proper stalls?"

"Here's the plan."

The psychologist looked at it thoughtfully, "Um-m-m."

The general peered over her shoulder. "What's the idea of the arrangement, Dr. Calvin?"

"I've asked to have those robots that appeared even slightly out of true in the previous tests concentrated on one side of the circle. I'm going to be sitting in the center myself this time, and I wanted to watch those particularly."

"*You're* going to be sitting there—" exclaimed Bogert.

"Why not?" she demanded coldly. "What I expect to see may be something quite momentary. I can't risk having anyone else as main observer. Peter, you'll be in the observing booth, and I want you to keep your eye on the opposite side of the circle.

General Kallner, I've arranged for motion pictures to be taken of each robot, in case visual observation isn't enough. If these are required, the robots are to remain exactly where they are until the pictures are developed and studied. None must leave, none must change place. Is that clear?"

"Perfectly."

"Then let's try it this one last time."

* * *

Susan Calvin sat in the chair, silent, eyes restless. A weight dropped, crashed downward, then pounded aside at the last moment under the synchronized thump of a sudden force beam.

And a single robot jerked upright and took two steps.

And stopped.

But Dr. Calvin was upright, and her finger pointed to him sharply. "Nestor 10, come here," she cried, "*come here!* COME HERE!"

Slowly, reluctantly, the robot took another step forward. The psychologist shouted at the top of her voice, without taking her eyes from the robot, "Get every other robot out of this place, somebody. Get them out quickly, and *keep* them out."

Somewhere within reach of her ears there was noise, and the thud of hard feet upon the floor. She did not look away.

Nestor 10—if it was Nestor 10—took another step, and then, under force of her imperious gesture, two more. He was only ten feet away, when he spoke harshly, "I have been told to be lost—"

Another step. "I must not disobey. They have not found me so far— He would think me a failure— He told me— But it's not so— I am powerful and intelligent—"

The words came in spurts.

Another step. "I know a good deal— He would think . . . I mean I've been found— Disgraceful— Not I— I am intelligent— And by just a master . . . who's weak— Slow— "

Another step—and one metal arm flew out suddenly to her shoulder, and she felt the weight bearing her down. Her throat constricted, and she felt a shriek tear through.

Dimly, she heard Nestor 10's next words, "No one must find me. No master—" and the cold metal was against her, and she was sinking under the weight of it.

And then a queer, metallic sound, and she was on the ground with an unfelt thump, and a gleaming arm was heavy across her body. It did not move. Nor did Nestor 10, who sprawled beside her.

And now faces were bending over her.

Gerald Black was gasping, "Are you hurt, Dr. Calvin?"

She shook her head feebly. They pried the arm off her and lifted her gently to her feet, "What happened?"

Black said, "I bathed the place in gamma rays for five seconds. We didn't know what was happening. It wasn't till the last second that we realized he was attacking you, and then there was no time for anything but a gamma field. He went down in an instant. There wasn't enough to harm you though. Don't worry about it."

"I'm not worried." She closed her eyes and leaned for a moment upon his shoulder. "I don't think I was attacked exactly. Nestor 10 was simply *trying* to do so. What was left of the First Law was still holding him back."

* * *

Susan Calvin and Peter Bogert, two weeks after their first meeting with Major-general Kallner had their last. Work at Hyper Base had been resumed. The trading ship with its sixty-two normal NS-2's was gone to wherever it was bound, with an officially imposed story to explain its two weeks' delay. The government cruiser was making ready to carry the two roboticists back to Earth.

Kallner was once again a-gleam in dress uniform. His white gloves shone as he shook hands.

Calvin said, "The other modified Nestors are, of course, to be destroyed."

"They will be. We'll make shift with normal robots, or, if necessary, do without."

"Good."

"But tell me— You haven't explained— How was it done?"

She smiled tightly, "Oh, that. I would have told you in advance if I had been more certain of its working. You see, Nestor 10 had a superiority complex that was becoming more radical all the time. He liked to think that he and other robots knew more than human beings. It was becoming very important for him to think so.

"We knew that. So we warned every robot in advance that gamma rays would kill them, which it would, and we further warned them all that gamma rays would be between them and myself. So they all stayed where they were, naturally. By Nestor 10's own logic in the previous test they had all decided that there was no point in trying to save a human being if they were sure to die before they could do it."

"Well, yes, Dr. Calvin, I understand that. But why did Nestor 10 himself leave his seat."

"Ah! That was a little arrangement between myself and your young Mr. Black. You see it wasn't gamma rays that flooded the area between myself and the robots—but infrared rays. Just ordinary heat rays, absolutely harmless. Nestor 10 knew they were infrared and harmless and so he began to dash out, as he expected the rest would do, under First Law compulsion. It was only a fraction of a second too late that he remembered that the normal NS-2's could detect radiation, but could not identify the type. That he himself could only identify wave lengths by virtue of the training he had received at Hyper Base, under mere human beings, was a little too humiliating to remember for just a moment. To the normal robots the area was fatal because we had told them it would be, and only Nestor 10 knew we were lying.

"And just for a moment he forgot, or didn't want to remember, that other robots might be more ignorant than human beings. His very superiority caught him. Good-by, general."

No Connection

Raph was a typical American of his times. Remarkably ugly, too, by American standards of our times. The bony structure of his jaws was tremendous and the musculature suited it. His nose was arched and wide and his black eyes were small and forced wide apart by the span of said nose. His neck was thick, his body broad, his fingers spatulate, with strongly curved nails.

If he had stood erect, on thick legs with large, well-padded feet, he would have topped two and a half yards. Standing or sitting, his mass neared a quarter of a ton.

Yet his forehead rose in an unrestricted arc and his cranial capacity did not stint. His enormous hand dealt delicately with a pen, and his mind droned comfortably on as he bent over his desk.

In fact, his wife and most of his fellow-Americans found him a fine-looking fellow.

Which shows the alchemy of a long displacement along the time-axis.

* * *

Raph, Junior, was a smaller edition of our typical American. He was adolescent and had not yet lost the hairy covering of childhood. It spread in a dark, close-curled mat across his chest and back, but it was already thinning and perhaps within the year he would first don the adult shirt that would cover the proudly-naked skin of manhood.

But, meanwhile, he sat in breeches alone, and scratched idly at a favorite spot just above the diaphragm. He felt curious and just a little bored. It wasn't bad to come with his father to the museum when people were there. Today was a Closed-Day, however, and the empty corridors rang lonesomely when he walked along them.

Besides, he knew everything in it—mostly bones and stones.

Junior said: "What's that thing?"

"What thing?" Raph lifted his head and looked over his shoulder. Then he looked pleased. "Oh, that's something quite new. That's a reconstruction of Primate Primeval. It was sent to me from the North River Grouping. Isn't it a nice job, though?" And he

returned to his work, in the grip of a momentary twinge of pleasure. Primate Primeval wasn't to go on exhibition for a week at least—not until he prepared an honorable place for it with suitable surroundings, but, for the moment, it was in his office and his own private darling.

Raph looked at the "nice job" with quite other emotions, however. What he saw was a spindly figure of contemptuous size, with thin legs and arms, hair-covered and owning an ugly, small-featured face with large, protruding eyes.

He said: "Well, what *is* it, Pa?"

Raph stirred impatiently: "It's a creature that lived many millions of years ago, we think. That's the way we think it looks."

"Why?" insisted the youngster.

Raph gave up. Apparently, he would have to root out the subject and do away with it.

"Well, for one thing we can tell about the muscles from the shape of the bones, and the positions where the tendons would fit and where some of the nerves would go. From the teeth we can tell the type of digestive system the animal would have, and from the footbones, what type of posture it would have. For the rest, we go by the principle of Analogy, that is, by the outside appearance of creatures that exist today that have the same kind of skeleton. For instance, that's why he's covered with red hair. Most of the Primates today—they're little insignificant creatures, practically extinct—are red-haired, have bare callosities on the rump—"

Junior scurried behind the figure and satisfied himself on that score.

"—have long, fleshy probosces, and short, shriveled ears. Their diets are unspecialized, hence the rather all-purpose teeth, and they are nocturnal, hence the large eyes. It's all simple, really. Now, does that dispose of you, youngster?"

And then Junior, having thought and thought about it, came out with a disparaging: "He looks just like an Eekah to me, though. Just like an ugly, old Eekah."

Raph stared at him. Apparently he had missed a point: "An Eekah?" he said, "What's an Eekah? Is that an imaginary creature you've been reading about?"

"Imaginary! Say, Pa, don't you *ever* stop at the Recorder's?"

This was an embarrassing question to answer, for "Pa" never did, or at least, never since his maturity. As a child, the Recorder, as custodian of the world's spoken, written, and recorded fiction, had, of course, had an unfailing fascination. But he had grown up—

He said, tolerantly: "Are there new stories about Eekahs? I remember none when I was young."

"You don't get it, Pa." One would almost suppose that the young Raph was on the very verge of an exasperation he was too cautious to express. He explained in wounded fashion: "The Eekahs are real things. They come from the Other World. Haven't you heard about *that?* We've been hearing about it in school, even, and in the Group Magazine. They stand upside down in their country, only they don't know it, and they look just like Ol' Primeval there."

Raph collected his astonished wits. He felt the incongruity of cross-examining his half-grown child for archeological data and he hesitated a moment. After all, he had heard *some* things. There *had* been word of vast continents existing on the other hemisphere of Earth. It seemed to him that there were reports of life on them. It was all hazy—perhaps it wasn't always wise to stick so closely to the field of one's own interest.

He asked Junior: "Are there Eekahs here among the Groupings?"

Junior nodded rapidly: "The Recorder says they can think as good as us. They got

machines that go through the air. That's how they got here."

"Junior!" said Raph severely.

"I ain't lying," Junior cried with aggrieved virtue. "You ask the Recorder and see what *he* says."

Raph slowly gathered his papers together. It was Closed-Day, but he could find the Recorder at his home, no doubt.

* * *

The Recorder was an elderly member of the Red River Gurrow Grouping and few alive could remember a time when he was not. He had succeeded to the post by general consent and filled it well, for he was Recorder for the same reason that Raph was curator of the museum. He liked to be, he wanted to be, and he could conceive no other life.

The social pattern of the Gurrow Grouping is difficult to grasp unless born into it, but there was a looseness about it that almost made the word "pattern" incongruous. The individual Gurrow took whatever job he felt an aptitude for, and such work as was left over and needed to be done was done either in common, or consecutively by each according to an order determined by lot. Put so, it sounds too simple to work, but actually the traditions that had gathered with the five thousand years since the first Voluntary Grouping of Gurrahs was supposed to have been established, made the system complicated, flexible—and workable.

The Recorder was, as Raph had anticipated, at his home, and there was the embarrassment of renewing an old and unjustly neglected acquaintanceship. He had made use of the Recorder's reference library, of course, but always indirectly—yet he had once been a child, an intimate learner at the feet of accumulated wisdom, and he had let the intimacy lapse.

The room he now entered was more or less choked with recordings and, to a lesser degree, with printed material. The Recorder interspersed greetings with apologies.

"Shipments have come from some of the other Groupings," he said. "It needs time for cataloguing, you know, and I can't seem to find the time I used to." He lit a pipe and puffed strongly. "Seems to me I'll have to find a full-time assistant. What about your son, Raph? He clusters about here the way you did twenty years ago."

"You remember those times?"

"Better than you do, I think. Think your son would like that?"

"Suppose you talk to him. He might like to. I can't honestly say he's fascinated by archaeology." Raph picked up a recording at random and looked at the identification tag: "Um-m-m—from the Joquin Valley Grouping. That's a long way from here."

"A long way." The Recorder nodded. "I have sent them some of ours, of course. The works of our own Grouping are highly regarded throughout the continent," he said, with proprietary pride. "In fact"—he pointed the stem of his pipe at the other—"your own treatise on extinct primates has been distributed everywhere. I've sent out two thousand copies and there are still requests. That's pretty good—for archaeology."

"Well, archaeology is why I am here—that and what my son says you've been telling him." Raph had a little trouble starting: "It seems you have spoken of creatures called Eekahs from the Antipodes, and I would like to have such information as you have on them."

The Recorder looked thoughtful: "Well, I could tell you what I know offhand, or we could go to the Library and look up the references."

"Don't bother opening the Library for me. It's a Closed-Day. Just give me some notion of things and I'll search the references later."

The Recorder bit at his pipe, shoved his chair back against the wall and de-focused his eyes thoughtfully. "Well," he said, "I suppose it starts with the discovery of the continents on the other side. That was five years ago. You know about that, perhaps?"

"Only the fact of it. I know the continents exist, as everyone does now. I remember once speculating on what a shining new field it would be for archaeological research, but that is all."

"Ah, then there is much else to tell you of. The new continents were never discovered by us directly, you know. It was five years ago that a group of non-Gurrow creatures arrived at the East Harbor Grouping in a machine that flew—by definite scientific principles, we found out later, based essentially on the buoyancy of air. They spoke a language, were obviously intelligent, and called themselves Eekahs. The Gurrows, of the East Harbor Grouping, learned their language—a simple one though full of unpronounceable sounds—and I have a grammar of it, if you're interested—"

Raph waved that away.

The Recorder continued: "The Gurrows of the Grouping, with the aid of those of the Iron Mountain Grouping—which specialize in steel works, you know—built duplicates of the flying machine. A flight was made across the ocean, and I should say there are several dozens of volumes on all that—volumes on the flying machine, on a new science called aerodynamics, new geographies, even a new system of philosophy based on the plurality of intelligences. All produced at the East Harbor and Iron Mountain Groupings. Remarkable work for only five years, and all are available here."

"But the Eekahs—are they still at the East Harbor Groupings?"

"Um-m-m. I'm pretty certain they are. They refused to return to their own continents. They call themselves 'political refugees.'"

"Politi . . . *what*?"

"It's their own language," said the Recorder, "and it's the only translation available."

"Well, why *political* refugees? Why not geological refugees, or oompah refugees. I should think a translation ought to make sense."

The Recorder shrugged: "I refer you to the books. They're not criminals, they claim. I know only what I tell you."

"Well, then, what do they look like? Do you have pictures?"

"At the Library."

"Did you read my 'Principles of Archaeology'?"

"I looked through it."

"Do you remember the drawings of Primate Primeval?"

"I'm afraid not."

"Then, look, let's go down to the Library, after all."

"Well, sure." The Recorder grunted as he rose.

* * *

The Administrator of the Red River Gurrow Grouping held a position in no way different in essentials from that of the Museum Curator, the Recorder or any other voluntary job holder. To expect a difference is to assume a society in which executive ability is rare.

Actually, all jobs in a Gurrow Grouping—where a "job" is defined as regular work,

the fruits of which adhere to others in addition to the worker himself—are divided into two classes: one, Voluntary Jobs, and the other, Involuntary or Community Jobs. All of the first classification are equal. If a Gurrow enjoys the digging of useful ditches, his bent is to be respected and his job to be honored. If no one enjoys such burrowing and yet it is found necessary for comfort, it becomes a Community Job, done by lot or rotation according to convenience—annoying but unavoidable.

And so it was that the Administrator lived in a house no more ample and luxurious than others, sat at the head of no tables, had no particular title other than the name of his job, and was neither envied, hated, nor adored.

He liked to arrange Inter-Group trade, to supervise the common finances of the Group, and to judge the infrequent disagreements that arose. Of course, he received no additional food or energy privileges for doing what he liked.

It was not, therefore, to obtain permission, but to place his accounts in decent order, that Raph stopped in to see the Administrator. The Closed-Day had not yet ended. The Administrator sat peacefully in his after-dinner armchair, with an after-dinner cigar in his mouth, and an after-dinner book in his hand. Although there was something rather timeless about six children and a wife, even they had an after-dinner air about them.

Raph received a multiple greeting upon entering, and raised two hands to his ears, for if the various Administratelets (Only applicable title. Author.) had a job, it was noisemaking. Certainly, it was what they liked to do, and certainly others reaped most of the fruits therefrom, for their own eardrums were apparently impervious.

The Administrator shooed them.

Raph accepted a cigar.

"I intend leaving the Grouping for a time, Lahr," he said. "My job necessitates it."

"We won't enjoy your going, Raph. I hope it will not be for long."

"I hope not. What have we in Common Units?"

"Oh, ample for your purposes, I'm sure. Where do you intend going?"

"To the East Harbor Grouping."

The Administrator nodded and blew out a thoughtful puff of smoke: "Unfortunately, East Harbor has a surplus in their favor registered in our books—I can verify that, if you wish—but the Common Units of Exchange on hand will take care of transportation and necessary expenses."

"Well, that's fine. But tell me, what is my status on the Community Job Roster?"

"Um-m-m—I'll have to get the rolls. You'll excuse me a moment." He trundled away, heaving his great weight across the room and out into the hallway. Raph paused to poke at the youngest of the children who rolled up to him, growling in mock ferocity with gleaming teeth—a black little bundle of thick fur, with the long, childish snout that had not yet broadened away from the shape of the animal ancestry of half a million years earlier.

The Administrator returned with a heavy ledger and larger spectacles. He opened the ledger meticulously, riffled the pages to the proper place and then drew a careful finger down the columns.

He said: "There's only the question of the water supply, Raph. You're due on the Maintenance gang for this next week. There's nothing else due for at least two months."

"I'll be back before then. Is there any chance of someone subbing for me on the Water Maintenance?"

"Um-m-m—I'll get someone. I can always send my oldest. He's getting to job age and he might as well taste everything. He may like working on the dam."

"Yes? You tell me if he does, then. He can replace me, regularly."

The Administrator smiled gently: "Don't plan on that, Raph. If he can figure out a way of making sleeping useful to all of us, he'll certainly take it up as a job. And why are you going to East Harbor Grouping, by the way, if it's something you care to talk about?"

"You'll laugh, perhaps, but I have just found out that there exist such things as Eekahs."

"Eekahs? Yes, I know." The Administrator pointed a finger. "Creatures from across the sea! Right?"

"Right! But that's not all. I've come from the Library. I've seen trimensional reproductions, Lahr, and they're *Primate Primeval,* or almost. They're primates, anyway, *intelligent* primates. They've got small eyes, flat noses, and completely different jawbones—but they're at least second cousins. I've *got* to see them, Lahr."

The Administrator shrugged. He felt no interest in the matter himself. "Why? I ask out of ignorance, Raph. Does it matter, your seeing them?"

"Matter?" Raph was obviously appalled at the question. "Don't you know what's been going on these last years? Have you read my archaeology book?"

"No," said the Administrator, definitely, "I wouldn't read it to save myself a turn at Garbage Disposal."

Raph said: "Which probably proves you more suited to Garbage Disposal than archaeology. But never mind. I've been fighting single-handed for nearly ten years in favor of my theory that Primate Primeval was an intelligent creature with a developed civilization. I have nothing on my side so far but logical necessity, which is the last thing most archaeologists will accept. They want something solid. They want the remains of a Grouping, or artifacts, structures, books—get it. All I can give them is a skeleton with a huge brain-pan. Stars above, Lahr, what do they expect to survive in ten million years? Metal dies. Paper dies. Film dies.

"Only stone lasts, Lahr. And bone that's turned to stone. I've got that. A skull with room for a brain. And stone, too, old sharpened knives. Ground flints."

"Well," said Lahr, "there are your artifacts."

"Those are called eoliths, dawn stones. They won't accept them. They call them natural products, fortuitously shaped by erosion into the shapes they have, the idiots."

Then he grinned with a scientific ferocity: "But if the Eekahs are intelligent primates, I've practically proven my case."

* * *

Raph had traveled before, but never eastward, and the decline of agriculture on the road impressed him. In early history, the Gurrow Groupings had been entirely unspecialized. Each had been self-sufficient, and trade was a gesture of friendliness rather than a matter of necessity.

And so it was still in most Groupings. His own Grouping, the Red River, was perhaps typical. Some five hundred miles inland, set in lush farm land, agriculture remained centric. The river yielded some fish and there was a well-developed dairy industry. In fact, it was food exports that provided cause for the healthy state of the store of Common Units.

As they traveled eastward, however, the Groupings through which they passed paid less and less mind to the shallowing soil and more and more to the smoking factory structures.

In the East Harbor Grouping, Raph found a trading center which depended for its prosperity primarily upon ships. It was a more populous Grouping than the average, more densely packed, with houses, on occasion, within a hundred yards of each other.

Raph felt an uncomfortable prickling at the thought of living in such close quarters. The docks were even worse, with Gurrows engaged at the huge Community Jobs of loading and unloading.

The Administrator of this East Harbor Grouping was a young man, new at his job, overwhelmed with the joy of his work, and beside himself with the pleasure of welcoming a distinguished stranger.

Raph sat through an excellent meal, and was treated to a long discourse as to the exact derivation of each dish. To his provincial ears, beef from the Prairie Grouping, potatoes from the Northeast Woods Grouping, coffee from the Isthmus Grouping, wine from the Pacific Grouping, and fruit from the Central Lakes Grouping were something strange and wonderful.

Over the cigars—South Island Grouping—he brought up the subject of the Eekahs. The East Harbor Administrator grew solemn and a little uneasy.

"The man you want to see is Lernin. He'll be glad to help you all he can. You say you know something of these Eekahs?"

"I say I would *like* to know something. They resemble an extinct species of animal I am familiar with."

"Then *that* is your field of interest. I see."

"Perhaps you can tell me some of the details of their arrival, Administrator," suggested Raph, politely.

"I was not Administrator at the time, friend, so that I lack firsthand information, but the records are plain. This group of Eekahs that arrived in their flying-machine . . . you've heard about these aeronautical devices?"

"Yes, yes."

"Yes. Well . . . apparently they were fugitives."

"So I have heard. Yet they claim not to be criminals. Isn't that so?"

"Yes. Queer, isn't it? They admitted that they had been condemned—this was after long and skillful questioning, once we had learned their language—but denied that they were evildoers. Apparently, they had disagreed with their Administrator on principles of policy."

Raph nodded his head knowingly: "Ah, and refused to abide by the common decision. Is that it?"

"More confusing than that. They insist there was no common decision. They claim that the Administrator decided on policy of his own accord."

"And was not replaced?"

"Apparently those who believe he should are considered criminals—as these were."

There was a frank pause of disbelief. Then Raph said: "Does that sound reasonable to you?"

"No, I merely relay to you their words. Of course, the Eekah language is quite a barrier. Some of the sounds can't be pronounced: words have different meanings according to position in the sentence and according to tiny differences in inflection. And it happens often that Eekah words even when best translated are a complete puzzle."

"They must have been surprised to find Gurrows here," suggested Raph, "if they are members of a different genus."

"Surprised!" The Administrator's voice sank: "I'll say they were surprised. Now, this

information has not been generally published for obvious reasons, so I hope you remember that it's confidential. These Eekahs killed five Gurrows before they could be disarmed. They had an instrument that expelled metal pellets at high speed by means of a controlled explosive chemical reaction. We have duplicated it since. Naturally, under the circumstances, we are not branding them criminals, for it is reasonable to assume that they did not realize we were intelligent beings. Apparently," and the Administrator smiled ruefully, "we resemble certain animals in their world. Or so they say."

But Raph was galvanized into a sudden enthusiasm: "Stars above! They said that, did they? Did they go into details? What kind of animals?"

The Administrator was taken back: "Well, I don't know. They give names in their language. What meaning has that? They called us giant 'bears.'"

"Giant what?"

"Bears. I haven't the slightest idea what they are, except presumably that they look like us. I know of no such in America."

"Bears. Bears." Raph stumbled over the word. "That's interesting. It's more than interesting. It's stupendous. Do you know, Administrator, that there is a great dispute among us as to the ancestry of Gurrows? Living animals related to Gurrow sapiens would be of immense importance." Raph rubbed his huge hands with pleasure.

The Administrator was pleased at the sensation he had caused. He said: "And a puzzling thing in addition is that they call themselves by two names."

"Two names?"

"Yes. No one knows the distinction yet, no matter how much the Eekahs explain it to us, except that one is a more general name, and one a more specific. The basis of the difference escapes us."

"I see. Which is 'Eekah'?"

"That is the specific one. The general one is"—the Administrator stumbled slowly over the harsh syllables—"Chim-pan-zee. There, that's it. There are a group called Eekahs and there are other groups with other names. But they are all called Chim . . . what I said before."

The Administrator sought through his mind for other juicy items of miscellany with which he was acquainted, but Raph interrupted him.

"May I see Lernin tomorrow?"

"Of course."

"Then I shall do so. Thank you for your courtesy, Administrator."

* * *

Lernin was a slight individual. It is doubtful if he weighed more than two hundred and fifty. There was also an imperfection in his walk, a slight lameness. But neither of these facts made much of an impression on Raph once the conversation had begun, for Lernin was a thinker who could impose his vigor upon others.

It was Raph whose eagerness dominated the first half of the conversation, and Lernin's comments were as luminous and as brief as lightning flashes. And then, there was a sudden whirl of the center of gravity, and Lernin took over.

"You will excuse me, learned friend," Lernin said with a characteristic stiffness that he could make so amiable, "if I find your problem unimportant. No, no"—he lifted a long-fingered hand—"not, in the uncomplicated talk of the times, merely unimportant

to myself because my interest lies elsewhere, but unimportant to the Grouping of all the Groupings—to every single Gurrow from end to end of the world."

The concept was staggering. For a moment, Raph was offended; offended deep in his sense of individuality. It showed in his face.

Lernin added quickly: "It may sound impolite, crude, uncivilized. But I must explain. I must explain because you are primarily a social scientist and will understand—perhaps better than we ourselves."

"My life-interest," said Raph angrily, "is important to myself. I cannot assume those of others in preference."

"What I talk about should be the life-interest of all—if only because it may be the means of saving the lives of all of us."

Raph was beginning to suspect all sorts of things from a queer form of joking to the unbalance of mind that sometimes came with age. Yet Lernin was not old.

Lernin said, with an impressive fervor: "The Eekahs of the other world are a danger to us, for they are not friendly to us."

And Raph replied naturally: "How do you know?"

"No one other than myself, my friend, has lived more closely with these Eekahs who have arrived here, and I find them people with minds of emotional content strange to us. I have collected queer facts which we find difficult to interpret, but which point, at any rate, in disquieting directions.

"I'll list a few: Eekahs in organized groups kill one another periodically for obscure reasons. Eekahs find it impossible to live in a manner other than those of ants—that is, in huge conglomerate societies—yet find it impossible to allow for the presence of one another. Or, to use the terminology of the social scientists, they are gregarious without being social, just as we Gurrows are social without being gregarious. They have elaborate codes of behavior, which, we are told, are taught to the young, but which are disobeyed in universal practice, for reasons obscure to us. Et cetera. Et cetera. Et cetera."

"I am an archaeologist," said Raph, stiffly. "These Eekahs are of interest to me biologically only. If the curvature of the thigh bone is known to me, I care little for the curvature of their cultural processes. If I can follow the shape of the skull, it is immaterial to me that the shape of their ethics is mysterious."

"You don't think that their insanities may affect us here?"

"We are six thousand miles apart, or more, along either ocean," said Raph. "We have our world. They have theirs. There is no connection between us."

"No connection," mused Lernin, "so others have said. No connection at all. Yet Eekahs have reached us, and others may follow. We are told that the other world is dominated by a few, who are in turn dominated by their queer need for security which they confuse with an Eekah word called 'power,' which, apparently, means the prevailing on one's own will over the sum of the will of the community. What if this 'power' should extend to us?"

Raph bent his mind to the task. The matter was utterly ridiculous. It seemed impossible to picture the strange concepts.

Lernin said: "These Eekahs say that their world and ours in the long past were closer together. They say that there is a well-known scientific hypothesis in their world of a continental drift. That may interest you, since otherwise you might find it difficult to reconcile the existence of fossils of Primate Primeval closely related to living Eekahs six thousand miles away."

* * *

And the mists cleared from the archaeologist's brain as he glanced up with a live interest untroubled by insanities: "Ah, you should have said this sooner."

"I say it now as an example of what you may achieve for yourself by joining us and helping us. There is another thing. These Eekahs are physical scientists, like ourselves here in East Harbor, but with a difference dictated by their own cultural pattern. Since they live in hives, they think in hives, and their science is the result of an ant-society. Individually, they are slow and unimaginative; collectively, each supplies a crumb different from that supplied by his fellow—so that a vast structure is erected quickly. Here the individual is infinitely brighter, but he works alone. You, for instance, know nothing of chemistry, I imagine."

"A few of the fundamentals, but nothing else," admitted Raph. "I leave that, naturally, to the chemist."

"Yes, naturally. But I *am* a chemist. Yet these Eekahs, though my mental inferiors, and no chemists in their own world, know more chemistry than I. For instance, did you know that there exist elements that spontaneously disintegrate?"

"Impossible," exploded Raph. "Elements are eternal, changeless—"

Lernin laughed: "So you have been taught. So I have been taught. So I taught others. Yet the Eekahs are right, for in my laboratories I have checked them, and in every detail they are right. Uranium gives rise to a spontaneous radiation. You've heard of uranium, of course? And furthermore, I have detected radiations of energy beyond that produced by uranium which must be due to traces of elements unknown to us but described by the Eekahs. And these missing elements fit well into the so-called Periodic Tables some chemists have tried to foist upon the science. Though I do wrong to use the word 'foist' now."

"Well," said Raph, "why do you tell me this? Does this, too, help me in my problem?"

"Perhaps," said Lernin, ironically, "you will yet find it a royal bribe. You see, the energy production of uranium is absolutely constant. No known outward change in environment can affect it—and as a result of the loss in energy, uranium slowly turns to lead at an *absolutely constant rate.* A group of our men is even now using this fact as a basis for a method of determining the age of the earth. You see, to determine the age of a stratum of rock in the earth, then, it is but necessary to discover a region in it containing a trace of uranium—a widely spread element—and to determine about it the quantity of lead—and I might here add that the lead produced from uranium differs from ordinary lead and can be easily characterized—and it is then simple to determine the length of time in which that stratum has been solid. And of course, if a fossil is found in that stratum, it is of the same age, am I not correct?"

"Stars above," and Raph rose to his feet in a tremble, "you do not deceive me? It is really possible to do this?"

"It is possible. It is even easy. I tell you that our great defense, even at this late date, is co-operation in science. We are a group now of many, my friend, from many Groupings, and we want you among us. If you join us, it would be a simple matter to extend our earth-age project to such regions as you may indicate—regions rich in fossils. What do you say?"

"I will help you."

* * *

It is doubtful if the Gurrow Groupings had ever before seen a community venture

of such breadth as now took place. East Harbor Grouping, as has been remarked, was a shipping center, and certainly a trans-Atlantic vessel was not beyond the capacity of a Grouping that traded along the full lengths of both coasts of the Americas. What *was* unusual was the vastness of the co-operation of Gurrows from many Groupings, Gurrows of many interests.

Not that they were all happy.

Raph, for instance, on the particular morning that now concerns us, six months from the date of his first arrival in East Harbor, was searching anxiously for Lernin.

Lernin, for his part, was searching for nothing but greater speed.

They met on the docks, where Lernin, biting the end off a cigar and leading the way to a region where smoking was permitted, said: "And you, my friend, seem concerned. Not, certainly, about the progress of our ocean liner?"

"I am concerned," said Raph, gravely, "about the reports I have received of the expedition testing the age of the rocks."

"Oh— And you are unhappy about it?"

"Unhappy!" exploded Raph. "Have you seen them?"

"I have received a copy. I have looked at it. I have even read parts of it. But I have had little time and most of it bounced off. Will you please enlighten me?"

"Certainly. In the last several months, three of the regions I have indicated as being fossiliferous have been tested. The first region was in the area of East Harbor Grouping itself. Another was in the Pacific Bay Grouping, and a third in the Central Lakes Grouping. I purposely asked that those be done first because they are the richest areas and because they are widely separated. Do you know, for instance, what age they tell me the rocks upon which we stand are?"

"Two billion years, I think, is the oldest figure I noticed."

"And that's the figure for the oldest rocks—the basic igneous stratum of basalt. The upper strata, however—the recent sedimentary layers containing dozens of fossils of Primate Primeval—how old do you think *these* are supposed to be? Five—hundred—trillion—years! How is that? Do you understand?"

"Trillion?" Lernin squinted upwards and shook his head. "That's strange."

"I'll add to it. The Pacific Coast Grouping is one hundred trillion years old—so I am told—and Central Lakes almost eighty trillion years old."

Lernin said: "And the other measurements? The ones that did not involve your strata?"

"That is the most peculiar thing of all. Most of the chosen investigations were carried on in strata that were not particularly fossiliferous. They had their own criteria of choice based on geological reasoning—and they got consistent results—one million to two billion years depending upon the depth and geological history of the particular region tested. Only *my* areas give these strange and impossible vagaries."

And Lernin said, "But what do the geologists say about all this? Can there be some error?"

"Undoubtedly. But they have fifty decent, reasonable measurements. For themselves, they have proved the method and are happy. There are three anomalies, to be sure, but they view them with equanimity as involving some unknown factors. I don't see it that way. These three measurements mean everything." Raph interrupted himself fiercely: "How sure are you that radioactivity is an absolute constant?"

"Sure? Can one ever be sure? Nothing we know of so far affects it, and such is likewise the definite testimony of our Eekahs. Besides, my friend, if you are implying that radioactivity was more extensive in the past than in the present, why only in your fossil regions? Why not everywhere?"

"Why, indeed? It's another aspect of a problem which is growing more important daily. Consider. We have regions which show a past of abnormal radioactivity. We have regions which show abnormal fossil frequencies. Why should these regions coincide, Lernin?"

"One obvious answer suggests itself, my friend. If your Primate Primeval existed at a time when certain regions were highly radioactive, certain individuals would wander into them and die. Radioactive radiation is deadly in excess, of course. Radioactivity and fossils, there you are."

"Why not other creatures," demanded Raph. "Only Primate Primeval occurs in excess, and he was intelligent. He would not be trapped by dangerous radiation."

"Perhaps he was not intelligent. That is, after all, only your theory and not a proven fact."

"Certainly, then, he was more intelligent than his small-brained contemporaries."

"Perhaps not even that. You romanticize too much."

"Perhaps I do." Raph spoke in half a whisper. "It seems to me that I can conjure up visions of a great civilization of a million years back—or more. A great power; a great intelligence—that has vanished completely, except for the tiny whispers of ossified bones which retain that huge cavity in which a brain once existed, and a bony five-fingered hand curving into slender signs of manipulative skill—with an opposing thumb. They *must* have been intelligent."

"Then, what killed them?" Lernin shrugged: "Several million species of living things have survived."

* * *

Raph looked up, half in anger: "I cannot accompany your group, Lernin, on a Voluntary basis. To go to the other world would be useful, yes, if I could engage in my own studies. For your purposes, it can be only a Community Job to me. I cannot give my heart to it."

But Lernin's jaw was set: "That arrangement would not be fair. There are many of us, my friend, who are sacrificing our own interests. If we all placed them first and investigated the other world in terms of our own particular provincialisms only, our great purpose would be destroyed. My friend, there is not one of our men that we can spare. We must all work as if our lives depended on our instant solution of the Eekah problem, which, believe me, it does."

Raph's jaws twisted in distaste. "On your side, you have a vague apprehension of these weak, stupid little creatures. On my side I have a definite problem of great intellectual attraction to myself. And between the two I can see no connection—no possible connection at all."

"Nor can I. But listen to me a moment. A small group of our most trusted men returned last week from a visit to the other world. It was not official, as ours will be. It made no contacts. It was a frank piece of espionage, which I am telling you about now. I ask your discretion on the matter."

"Naturally."

"Our men possessed themselves of Eekah event-sheets."

"Pardon me?"

"It is a created name to describe the objects. Printed records are issued daily in the various centers of Eekah population of events and occurrences of the day, and what passes for literary efforts as well."

Raph was momentarily interested: "It strikes me as an excellent idea."

"Yes, in its essence. The Eekah notion of interesting events, however, appears to consist entirely of antisocial events. However, leave that be. My point is that the existence of the Americas is well-known there these days—and it is universally spoken of as a 'new land of opportunity.' The various divisions of Eekahs eye it with a universal desire. The Eekahs are many, they are crowded, their economy is irrational. They want new land, and that is what this is to them—new and empty land."

"Not empty," pointed out Raph, mildly.

"Empty to them," insisted Lernin terribly. "That is the vast danger. Lands occupied by Gurrows are to them empty and they mean to take it, all the more so since they have often enough striven to take the lands of one another."

Raph shrugged: "Even so, they—"

"Yes. They are weak and stupid. You said that, and so they are. But only singly. They will unite for a purpose. To be sure, they will fall apart when the purpose is done—but momentarily they will join and become strong, which we perhaps cannot do, witness yourself. And their weapons of war have been keened in the fire of conflict. Their flying machines, for instance, are superb war weapons."

"But we have duplicated it—"

"In quantity? We have also duplicated their chemical explosives, but only in the laboratory, and their firing tubes and armored vehicles, but only in experimental plants. And yet there is more—something developed within the last five years, for our own Eekahs know nothing about it."

"And what is that?"

"We don't know. Their event-sheets speak of it—the names applied to it mean nothing to us—but the context implies the terror of it, even on the part of these kill-mad Eekahs. There seems no evidence that it has been used, or that all the Eekah groups have it—but it is used as a supreme threat. It will perhaps be clearer to you when all the evidence is presented once our voyage is under way."

"But what is it? You talk of it as if it were a bogey."

"Why, *they* talk of it as if it were a bogey. And what *could* be a bogey to an Eekah? That is the most frightening aspect of it. So far, we know only that it involves the bombardment of an element they call plutonium—of which we have never heard and of which our own Eekahs have never heard either—by objects called neutrons, which our Eekahs say are subatomic particles without charge, which seems to us completely ridiculous."

"And that is all?"

"All. Will you suspend judgment till we show you the sheets?"

Raph nodded reluctantly: "Very well."

* * *

Raph's leaden thoughts revolved in their worn groove as he stood there alone.

Eekahs and Primate Primeval. A living creature of erratic habits and a dead creature that must have aspired to heights. A sordid present of explosives and neutron bombardments and a glorious, mysterious past—

No connection! No connection!

The Red Queen's Race

Here's a puzzle for you, if you like. Is it a crime to translate a chemistry textbook into Greek?

Or let's put it another way. If one of the country's largest atomic power plants is completely ruined in an unauthorized experiment, is an admitted accessory to that act a criminal?

These problems only developed with time, of course. We started with the atomic power plant—drained. I really mean *drained.* I don't know exactly how large the fissionable power source was—but in two flashing microseconds, it had all fissioned.

No explosion. No undue gamma ray density. It was merely that every moving part in the entire structure was fused. The entire main building was mildly hot. The atmosphere for two miles in every direction was gently warm. Just a dead, useless building which later on took a hundred million dollars to replace.

It happened about three in the morning, and they found Elmer Tywood alone in the central source chamber. The findings of twenty-four close-packed hours can be summarized quickly.

1. Elmer Tywood—Ph.D., Sc.D., Fellow of This and Honorary That, one-time youthful participant of the original Manhattan Project, and now full Professor of Nuclear Physics—was no interloper. He had a Class-A Pass—Unlimited. But no record could be found as to his purpose in being there just then. A table on casters contained equipment which had not been made on any recorded requisition. It, too, was a single fused mass—not quite too hot to touch.

2. Elmer Tywood was dead. He lay next to the table; his face congested, nearly black. No radiation effect. No external force of any sort. The doctor said apoplexy.

3. In Elmer Tywood's office safe were found two puzzling items: i.e. twenty foolscap sheets of apparent mathematics, and a bound folio in a foreign language which turned out to be Greek, the subject matter, on translation, turning out to be chemistry.

The secrecy which poured over the whole mess was something so terrific as to make everything that touched it, *dead.* It's the only word that can describe it. Twenty-seven men and women, all told, including the Secretary of Defense, the Secretary of

Science, and two or three others so top-notch that they were completely unknown to the public, entered the power plant during the period of investigation. All who had been in the plant that night, the physicist who had identified Tywood, the doctor who had examined him, were retired into virtual home arrest.

No newspaper ever got the story. No inside dopester got it. A few members of Congress got part of it.

And naturally so! Anyone or any group or any country that could suck all the available energy out of the equivalent of perhaps fifty to a hundred pounds of plutonium without exploding it, had America's industry and America's defense so snugly in the palm of the hand that the light and life of one hundred sixty million people could be turned off between yawns.

Was it Tywood? Or Tywood and others? Or just others, through Tywood?

And my job? I was decoy; or front man, if you like. Someone has to hang around the university and ask questions about Tywood. After all, he was missing. It could be amnesia, a hold-up, a kidnapping, a killing, a runaway, insanity, accident—I could busy myself with that for five years and collect black looks, and maybe divert attention. To be sure, it didn't work out that way.

But don't think I was in on the whole case at the start. I wasn't one of the twenty-seven men I mentioned a while back, though my boss was. But I knew a little—enough to get started.

Professor John Keyser was also in Physics. I didn't get to him right away. There was a good deal of routine to cover first in as conscientious a way as I could. Quite meaningless. Quite necessary. But I was in Keyser's office now.

Professors' offices are distinctive. Nobody dusts them except some tired cleaning woman who hobbles in and out at eight in the morning, and the professor never notices the dust anyway. Lots of books without much arrangement. The ones close to the desk are used a lot—lectures are copied out of them. The ones out of reach are wherever a student put them back after borrowing them. Then there are professional journals that look cheap and are darned expensive, which are waiting about and which may some day be read. And plenty of paper on the desk; some of it scribbled on.

Keyser was an elderly man—one of Tywood's generation. His nose was big and rather red, and he smoked a pipe. He had that easy-going and nonpredatory look in his eyes that goes with an academic job—either because that kind of job attracts that kind of man or because that kind of job makes that kind of man.

I said: "What kind of work is Professor Tywood doing?"

"Research physics."

Answers like that bounce off me. Some years ago they used to get me mad. Now I just said: "We know that, professor. It's the details I'm after."

And he twinkled at me tolerantly: "Surely the details can't help much unless you're a research physicist yourself. Does it matter—under the circumstances?"

"Maybe not. But he's gone. If anything's happened to him in the way of"—I gestured, and deliberately clinched—"foul play, his work may have something to do with it—unless he's rich and the motive is money."

Keyser chuckled dryly: "College professors are never rich. The commodity we peddle is but lightly considered, seeing how large the supply is."

I ignored that, too, because I know my looks are against me. Actually, I finished college with a "very good" translated into Latin so that the college president could understand it, and never played in a football game in my life. But I look rather the reverse.

I said: "Then we're left with his work to consider."

"You mean spies? International intrigue?"

"Why not? It's happened before! After all, he's a nuclear physicist, isn't he?"

"He is. But so are others. So am I."

"Ah, but perhaps he knows something you don't."

There was a stiffening to the jaw. When caught off-guard, professors can act just like people. He said, stiffly: "As I recall offhand, Tywood has published papers on the effect of liquid viscosity on the wings of the Rayleigh line, on higher-orbit field equations, and on spin-orbit coupling of two nucleons, but his main work is on quadrupole moments. I am quite competent in these matters."

"Is he working on quadrupole moments now?" I tried not to bat an eye, and I think I succeeded.

"Yes—in a way." He almost sneered, "He may be getting to the experimental stage finally. He's spent most of his life, it seems, working out the mathematical consequences of a special theory of his own."

"Like this," and I tossed a sheet of foolscap at him.

That sheet was one of those in the safe in Tywood's office. The chances, of course, were that the bundle meant nothing, if only because it was a professor's safe. That is, things are sometimes put in at the spur of the moment because the logical drawer was filled with unmarked exam papers. And, of course, nothing is ever taken out. We had found in that safe dusty little vials of yellowish crystals with scarcely legible labels, some mimeographed booklets dating back to World War II and marked "Restricted," a copy of an old college yearbook, and some correspondence concerning a possible position as Director of Research for American Electric, dated ten years back, and, of course, chemistry in Greek.

The foolscap was there, too. It was rolled up like a college diploma with a rubber band about it and had no label or descriptive title. Some twenty sheets were covered with ink marks, meticulous and small—

I had one sheet of that foolscap. I don't think any one man in the world had more than one sheet. And I'm sure that no man in the world but one knew that the loss of his particular sheet and of his particular life would be as nearly simultaneous as the government could make it.

So I tossed the sheet at Keyser, as if it were something I'd found blowing about the campus.

He stared at it and then looked at the back side, which was blank. His eyes moved down from the top to the bottom, then jumped back to the top.

"I don't know what this is about," he said, and the words seemed sour to his own taste.

I didn't say anything. Just folded the paper and shoved it back into the inside jacket pocket.

Keyser added petulantly: "It's a fallacy you laymen have that scientists can look at an equation and say, 'Ah, yes—' and go on to write a book about it. Mathematics has no existence of its own. It is merely an arbitrary code devised to describe physical observations or philosophical concepts. Every man can adapt it to his own particular needs. For instance no one can look at a symbol and be sure of what it means. So far, science has used every letter in the alphabet, large, small and italic, each symbolizing many different things. They have used bold-faced letters, Gothic-type letters, Greek letters, both capital and small, subscripts, superscripts, asterisks, even Hebrew letters. Different scientists use different symbols for the same concept and the same symbol for different

concepts. So if you show a disconnected page like this to any man, without information as to the subject being investigated or the particular symbology used, he could absolutely not make sense out of it."

I interrupted: "But you said he was working on quadrupole moments. Does that make this sensible?" and I tapped the spot on my chest where the foolscap had been slowly scorching a hole in my jacket for two days.

"I can't tell. I saw none of the standard relationships that I'd expect to be involved. At least I recognized none. But I obviously can't commit myself."

There was a short silence, then he said: "I'll tell you. Why don't you check with his students?"

I lifted my eyebrows: "You mean in his classes?"

He seemed annoyed: "No, for Heaven's sake. His research students! His doctoral candidates! They've been working with him. They'll know the details of that work better than I, or anyone in the faculty, could possibly know it."

"It's an idea," I said, casually. It was, too. I don't know why, but I wouldn't have thought of it myself. I guess it's because it's only natural to think that any professor knows more than any student.

Keyser latched onto a lapel as I rose to leave. "And, besides," he said, "I think you're on the wrong track. This is in confidence, you understand, and I wouldn't say it except for the unusual circumstances, but Tywood is not thought of too highly in the profession. Oh, he's an adequate teacher, I'll admit, but his research papers have never commanded respect. There has always been a tendency towards vague theorizing, unsupported by experimental evidence. That paper of yours is probably more of it. No one could possibly want to . . . er, kidnap him because of it."

"Is that so? I see. Any ideas, yourself, as to why he's gone, or where he's gone?"

"Nothing concrete," he said pursing his lips, "but everyone knows he is a sick man. He had a stroke two years ago that kept him out of classes for a semester. He never did get well. His left side was paralyzed for a while and he still limps. Another stroke would kill him. It could come any time."

"You think he's dead, then?"

"It's not impossible."

"But where's the body, then?"

"Well, really—That is *your* job, I think."

It was, and I left.

* * *

I interviewed each one of Tywood's four research students in a volume of chaos called a research laboratory. These student research laboratories usually have two hopefuls working therein, said two constituting a floating population, since every year or so they are alternately replaced.

Consequently, the laboratory has its equipment stack in tiers. On the laboratory benches is the equipment immediately being used, and in three or four of the handiest drawers are replacements or supplements which are likely to be used. In the farther drawers, in the shelves reaching up to the ceiling, in odd corners, are fading remnants of the past student generations—oddments never used and never discarded. It is claimed, in fact, that no research student ever knew all the contents of his laboratory.

All four of Tywood's students were worried. But three were worried mainly by their

own status. That is, by the possible effect the absence of Tywood might have on the status of their "problem." I dismissed those three—who all have their degrees now, I hope—and called back the fourth.

He had the most haggard look of all, and had been least communicative—which I considered a hopeful sign.

He now sat stiffly in the straight-backed chair at the right of the desk, while I leaned back in a creaky old swivel-chair and pushed my hat off my forehead. His name was Edwin Howe and *he* did get his degree later on; I know that for sure, because he's a big wheel in the Department of Science now.

I said: "You do the same work the other boys do, I suppose?"

"It's all nuclear work, in a way."

"But it's not all exactly the same?"

He shook his head slowly. "We take different angles. You have to have something clear-cut, you know, or you won't be able to publish. We've got to get our degrees."

He said it exactly the way you or I might say, "We've got to make a living." At that, maybe it's the same thing for them.

I said: "All right. What's *your* angle?"

He said: "I do the math. I mean, with Professor Tywood."

"What kind of math?"

And he smiled a little, getting the same sort of atmosphere about him that I had noticed in Professor Keyser's case that morning. A sort of, "Do-you-really-think-I-can-explain-all-my-profound-thoughts-to-stupid-little-you?" sort of atmosphere.

All he said aloud, however, was: "That would be rather complicated to explain."

"I'll help you," I said. "Is that anything like it?" And I tossed the foolscap sheet at him.

He didn't give it any once-over. He just snatched it up and let out a thin wail: "Where'd you get this?"

"From Tywood's safe."

"Do you have the rest of it, too?"

"It's safe," I hedged.

He relaxed a little—just a little: "You didn't show it to anybody, did you?"

"I showed it to Professor Keyser."

Howe made an impolite sound with his lower lip and front teeth, "*That* jackass. What did he say?"

I turned the palms of my hands upward and Howe laughed. Then he said, in an offhand manner: "Well, that's the sort of stuff I do."

"And what's it all about? Put it so I can understand it."

There was distinct hesitation. He said: "Now, look. This is confidential stuff. Even Pop's other students don't know anything about it. I don't even think *I* know *all* about it. This isn't just a degree I'm after, you know. It's Pop Tywood's Nobel Prize, and it's going to be an Assistant Professorship for me at Cal Tech. This has got to be published before it's talked about."

And I shook my head slowly and made my words very soft: "No, son. You have it twisted. You'll have to talk about it before it's published, because Tywood's gone and maybe he's dead and maybe he isn't. And if he's dead, maybe he's murdered. And when the department has a suspicion of murder, everybody talks. Now, it will look bad for you, kid, if you try to keep some secrets."

It worked. I knew it would, because everyone reads murder mysteries and knows all the clichés. He jumped out of his chair and rattled the words off as if he had a script in front of him.

"Surely," he said, "you can't suspect *me* of . . . of anything like that. Why . . . why, my career—"

I shoved him back into his chair with the beginnings of a sweat on his forehead. I went into the next line: "I don't suspect anybody of anything *yet*. And you won't be in any trouble, if you talk, chum."

He was ready to talk. "Now this is all in strict confidence."

Poor guy. He didn't know the meaning of the word "strict." He was never out of eyeshot of an operator from that moment till the government decided to bury the whole case with the one final comment of "?" Quote. Unquote. (I'm not kidding. To this day, the case is neither opened nor closed. It's just "?")

He said, dubiously; "You know what time travel is, I suppose?"

Sure I knew what time travel was. My oldest kid is twelve and he listens to the afternoon video programs till he swells up visibly with the junk he absorbs at the ears and eyes.

"What about time travel?" I said.

"In a sense, we can do it. Actually, it's only what you might call micro-temporal-translation—"

I almost lost my temper. In fact, I think I did. It seemed obvious that the squirt was trying to diddle me; and without subtlety. I'm used to having people think I look dumb; but not *that* dumb.

I said through the back of my throat: "Are you going to tell me that Tywood is out somewhere in time—like Ace Rogers, the Lone Time Ranger?" (That was Junior's favorite program—Ace Rogers was stopping Genghis Khan single-handed that week.)

But he looked as disgusted as I must have. "No," he yelled. "I don't know where Pop is. If you'd *listen* to me—I said micro-temporal-translation. Now, this isn't a video show and it isn't magic; this happens to be science. For instance, you know about matter-energy equivalence, I suppose."

I nodded sourly. Everyone knows about that since Hiroshima in the last war but one.

"All right, then," he went on, "that's good for a start. Now, if you take a brown mass of matter and apply temporal translation to it—you know, send it back in time—you are, in effect, creating matter at the point in time to which you are sending it. To do that, you must use an amount of energy equivalent to the amount of matter you have created. In other words, to send a gram—or, say, an ounce—of anything back in time, you have to disintegrate an ounce of matter completely, to furnish the energy required."

"Hm-m-m," I said, "that's to create the ounce of matter in the past. But aren't you destroying an ounce of matter by removing it from the present? Doesn't that *create* the equivalent amount of energy?"

And he looked just about as annoyed as a fellow sitting on a bumblebee that wasn't quite dead. Apparently laymen are never supposed to question scientists.

He said: "I was trying to simplify it so you would understand it. Actually, it's more complicated. It would be very nice if we could use the energy of disappearance to cause it to appear, but that would be working in a circle, believe me. The requirements of entropy would forbid it. To put it more rigorously, the energy is required to overcome temporal inertia and it just works out so that the energy in ergs required to send back a mass, in grams, is equal to that mass times the square of the speed of light in centimeters per second. Which just happens to be the Einstein Mass-Energy Equivalence Equation. I can give you the mathematics, you know."

"I know," I waxed some of that misplaced eagerness back. "But was all this worked

out experimentally? Or is it just on paper?"

Obviously, the thing was to keep him talking.

He had that queer light in his eye that every research student gets, I am told, when he is asked to discuss his problem. He'll discuss it with anyone, even with a "dumb flatfoot"—which was convenient at the moment.

"You see," he said like a man slipping you the inside dope on a shady business deal, "what started the whole thing was this neutrino business. They've been trying to find that neutrino since the late thirties and they haven't succeeded. It's a subatomic particle which has no charge and has a mass much less than even an electron. Naturally, it's next to impossible to spot, and hasn't been spotted yet. But they keep looking because, without assuming that a neutrino exists, the energetics of some nuclear reactions can't be balanced. So Pop Tywood got the idea about twenty years ago that some energy was disappearing, in the form of matter, back into time. We got working on that—or he did—and I'm the first student he's ever had tackle it along with him.

"Obviously, we had to work with tiny amounts of material and . . . well, it was just a stroke of genius on Pop's part to think of using traces of artificial radioactive isotopes. You could work with just a few micrograms of it, you know, by following its activity with counters. The variation of activity with time should follow a very definite and simple law which has never been altered by any laboratory condition known.

"Well, we'd send a speck back fifteen minutes, say, and fifteen minutes before we did that—everything was arranged automatically, you see—the count jumped to nearly double what it should be, fell off normally, and then dropped sharply at the moment it was sent back below where it would have been normally. The material overlapped itself in time, you see, and for fifteen minutes we counted the doubled material—"

I interrupted: "You mean you had the same atoms existing in two places at the same time."

"Yes," he said, with mild surprise, "why not? That's why we use so much energy—the equivalent of creating those atoms." And then he rushed on, "Now I'll tell you what my particular job is. If you send back the material fifteen minutes, it is apparently sent back to the same spot relative to the Earth despite the fact that in fifteen minutes, the Earth moved sixteen thousand miles around the Sun, and the Sun itself moves more thousand miles and so on. But there are certain tiny discrepancies which I've analyzed and which turn out to be due, possibly, to two causes.

"First, there is a frictional effect—if you can use such a term—so that matter does drift a little with respect to the Earth, depending on how far back in time it is sent, and on the nature of material. Then, too, some of the discrepancy can only be explained by the assumption that passage through time itself takes time."

"How's that?" I said.

"What I mean is that some of the radioactivity is evenly spread throughout the time of translation as if the material tested had been reacting during backward passage through time by a constant amount. My figures show that—well, if you were to be moved backward in time, you would age one day for every hundred years. Or, to put it another way, if you could watch a time dial which recorded the time outside a 'time-machine,' your watch would move forward twenty-four hours while the time dial moved back a hundred years. That's a universal constant, I think, because the speed of light is a universal constant. Anyway, that's my work."

After a few minutes, in which I chewed all this, I asked: "Where did you get the energy needed for your experiments?"

"They ran out a special line from the power plant. Pop's a big shot there, and swung the deal."

"Hm-m-m. What was the heaviest amount of material you sent into the past?"

"Oh"—he sent his eyes upwards—"I think we shot back one hundredth of a milligram once. That's ten micrograms."

"Ever try sending anything into the future?"

"That won't work," he put in quickly. "Impossible. You can't change signs like that, because the energy required becomes more than infinite. It's a one-way proposition."

I looked hard at my fingernails: "How much material could you send back in time if you fissioned about . . . oh, say, one hundred pounds of plutonium." Things, I thought, were becoming, if anything, too obvious.

The answer came quickly: "In plutonium fission," he said, "not more than one or two percent of the mass is converted into energy. Therefore, one hundred pounds of plutonium when completely used up would send a pound or two back into time."

"Is that all? But could you handle all that energy? I mean, a hundred pounds of plutonium can make quite an explosion."

"All relative," he said, a bit pompously. "If you took all that energy and let it loose a little at a time, you could handle it. If you released it all at once, but used it just as fast as you released it, you could still handle it. In sending back material through time, energy can be used much faster than it can possibly be released even through fission. Theoretically, anyway."

"But how do you get rid of it?"

"It's spread through time, naturally. Of course, the minimum time through which material could be transferred would, therefore, depend on the mass of the material. Otherwise, you're liable to have the energy density with time too high."

"All right, kid," I said. "I'm calling up Headquarters, and they'll send a man here to take you home. You'll stay there a while."

"But—What for?"

"It won't be for long."

It wasn't—and it was made up to him afterwards.

I spend the evening at Headquarters. We had a library there—a very special kind of library. The very morning after the explosion, two or three operators had drifted quietly into the chemistry and physics libraries of the University. Experts in their way. They located every article Tywood had ever published in any scientific journal and had snapped each page. Nothing was disturbed otherwise.

Other men went through magazine files and through book lists. It ended with a room at Headquarters that represented a complete Tywoodana. Nor was there a definite purpose in doing this. It merely represented part of the thoroughness with which a problem of this sort is met.

I went through that library. Not the scientific papers. I knew there'd be nothing there that I wanted. But he had written a series of articles for a magazine twenty years back, and I read those. And I grabbed at every piece of private correspondence they had available.

After that, I just sat and thought—and got scared.

I got to bed about four in the morning and had nightmares.

But I was in the Boss' private office at nine in the morning just the same.

He's a big man, the Boss, with iron-gray hair slicked down tight. He doesn't smoke, but he keeps a box of cigars on his desk and when he doesn't want to say anything for a few seconds, he picks one up, rolls it about a little, smells it, then sticks it right into the middle of his mouth and lights it in a very careful way. By that time, he either has something to say or doesn't have to say anything at all. Then he puts the cigar down and lets it burn to death.

He used up a box in about three weeks, and every Christmas, half his gift-wraps held boxes of cigars.

He wasn't reaching for any cigars now, though. He just folded his big fists together on the desk and looked up at me from under a creased forehead. "What's boiling?"

I told him. Slowly, because micro-temporal-translation doesn't sit well with anybody, especially when you call it time travel, which I did. It's a sign of how serious things were that he only asked me once if I were crazy.

Then I was finished and we stared at each other.

He said: "And you think he tried to send something back in time—something weighing a pound or two—and blew an entire plant doing it?"

"It fits in," I said.

I let him go for a while. He was thinking and I wanted him to keep on thinking. I wanted him, if possible, to think of the same thing I was thinking, so that I wouldn't have to tell him—

Because I hated to have to tell him—

Because it was nuts, for one thing. And too horrible, for another.

So I kept quiet and he kept on thinking and every once in a while some of his thoughts came to the surface.

After a while, he said: "Assuming the student, Howe, to have told the truth—and you'd better check his notebooks, by the way, which I hope you've impounded—"

"The entire wing of that floor is out of bounds, sir. Edwards has the notebooks."

He went on: "All right. Assuming he told us all the truth he knows, why did Tywood jump from less than a milligram to a pound?"

His eyes came down and they were hard: "Now you're concentrating on the time-travel angle. To you, I gather, that is the crucial point, with the energy involved as incidental—purely incidental."

"Yes, sir," I said grimly. "I think exactly that."

"Have you considered that you might be wrong? That you might have matters inverted?"

"I don't quite get that."

"Well, look. You say you've read up on Tywood. All right. He was one of that bunch of scientists after World War II that fought the atom bomb; wanted a world state—You know about that, don't you?"

I nodded.

"He had a guilt complex," the Boss said with energy. "He'd helped work out the bomb, and he couldn't sleep nights thinking of what he'd done. He lived with that fear for years. And even though the bomb wasn't used in World War III, can you imagine what every day of uncertainty must have meant to him? Can you imagine the shriveling horror in his soul as he waited for others to make the decision at every crucial moment till the final Compromise of Sixty-Five?

"We have a complete psychiatric analysis of Tywood and several others just like him, taken during the last war. Did you know that?"

"No, sir."

"It's true. We let up after Sixty-Five, of course, because with the establishment of world control of atomic power, the scrapping of the atomic bomb stockpile in all countries, and the establishment of research liaison among the various spheres of influence on the planet, most of the ethical conflict in the scientific mind was removed.

"But the findings at the time were serious. In 1964, Tywood had a morbid subconscious hatred for the very concept of atomic power. He began to make mistakes, serious

ones. Eventually, we were forced to take him off research of any kind. And several others as well, even though things were pretty bad at the time. We had just lost India, if you remember."

Considering that I was in India at the time, I remembered. But I still wasn't seeing his point.

"Now, what," he continued, "if dregs of that attitude remained buried in Tywood to the very end? Don't you see that this time-travel is a double-edged sword? Why throw a pound of anything into the past, anyway? For the sake of proving a point? He had proved his case just as much when he sent back a fraction of a milligram. That was good enough for the Nobel Prize, I suppose.

"But there was *one* thing he could do with a pound of matter that he couldn't do with a milligram, and that was *to drain a power plant*. So that was what he must have been after. He had discovered a way of consuming inconceivable quantities of energy. By sending back eighty pounds of dirt, he could remove all the existing plutonium in the world. End atomic power for an indefinite period."

I was completely unimpressed, but I tried not to make that too plain. I just said: "Do you think he could possibly have thought he could get away with it more than once?"

"This is all based on the fact that he wasn't a normal man. How do I know what he could imagine he could do? Besides, there may be men behind him—with less science and more brains—who are quite ready to continue onwards from this point."

"Have any of these men been found yet? Any evidence of such men?"

A little wait, and his hand reached for the cigar box. He stared at the cigar and turned it end for end. Just a little wait more. I was patient.

Then he put it down decisively without lighting it.

"No," he said.

He looked at me, and clear through me, and said: "Then, you still don't go for that?"

I shrugged, "Well—It doesn't sound right."

"Do you have a notion of your own?"

"Yes. But I can't bring myself to talk about it. If I'm wrong, I'm the wrongest man that ever was; but if I'm right, I'm the rightest."

"I'll listen," he said, and he put his hand under the desk.

That was the pay-off. The room was armored, sound-proof, and radiation-proof to anything short of a nuclear explosion. And with that little signal showing on his secretary's desk, the President of the United States couldn't have interrupted us.

I leaned back and said: "Chief, do you happen to remember how you met your wife? Was it a little thing?"

He must have thought it a *non sequitur*. What else could he have thought? But he was giving me my head now; having his own reasons, I suppose.

He just smiled and said: "I sneezed and she turned around. It was at a street corner."

"What made you be on that street corner just then? What made her be? Do you remember just why you sneezed? Where you caught the cold? Or where the speck of dust came from? Imagine how many factors had to intersect in just the right place at just the right time for you to meet your wife."

"I suppose we would have met some other time, if not then?"

"But you can't *know* that. How do you know whom you *didn't* meet, because once when you might have turned around, you didn't; because once when you might have been late, you weren't. Your life forks at every instant, and you go down one of the forks almost at random, and so does everyone else. Start twenty years ago, and the forks diverge further and further with time.

"You sneezed, and met a girl, and not another. As a consequence, you made certain decisions, and so did the girl, and so did the girl you didn't meet, and the man who did meet her, and the people you all met thereafter. And your family, her family, their family—and your children.

"Because you sneezed twenty years ago, five people, or fifty, or five hundred, might be dead now who would have been alive, or might be alive who would have been dead. Move it two hundred years ago: two thousand years ago, and a sneeze—even by someone no history ever heard of—might have meant that no one now alive would have been alive."

The Boss rubbed the back of his head: "Widening ripples. I read a story once—"

"So did I. It's not a new idea—but I want you to think about it for a while, because I want to read to you from an article by Professor Elmer Tywood in a magazine twenty years old. It was just before the last war."

I had copies of the film in my pocket and the white wall made a beautiful screen, which was what it was meant to do. The Boss made a motion to turn about, but I waved him back.

"No, sir," I said. "I want to read this to you. And I want you to listen to it."

He leaned back.

"The article," I went on, "is entitled: 'Man's First Great Failure!' Remember, this was just before the war, when the bitter disappointment at the final failure of the United Nations was at its height. What I will read are some excerpts from the first part of the article. It goes like this:

"'. . . That Man, with his technical perfection, has failed to solve the great sociological problems of today is only the second immense tragedy that has come to the race. The first, and perhaps the greater, was that, once, these same great sociological problems *were* solved; and yet these solutions were not permanent, because the technical perfection we have today did not then exist.

"'It was a case of having bread without butter, or butter without bread. Never both together . . .

"'Consider the Hellenic world, from which our philosophy, our mathematics, our ethics, our art, our literature—our entire culture, in fact—stem . . . In the days of Pericles, Greece, like our own world in microcosm, was a surprisingly modern potpourri of conflicting ideologies and ways of life. But then Rome came, adopting the culture, but bestowing, and enforcing, peace. To be sure, the *Pax Romana* lasted only two hundred years, but no like period has existed since . . .

"'War was abolished. Nationalism did not exist. The Roman citizen was Empire-wide. Paul of Tarsus and Flavius Josephus were Roman citizens. Spaniards, North Africans, Illyrians assumed the purple. Slavery existed, but it was an indiscriminate slavery, imposed as a punishment, incurred as the price of economic failure, brought on by the fortunes of war. No man was a *natural* slave—because of the color of his skin or the place of his birth.

"'Religious toleration was complete. If an exception was made early in the case of the Christians, it was because they refused to accept the principle of toleration; because they insisted that only they themselves knew truth—a principle abhorrent to the civilized Roman . . .

"'With all of Western culture under a single *polis*, with the cancer of religious and national particularism and exclusivism absent; with a high civilization in existence—why could not Man hold his gains?

"'It was because, technologically, ancient Hellenism remained backward. It was

because without a machine civilization, the price of leisure—and hence civilization and culture—for the few, was slavery for the many. Because the civilization could not find the means to bring comfort and ease to *all* the population.

"'Therefore, the depressed classes turned to the other world, and to religions which spurned the material benefits of this world—so that science was made impossible in any true sense for over a millennium. And further, as the initial impetus of Hellenism waned, the Empire lacked the technological powers to beat back the barbarians. In fact, it was not till after 1500 A.D. that war became sufficiently a function of the industrial resources of a nation to enable the settled people to defeat invading tribesmen and nomads with ease . . .

"'Imagine, then, if somehow the ancient Greeks had learned just a hint of modern chemistry and physics. Imagine if the growth of the Empire had been accompanied by the growth of science, technology and industry. Imagine an Empire in which machinery replaced slaves, in which all men had a decent share of the world's goods, in which the legion became the armored column against which no barbarians could stand. Imagine an Empire which would therefore spread all over the world, *without* religious or national prejudices.

"'An Empire of all men—all brothers—eventually all free . . .

"'If history could be changed. If that first great failure could have been prevented—"

And I stopped at that point.

"Well?" said the Boss.

"Well," I said, "I think it isn't difficult to connect all that with the fact that Tywood blew an entire power plant in his anxiety to send something back to the past, while in his office safe we found sections of a chemistry textbook translated into Greek."

His face changed, while he considered.

Then he said heavily: "But nothing's happened."

"I know. But then I've been told by Tywood's student that it takes a day to move back a century in time. Assuming that ancient Greece was the target area, we have twenty centuries, hence twenty days."

"But can it be stopped?"

"*I* wouldn't know. Tywood might, but he's dead."

The enormity of it all hit me at once, deeper than it had the night before—

All humanity was virtually under sentence of death. And while that was merely horrible abstraction, the fact that reduced it to a thoroughly unbearable reality was that I was, too. And my wife, and my kid.

Further, it was a death without precedence. A ceasing to exist, and no more. The passing of a breath. The vanishing of a dream. The drift into eternal non-space and non-time of a shadow. I would not be dead at all, in fact. I would merely never have been born.

Or would I? Would I exist—my individuality—my ego—my soul, if you like? Another life? Other circumstances?

I thought none of that in words then. But if a cold knot in the stomach could ever speak under the circumstances, it would sound like that, I think.

The Boss moved in on my thoughts—hard.

"Then, we have about two and a half weeks. No time to lose. Come on."

I grinned with one side of my mouth: "What do we do? Chase the book?"

"No," he replied coldly, "but there are two courses of action we must follow. First, you may be wrong—altogether. All of this circumstantial reasoning may still represent a false lead, perhaps deliberately thrown before us, to cover up the real truth. That must be checked.

"Secondly, you may be right—but there may be some way of stopping the book: other than chasing it in a time machine, I mean. If so, we must find out how."

"I would just like to say, sir, if this is a false lead, only a madman would consider it a believable one. So suppose I'm right, and suppose there's no way of stopping it?"

"Then, young fellow, I'm going to keep pretty busy for two and a half weeks, and I'd advise you to do the same. The time will pass more quickly that way."

Of course he was right.

"Where do we start?" I asked.

"The first thing we need is a list of all men and women on the government payroll under Tywood."

"Why?"

"Reasoning. Your specialty, you know. Tywood doesn't know Greek, I think we can assume with fair safety, so someone else must have done the translating. It isn't likely that anyone would do a job like that for nothing, and it isn't likely that Tywood would pay out of his personal funds—not on a professor's salary."

"He might," I pointed out, "have been interested in more secrecy than a government payroll affords."

"Why? Where was the danger? Is it a crime to translate a chemistry textbook into Greek? Who would ever deduce from that a plot such as you've described?"

It took us half an hour to turn up the name of Mycroft James Boulder, listed as "Consultant," and to find out that he was mentioned in the University Catalogue as Assistant Professor of Philosophy and to check by telephone that among his many accomplishments was a thorough knowledge of Attic Greek.

Which was a coincidence—because with the Boss reaching for his hat, the interoffice teletype clicked away and it turned out that Mycroft James Boulder was in the anteroom, at the end of a two-hour continuing insistence that he see the Boss.

The Boss put his hat back and opened his office door.

Professor Mycroft James Boulder was a gray man. His hair was gray and his eyes were gray. His suit was gray, too.

But most of all, his expression was gray; gray with a tension that seemed to twist at the lines in his thin face.

Boulder said, softly: "I've been trying for three days to get a hearing, sir, with a responsible man. I can get no higher than yourself."

"I may be high enough," said the Boss. "What's on your mind?"

"It is quite important that I be granted an interview with Professor Tywood."

"Do you know where he is?"

"I am quite certain that he is in government custody."

"Why?"

"Because I know that he was planning an experiment which would entail the breaking of security regulations. Events since, as nearly as I can make them out, flow naturally from the supposition that security regulations have indeed been broken. I can presume, then, that the experiment has at least been attempted. I must discover whether it had been successfully concluded."

"Professor Boulder," said the Boss, "I believe you can read Greek."

"Yes, I can,"—coolly.

"And have translated chemical texts for Professor Tywood on government money."

"Yes—as a legally employed consultant."

"Yet such translation, under the circumstances, constitutes a crime, since it makes you an accessory to Tywood's crime."

"You can establish a connection?"

"Can't you? Or haven't you heard of Tywood's notions on time travel, or . . . what do you call it . . . micro-temporal-translation?"

"Ah?" and Boulder smiled a little. "He's told you, then."

"No, he hasn't," said the Boss, harshly. "Professor Tywood is dead."

"What?" Then—"I don't believe you."

"He died of apoplexy. Look at this."

He had one of the photographs taken that first night in his wall safe. Tywood's face was distorted but recognizable—sprawled and dead.

Boulder's breath went in and out as if the gears were clogged. He stared at the picture for three full minutes by the electric clock on the wall. "Where is this place?" he asked.

"The Atomic Power Plant."

"Had he finished his experiment?"

The Boss shrugged: "There's no way of telling. He was dead when we found him."

Boulder's lips were pinched and colorless. "That must be determined, somehow. A commission of scientists must be established, and, if necessary, the experiment must be repeated—"

But the Boss just looked at him, and reached for a cigar. I've never seen him take longer—and when he put it down, curled in its unused smoke, he said: "Tywood wrote an article for a magazine, twenty years ago—"

"Oh," and the professor's lips twisted, "is *that* what gave you your clue? You may ignore that. The man is only a physical scientist and knows nothing of either history or sociology. A schoolboy's dreams and nothing more."

"Then, you don't think sending your translation back will inaugurate a Golden Age, do you?"

"Of course not. Do you think you can graft the developments of two thousand years of slow labor onto a child society not ready for it? Do you think a great invention or a great scientific principle is born full-grown in the mind of a genius divorced from his cultural *milieu*? Newton's enunciation of the Law of Gravity was delayed for twenty years because the then-current figure for the Earth's diameter was wrong by ten percent. Archimedes almost discovered calculus, but failed because Arabic numerals, invented by some nameless Hindu or group of Hindus, were unknown to him.

"For that matter, the mere existence of a slave society in ancient Greece and Rome meant that machines could scarcely attract much attention—slaves being so much cheaper and more adaptable. And men of true intellect could scarcely be expected to spend their energies on devices intended for manual labor. Even Archimedes, the greatest engineer of antiquity, refused to publish any of his practical inventions—only mathematic abstractions. And when a young man asked Plato of what use geometry was, he was forthwith expelled from the Academy as a man with a mean, unphilosophic soul.

"Science does not plunge forward—it inches along in the directions permitted by the greater forces that mold society and which are in turn molded by society. And no great man advances but on the shoulders of the society that surrounds him—"

The Boss interrupted him at that point. "Suppose you tell us what your part in Tywood's work was, then. We'll take your word for it that history cannot be changed."

"Oh it can, but not purposefully—You see, when Tywood first requested my services in the matter of translating certain textbook passages into Greek, I agreed for the money involved. But he wanted the translation on parchment; he insisted on the use of

ancient Greek terminology—the language of Plato, to use his words—regardless of how I had to twist the literal significance of passages, and he wanted it hand-written in rolls.

"I was curious. I, too, found his magazine article. It was difficult for me to jump to the obvious conclusion, since the achievements of modern science transcend the imaginings of philosophy in so many ways. But I learned the truth eventually, and it was at once obvious that Tywood's theory of changing history was infantile. There are twenty million variables for every instant of time, and no system of mathematics—no mathematic psychohistory, to coin a phrase—has yet been developed to handle that ocean of varying functions.

"In short, any variation of events two thousand years ago would change all subsequent history, but in *no predictable way.*"

The Boss suggested, with a false quietness: "Like the pebble that starts the avalanche, right?"

"Exactly. You have some understanding of the situation, I see. I thought deeply for weeks before I proceeded, and then I realized how I must act—*must* act."

There was a low roar. The Boss stood up and his chair went over backward. He swung around his desk, and he had a hand on Boulder's throat. I was stepping out to stop him, but he waved me back—

He was only tightening the necktie a little. Boulder could still breathe. He had gone very white, and for all the time that the Boss talked, he restricted himself to just that—breathing.

And the Boss said: "Sure, I can see how you decided you must act. I know that some of you brain-sick philosophers think the world needs fixing. You want to throw the dice again and see what turns up. Maybe you don't even care if you're alive in the new setup—or that no one can possibly know what you've done. But you're going to create, just the same. You're going to give God another chance, so to speak.

"Maybe I just want to live—but the world could be worse. In twenty million different ways, it could be worse. A fellow named Wilder once wrote a play called *The Skin of Our Teeth.* Maybe you've read it. Its thesis was that Mankind survived by just that skin of their teeth. No, I'm not going to give you a speech about the Ice Age nearly wiping us out. I don't know enough. I'm not even going to talk about the Greeks winning at Marathon; the Arabs being defeated at Tours; the Mongols turning back at the last minute without even being defeated—because I'm no historian.

"But take the Twentieth Century. The Germans were stopped at the Marne twice in World War I. Dunkirk happened in World War II, and somehow the Germans were stopped at Moscow and Stalingrad. We could have used the atom bomb in the last war and we didn't, and just when it looked as if both sides would have to, the Great Compromise happened—just because General Bruce was delayed in taking off from the Ceylon airfield long enough to receive the message directly. One after the other, just like that, all through history—lucky breaks. For every 'if' that didn't come true that would have made wonder-men of all of us if it had, there were twenty 'ifs' that didn't come true that would have brought disaster to all of us if they had.

"You're gambling on that one-in-twenty chance—gambling every life on Earth. And you've succeeded, too, because Tywood *did* send that text back."

He ground out that last sentence, and opened his fist, so that Boulder could fall out and back into his chair.

And Boulder laughed.

"You fool," he gasped, bitterly, "How close you can be and yet how widely you can miss the mark. Tywood *did* send his book back, then? You are sure of that?"

"No chemical textbook in Greek was found on the scene," said the Boss, grimly, "and millions of calories of energy had disappeared. Which doesn't change the fact, however, that we have two and a half weeks in which to—make things interesting for you."

"Oh, nonsense. No foolish dramatics, please. Just listen to me, and try to understand. There were Greek philosophers once, named Leucippus and Democritus, who evolved an atomic theory. All matter, they said, was composed of atoms. Varieties of atoms were distinct and changeless and by their different combinations with each other formed the various substances found in nature. That theory was not the result of experiment or observation. It came into being, somehow, full-grown.

"The didactic Roman poet Lucretius, in his *'De Rerum Natura,'*—'On the Nature of Things'—elaborated on that theory and throughout manages to sound startlingly modern.

"In Hellenistic times, Hero built a steam engine and weapons of war became almost mechanized. The period has been referred to as an abortive mechanical age, which came to nothing because, somehow, it neither grew out of nor fitted into its social and economic *milieu.* Alexandrian science was a queer and rather inexplicable phenomenon.

"Then one might mention the old Roman legend about the books of the Sibyl that contained mysterious information direct from the gods—

"In other words, gentlemen, while you are right that any change in the course of past events, however trifling, would have incalculable consequences, and while I also believe that you are right in supposing that any random change is much more likely to be for the worse than for the better, I must point out that you are nevertheless wrong in your final conclusions.

"*Because* THIS *is the world in which the Greek chemistry text* WAS *sent back.*

"This has been a Red Queen's race, if you remember your 'Through the Looking Glass.' In the Red Queen's country, one had to run as fast as one could merely to stay in the same place. And so it was in this case! Tywood may have thought he was creating a new world, but it was I who prepared the translations, and I took care that only such passages as would account for the queer scraps of knowledge the ancients apparently got from nowhere would be included.

"And my only intention, for all my racing, was to stay in the same place."

Three weeks passed; three months; three years. Nothing happened. When nothing happens, you have no proof. We gave up trying to explain, and we ended, the Boss and I, by doubting it ourselves.

The case never ended. Boulder could not be considered a criminal without being considered a world savior as well, and vice versa. He was ignored. And in the end, the case was neither solved, nor closed out; merely put in a file all by itself, under the designation "?" and buried in the deepest vault in Washington.

The Boss is in Washington now; a big wheel. And I'm Regional Head of the Bureau.

Boulder is still assistant professor, though. Promotions are slow at the University.

Green Patches

He had slipped aboard the ship! There had been dozens waiting outside the energy barrier when it had seemed that waiting would do no good. Then the barrier had faltered for a matter of two minutes (which showed the superiority of unified organisms over life fragments) and he was across.

None of the others had been able to move quickly enough to take advantage of the break, but that didn't matter. All alone, he was enough. No others were necessary.

And the thought faded out of satisfaction and into loneliness. It was a terribly unhappy and unnatural thing to be parted from all the rest of the unified organism, to be a life fragment oneself. How could these aliens stand being fragments?

It increased his sympathy for the aliens. Now that he experienced fragmentation himself, he could feel, as though from a distance, the terrible isolation that made them so afraid. It was fear born of that isolation that dictated their actions. What but the insane fear of their condition could have caused them to blast an area, one mile in diameter, into dull-red heat before landing their ship? Even the organized life ten feet deep in the soil had been destroyed in the blast.

He engaged reception, listening eagerly, letting the alien thought saturate him. He enjoyed the touch of life upon his consciousness. He would have to ration that enjoyment. He must not forget himself.

But it could do no harm to listen to thoughts. Some of the fragments of life on the ship thought quite clearly, considering that they were such primitive, incomplete creatures. Their thoughts were like tiny bells.

Roger Oldenn said, "I feel contaminated. You know what I mean? I keep washing my hands and it doesn't help."

Jerry Thorn hated dramatics and didn't look up. They were still maneuvering in the stratosphere of Saybrook's Planet and he preferred to watch the panel dials. He said, "No reason to feel contaminated. Nothing happened."

"I hope not," said Oldenn. "At least they had all the field men discard their spacesuits in the air lock for complete disinfection. They had a radiation bath for all men entering from outside. I *suppose* nothing happened."

"Why be nervous, then?"

"I don't know. I wish the barrier hadn't broken down."

"Who doesn't? It was an accident."

"I wonder." Oldenn was vehement. "I was here when it happened. My shift, you know. There was no reason to overload the power line. There was equipment plugged into it that had no damn business near it. None whatsoever."

"All right. People are stupid."

"Not that stupid. I hung around when the Old Man was checking into the matter. None of them had reasonable excuses. The armor-baking circuits, which were draining off two thousand watts, had been put into the barrier line. They'd been using the second subsidiaries for a week. Why not this time? They couldn't give any reason."

"Can you?"

Oldenn flushed. "No, I was just wondering if the men had been"—he searched for a word—"hypnotized into it. By those things outside."

Thorn's eyes lifted and met those of the other levelly. "I wouldn't repeat that to anyone else. The barrier was down only two minutes. If anything had happened, if even a spear of grass had drifted across it would have shown up in our bacteria cultures within half an hour, in the fruit-fly colonies in a matter of days. Before we got back it would show up in the hamsters, the rabbits, maybe the goats. Just get it through your head, Oldenn, that nothing happened. Nothing."

Oldenn turned on his heel and left. In leaving, his foot came within two feet of the object in the corner of the room. He did not see it.

* * *

He disengaged his reception centers and let the thoughts flow past him unperceived. These life fragments were not important, in any case, since they were not fitted for the continuation of life. Even as fragments, they were incomplete.

The other types of fragments now—they were different. He had to be careful of them. The temptation would be great, and he must give no indication, none at all, of his existence on board ship till they landed on their home planet.

He focused on the other parts of the ship, marveling at the diversity of life. Each item, no matter how small, was sufficient to itself. He forced himself to contemplate this, until the unpleasantness of the thought grated on him and he longed for the normality of home.

Most of the thoughts he received from the smaller fragments were vague and fleeting, as you would expect. There wasn't much to be had from them, but that meant their need for completeness was all the greater. It was that which touched him so keenly.

There was the life fragment which squatted on its haunches and fingered the wire netting that enclosed it. Its thoughts were clear, but limited. Chiefly, they concerned the yellow fruit a companion fragment was eating. It wanted the fruit very deeply. Only the wire netting that separated the fragments prevented its seizing the fruit by force.

He disengaged reception in a moment of complete revulsion. *These fragments competed for food!*

He tried to reach far outward for the peace and harmony of home, but it was already an immense distance away. He could reach only into the nothingness that separated him from sanity.

He longed at the moment even for the feel of the dead soil between the barrier and the ship. He had crawled over it last night. There had been no life upon it, but it had been the soil of home, and on the other side of the barrier there had still been the comforting feel of the rest of organized life.

He could remember the moment he had located himself on the surface of the ship, maintaining a desperate suction grip until the air lock opened. He had entered, moving cautiously between the outgoing feet. There had been an inner lock and that had been passed later. Now he lay here, a life fragment himself, inert and unnoticed.

Cautiously, he engaged reception again at the previous focus. The squatting fragment of life was tugging furiously at the wire netting. It still wanted the other's food, though it was the less hungry of the two.

* * *

Larsen said, "Don't feed the damn thing. She isn't hungry; she's just sore because Tillie had the nerve to eat before she herself was crammed full. The greedy ape! I wish we were back home and I never had to look another animal in the face again."

He scowled at the older female chimpanzee frowningly and the chimp mouthed and chattered back to him in full reciprocation.

Rizzo said, "Okay, okay. Why hang around here, then? Feeding time is over. Let's get out."

They went past the goat pens, the rabbit hutches, the hamster cages.

Larsen said bitterly, "You volunteer for an exploration voyage. You're a hero. They send you off with speeches—and make a zoo keeper out of you."

"They give you double pay."

"All right, so what? I didn't sign up just for the money. They said at the original briefing that it was even odds we wouldn't come back, that we'd end up like Saybrook. I signed up because I wanted to do something important."

"Just a bloomin' bloody hero," said Rizzo.

"I'm not an animal nurse."

Rizzo paused to lift a hamster out of the cage and stroke it. "Hey," he said, "did you ever think that maybe one of these hamsters has some cute little baby hamsters inside, just getting started?"

"Wise guy! They're tested every day."

"Sure, sure." He muzzled the little creature, which vibrated its nose at him. "But just suppose you came down one morning and found them there. New little hamsters looking up at you with soft, green patches of fur where the eyes ought to be."

"Shut up, for the love of Mike," yelled Larsen.

"Little soft, green patches of shining fur," said Rizzo, and put the hamster down with a sudden loathing sensation.

* * *

He engaged reception again and varied the focus. There wasn't a specialized life fragment at home that didn't have a rough counterpart on shipboard.

There were the moving runners in various shapes, the moving swimmers, and the moving fliers. Some of the fliers were quite large, with perceptible thoughts; others

were small, gauzy-winged creatures. These last transmitted only patterns of sense perception, imperfect patterns at that, and added nothing intelligent of their own.

There were the non-movers, which, like the non-movers at home, were green and lived on the air, water, and soil. These were a mental blank. They knew only the dim, dim consciousness of light, moisture, and gravity.

And each fragment, moving and non-moving, had its mockery of life.

Not yet. Not yet . . .

He clamped down hard upon his feelings. Once before, these life fragments had come, and the rest at home had tried to help them—too quickly. It had not worked. This time they must wait.

If only these fragments did not discover him.

They had not, so far. They had not noticed him lying in the corner of the pilot room. No one had bent down to pick up and discard him. Earlier, it had meant he could not move. Someone might have turned and stared at the stiff wormlike thing, not quite six inches long. First stare, then shout, and then it would all be over.

But now, perhaps, he had waited long enough. The take-off was long past. The controls were locked; the pilot room was empty.

It did not take him long to find the chink in the armor leading to the recess where some of the wiring was. They were dead wires.

The front end of his body was a rasp that cut in two a wire of just the right diameter. Then, six inches away, he cut it in two again. He pushed the snipped-off section of the wire ahead of him packing it away neatly and invisibly into a corner of recess. Its outer covering was a brown elastic material and its core was gleaming, ruddy metal. He himself could not reproduce the core, of course, but that was not necessary. It was enough that the pellicle that covered him had been carefully bred to resemble a wire's surface.

He returned and grasped the cut sections of the wire before and behind. He tightened against them as his little suction disks came into play. Not even a seam showed.

They could not find him now. They could look right at him and see only a continuous stretch of wire.

Unless they looked very closely indeed and noted that, in a certain spot on this wire, there were two tiny patches of soft and shining green fur.

* * *

"It is remarkable," said Dr. Weiss, "that little green hairs can do so much."

Captain Loring poured the brandy carefully. In a sense, this was a celebration. They would be ready for the jump through hyper-space in two hours, and after that, two days would see them back on Earth.

"You are convinced, then, the green fur is the sense organ?" he asked.

"It is," said Weiss. Brandy made him come out in splotches, but he was aware of the need of celebration—quite aware. "The experiments were conducted under difficulties, but they were quite significant."

The captain smiled stiffly. "'Under difficulties' is one way of phrasing it. I would never have taken the chances you did to run them."

"Nonsense. We're all heroes aboard this ship, all volunteers, all great men with trumpet, fife, and fanfarade. You took the chance of coming here."

"You were the first to go outside the barrier."

"No particular risk was involved," Weiss said. "I burned the ground before me as I went, to say nothing of the portable barrier that surrounded me. Nonsense, Captain. Let's all take our medals when we come back; let's take them without attempt at gradation. Besides, I'm a male."

"But you're filled with bacteria to here." The captain's hand made a quick, cutting gesture three inches above his head. "Which makes you as vulnerable as a female would be."

They paused for drinking purposes.

"Refill?" asked the captain.

"No, thanks. I've exceeded my quota already."

"Then one last for the spaceroad." He lifted his glass in the general direction of Saybrook's Planet, no longer visible, its sun only a bright star in the visiplate. "To the little green hairs that gave Saybrook his first lead."

Weiss nodded. "A lucky thing. We'll quarantine the planet, of course."

The captain said, "That doesn't seem drastic enough. Someone might always land by accident someday and not have Saybrook's insight, or his guts. Suppose he did not blow up his ship, as Saybrook did. Suppose he got back to some inhabited place."

The captain was somber. "Do you suppose they might ever develop interstellar travel on their own?"

"I doubt it. No proof, of course. It's just that they have such a completely different orientation. Their entire organization of life has made tools unnecessary. As far as we know, even a stone ax doesn't exist on the planet."

"I hope you're right. Oh, and, Weiss, would you spend some time with Drake?"

"The Galactic Press fellow?"

"Yes. Once we get back, the story of Saybrook's Planet will be released for the public and I don't think it would be wise to oversensationalize it. I've asked Drake to let you consult with him on the story. You're a biologist and enough of an authority to carry weight with him. Would you oblige?"

"A pleasure."

The captain closed his eyes wearily and shook his head.

"Headache, Captain?"

"No. Just thinking of poor Saybrook."

* * *

He was weary of the ship. Awhile back there had been a queer, momentary sensation, as though he had been turned inside out. It was alarming and he had searched the minds of the keen-thinkers for an explanation. Apparently the ship had leaped across vast stretches of empty space by cutting across something they knew as "hyper-space." The keen-thinkers were ingenious.

But—he was weary of the ship. It was such a futile phenomenon. These life fragments were skillful in their constructions, yet it was only a measure of their unhappiness, after all. They strove to find in the control of inanimate matter what they could not find in themselves. In their unconscious yearning for completeness, they built machines and scoured space, seeking, seeking . . .

These creatures, he knew, could never, in the very nature of things, find that for which they were seeking. At least not until such time as he gave it to them. He quivered a little at the thought.

Completeness!

These fragments had no concept of it, even. "Completeness" was a poor word.

In their ignorance they would even fight it. There had been the ship that had come before. The first ship had contained many of the keen-thinking fragments. There had been two varieties, life producers and the sterile ones. (How different this second ship was. The keen-thinkers were all sterile, while the other fragments, the fuzzy-thinkers and the no-thinkers, were all producers of life. It was strange.)

How gladly that first ship had been welcomed by all the planet! He could remember the first intense shock at the realization that the visitors were fragments and not complete. The shock had given way to pity, and the pity to action. It was not certain how they would fit into the community, but there had been no hesitation. All life was sacred and somehow room would have been made for them—for all of them, from the large keen-thinkers to the little multipliers in the darkness.

But there had been a miscalculation. They had not correctly analyzed the course of the fragments' ways of thinking. The keen-thinkers became aware of what had been done and resented it. They were frightened, of course; they did not understand.

They had developed the barrier first, and then, later, had destroyed themselves, exploding their ship to atoms.

Poor, foolish fragments.

This time, at least, it would be different. They would be saved, despite themselves.

* * *

John Drake would not have admitted it in so many words, but he was very proud of his skill on the photo-typer. He had a travel-kit model, which was a six-by-eight, featureless dark plastic slab, with cylindrical bulges on either end to hold the roll of thin paper. It fitted into a brown leather case, equipped with a beltlike contraption that held it closely about the waist and at one hip. The whole thing weighed less than a pound.

Drake could operate it with either hand. His fingers would flick quickly and easily, placing their light pressure at exact spots on the blank surface, and, soundlessly, words would be written.

He looked thoughtfully at the beginning of his story, then up at Dr. Weiss. "What do you think, Doc?"

"It starts well."

Drake nodded. "I thought I might as well start with Saybrook himself. They haven't released his story back home yet. I wish I could have seen Saybrook's original report. How did he ever get it through, by the way?"

"As near as I could tell, he spent one last night sending it through the sub-ether. When he was finished, he shorted the motors, and converted the entire ship into a thin cloud of vapor a millionth of a second later. The crew and himself along with it."

"What a man! You were in this from the beginning, Doc?"

"Not from the beginning," corrected Weiss gently. "Only since the receipt of Saybrook's report."

He could not help thinking back. He had read that report, realizing even then how wonderful the planet must have seemed when Saybrook's colonizing expedition first reached it. It was practically a duplicate of Earth, with an abounding plant life and a purely vegetarian animal life.

There had been only the little patches of green fur (how often had he used that

phrase in his speaking and thinking!) which seemed strange. No living individual on the planet had eyes. Instead, there was this fur. Even the plants, each blade or leaf or blossom, possessed the two patches of richer green.

Then Saybrook had noticed, startled and bewildered, that there was no conflict for food on the planet. All plants grew pulpy appendages which were eaten by the animals. These were regrown in a matter of hours. No other parts of the plants were touched. It was as though the plants fed the animals as part of the order of nature. And the plants themselves did not grow in overpowering profusion. They might almost have been cultivated, they were spread across the available soil so discriminately.

How much time, Weiss wondered, had Saybrook had to observe the strange law and order on the planet?—the fact that insects kept their numbers reasonable, though no birds ate them; that the rodentlike things did not swarm, though no carnivores existed to keep them in check.

And then there had come the incident of the white rats.

That prodded Weiss. He said, "Oh, one correction, Drake. Hamsters were not the first animals involved. It was the white rats."

"White rats," said Drake, making the correction in his notes.

"Every colonizing ship," said Weiss, "takes a group of white rats for the purpose of testing any alien foods. Rats, of course, are very similar to human beings from a nutritional viewpoint. Naturally, only female white rats are taken."

Naturally. If only one sex was present, there was no danger of unchecked multiplication in case the planet proved favorable. Remember the rabbits in Australia.

"Incidentally, why not use males?" asked Drake.

"Females are hardier," said Weiss, "which is lucky, since that gave the situation away. It turned out suddenly that all the rats were bearing young."

"Right. Now that's where I'm up to, so here's my chance to get some things straight. For my own information, Doc, how did Saybrook find out they were in a family way?"

"Accidentally, of course. In the course of nutritional investigations, rats are dissected for evidence of internal damage. Their condition was bound to be discovered. A few more were dissected; same results. Eventually, all that lived gave birth to young—with *no* male rats aboard!"

"And the point is that all the young were born with little green patches of fur instead of eyes."

"That is correct. Saybrook said so and we corroborate him. After the rats, the pet cat of one of the children was obviously affected. When it finally kittened, the kittens were not born with closed eyes but with little patches of green fur. There was no tomcat aboard.

"Eventually Saybrook had the women tested. He didn't tell them what for. He didn't want to frighten them. Every single one of them was in the early stages of pregnancy, leaving out of consideration those few who had been pregnant at the time of embarkation. Saybrook never waited for any child to be born, of course. He knew they would have no eyes, only shining patches of green fur.

"He even prepared bacterial cultures (Saybrook was a thorough man) and found each bacillus to show microscopic green spots."

Drake was eager. "That goes way beyond our briefing—or, at least, the briefing I got. But granted that life on Saybrook's Planet is organized into a unified whole, how is it done?"

"How? How are your cells organized into a unified whole? Take an individual cell out of your body, even a brain cell, and what is it by itself? Nothing. A little blob of

protoplasm with no more capacity for anything human than an amoeba. Less capacity, in fact, since it couldn't live by itself. But put the cells together and you have something that could invent a spaceship or write a symphony."

"I get the idea," said Drake.

Weiss went on, "*All* life on Saybrook's Planet is a *single* organism. In a sense, all life on Earth is too, but it's a fighting dependence, a dog-eat-dog dependence. The bacteria fix nitrogen; the plants fix carbon; animals eat plants and each other; bacterial decay hits everything. It comes full circle. Each grabs as much as it can, and is, in turn, grabbed.

"On Saybrook's Planet, each organism has its place, as each cell in our body does. Bacteria and plants produce food, on the excess of which animals feed, providing in turn carbon dioxide and nitrogenous wastes. Nothing is produced more or less than is needed. The scheme of life is intelligently altered to suit the local environment. No group of life forms multiplies more or less than is needed, just as the cells in our body stop multiplying when there are enough of them for a given purpose. When they don't stop multiplying, we call it cancer. And that's what life on Earth really is, the kind of organic organization we have, compared to that on Saybrook's Planet. One big cancer. Every species, every individual doing its best to thrive at the expense of every other species and individual."

"You sound as if you approve of Saybrook's Planet, Doc."

"I do, in a way. It makes sense out of the business of living. I can see their viewpoint toward us. Suppose one of the cells of your body could be conscious of the efficiency of the human body as compared with that of the cell itself, and could realize that this was only the result of the union of many cells into a higher whole. And then suppose it became conscious of the existence of free-living cells, with bare life and nothing more. It might feel a very strong desire to drag the poor thing into an organization. It might feel sorry for it, feel perhaps a sort of missionary spirit. The things on Saybrook's Planet —or the thing; one should use the singular—feels just that, perhaps."

"And went ahead by bringing about virgin births, eh, Doc? I've got to go easy on that angle of it. Post-office regulations, you know."

"There's nothing ribald about it, Drake. For centuries we've been able to make the eggs of sea urchins, bees, frogs, et cetera develop without the intervention of male fertilization. The touch of a needle was sometimes enough, or just immersion in the proper salt solution. The thing on Saybrook's Planet can cause fertilization by the controlled use of radiant energy. That's why an appropriate energy barrier stops it; interference, you see, or static.

"They can do more than stimulate the division and development of an unfertilized egg. They can impress their own characteristics upon its nucleoproteins, so that the young are born with the little patches of green fur, which serve as the planet's sense organ and means of communication. The young, in other words, are not individuals, but become part of the thing on Saybrook's Planet. The thing on the planet, not at all incidentally, can impregnate any species—plant, animal, or microscopic."

"Potent stuff," muttered Drake.

"Totipotent," Dr. Weiss said sharply. "Universally potent. Any fragment of it is totipotent. Given time, a single bacterium from Saybrook's Planet can convert *all of Earth* into a single organism! We've got the experimental proof of that."

Drake said unexpectedly, "You know, I think I'm a millionaire, Doc. Can you keep a secret?"

Weiss nodded, puzzled.

"I've got a souvenir from Saybrook's Planet," Drake told him, grinning. "It's only a pebble, but after the publicity the planet will get, combined with the fact that it's quarantined from here on in, the pebble will be all any human being will ever see of it. How much do you suppose I could sell the thing for?"

Weiss stared. "A pebble?" He snatched at the object shown him, a hard, gray ovoid. "You shouldn't have done that, Drake. It was strictly against regulations."

"I know. That's why I asked if you could keep a secret. If you could give me a signed note of authentication— *What's the matter, Doc?*"

Instead of answering, Weiss could only chatter and point. Drake ran over and stared down at the pebble. It was the same as before—

Except that the light was catching it at an angle, and it showed up two little green spots. Look very closely; they were patches of green hairs.

* * *

He was disturbed. There was a definite air of danger within the ship. There was the suspicion of his presence aboard. How could that be? He had done nothing yet. Had another fragment of home come aboard and been less cautious? That would be impossible without his knowledge, and though he probed the ship intensely, he found nothing.

And then the suspicion diminished, but it was not quite dead. One of the keen-thinkers still wondered, and was treading close to the truth.

How long before the landing? Would an entire world of life fragments be deprived of completeness? He clung closer to the severed ends of the wire he had been specially bred to imitate, afraid of detection, fearful for his altruistic mission.

* * *

Dr. Weiss had locked himself in his own room. They were already within the solar system, and in three hours they would be landing. He had to think. He had three hours in which to decide.

Drake's devilish "pebble" had been part of the organized life on Saybrook's Planet, of course, but it was dead. It was dead when he had first seen it, and if it hadn't been, it was certainly dead after they fed it into the hyper-atomic motor and converted it into a blast of pure heat. And the bacterial cultures still showed normal when Weiss anxiously checked.

That was not what bothered Weiss now.

Drake had picked up the "pebble" during the last hours of the stay on Saybrook's Planet—*after* the barrier breakdown. What if the breakdown had been the result of a slow, relentless mental pressure on the part of the thing on the planet? What if parts of its being waited to invade as the barrier dropped? If the "pebble" had not been fast enough and had moved only after the barrier was re-established, it would have been killed. It would have lain there for Drake to see and pick up.

It was a "pebble," not a natural life form. But did that mean it was not *some* kind of life form? It might have been a deliberate production of the planet's single organism—a creature deliberately designed to look like a pebble, harmless-seeming, unsuspicious. Camouflage, in other words—a shrewd and frighteningly successful camouflage.

Had any other camouflaged creature succeeded in crossing the barrier *before* it was re-established—with a suitable shape filched from the minds of the humans aboard ship by the mind-reading organism of the planet? Would it have the casual appearance of a paperweight? Of an ornamental brass-head nail in the captain's old-fashioned chair? And how would they locate it? Could they search every part of the ship for the telltale green patches—even down to individual microbes?

And why camouflage? Did it intend to remain undetected for a time? Why? So that it might wait for the landing on Earth?

An infection *after landing* could not be cured by blowing up a ship. The bacteria of Earth, the molds, yeasts, and protozoa, would go first. Within a year the non-human young would begin arriving by the uncountable billions.

Weiss closed his eyes and told himself it might not be such a bad thing. There would be no more disease, since no bacterium would multiply at the expense of its host, but instead would be satisfied with its fair share of what was available. There would be no more overpopulation; the hordes of mankind would decline to adjust themselves to the food supply. There would be no more wars, no crime, no greed.

But there would be no more individuality, either.

Humanity would find security by becoming a cog in a biological machine. A man would be brother to a germ, or to a liver cell.

He stood up. He would have a talk with Captain Loring. They would send their report and blow up the ship, just as Saybrook had done.

He sat down again. Saybrook had had proof, while he had only the conjectures of a terrorized mind, rattled by the sight of two green spots on a pebble. Could he kill the two hundred men on board ship because of a feeble suspicion?

He had to *think!*

* * *

He was straining. Why did he have to wait? If he could only welcome those who were aboard now. *Now!*

Yet a cooler, more reasoning part of himself told him that he could not. The little multipliers in the darkness would betray their new status in fifteen minutes, and the keen-thinkers had them under continual observation. Even one mile from the surface of their planet would be too soon, since they might still destroy themselves and their ship out in space.

Better to wait for the main air locks to open, for the planetary air to swirl in with millions of the little multipliers. Better to greet each one of them into the brotherhood of unified life and let them swirl out again to spread the message.

Then it would be done! Another world organized, complete!

He waited. There was the dull throbbing of the engines working mightily to control the slow dropping of the ship; the shudder of contact with planetary surface, then—

He let the jubilation of the keen-thinkers sweep into reception, and his own jubilant thoughts answered them. Soon they would be able to receive as well as himself. Perhaps not these particular fragments, but the fragments that would grow out of those which were fitted for the continuation of life.

The main air locks were about to be opened—

And all thought ceased.

* * *

Jerry Thorn thought, Damn it, something's wrong *now.*

He said to Captain Loring, "Sorry. There seems to be a power breakdown. The locks won't open."

"Are you sure, Thorn? The lights are on."

"Yes, sir. We're investigating it now."

He tore away and joined Roger Oldenn at the air-lock wiring box. "What's wrong?"

"Give me a chance, will you?" Oldenn's hands were busy. Then he said, "For the love of Pete, there's a six-inch break in the twenty-amp lead."

"What? That can't be!"

Oldenn held up the broken wires with their clean, sharp, sawn-through ends.

Dr. Weiss joined them. He looked haggard and there was the smell of brandy on his breath.

He said shakily, "What's the matter?"

They told him. At the bottom of the compartment, in one corner, was the missing section.

Weiss bent over. There was a black fragment on the floor of the compartment. He touched it with his finger and it smeared, leaving a sooty smudge on his finger tip. He rubbed it off absently.

There might have been something taking the place of the missing section of wire. Something that had been alive and only looked like wire, yet something that would heat, die, and carbonize in a tiny fraction of a second once the electrical circuit which controlled the air lock had been closed.

He said, "How are the bacteria?"

A crew member went to check, returned and said, "All normal, Doc."

The wires had meanwhile been spliced, the locks opened, and Dr. Weiss stepped out into the anarchic world of life that was Earth.

"Anarchy," he said, laughing a little wildly. "And it will stay that way."

"Breeds There a Man . . . ?"

Police Sergeant Mankiewicz was on the telephone and he wasn't enjoying it. His conversation was sounding like a one-sided view of a firecracker.

He was saying, "That's right! He came in here and said, 'Put me in jail, because I want to kill myself.'

". . . I can't help that. Those were his exact words. It sounds crazy to me, too.

". . . Look, mister, the guy answers the description. You asked me for information and I'm giving it to you.

". . . He has exactly that scar on his right cheek and he said his name was John Smith. He didn't say it was Doctor anything-at-all.

". . . Well, sure it's a phony. Nobody is named John Smith. Not in a police station, anyway.

". . . He's in jail now.

". . . Yes, I mean it.

". . . Resisting an officer; assault and battery; malicious mischief. That's three counts.

". . . I don't care who he is.

". . . All right. I'll hold on."

He looked up at Officer Brown and put his hand over the mouthpiece of the phone. It was a ham of a hand that nearly swallowed up the phone altogether. His blunt-featured face was ruddy and steaming under a thatch of pale-yellow hair.

He said, "Trouble! Nothing but trouble at a precinct station. I'd rather be pounding a beat any day."

"Who's on the phone?" asked Brown. He had just come in and didn't really care. He thought Mankiewicz would look better on a suburban beat, too.

"Oak Ridge. Long Distance. A guy called Grant. Head of somethingological division, and now he's getting somebody else at seventy-five cents a min . . . Hello!"

Mankiewicz got a new grip on the phone and held himself down.

"Look," he said, "let me go through this from the beginning. I want you to get it straight and then if you don't like it, you can send someone down here. The guy doesn't want a lawyer. He claims he just wants to stay in jail and, brother, that's all right with me.

"Well, will you listen? He came in yesterday, walked right up to me, and said, 'Officer, I want you to put me in jail because I want to kill myself.' So I said, 'Mister, I'm sorry you want to kill yourself. Don't do it, because if you do, you'll regret it the rest of your life.'

". . . I *am* serious. I'm just telling you what I said. I'm not saying it was a funny joke, but I've got my own troubles here, if you know what I mean. Do you think all I've got to do here is to listen to cranks who walk in and—

"'. . . Give me a chance, will you?' I said, 'I can't put you in jail for wanting to kill yourself. That's no crime.' And he said, 'But I don't want to die.' So I said, 'Look, bud, get out of here.' I mean if a guy wants to commit suicide, all right, and if he doesn't want to, all right, but I don't want him weeping on my shoulder.

". . . I'm *getting* on with it. So he said to me, 'If I commit a crime, will you put me in jail?' I said, 'If you're caught and if someone files a charge and you can't put up bail, we will. Now beat it.' So he picked up the inkwell on my desk and, before I could stop him, he turned it upside down on the open police blotter.

". . . That's right! Why do you think we have 'malicious mischief' tabbed on him? The ink ran down all over my pants.

". . . Yes, assault and battery, too! I came hopping down to shake a little sense into him, and he kicked me in the shins and handed me one in the eye.

". . . I'm not making this up. You want to come down here and look at my face?

". . . He'll be up in court one of these days. About Thursday, maybe.

". . . Ninety days is the least he'll get, unless the psychoes say otherwise. I think he belongs in the loony-bin myself.

". . . Officially, he's John Smith. That's the only name he'll give.

". . . No, sir, he doesn't get released without the proper legal steps.

". . . O.K., you do that, if you want to, bud! I just do my job here."

He banged the phone into its cradle, glowered at it, then picked it up and began dialing. He said, "Gianetti?", got the proper answer and began talking.

"What's the A.E.C.? I've been talking to some Joe on the phone and he says—

". . . No, I'm not kidding, lunk-head. If I were kidding, I'd put up a sign. What's the alphabet soup?"

He listened, said, "Thanks" in a small voice and hung up again.

He had lost some of his color. "That second guy was the head of the Atomic Energy Commission," he said to Brown. "They must have switched me from Oak Ridge to Washington."

Brown lounged to his feet, "Maybe the F.B.I. is after this John Smith guy. Maybe he's one of these here scientists." He felt moved to philosophy. "They ought to keep atomic secrets away from those guys. Things were O.K. as long as General Groves was the only fella who knew about the atom bomb. Once they cut in these here scientists on it, though—"

"Ah, shut up," snarled Mankiewicz.

* * *

Dr. Oswald Grant kept his eyes fixed on the white line that marked the highway and handled the car as though it were an enemy of his. He always did. He was tall and knobby with a withdrawn expression stamped on his face. His knees crowded the wheel, and his knuckles whitened whenever he made a turn.

Inspector Darrity sat beside him with his legs crossed so that the sole of his left shoe came up hard against the door. It would leave a sandy mark when he took it away. He tossed a nut-brown penknife from hand to hand. Earlier, he had unsheathed its wicked, gleaming blade and scraped casually at his nails as they drove, but a sudden swerve had nearly cost him a finger and he desisted.

He said, "What do you know about this Ralson?"

Dr. Grant took his eyes from the road momentarily, then returned them. He said, uneasily, "I've known him since he took his doctorate at Princeton. He's a very brilliant man."

"Yes? Brilliant, huh? Why is it that all you scientific men describe one another as 'brilliant'? Aren't there any mediocre ones?"

"Many. I'm one of them. But Ralson isn't. You ask anyone. Ask Oppenheimer. Ask Bush. He was the youngest observer at Alamogordo."

"O.K. He was brilliant. What about his private life?"

Grant waited. "I wouldn't know."

"You know him since Princeton. How many years is that?"

They had been scouring north along the highway from Washington for two hours with scarcely a word between them. Now Grant felt the atmosphere change and the grip of the law on his coat collar.

"He got his degree in '43."

"You've known him eight years then."

"That's right."

"And you don't know about his private life?"

"A man's life is his own, Inspector. He wasn't very sociable. A great many of the men are like that. They work under pressure and when they're off the job, they're not interested in continuing the lab acquaintanceships."

"Did he belong to any organizations that you know of?"

"No."

The inspector said, "Did he ever say anything to you that might indicate he was disloyal?"

Grant shouted "No!" and there was silence for a while.

Then Darrity said, "How important is Ralson in atomic research?"

Grant hunched over the wheel and said, "As important as any one man can be. I grant you that no one is indispensable, but Ralson has always seemed to be rather unique. He has the engineering mentality."

"What does that mean?"

"He isn't much of a mathematician himself, but he can work out the gadgets that put someone else's math into life. There's no one like him when it comes to that. Time and again, Inspector, we've had a problem to lick and no time to lick it in. There were nothing but blank minds all around until he put some thought into it and said, 'Why don't you try so-and-so?' Then he'd go away. He wouldn't even be interested enough to see if it worked. But it always did. Always! Maybe we would have got it ourselves eventually, but it might have taken months of additional time. I don't know how he does it. It's no use asking him either. He just looks at you and says 'It was obvious', and walks away. Of course, once he's shown us how to do it, it *is* obvious."

The inspector let him have his say out. When no more came, he said, "Would you say he was queer, mentally? Erratic, you know."

"When a person is a genius, you wouldn't expect him to be normal, would you?"

"Maybe not. But just how abnormal was this particular genius?"

"He never talked, particularly. Sometimes, he wouldn't work."

"Stayed at home and went fishing instead?"

"No. He came to the labs all right; but he would just sit at his desk. Sometimes that would go on for weeks. Wouldn't answer you, or even look at you, when you spoke to him."

"Did he ever actually leave work altogether?"

"Before now, you mean? Never!"

"Did he ever claim he wanted to commit suicide? Ever say he wouldn't feel safe except in jail?"

"No."

"You're sure this John Smith is Ralson?"

"I'm almost positive. He has a chemical burn on his right cheek that can't be mistaken."

"O.K. That's that, then I'll speak to him and see what he sounds like."

The silence fell for good this time. Dr. Grant followed the snaking line as Inspector Darrity tossed the penknife in low arcs from hand to hand.

The warden listened to the call-box and looked up at his visitors. "We can have him brought up here, Inspector, regardless."

"No." Dr. Grant shook his head. "Let's go to him."

Darrity said, "Is that normal for Ralson, Dr. Grant? Would you expect him to attack a guard trying to take him out of a prison cell?"

Grant said, "I can't say."

The warden spread a calloused palm. His thick nose twitched a little. "We haven't tried to do anything about him so far because of the telegram from Washington, but, frankly, he doesn't belong here. I'll be glad to have him taken off my hands."

"We'll see him in his cell," said Darrity.

They went down the hard, barlined corridor. Empty, incurious eyes watched their passing.

Dr. Grant felt his flesh crawl. "Has he been kept *here* all the time?"

Darrity did not answer.

The guard, pacing before them, stopped. "This is the cell."

Darrity said, "Is that Dr. Ralson?"

Dr. Grant looked silently at the figure upon the cot. The man had been lying down when they first reached the cell, but now he had risen to one elbow and seemed to be trying to shrink into the wall. His hair was sandy and thin, his figure slight, his eyes blank and china-blue. On his right cheek was a raised pink patch that tailed off like a tadpole.

Dr. Grant said, "That's Ralson."

The guard opened the door and stepped inside, but Inspector Darrity sent him out again with a gesture. Ralson watched them mutely. He had drawn both feet up to the cot and was pushing backwards. His Adam's apple bobbled as he swallowed.

Darrity said quietly, "Dr. Elwood Ralson?"

"What do you want?" The voice was a surprising baritone.

"Would you come with us, please? We have some questions we would like to ask you."

"No! Leave me alone!"

"Dr. Ralson," said Grant, "I've been sent here to ask you to come back to work."

Ralson looked at the scientist and there was a momentary glint of something other than fear in his eyes. He said, "Hello, Grant." He got off his cot. "Listen, I've been trying

to have them put me into a padded cell. Can't you make them do that for me? You know me, Grant. I wouldn't ask for something I didn't feel was necessary. Help me. I can't stand the hard walls. It makes me want to . . . bash—" He brought the flat of his palm thudding down against the hard, dull-gray concrete behind his cot.

Darrity looked thoughtful. He brought out his penknife and unbent the gleaming blade. Carefully, he scraped at his thumbnail, and said, "Would you like to see a doctor?"

But Ralson didn't answer that. He followed the gleam of metal and his lips parted and grew wet. His breath became ragged and harsh.

He said, "Put that away!"

Darrity paused. "Put what away?"

"The knife. Don't hold it in front of me. I can't stand looking at it."

Darrity said, "Why not?" He held it out. "Anything wrong with it? It's a good knife."

Ralson lunged. Darrity stepped back and his left hand came down on the other's wrist. He lifted the knife high in the air. "What's the matter, Ralson? What are you after?"

Grant cried a protest but Darrity waved him away.

Darrity said, "What do you want, Ralson?"

Ralson tried to reach upward, and bent under the other's appalling grip. He gasped, "Give me the knife."

"Why, Ralson? What do you want to do with it?"

"Please. I've got to—" He was pleading. "I've got to stop living."

"You want to die?"

"No. But I must."

Darrity shoved. Ralson flailed backward and tumbled into his cot, so that it squeaked noisily. Slowly, Darrity bent the blade of his penknife into its sheath and put it away. Ralson covered his face. His shoulders were shaking but otherwise he did not move.

There was the sound of shouting from the corridor, as the other prisoners reacted to the noise issuing from Ralson's cell. The guard came hurrying down, yelling, "Quiet!" as he went.

Darrity looked up. "It's all right, guard."

He was wiping his hands upon a large white handkerchief. "I think we'll get a doctor for him."

* * *

Dr. Gottfried Blaustein was small and dark and spoke with a trace of an Austrian accent. He needed only a small goatee to be the layman's caricature of a psychiatrist. But he was clean-shaven, and very carefully dressed. He watched Grant closely, assessing him, blocking in certain observations and deductions. He did this automatically, now, with everyone he met.

He said, "You give me a sort of picture. You describe a man of great talent, perhaps even genius. You tell me he has always been uncomfortable with people; that he has never fitted in with his laboratory environment, even though it was there that he met the greatest of success. Is there another environment to which he has fitted himself?"

"I don't understand."

"It is not given to all of us to be so fortunate as to find a congenial type of company at the place or in the field where we find it necessary to make a living. Often, one compensates by playing an instrument, or going hiking, or joining some club. In other

words, one creates a new type of society, when not working, in which one can feel more at home. It need not have the slightest connection with what one's ordinary occupation is. It is an escape, and not necessarily an unhealthy one." He smiled and added, "Myself, I collect stamps. I am an active member of the American Society of Philatelists."

Grant shook his head. "I don't know what he did outside working hours. I doubt that he did anything like what you've mentioned."

"Um-m-m. Well, that would be sad. Relaxation and enjoyment are wherever you find them; but you must find them somewhere, no?"

"Have you spoken to Dr. Ralson, yet?"

"About his problems? No."

"Aren't you going to?"

"Oh, yes. But he has been here only a week. One must give him a chance to recover. He was in a highly excited state when he first came here. It was almost a delirium. Let him rest and become accustomed to the new environment. I will question him, then."

"Will you be able to get him back to work?"

Blaustein smiled. "How should I know? I don't even know what his sickness is."

"Couldn't you at least get rid of the worst of it; this suicidal obsession of his, and take care of the rest of the cure while he's at work?"

"Perhaps. I couldn't even venture an opinion so far without several interviews."

"How long do you suppose it will all take?"

"In these matters, Dr. Grant, nobody can say."

Grant brought his hands together in a sharp slap. "Do what seems best then. But this is more important than you know."

"Perhaps. But you may be able to help me, Dr. Grant."

"How?"

"Can you get me certain information which may be classified as top secret?"

"What kind of information?"

"I would like to know the suicide rate, since 1945, among nuclear scientists. Also, how many have left their jobs to go into other types of scientific work, or to leave science altogether."

"Is this in connection with Ralson?"

"Don't you think it might be an occupational disease, this terrible unhappiness of his?"

"Well—a good many have left their jobs, naturally."

"Why naturally, Dr. Grant?"

"You must know how it is, Dr. Blaustein. The atmosphere in modern atomic research is one of great pressure and red tape. You work with the government; you work with military men. You can't talk about your work; you have to be careful what you say. Naturally, if you get a chance at a job in a university, where you can fix your own hours, do your own work, write papers that don't have to be submitted to the A.E.C., attend conventions that aren't held behind locked doors, you take it."

"And abandon your field of specialty forever."

"There are always non-military applications. Of course, there was one man who did leave for another reason. He told me once he couldn't sleep nights. He said he'd hear one hundred thousand screams coming from Hiroshima, when he put the lights out. The last I heard of him he was a clerk in a haberdashery."

"And do you ever hear a few screams yourself?"

Grant nodded. "It isn't a nice feeling to know that even a little of the responsibility of atomic destruction might be your own."

"How did Ralson feel?"

"He never spoke of anything like that."

"In other words, if he felt it, he never even had the safety-valve effect of letting off steam to the rest of you."

"I guess he hadn't."

"Yet nuclear research must be done, no?"

"I'll say."

"What would you do, Dr. Grant, if you felt you *had* to do something that you *couldn't* do."

Grant shrugged. "I don't know."

"Some people kill themselves."

"You mean that's what has Ralson down."

"I don't know. I do not know. I will speak to Dr. Ralson this evening. I can promise nothing, of course, but I will let you know whatever I can."

Grant rose. "Thanks, Doctor. I'll try to get the information you want."

* * *

Elwood Ralson's appearance had improved in the week he had been at Dr. Blaustein's sanatorium. His face had filled out and some of the restlessness had gone out of him. He was tieless and beltless. His shoes were without laces.

Blaustein said, "How do you feel, Dr. Ralson?"

"Rested."

"You have been treated well?"

"No complaints, Doctor."

Blaustein's hand fumbled for the letter-opener with which it was his habit to play during moments of abstraction, but his fingers met nothing. It had been put away, of course, with anything else possessing a sharp edge. There was nothing on his desk, now, but papers.

He said, "Sit down, Dr. Ralson. How do your symptoms progress?"

"You mean, do I have what you would call a suicidal impulse? Yes. It gets worse or better, depending on my thoughts, I think. But it's always with me. There is nothing you can do to help."

"Perhaps you are right. There are often things I cannot help. But I would like to know as much as I can about you. You are an important man—"

Ralson snorted.

"You do not consider that to be so?" asked Blaustein.

"No, I don't. There are no important men, any more than there are important individual bacteria."

"I don't understand."

"I don't expect you to."

"And yet it seems to me that behind your statement there must have been much thought. It would certainly be of the greatest interest to have you tell me some of this thought."

For the first time, Ralson smiled. It was not a pleasant smile. His nostrils were white. He said, "It is amusing to watch you, Doctor. You go about your business so conscientiously. You must listen to me, mustn't you, with just that air of phony interest and unctuous sympathy. I can tell you the most ridiculous things and still be sure of an audience, can't I?"

"Don't you think my interest can be real, even granted that it is professional, too?"

"No, I don't."

"Why not?"

"I'm not interested in discussing it."

"Would you rather return to your room?"

"If you don't mind. No!" His voice had suddenly suffused with fury as he stood up, then almost immediately sat down again. "Why shouldn't I use you? I don't like to talk to people. They're stupid. They don't see things. They stare at the obvious for hours and it means nothing to them. If I spoke to them, they wouldn't understand; they'd lose patience; they'd laugh. Whereas you must listen. It's your job. You can't interrupt to tell me I'm mad, even though you may think so."

"I'd be glad to listen to whatever you would like to tell me."

Ralson drew a deep breath. "I've known something for a year now, that very few people know. Maybe it's something no *live* person knows. Do you know that human cultural advances come in spurts? Over a space of two generations in a city containing thirty thousand free men, enough literary and artistic genius of the first rank arose to supply a nation of millions for a century under ordinary circumstances. I'm referring to the Athens of Pericles.

"There are other examples. There is the Florence of the Medicis, the England of Elizabeth, the Spain of the Cordovan Emirs. There was the spasm of social reformers among the Israelites of the Eighth and Seventh centuries before Christ. Do you know what I mean?"

Blaustein nodded. "I see that history is a subject that interests you."

"Why not? I suppose there's nothing that says I must restrict myself to nuclear cross-sections and wave mechanics."

"Nothing at all. Please proceed."

"At first, I thought I could learn more of the true inwardness of historical cycles by consulting a specialist. I had some conferences with a professional historian. A waste of time!"

"What was his name; this professional historian?"

"Does it matter?"

"Perhaps not, if you would rather consider it confidential. What did he tell you?"

"He said I was wrong; that history only appeared to go in spasms. He said that after closer studies the great civilizations of Egypt and Sumeria did not arise suddenly or out of nothing, but upon the basis of a long-developing sub-civilization that was already sophisticated in its arts. He said that Periclean Athens built upon a pre-Periclean Athens of lower accomplishments, without which the age of Pericles could not have been.

"I asked why was there not a post-Periclean Athens of higher accomplishments still, and he told me that Athens was ruined by a plague and by a long war with Sparta. I asked about other cultural spurts and each time it was a war that ended it, or, in some cases, even accompanied it. He was like all the rest. The truth was there; he had only to bend and pick it up; but he didn't."

Ralson stared at the floor, and said in a tired voice, "They come to me in the laboratory sometimes, Doctor. They say, 'how the devil are we going to get rid of the such-and-such effect that is ruining all our measurements, Ralson?' They show me the instruments and the wiring diagrams and I say, 'It's staring at you. Why don't you do so-and-so? A child could tell you that.' Then I walk away because I can't endure the slow puzzling of their stupid faces. Later, they come to me and say, 'It worked, Ralson. How

did you figure it out?' I can't explain to them, Doctor; it would be like explaining that water is wet. And I couldn't explain to the historian. And I can't explain to you. It's a waste of time."

"Would you like to go back to your room?"

"Yes."

Blaustein sat and wondered for many minutes after Ralson had been escorted out of his office. His fingers found their way automatically into the upper right drawer of his desk and lifted out the letter-opener. He twiddled it in his fingers.

Finally, he lifted the telephone and dialed the unlisted number he had been given.

He said, "This is Blaustein. There is a professional historian who was consulted by Dr. Ralson some time in the past, probably a bit over a year ago. I don't know his name. I don't even know if he was connected with a university. If you could find him, I would like to see him."

* * *

Thaddeus Milton, Ph.D., blinked thoughtfully at Blaustein and brushed his hand through his iron-gray hair. He said, "They came to me and I said that I had indeed met this man. However, I have had very little connection with him. None, in fact, beyond a few conversations of a professional nature."

"How did he come to you?"

"He wrote me a letter; why me, rather than someone else, I do not know. A series of articles written by myself had appeared in one of the semi-learned journals of semi-popular appeal about that time. It may have attracted his attention."

"I see. With what general topic were the articles concerned?"

"They were a consideration of the validity of the cyclic approach to history. That is, whether one can really say that a particular civilization must follow laws of growth and decline in any matter analogous to those involving individuals."

"I have read Toynbee, Dr. Milton."

"Well, then, you know what I mean."

Blaustein said, "And when Dr. Ralson consulted you, was it with reference to this cyclic approach to history?"

"U-m-m-m. In a way, I suppose. Of course, the man is not an historian and some of his notions about cultural trends are rather dramatic and . . . what shall I say . . . tabloidish. Pardon me, Doctor, if I ask a question which may be improper. Is Dr. Ralson one of your patients?"

"Dr. Ralson is not well and is in my care. This, and all else we say here, is confidential, of course."

"Quite. I understand that. However, your answer explains something to me. Some of his ideas almost verged on the irrational. He was always worried, it seemed to me, about the connection between what he called 'cultural spurts' and calamities of one sort or another. Now such connections have been noted frequently. The time of a nation's greatest vitality may come at a time of great national insecurity. The Netherlands is a good case in point. Her great artists, statesmen, and explorers belong to the early Seventeenth Century at the time when she was locked in a death struggle with the greatest European power of the time, Spain. When at the point of destruction at home, she was building an empire in the Far East and had secured footholds on the northern coast of South America, the southern tip of Africa, and the Hudson Valley of

North America. Her fleets fought England to a standstill. And then, once her political safety was assured, she declined.

"Well, as I say, that is not unusual. Groups, like individuals, will rise to strange heights in answer to a challenge, and vegetate in the absence of a challenge. Where Dr. Ralson left the paths of sanity, however, was in insisting that such a view amounted to confusing cause and effect. He declared that it was not times of war and danger that stimulated 'cultural spurts', but rather vice versa. He claimed that each time a group of men showed too much vitality and ability, a war became necessary to destroy the possibility of their further development."

"I see," said Blaustein.

"I rather laughed at him, I am afraid. It may be that that was why he did not keep the last appointment we made. Just toward the end of that last conference he asked me, in the most intense fashion imaginable, whether I did not think it queer that such an improbable species as man was dominant on earth, when all he had in his favor was intelligence. There I laughed aloud. Perhaps I should not have, poor fellow."

"It was a natural reaction," said Blaustein, "but I must take no more of your time. You have been most helpful."

They shook hands, and Thaddeus Milton took his leave.

* * *

"Well," said Darrity, "there are your figures on the recent suicides among scientific personnel. Get any deductions out of it?"

"I should be asking you that," said Blaustein, gently. "The F.B.I. must have investigated thoroughly."

"You can bet the national debt on that. They *are* suicides. There's no mistake about it. There have been people checking on it in another department. The rate is about four times above normal, taking age, social status, economic class into consideration."

"What about British scientists?"

"Just about the same."

"And the Soviet Union?"

"Who can tell?" The investigator leaned forward. "Doc, you don't think the Soviets have some sort of ray that can make people want to commit suicide, do you? It's sort of suspicious that men in atomic research are the only ones affected."

"Is it? Perhaps not. Nuclear physicists may have peculiar strains imposed upon them. It is difficult to tell without thorough study."

"You mean complexes might be coming through?" asked Darrity, warily.

Blaustein made a face. "Psychiatry is becoming too popular. Everybody talks of complexes and neuroses and psychoses and compulsions and what-not. One man's guilt complex is another man's good night's sleep. If I could talk to each one of the men who committed suicide, maybe I could know something."

"You're talking to Ralson."

"Yes, I'm talking to Ralson."

"Has *he* got a guilt complex?"

"Not particularly. He has a background out of which it would not surprise me if he obtained a morbid concern with death. When he was twelve he saw his mother die under the wheels of an automobile. His father died slowly of cancer. Yet the effect of those experiences on his present troubles is not clear."

Darrity picked up his hat. "Well, I wish you'd get a move on, Doc. There's something big on, bigger than the H-Bomb. I don't know how anything *can* be bigger than that, but it is."

* * *

Ralson insisted on standing. "I had a bad night last night, Doctor."

"I hope," said Blaustein, "these conferences are not disturbing you."

"Well, maybe they are. They have me thinking on the subject again. It makes things bad, when I do that. How do you imagine it feels being part of a bacterial culture, Doctor?"

"I had never thought of that. To a bacterium, it probably feels quite normal."

Ralson did not hear. He said, slowly, "A culture in which intelligence is being studied. We study all sorts of things as far as their genetic relationships are concerned. We take fruit flies and cross red eyes and white eyes to see what happens. We don't care anything about red eyes and white eyes, but we try to gather from them certain basic genetic principles. You see what I mean?"

"Certainly."

"Even in humans, we can follow various physical characteristics. There are the Hapsburg lips, and the hemophilia that started with Queen Victoria and cropped up in her descendants among the Spanish and Russian royal families. We can even follow feeble-mindedness in the Jukeses and Kallikaks. You learn about it in high-school biology. But you can't breed human beings the way you do fruit flies. Humans live too long. It would take centuries to draw conclusions. It's a pity we don't have a special race of men that reproduce at weekly intervals, eh?"

He waited for an answer, but Blaustein only smiled.

Ralson said, "Only that's exactly what we would be for another group of beings whose life span might be thousands of years. To them, we would reproduce rapidly enough. We would be short-lived creatures and they could study the genetics of such things as musical aptitude, scientific intelligence, and so on. Not that those things would interest them as such, any more than the white eyes of the fruit fly interest us as white eyes."

"This is a very interesting notion," said Blaustein.

"It is not simply a notion. It is true. To me, it is obvious, and I don't care how it seems to you. Look around you. Look at the planet, Earth. What kind of a ridiculous animal are we to be lords of the world after the dinosaurs had failed? Sure, we're intelligent, but what's intelligence? We think it is important because we have it. If the Tyranosaurus could have picked out the one quality that he thought would ensure species domination, it would be size and strength. And he would make a better case for it. He lasted longer than we're likely to.

"Intelligence in itself isn't much as far as survival values are concerned. The elephant makes out very poorly indeed when compared to the sparrow even though he is much more intelligent. The dog does well, under man's protection, but not as well as the housefly against whom every human hand is raised. Or take the primates as a group. The small ones cower before their enemies; the large ones have always been remarkably unsuccessful in doing more than barely holding their own. The baboons do the best and that is because of their canines, not their brains."

A light film of perspiration covered Ralson's forehead. "And one can see that man

has been tailored, made to careful specifications for those things that study us. Generally, the primate is short-lived. Naturally, the larger ones live longer, which is a fairly general rule in animal life. Yet the human being has a life span twice as long as any of the other great apes; considerably longer even than the gorilla that outweighs him. We mature later. It's as though we've been carefully bred to live a little longer so that our life cycle might be of a more convenient length."

He jumped to his feet, shaking his fists above his head. "A thousand years are but as yesterday—"

Blaustein punched a button hastily.

For a moment, Ralson struggled against the white-coated orderly who entered, and then he allowed himself to be led away.

Blaustein looked after him, shook his head, and picked up the telephone.

He got Darrity. "Inspector, you may as well know that this may take a long time."

He listened and shook his head. "I know. I don't minimize the urgency."

The voice in the receiver was tinny and harsh. "Doctor, you *are* minimizing it. I'll send Dr. Grant to you. He'll explain the situation to you."

* * *

Dr. Grant asked how Ralson was, then asked somewhat wistfully if he could see him. Blaustein shook his head gently.

Grant said, "I've been directed to explain the current situation in atomic research to you."

"So that I will understand, no?"

"I hope so. It's a measure of desperation. I'll have to remind you—"

"Not to breathe a word of it. Yes, I know. This insecurity on the part of you people is a very bad symptom. You must know these things cannot be hidden."

"You live with secrecy. It's contagious."

"Exactly. What is the current secret?"

"There is . . . or, at least, there might be a defense against the atomic bomb."

"And that is a secret? It would be better if it were shouted to all the people of the world instantly."

"For heaven's sake, no. Listen to me, Dr. Blaustein. It's only on paper so far. It's at the E equal mc square stage, almost. It may not be practical. It would be bad to raise hopes we would have to disappoint. On the other hand, if it were known that we *almost* had a defense, there *might* be a desire to start and win a war before the defense were completely developed."

"That I don't believe. But, nevertheless, I distract you. What is the nature of this defense, or have you told me as much as you dare?"

"No, I can go as far as I like; as far as is necessary to convince you we have to have Ralson—and fast!"

"Well, then tell me, and I too, will know secrets. I'll feel like a member of the Cabinet."

"You'll know more than most. Look, Dr. Blaustein, let me explain it in lay language. So far, military advances have been made fairly equally in both offensive and defensive weapons. Once before there seemed to be a definite and permanent tipping of all warfare in the direction of the offense, and that was with the invention of gunpowder. But

the defense caught up. The medieval man-in-armor-on-horse became the modern man-in-tank-on-treads, and the stone castle became the concrete pillbox. The same thing, you see, except that everything has been boosted several orders of magnitude."

"Very good. You make it clear. But with the atomic bomb comes more orders of magnitude, no? You must go past concrete and steel for protection."

"Right. Only we can't just make thicker and thicker walls. We've run out of materials that are strong enough. So we must abandon materials altogether. If the atom attacks, we must let the atom defend. We will use energy itself; a force field."

"And what," asked Blaustein, gently, "is a force field?"

"I wish I could tell you. Right now, it's an equation on paper. Energy can be so channeled as to create a wall of matterless inertia, theoretically. In practice, we don't know how to do it."

"It would be a wall you could not go through, is that it? Even for atoms?"

"Even for atom bombs. The only limit on its strength would be the amount of energy we could pour into it. It could even theoretically be made to be impermeable to radiation. The gamma rays would bounce off it. What we're dreaming of is a screen that would be in permanent place about cities; at minimum strength, using practically no energy. It could then be triggered to maximum intensity in a fraction of a millisecond at the impingement of short-wave radiation; say the amount radiating from the mass of plutonium large enough to be an atomic war head. All this is theoretically possible."

"And why must you have Ralson?"

"Because he is the only one who can reduce it to practice, if it can be made practical at all, quickly enough. Every minute counts these days. You know what the international situation is. Atomic defense *must* arrive before atomic war."

"You are so sure of Ralson?"

"I am as sure of him as I can be of anything. The man is amazing, Dr. Blaustein. He is always right. Nobody in the field knows how he does it."

"A sort of intuition, no?" The psychiatrist looked disturbed. "A kind of reasoning that goes beyond ordinary human capacities. Is that it?"

"I make no pretense of knowing what it is."

"Let me speak to him once more then. I will let you know."

"Good." Grant rose to leave; then, as if in afterthought, he said, "I might say, Doctor, that if you don't do something, the Commission plans to take Dr. Ralson out of your hands."

"And try another psychiatrist? If they wish to do that, of course, I will not stand in their way. It is my opinion, however, that no reputable practitioner will pretend there is a rapid cure."

"We may not intend further mental treatment. He may simply be returned to work."

"That, Dr. Grant, I will fight. You will get nothing out of him. It will be his death."

"We get nothing out of him anyway."

"This way there is at least a chance, no?"

"I hope so. And by the way, please don't mention the fact that I said anything about taking Ralson away."

"I will not, and I thank you for the warning. Good-bye, Dr. Grant."

* * *

"I made a fool of myself last time, didn't I, Doctor?" said Ralson. He was frowning.

"You mean you don't believe what you said then?"

"*I do!*" Ralson's slight form trembled with the intensity of his affirmation.

He rushed to the window, and Blaustein swiveled in his chair to keep him in view. There were bars in the window. He couldn't jump. The glass was unbreakable.

Twilight was ending, and the stars were beginning to come out. Ralson stared at them in fascination, then he turned to Blaustein and flung a finger outward. "Every single one of them is an incubator. They maintain temperatures at the desired point. Different experiments; different temperatures. And the planets that circle them are just huge cultures, containing different nutrient mixtures and different life forms. The experimenters are economical, too—whatever and whoever they are. They've cultured many types of life forms in this particular test-tube. Dinosaurs in a moist, tropical age and ourselves among the glaciers. They turn the sun up and down and we try to work out the physics of it. Physics!" He drew his lips back in a snarl.

"Surely," said Dr. Blaustein, "it is not possible that the sun can be turned up and down at will."

"Why not? It's just like a heating element in an oven. You think bacteria know what it is that works the heat that reaches them? Who knows? Maybe they evolve theories, too. Maybe they have their cosmogonies about cosmic catastrophes, in which clashing lightbulbs create strings of Petri dishes. Maybe they think there must be some beneficent creator that supplies them with food and warmth and says to them, 'Be fruitful and multiply!'

"We breed like them, not knowing why. We obey the so-called laws of nature which are only our interpretation of the not-understood forces imposed upon us.

"And now they've got the biggest experiment of any yet on their hands. It's been going on for two hundred years. They decided to develop a strain for mechanical aptitude in England in the seventeen hundreds, I imagine. We call it the Industrial Revolution. It began with steam, went on to electricity, then atoms. It was an interesting experiment, but they took their chances on letting it spread. Which is why they'll have to be very drastic indeed in ending it."

Blaustein said, "And how would they plan to end it? Do you have an idea about that?"

"You ask *me* how they plan to end it. You can look about the world today and still ask what is likely to bring our technological age to an end. All the earth fears an atomic war and would do anything to avoid it; yet all the earth fears that an atomic war is inevitable."

"In other words, the experimenters will arrange an atom war whether we want it or not, to kill off the technological era we are in, and to start fresh. That is it, no?"

"Yes. It's logical. When we sterilize an instrument, do the germs know where the killing heat comes from? Or what has brought it about? There is some way the experimenters can raise the heat of our emotions; some way they can handle us that passes our understanding."

"Tell me," said Blaustein, "is that why you want to die? Because you think the destruction of civilization is coming and can't be stopped?"

Ralson said, "I *don't* want to die. It's just that I must." His eyes were tortured. "Doctor, if you had a culture of germs that were highly dangerous and that you had to keep under absolute control, might you not have an agar medium impregnated with, say, penicillin, in a circle at a certain distance from the center of inoculation? Any germs spreading out too far from the center would die. You would have nothing against

the particular germs who were killed; you might not even know that any germs had spread that far in the first place. It would be purely automatic.

"Doctor, there is a penicillin ring about our intellects. When we stray too far; when we penetrate the true meaning of our own existence, we have reached into the penicillin and we must die. It works slowly—but it's hard to stay alive."

He smiled briefly and sadly. Then he said, "May I go back to my room now, Doctor?"

* * *

Dr. Blaustein went to Ralson's room about noon the next day. It was a small room and featureless. The walls were gray with padding. Two small windows were high up and could not be reached. The mattress lay directly on the padded floor. There was nothing of metal in the room; nothing that could be utilized in tearing life from body. Even Ralson's nails were clipped short.

Ralson sat up. "Hello!"

"Hello, Dr. Ralson. May I speak to you?"

"Here? There isn't any seat I can offer you."

"It's all right. I'll stand. I have a sitting job and it is good for my sitting-down place that I should stand sometimes. Dr. Ralson, I have thought all night of what you told me yesterday and in the days before."

"And now you are going to apply treatment to rid me of what you think are delusions."

"No. It is just that I wish to ask questions and perhaps to point out some consequences of your theories which . . . you will forgive me? . . . you may not have thought of."

"Oh?"

"You see, Dr. Ralson, since you have explained your theories, I, too, know what you know. Yet I have no feeling about suicide."

"Belief is more than something intellectual, Doctor. You'd have to believe this with all your insides, which you don't."

"Do you not think perhaps it is rather a phenomenon of adaptation?"

"How do you mean?"

"You are not really a biologist, Dr. Ralson. And although you are very brilliant indeed in physics, you do not think of everything with respect to these bacterial cultures you use as analogies. You know that it is possible to breed bacterial strains that are resistant to penicillin or to almost any bacterial poison."

"Well?"

"The experimenters who breed us have been working with humanity for many generations, no? And this particular strain which they have been culturing for two centuries shows no sign of dying out spontaneously. Rather, it is a vigorous strain and a very infective one. Older high-culture strains were confined to single cities or to small areas and lasted only a generation or two. This one is spreading throughout the world. It is a *very* infective strain. Do you not think it may have developed penicillin immunity? In other words, the methods the experimenters use to wipe out the culture may not work too well any more, no?"

Ralson shook his head. "It's working on me."

"You are perhaps non-resistant. Or you have stumbled into a very high concentration of penicillin indeed. Consider all the people who have been trying to outlaw atomic warfare and to establish some form of world government and lasting peace. The effort has risen in recent years, without too awful results."

"It isn't stopping the atomic war that's coming."

"No, but maybe only a little more effort is all that is required. The peace-advocates do not kill themselves. More and more humans are immune to the experimenters. Do you know what they are doing in the laboratory?"

"I don't want to know."

"You *must* know. They are trying to invent a force field that will stop the atom bomb. Dr. Ralson, if I am culturing a virulent and pathological bacterium; then, even with all precautions, it may sometimes happen that I will start a plague. We may be bacteria to them, but we are dangerous to them, also, or they wouldn't wipe us out so carefully after each experiment.

"They are not quick, no? To them a thousand years is as a day, no? By the time they realize we are out of the culture, past the penicillin, it will be too late for them to stop us. They have brought us to the atom, and if we can only prevent ourselves from using it upon one another, we may turn out to be too much even for the experimenters."

Ralson rose to his feet. Small though he was, he was an inch and a half taller than Blaustein. "They are really working on a force field?"

"They are trying to. But they need you."

"No. I can't."

"They must have you in order that you might see what is so obvious to you. It is not obvious to them. Remember, it is your help, or else—defeat of man by the experimenters."

Ralson took a few rapid steps away, staring into the blank, padded wall. He muttered, "But there must be that defeat. If they build a force field, it will mean death for all of them before it can be completed."

"Some or all of them may be immune, no? And in any case, it will be death for them anyhow. They are trying."

Ralson said, "I'll try to help them."

"Do you still want to kill yourself?"

"Yes."

"But you'll try not to, no?"

"I'll *try* not to, Doctor." His lip quivered. "I'll have to be watched."

* * *

Blaustein climbed the stairs and presented his pass to the guard in the lobby. He had already been inspected at the outer gate, but he, his pass, and its signature were now scrutinized once again. After a moment, the guard retired to his little booth and made a phone call. The answer satisfied him. Blaustein took a seat and, in half a minute, was up again, shaking hands with Dr. Grant.

"The President of the United States would have trouble getting in here, no?" said Blaustein.

The lanky physicist smiled. "You're right, if he came without warning."

They took an elevator which traveled twelve floors. The office to which Grant led the way had windows in three directions. It was sound-proofed and air-conditioned. Its walnut furniture was in a state of high polish.

Blaustein said, "My goodness. It is like the office of the chairman of a board of directors. Science is becoming big business."

Grant looked embarrassed. "Yes, I know, but government money flows easily and it is difficult to persuade a congressman that your work is important unless he can see, smell, and touch the surface shine."

Blaustein sat down and felt the upholstered seat give way slowly. He said, "Dr. Elwood Ralson has agreed to return to work."

"Wonderful. I was hoping you would say that. I was hoping that was why you wanted to see me." As though inspired by the news, Grant offered the psychiatrist a cigar, which was refused.

"However," said Blaustein, "he remains a very sick man. He will have to be treated carefully and with insight."

"Of course. Naturally."

"It's not quite as simple as you may think. I want to tell you something of Ralson's problems, so that you will really understand how delicate the situation is."

He went on talking and Grant listened first in concern, and then in astonishment. "But then the man is out of his head, Dr. Blaustein. He'll be of no use to us. He's crazy."

Blaustein shrugged. "It depends on how you define 'crazy.' It's a bad word; don't use it. He had delusions, certainly. Whether they will affect his peculiar talents one cannot know."

"But surely no sane man could possibly—"

"Please. Please. Let us not launch into long discussions on psychiatric definitions of sanity and so on. The man has delusions and, ordinarily, I would dismiss them from all consideration. It is just that I have been given to understand that the man's particular ability lies in his manner of proceeding to the solution of a problem by what seems to be outside ordinary reason. That is so, no?"

"Yes. That *must* be admitted."

"How can you and I judge then as to the worth of one of his conclusions. Let me ask you, do *you* have suicidal impulses lately?"

"I don't think so."

"And other scientists here?"

"No, of course not."

"I would suggest, however, that while research on the force field proceeds, the scientists concerned be watched here and at home. It might even be a good enough idea that they should not go home. Offices like these could be arranged to be a small dormitory—"

"Sleep at work. You would never get them to agree."

"Oh, yes. If you do not tell them the real reason but say it is for security purposes, they will agree. 'Security purposes' is a wonderful phrase these days, no? Ralson must be watched more than anyone."

"Of course."

"But all this is minor. It is something to be done to satisfy my conscience in case Ralson's theories are correct. Actually, I don't believe them. They *are* delusions, but once that is granted, it is necessary to ask what the causes of those delusions are. What is it in Ralson's mind, in his background, in his life that makes it so necessary for him to have these particular delusions? One cannot answer that simply. It may well take years of constant psychoanalysis to discover the answer. And until the answer is discovered, he will not be cured.

"But, meanwhile, we can perhaps make intelligent guesses. He has had an unhappy

childhood, which, in one way or another, has brought him face to face with death in very unpleasant fashion. In addition, he has never been able to form associations with other children, or, as he grew older, with other men. He was always impatient with their slower forms of reasoning. Whatever difference there is between his mind and that of others, it has built a wall between him and society as strong as the force field you are trying to design. For similar reasons, he has been unable to enjoy a normal sex life. He has never married; he has had no sweethearts.

"It is easy to see that he could easily compensate to himself for this failure to be accepted by his social milieu by taking refuge in the thought that other human beings are inferior to himself. Which is, of course, true, as far as mentality is concerned. There are, of course, many, many facets to the human personality and in not all of them is he superior. No one is. Others, then, who are more prone to see merely what is inferior, just as he himself is, would not accept his affected pre-eminence of position. They would think him queer, even laughable, which would make it even more important to Ralson to prove how miserable and inferior the human species was. How could he better do that than to show that mankind was simply a form of bacteria to other superior creatures which experiment upon them. And then his impulses to suicide would be a wild desire to break away completely from being a man at all; to stop this identification with the miserable species he has created in his mind. You see?"

Grant nodded. "Poor guy."

"Yes, it is a pity. Had he been properly taken care of in childhood— Well, it is best for Dr. Ralson that he have no contact with any of the other men here. He is too sick to be trusted with them. You, yourself, must arrange to be the only man who will see him or speak to him. Dr. Ralson has agreed to that. He apparently thinks you are not as stupid as some of the others."

Grant smiled faintly. "That is agreeable to me."

"You will, of course, be careful. I would not discuss anything with him but his work. If he should volunteer information about his theories, which I doubt, confine yourself to something non-committal, and leave. And at all times, keep away anything that is sharp and pointed. Do not let him reach a window. Try to have his hands kept in view. You understand. I leave my patient in your care, Dr. Grant."

"I will do my best, Dr. Blaustein."

* * *

For two months, Ralson lived in a corner of Grant's office, and Grant lived with him. Gridwork had been built up before the windows, wooden furniture was removed and upholstered sofas brought in. Ralson did his thinking on the couch and his calculating on a desk pad atop a hassock.

The "Do Not Enter" was a permanent fixture outside the office. Meals were left outside. The adjoining men's room was marked off for private use and the door between it and the office removed. Grant switched to an electric razor. He made certain that Ralson took sleeping pills each night and waited till the other slept before sleeping himself.

And always reports were brought to Ralson. He read them while Grant watched and tried to seem not to watch.

Then Ralson would let them drop and stare at the ceiling, with one hand shading his eyes.

"Anything?" asked Grant.

Ralson shook his head from side to side.

Grant said, "Look, I'll clear the building during the swing shift. It's important that you see some of the experimental jigs we've been setting up."

They did so, wandering through the lighted, empty buildings like drifting ghosts, hand in hand. Always hand in hand. Grant's grip was tight. But after each trip, Ralson would still shake his head from side to side.

Half a dozen times he would begin writing; each time there would be a few scrawls and then he would kick the hassock over on its side.

Until, finally, he began writing once again and covered half a page rapidly. Automatically, Grant approached. Ralson looked up, covering the sheet of paper with a trembling hand.

He said, "Call Blaustein."

"What?"

"I said, 'Call Blaustein.' Get him here. Now!"

Grant moved to the telephone.

Ralson was writing rapidly now, stopping only to brush wildly at his forehead with the back of a hand. It came away wet.

He looked up and his voice was cracked, "Is he coming?"

Grant looked worried. "He isn't at his office."

"Get him at his home. Get him wherever he is. *Use* that telephone. Don't play with it."

Grant used it; and Ralson pulled another sheet toward himself.

Five minutes later, Grant said, "He's coming. What's wrong? You're looking sick."

Ralson could speak only thickly, "No time— Can't talk—"

He was writing, scribbling, scrawling, shakily diagraming. It was as though he were driving his hands, fighting it.

"Dictate!" urged Grant. "I'll write."

Ralson shook him off. His words were unintelligible. He held his wrist with his other hand, shoving it as though it were a piece of wood, and then he collapsed over the papers.

Grant edged them out from under and laid Ralson down on the couch. He hovered over him restlessly and hopelessly until Blaustein arrived.

Blaustein took one look. "What happened?"

Grant said, "I think he's alive," but by that time Blaustein had verified that for himself, and Grant told him what had happened.

Blaustein used a hypodermic and they waited. Ralson's eyes were blank when they opened. He moaned.

Blaustein leaned close. "Ralson."

Ralson's hands reached out blindly and clutched at the psychiatrist. "Doc. Take me back."

"I will. Now. It is that you have the force field worked out, no?"

"It's on the papers. Grant, it's on the papers."

Grant had them and was leafing through them dubiously. Ralson said, weakly, "It's not *all* there. It's all I can write. You'll *have* to make it out of that. Take me back, Doc!"

"Wait," said Grant. He whispered urgently to Blaustein. "Can't you leave him here till we test this thing? I can't make out what most of this is. The writing is illegible. Ask him what makes him think this will work."

"Ask *him?*" said Blaustein, gently. "Isn't he the one who always knows?"

"Ask me, anyway," said Ralson, overhearing from where he lay on the couch. His eyes were suddenly wide and blazing.

They turned to him.

He said, "*They* don't want a force field. *They!* The experimenters! As long as I had no true grasp, things remained as they were. But I hadn't followed up that thought—*that* thought which is there in the papers—I hadn't followed it up for thirty seconds before I felt . . . I felt— Doctor—"

Blaustein said, "What is it?"

Ralson was whispering again, "I'm deeper in the penicillin. I could feel myself plunging in and in, the further I went with that. I've never been in . . . so deep. That's how I knew I was right. Take me away."

Blaustein straightened. "I'll have to take him away, Grant. There's no alternative. If you can make out what he's written, that's it. If you can't make it out, I can't help you. That man can do no more work in his field without dying, do you understand?"

"But," said Grant, "he's dying of something imaginary."

"All right. Say that he is. But he will be really dead just the same, no?"

Ralson was unconscious again and heard nothing of this. Grant looked at him somberly, then said, "Well, take him away, then."

* * *

Ten of the top men at the Institute watched glumly as slide after slide filled the illuminated screen. Grant faced them, expression hard and frowning.

He said, "I think the idea is simple enough. You're mathematicians and you're engineers. The scrawl may seem illegible, but it was done with meaning behind it. That meaning must somehow remain in the writing, distorted though it is. The first page is clear enough. It should be a good lead. Each one of you will look at every page over and over again. You're going to put down every possible version of each page as it seems it might be. You will work independently. I want no consultations."

One of them said, "How do you know it means *anything*, Grant?"

"Because those are Ralson's notes."

"*Ralson!* I thought he was—"

"You thought he was sick," said Grant. He had to shout over the rising hum of conversation. "I know. He is. That's the writing of a man who was nearly dead. It's all we'll ever get from Ralson, any more. Somewhere in that scrawl is the answer to the force field problem. If we can't find it, we may have to spend ten years looking for it elsewhere."

They bent to their work. The night passed. Two nights passed. Three nights—

Grant looked at the results. He shook his head. "I'll take your word for it that it is all self-consistent. I can't say I understand it."

Lowe, who, in the absence of Ralson, would readily have been rated the best nuclear engineer at the Institute, shrugged. "It's not exactly clear to me. If it works, he hasn't explained why."

"He had no time to explain. Can you build the generator as he describes it?"

"I could try."

"Would you look at all the other versions of the pages?"

"The others are definitely not self-consistent."

"Would you double-check?"

"Sure."

"And could you start construction anyway?"

"I'll get the shop started. But I tell you frankly that I'm pessimistic."

"I know. So am I."

* * *

The thing grew. Hal Ross, Senior Mechanic, was put in charge of the actual construction, and he stopped sleeping. At any hour of the day or night, he could be found at it, scratching his bald head.

He asked questions only once, "What is it, Dr. Lowe? Never saw anything like it. What's it supposed to do?"

Lowe said, "You know where you are, Ross. You know we don't ask questions here. Don't ask again."

Ross did not ask again. He was known to dislike the structure that was being built. He called it ugly and unnatural. But he stayed at it.

* * *

Blaustein called one day.

Grant said, "How's Ralson?"

"Not good. He wants to attend the testing of the Field Projector he designed."

Grant hesitated, "I suppose he should. It's his after all."

"I would have to come with him."

Grant looked unhappier. "It might be dangerous, you know. Even in a pilot test, we'd be playing with tremendous energies."

Blaustein said, "No more dangerous for us than for you."

"Very well. The list of observers will have to be cleared through the Commission and the F.B.I., but I'll put you in."

* * *

Blaustein looked about him. The field projector squatted in the very center of the huge testing laboratory, but all else had been cleared. There was no visible connection with the plutonium pile which served as energy-source, but from what the psychiatrist heard in scraps about him—he knew better than to ask Ralson—the connection was from beneath.

At first, the observers had circled the machine, talking in incomprehensibles, but they were drifting away now. The gallery was filling up. There were at least three men in generals' uniforms on the other side, and a real coterie of lower-scale military. Blaustein chose an unoccupied portion of the railing; for Ralson's sake, most of all.

He said, "Do you still think you would like to stay?"

It was warm enough within the laboratory, but Ralson was in his coat, with his collar turned up. It made little difference, Blaustein felt. He doubted that any of Ralson's former acquaintances would now recognize him.

Ralson said, "I'll stay."

Blaustein was pleased. He wanted to see the test. He turned again at a new voice.

"Hello, Dr. Blaustein."

For a minute, Blaustein did not place him, then he said, "Ah, Inspector Darrity. What are you doing here?"

"Just what you would suppose." He indicated the watchers. "There isn't any way you can weed them out so that you can be sure there won't be any mistakes. I once stood as near to Klaus Fuchs as I am standing to you." He tossed his pocketknife into the air and retrieved it with a dexterous motion.

"Ah, yes. Where shall one find perfect security? What man can trust even his own unconscious? And you will now stand near to me, no?"

"Might as well." Darrity smiled. "You were very anxious to get in here, weren't you?"

"Not for myself, Inspector. And would you put away the knife, please."

Darrity turned in surprise in the direction of Blaustein's gentle head-gesture. He put his knife away and looked at Blaustein's companion for the second time. He whistled softly.

He said, "Hello, Dr. Ralson."

Ralson croaked, "Hello."

Blaustein was not surprised at Darrity's reaction. Ralson had lost twenty pounds since returning to the sanatorium. His face was yellow and wrinkled; the face of a man who had suddenly become sixty.

Blaustein said, "Will the test be starting soon?"

Darrity said, "It looks as if they're starting now."

He turned and leaned on the rail. Blaustein took Ralson's elbow and began leading him away, but Darrity said, softly, "Stay here, Doc. I don't want you wandering about."

Blaustein looked across the laboratory. Men were standing about with the uncomfortable air of having turned half to stone. He could recognize Grant, tall and gaunt, moving his hand slowly to light a cigarette, then changing his mind and putting lighter and cigarette in his pocket. The young men at the control panels waited tensely.

Then there was a low humming and the faint smell of ozone filled the air.

Ralson said harshly, "Look!"

Blaustein and Darrity looked along the pointing finger. The projector seemed to flicker. It was as though there were heated air rising between it and them. An iron ball came swinging down pendulum fashion and passed through the flickering area.

"It slowed up, no?" said Blaustein, excitedly.

Ralson nodded. "They're measuring the height of rise on the other side to calculate the loss of momentum. Fools! I *said* it would work." He was speaking with obvious difficulty.

Blaustein said, "Just watch, Dr. Ralson. I would not allow myself to grow needlessly excited."

The pendulum was stopped in its swinging, drawn up. The flickering about the projector became a little more intense and the iron sphere arced down once again.

Over and over again, and each time the sphere's motion was slowed with more of a jerk. It made a clearly audible sound as it struck the flicker. And eventually, it *bounced.* First, soggily, as though it hit putty, and then ringingly, as though it hit steel, so that the noise filled the place.

They drew back the pendulum bob and used it no longer. The projector could hardly be seen behind the haze that surrounded it.

Grant gave an order and the odor of ozone was suddenly sharp and pungent. There was a cry from the assembled observers; each one exclaiming to his neighbor. A dozen fingers were pointing.

Blaustein leaned over the railing, as excited as the rest. Where the projector had been, there was now only a huge semi-globular mirror. It was perfectly and beautifully clear. He could see himself in it, a small man standing on a small balcony that curved up on each side. He could see the fluorescent lights reflected in spots of glowing illumination. It was wonderfully sharp.

He was shouting, "Look, Ralson. It is reflecting energy. It is reflecting light waves like a mirror. Ralson—"

He turned, "Ralson! Inspector, where is Ralson?"

"What?" Darrity whirled. "I haven't seen him."

He looked about, wildly. "Well, he won't get away. No way of getting out of here now. You take the other side." And then he clapped hand to thigh, fumbled for a moment in his pocket, and said, "My knife is gone."

Blaustein found him. He was inside the small office belonging to Hal Ross. It led off the balcony, but under the circumstances, of course, it had been deserted. Ross himself was not even an observer. A senior mechanic need not observe. But his office would do very well for the final end of the long fight against suicide.

Blaustein stood in the doorway for a sick moment, then turned. He caught Darrity's eye as the latter emerged from a similar office a hundred feet down the balcony. He beckoned, and Darrity came at a run.

* * *

Dr. Grant was trembling with excitement. He had taken two puffs at each of two cigarettes and trodden each underfoot thereafter. He was fumbling with the third now.

He was saying, "This is better than any of us could possibly have hoped. We'll have the gunfire test tomorrow. I'm sure of the result now, but we've planned it; we'll go through with it. We'll skip the small arms and start with the bazooka levels. Or maybe not. It might be necessary to construct a special testing structure to take care of the ricochet problem."

He discarded his third cigarette.

A general said, "We'd have to try a literal atom-bombing, of course."

"Naturally. Arrangements have already been made to build a mock-city at Eniwetok. We could build a generator on the spot and drop the bomb. There'd be animals inside."

"And you really think if we set up a field in full power it would hold the bomb?"

"It's not just that, General. There'd be no noticeable field at all until the bomb is dropped. The radiation of the plutonium would have to energize the field before explosion. As we did here in the last step. That's the essence of it all."

"You know," said a Princeton professor, "I see disadvantages, too. When the field is on full, anything it protects is in total darkness, as far as the sun is concerned. Besides that, it strikes me that the enemy can adopt the practice of dropping harmless radioactive missiles to set off the field at frequent intervals. It would have nuisance value and be a considerable drain on our pile as well."

"Nuisances," said Grant, "can be survived. These difficulties will be met eventually, I'm sure, now that the main problem has been solved."

The British observer had worked his way toward Grant and was shaking hands. He said, "I feel better about London already. I cannot help but wish your government would allow me to see the complete plans. What I have seen strikes me as completely ingenious. It seems obvious now, of course, but how did anyone ever come to think of it?"

Grant smiled. "That question has been asked before with reference to Dr. Ralson's devices—"

He turned at the touch of a hand upon his shoulder. "Dr. Blaustein! I had nearly forgotten. Here, I want to talk to you."

He dragged the small psychiatrist to one side and hissed in his ear, "Listen, can you persuade Ralson to be introduced to these people? This is his triumph."

Blaustein said, "Ralson is dead."

"*What!*"

"Can you leave these people for a time?"

"Yes . . . yes— Gentlemen, you will excuse me for a few minutes?"

He hurried off with Blaustein.

The Federal men had already taken over. Unobtrusively, they barred the doorway to Ross's office. Outside there was the milling crowd discussing the answer to Alamogordo that they had just witnessed. Inside, unknown to them, was the death of the answerer. The G-man barrier divided to allow Grant and Blaustein to enter. It closed behind them again.

For a moment, Grant raised the sheet. He said, "He looks peaceful."

"I would say—happy," said Blaustein.

Darrity said, colorlessly, "The suicide weapon was my own knife. It was my negligence; it will be reported as such."

"No, no," said Blaustein, "that would be useless. He was my patient and I am responsible. In any case, he would not have lived another week. Since he invented the projector, he was a dying man."

Grant said, "How much of this has to be placed in the Federal files? Can't we forget all about his madness?"

"I'm afraid not, Dr. Grant," said Darrity.

"I have told him the whole story," said Blaustein, sadly.

Grant looked from one to the other. "I'll speak to the Director. I'll go to the President, if necessary. I don't see that there need be any mention of suicide or of madness. He'll get full publicity as inventor of the field projector. It's the least we can do for him." His teeth were gritting.

Blaustein said, "He left a note."

"A note?"

Darrity handed him a sheet of paper and said, "Suicides almost always do. This is one reason the doctor told me about what really killed Ralson."

The note was addressed to Blaustein and it went:

"The projector works; I knew it would. The bargain is done. You've got it and you don't need me any more. So I'll go. You needn't worry about the human race, Doc. You were right. They've bred us too long; they've taken too many chances. We're out of the culture now and they won't be able to stop us. I know. That's all I can say. I know."

He had signed his name quickly and then underneath there was one scrawled line, and it said:

"Provided enough men are penicillin-resistant."

Grant made a motion to crumple the paper, but Darrity held out a quick hand.

"For the record, Doctor," he said.

Grant gave it to him and said, "Poor Ralson! He died believing all that trash."

Blaustein nodded. "So he did. Ralson will be given a great funeral, I suppose, and the fact of his invention will be publicized without the madness and the suicide. But the government men will remain interested in his mad theories. They may not be so mad, no, Mr. Darrity?"

"That's ridiculous, Doctor," said Grant. "There isn't a scientist on the job who has shown the least uneasiness about it at all."

"Tell him, Mr. Darrity," said Blaustein.

Darrity said, "There has been another suicide. No, no, none of the scientists. No one with a degree. It happened this morning, and we investigated because we thought it might have some connection with today's test. There didn't seem any, and we were going to keep it quiet till the test was over. Only now there seems to be a connection.

"The man who died was just a guy with a wife and three kids. No reason to die. No history of mental illness. He threw himself under a car. We have witnesses, and it's certain he did it on purpose. He didn't die right away and they got a doctor to him. He was horribly mangled, but his last words were 'I feel much better now' and he died."

"But who was he?" cried Grant.

"Hal Ross. The guy who actually built the projector. The guy whose office this is."

Blaustein walked to the window. The evening sky was darkening into starriness.

He said, "The man knew nothing about Ralson's views. He had never spoken to Ralson, Mr. Darrity tells me. Scientists are probably resistant as a whole. They must be or they are quickly driven out of the profession. Ralson was an exception, a penicillin-sensitive who insisted on remaining. You see what happened to him. But what about the others; those who have remained in walks of life where there is no constant weeding out of the sensitive ones. How much of humanity *is* penicillin-resistant?"

"You *believe* Ralson?" asked Grant in horror.

"I don't really know."

Blaustein looked at the stars.

Incubators?

The Martian Way

From the doorway of the short corridor between the only two rooms in the travelhead of the spaceship, Mario Esteban Rioz watched sourly as Ted Long adjusted the video dials painstakingly. Long tried a touch clockwise, then a touch counter. The picture was lousy.

Rioz knew it would stay lousy. They were too far from Earth and at a bad position facing the Sun. But then Long would not be expected to know that. Rioz remained standing in the doorway for an additional moment, head bent to clear the upper lintel, body turned half sidewise to fit the narrow opening. Then he jerked into the galley like a cork popping out of a bottle.

"What are you after?" he asked.

"I thought I'd get Hilder," said Long.

Rioz propped his rump on the corner of a table shelf. He lifted a conical can of milk from the companion shelf just above his head. Its point popped under pressure. He swirled it gently as he waited for it to warm.

"What for?" he said. He upended the cone and sucked noisily.

"Thought I'd listen."

"I think it's a waste of power."

Long looked up, frowning. "It's customary to allow free use of personal video sets."

"Within reason," retorted Rioz.

Their eyes met challengingly. Rioz had the rangy body, the gaunt, cheek-sunken face that was almost the hallmark of the Martian Scavenger, those Spacers who patiently haunted the space routes between Earth and Mars. Pale blue eyes were set keenly in the brown, lined face which, in turn, stood darkly out against the white surrounding synthofur that lined the up-turned collar of his leathtic space jacket.

Long was altogether paler and softer. He bore some of the marks of the Grounder, although no second-generation Martian could be a Grounder in the sense that Earthmen were. His own collar was thrown back and his dark brown hair freely exposed.

"What do you call within reason?" demanded Long.

Rioz's thin lips grew thinner. He said, "Considering that we're not even going to make expenses this trip, the way it looks, any power drain at all is outside reason."

Long said, "If we're losing money, hadn't you better get back to your post? It's your watch."

Rioz grunted and ran a thumb and forefinger over the stubble on his chin. He got up and trudged to the door, his soft, heavy boots muting the sound of his steps. He paused to look at the thermostat, then turned with a flare of fury.

"I *thought* it was hot. Where do you think you are?"

Long said, "Forty degrees isn't excessive."

"For you it isn't, maybe. But this is space, not a heated office at the iron mines." Rioz swung the thermostat control down to minimum with a quick thumb movement. "Sun's warm enough."

"The galley isn't on Sunside."

"It'll percolate through, damn it."

Rioz stepped through the door and Long stared after him for a long moment, then turned back to the video. He did not turn up the thermostat.

The picture was still flickering badly, but it would have to do. Long folded a chair down out of the wall. He leaned forward waiting through the formal announcement, the momentary pause before the slow dissolution of the curtain, the spotlight picking out the well-known bearded figure which grew as it was brought forward until it filled the screen.

The voice, impressive even through the flutings and croakings induced by the electron storms of twenty millions of miles, began:

"Friends! My fellow citizens of Earth . . ."

2

Rioz's eye caught the flash of the radio signal as he stepped into the pilot room. For one moment, the palms of his hands grew clammy when it seemed to him that it was a radar pip; but that was only his guilt speaking. He should not have left the pilot room while on duty theoretically, though all Scavengers did it. Still, it was the standard nightmare, this business of a strike turning up during just those five minutes when one knocked off for a quick coffee because it seemed certain that space was clear. And the nightmare had been known to happen, too.

Rioz threw in the multi-scanner. It was a waste of power, but while he was thinking about it, he might as well make sure.

Space was clear except for the far-distant echoes from the neighboring ships on the scavenging line.

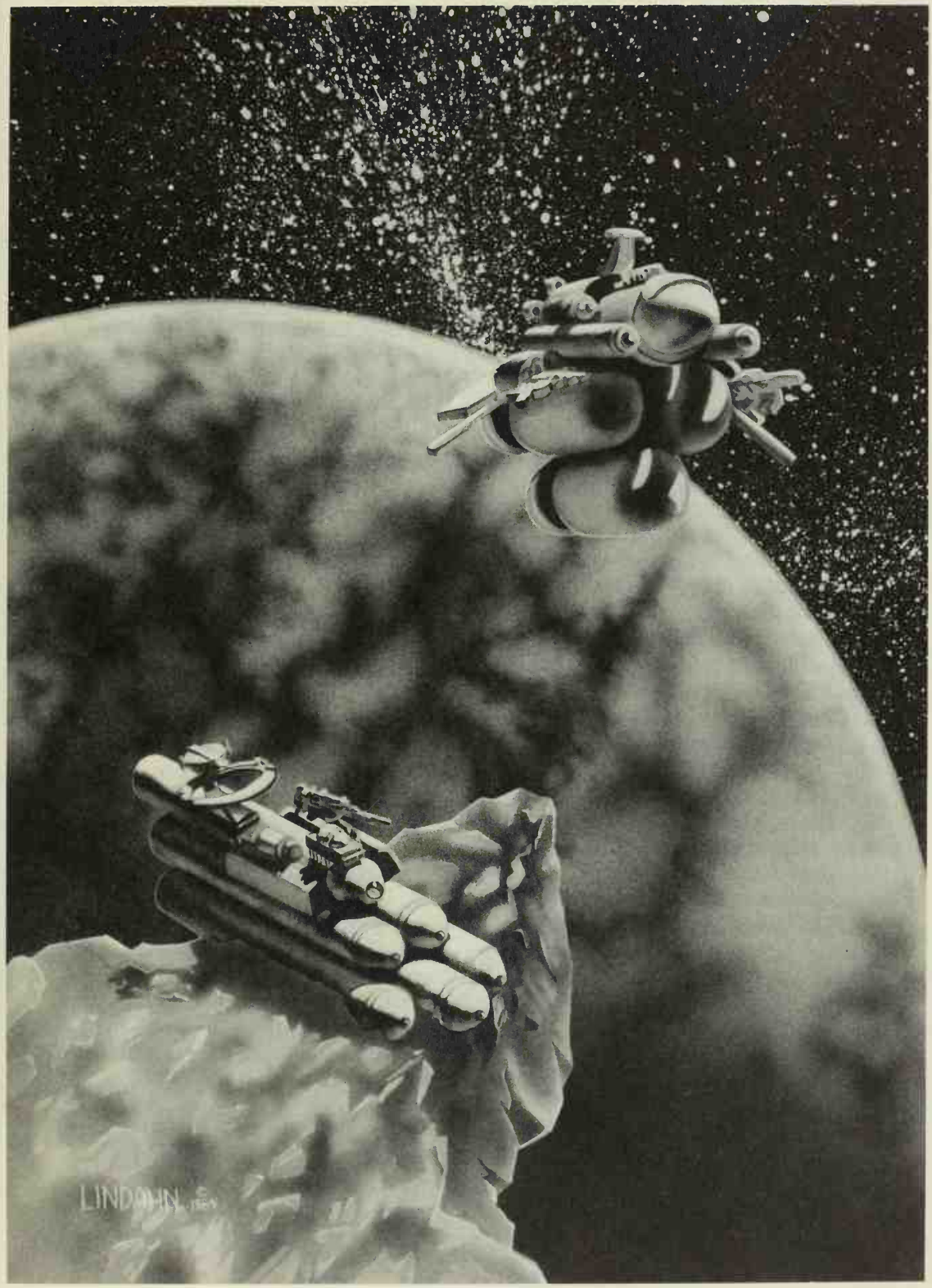
He hooked up the radio circuit, and the blond, long-nosed head of Richard Swenson, copilot of the next ship on the Marsward side, filled it.

"Hey, Mario," said Swenson.

"Hi. What's new?"

There was a second and a fraction of pause between that and Swenson's next comment, since the speed of electromagnetic radiation is not infinite.

"What a day I've *had*."


LINDOHN

"Something happened?" Rioz asked.

"I had a strike."

"Well, good."

"Sure, if I'd roped it in," said Swenson morosely.

"What happened?"

"Damn it, I headed in the wrong direction."

Rioz knew better than to laugh. He said, "How did you do that?"

"It wasn't my fault. The trouble was the shell was moving way out of the ecliptic. Can you imagine the stupidity of a pilot that can't work the release maneuver decently? How was I to know? I got the distance of the shell and let it go at that. I just assumed its orbit was in the usual trajectory family. Wouldn't you? I started along what I thought was a good line of intersection and it was five minutes before I noticed the distance was still going up. The pips were taking their sweet time returning. So then I took the angular projections of the thing, and it was too late to catch up with it."

"Any of the other boys getting it?"

"No. It's 'way out of the ecliptic and'll keep on going forever. That's not what bothers me so much. It was only an inner shell. But I hate to tell you how many tons of propulsion I wasted getting up speed and then getting back to station. You should have heard Canute."

Canute was Richard Swenson's brother and partner.

"Mad, huh?" said Rioz.

"Mad? Like to have killed me! But then we've been out five months now and it's getting kind of sticky. You know."

"I know."

"How are you doing, Mario?"

Rioz made a spitting gesture. "About that much this trip. Two shells in the last two weeks and I had to chase each one for six hours."

"Big ones?"

"Are you kidding? I could have scaled them down to Phobos by hand. This is the worst trip I've ever had."

"How much longer are you staying?"

"For my part, we can quit tomorrow. We've only been out two months and it's got so I'm chewing Long out all the time."

There was a pause over and above the electromagnetic lag.

Swenson said, "What's he like, anyway? Long, I mean."

Rioz looked over his shoulder. He could hear the soft, crackly mutter of the video in the gallery. "I can't make him out. He says to me about a week after the start of the trip, 'Mario, why are you a Scavenger?' I just look at him and say, 'To make a living. Why do you suppose?' I mean, what the hell kind of a question is that? Why is anyone a Scavenger?

"Anyway, he says, 'That's not it, Mario.' *He's* telling *me*, you see. He says, 'You're a Scavenger because this is part of the Martian way.'"

Swenson said, "And what did he mean by that?"

Rioz shrugged. "I never asked him. Right now he's sitting in there listening to the ultra-microwave from Earth. He's listening to some Grounder called Hilder."

"Hilder? A Grounder politician, an Assemblyman or something, isn't he?"

"That's right. At least, I think that's right. Long is always doing things like that. He brought about fifteen pounds of books with him, all about Earth. Just plain dead weight, you know."

"Well, he's your partner. And talking about partners, I think I'll get back on the job. If I miss another strike, there'll be murder around here."

He was gone and Rioz leaned back. He watched the even green line that was the pulse scanner. He tried the multi-scanner a moment. Space was still clear.

He felt a little better. A bad spell is always worse if the Scavengers all about you are pulling in shell after shell; if the shells go spiraling down to the Phobos scrap forges with everyone's brand welded on except your own. Then, too, he had managed to work off some of his resentment toward Long.

It was a mistake teaming up with Long. It was always a mistake to team up with a tenderfoot. They thought what you wanted was conversation, especially Long, with his eternal theories about Mars and its great new role in human progress. That was the way he said it—Human Progress: the Martian Way; the New Creative Minority. And all the time what Rioz wanted wasn't talk, but a strike, a few shells to call their own.

At that, he hadn't any choice, really. Long was pretty well known down on Mars and made good pay as a mining engineer. He was a friend of Commissioner Sankov and he'd been out on one or two short scavenging missions before. You can't turn a fellow down flat before a tryout, even though it did look funny. Why should a mining engineer with a comfortable job and good money want to muck around in space?

Rioz never asked Long that question. Scavenger partners are forced too close together to make curiosity desirable, or sometimes even safe. But Long talked so much that he answered the question.

"I had to come out here, Mario," he said. "The future of Mars isn't in the mines; it's in space."

Rioz wondered how it would be to try a trip alone. Everyone said it was impossible. Even discounting lost opportunities when one man had to go off watch to sleep or attend to other things, it was well known that one man alone in space would become intolerably depressed in a relatively short while.

Taking a partner along made a six-month trip possible. A regular crew would be better, but no Scavenger could make money on a ship large enough to carry one. The capital it would take in propulsion alone!

Even two didn't find it exactly fun in space. Usually you had to change partners each trip and you could stay out longer with some than with others. Look at Richard and Canute Swenson. They teamed up every five or six trips because they were brothers. And yet whenever they did, it was a constantly mounting tension and antagonism after the first week.

Oh well. Space was clear. Rioz would feel a little better if he went back in the galley and smoothed down some of the bickering with Long. He might as well show he was an old spacehand who took the irritations of space as they came.

He stood up, walked the three steps necessary to reach the short, narrow corridor that tied together the two rooms of the spaceship.

3

Once again Rioz stood in the doorway for a moment, watching. Long was intent on the flickering screen.

Rioz said gruffly, "I'm shoving up the thermostat. It's all right—we can spare the power."

Long nodded. "If you like."

Rioz took a hesitant step forward. Space was clear, so to hell with sitting and looking at a blank, green, pipless line. He said, "What's the Grounder been talking about?"

"History of space travel mostly. Old stuff, but he's doing it well. He's giving the whole works—color cartoons, trick photography, stills from old films, everything."

As if to illustrate Long's remarks, the bearded figure faded out of view, and a cross-sectional view of a spaceship flitted onto the screen. Hilder's voice continued, pointing out features of interest that appeared in schematic color. The communications system of the ship outlined itself in red as he talked about it, the storerooms, the patron micropile drive, the cybernetic circuits . . .

Then Hilder was back on the screen. "But this is only the travelhead of the ship. What moves it? What gets it off the Earth?"

Everyone knew what moved a spaceship, but Hilder's voice was like a drug. He made spaceship propulsion sound like the secret of the ages, like an ultimate revelation. Even Rioz felt a slight tingling of suspense, though he had spent the greater part of his life aboard ship.

Hilder went on. "Scientists call it different names. They call it the Law of Action and Reaction. Sometimes they call it Newton's Third Law. Sometimes they call it Conservation of Momentum. But we don't have to call it any name. We can just use our common sense. When we swim we push water backward and move forward ourselves. When we walk, we push back against the ground and move forward. When we fly a gyro-flivver, we push air backward and move forward.

"Nothing can move forward unless something else moves backward. It's the old principle of 'You can't get something for nothing.'

"Now imagine a spaceship that weighs a hundred thousand tons lifting off Earth. To do that, something else must be moved downward. Since a spaceship is extremely heavy, a great deal of material must be moved downward. So much material, in fact, that there is no place to keep it all aboard ship. A special compartment must be built behind the ship to hold it."

Again Hilder faded out and the ship returned. It shrank and a truncated cone appeared behind it. In bright yellow, words appeared within it: MATERIAL TO BE THROWN AWAY.

"But now," said Hilder, "the total weight of the ship is much greater. You need still more propulsion and still more."

The ship shrank enormously to add on another larger shell and still another immense one. The ship proper, the travel-head, was a little dot on the screen, a glowing red dot.

Rioz said, "Hell, this is kindergarten stuff."

"Not to the people he's speaking to, Mario," replied Long. "Earth isn't Mars. There must be billions of Earth people who've never seen a spaceship; don't know the first thing about it."

Hilder was saying, "When the material inside the biggest shell is used up, the shell is detached. It's thrown away, too."

The outermost shell came loose, wobbled about the screen.

"Then the second one goes," said Hilder, "and then, if the trip is a long one, the last is ejected."

The ship was just a red dot now, with three shells shifting and moving, lost in space.

Hilder said, "These shells represent a hundred thousand tons of tungsten, magnesium, aluminum, and steel. They are gone forever from Earth. Mars is ringed by Scavengers, waiting along the routes of space travel, waiting for the cast-off shells, netting and branding them, saving them for Mars. Not one cent of payment reaches Earth for them. They are salvage. They belong to the ship that finds them."

Rioz said, "We risk our investment and our lives. If we don't pick them up, no one gets them. What loss is that to Earth?"

"Look," said Long, "he's been talking about nothing but the drain that Mars, Venus, and the Moon put on Earth. This is just another item of loss."

"They'll get their return. We're mining more iron every year."

"And most of it goes right back into Mars. If you can believe his figures, Earth has invested two hundred billion dollars in Mars and received back about five billion dollars' worth of iron. It's put five hundred billion dollars into the Moon and gotten back a little over twenty-five billion dollars of magnesium, titanium, and assorted light metals. It's put fifty billion dollars into Venus and gotten back nothing. And that's what the taxpayers of Earth are really interested in—tax money out; nothing in."

The screen was filled, as he spoke, with diagrams of the Scavengers on the route to Mars; little, grinning caricatures of ships, reaching out wiry, tenuous arms that groped for the tumbling, empty shells, seizing and snaking them in, branding them MARS PROPERTY in glowing letters, then scaling them down to Phobos.

Then it was Hilder again. "They tell us eventually they will return it all to us. Eventually! Once they are a going concern! We don't know when that will be. A century from now? A thousand years? A million? 'Eventually.' Let's take them at their word. Someday they will give us back all our metals. Someday they will grow their own food, use their own power, live their own lives.

"But one thing they can never return. Not in a hundred million years. *Water!*

"Mars has only a trickle of water because it is too small. Venus has no water at all because it is too hot. The Moon has none because it is too hot and too small. So Earth must supply not only drinking water and washing water for the Spacers, water to run their industries, water for the hydroponic factories they claim to be setting up—but even water to throw away by the millions of tons.

"What is the propulsive force that spaceships use? What is it they throw behind so that they can accelerate forward? Once it was the gases generated from explosives. That was very expensive. Then the proton micropile was invented—a cheap power source that could heat up any liquid until it was a gas under tremendous pressure. What is the cheapest and most plentiful liquid available? Why, water, of course.

"Each spaceship leaves Earth carrying nearly a million tons—not pounds, *tons*—of water, for the sole purpose of driving it into space, so that it may speed up or slow down.

"Our ancestors burned the oil of Earth madly and willfully. They destroyed its coal recklessly. We despise and condemn them for that, but at least they had this excuse—they thought that when the need arose, substitutes would be found. And they were

right. We have our plankton farms and our proton micropiles.

"But there is no substitute for water. None! There never can be. And when our descendants view the desert we will have made of Earth, what excuse will they find for us? When the droughts come and grow—"

Long leaned forward and turned off the set. He said, "That bothers me. The damn fool is deliberately—What's the matter?"

Rioz had risen uneasily to his feet. "I ought to be watching the pips."

"The hell with the pips." Long got up likewise, followed Rioz through the narrow corridor, and stood just inside the pilot room. "If Hilder carries this through, if he's got the guts to make a real issue out of it—*Wow!*"

He had seen it too. The pip was a Class A, racing after the outgoing signal like a greyhound after a mechanical rabbit.

Rioz was babbling, "Space was clear, I tell you, *clear.* For Mar's sake, Ted, don't just freeze on me. See if you can spot it visually."

Rioz was working speedily and with an efficiency that was the result of nearly twenty years of scavenging. He had the distance in two minutes. Then, remembering Swenson's experience, he measured the angle of declination and the radial velocity as well.

He yelled at Long, "One point seven six radians. You can't miss it, man."

Long held his breath as he adjusted the vernier. "It's only half a radian off the Sun. It'll only be crescent-lit."

He increased magnification as rapidly as he dared, watching for the one "star" that changed position and grew to have a form, revealing itself to be no star.

"I'm starting, anyway," said Rioz. "We can't wait."

"I've got it. I've got it." Magnification was still too small to give it a definite shape, but the dot Long watched was brightening and dimming rhythmically as the shell rotated and caught sunlight on cross sections of different sizes.

"Hold on."

The first of many fine spurts of steam squirted out of the proper vents, leaving long trails of micro-crystals of ice gleaming mistily in the pale beams of the distant Sun. They thinned out for a hundred miles or so. One spurt, then another, then another, as the Scavenger ship moved out of its stable trajectory and took up a course tangential to that of the shell.

"It's moving like a comet at perihelion!" yelled Rioz. "Those damned Grounder pilots knock the shells off that way on purpose. I'd like to—"

He swore his anger in a frustrated frenzy as he kicked steam backward and backward recklessly, till the hydraulic cushioning of his chair had soughed back a full foot and Long had found himself all but unable to maintain his grip on the guard rail.

"Have a heart," he begged.

But Rioz had his eye on the pips. "If you can't take it, man, stay on Mars!" The steam spurts continued to boom distantly.

The radio came to life. Long managed to lean forward through what seemed like molasses and closed contact. It was Swenson, eyes glaring.

Swenson yelled, "Where the hell are you guys going? You'll be in my sector in ten seconds."

Rioz said, "I'm chasing a shell."

"In *my* sector?"

"It started in mine and you're not in position to get it. Shut off that radio, Ted."

The ship thundered through space, a thunder that could be heard only within the

hull. And then Rioz cut the engines in stages large enough to make Long flail forward. The sudden silence was more ear-shattering than the noise that had preceded it.

Rioz said, "All right. Let me have the 'scope."

They both watched. The shell was a definite truncated cone now, tumbling with slow solemnity as it passed along among the stars.

"It's a Class A shell, all right," said Rioz with satisfaction. A giant among shells, he thought. It would put them into the black.

Long said, "We've got another pip on the scanner. I think it's Swenson taking after us."

Rioz scarcely gave it a glance. "He won't catch us."

The shell grew larger still, filling the visiplate.

Rioz's hands were on the harpoon lever. He waited, adjusted the angle microscropically twice, played out the length allotment. Then he yanked, tripping the release.

For a moment, nothing happened. Then a metal mesh cable snaked out onto the visiplate, moving toward the shell like a striking cobra. It made contact, but it did not hold. If it had, it would have snapped instantly like a cobweb strand. The shell was turning with a rotational momentum amounting to thousands of tons. What the cable did do was set up a powerful magnetic field that acted as a brake on the shell.

Another cable and another lashed out. Rioz sent them out in an almost heedless expenditure of energy.

"I'll get this one! By Mars, I'll get this one!"

With some two dozen cables stretching between ship and shell, he desisted. The shell's rotational energy, converted by breaking into heat, had raised its temperature to a point where its radiation could be picked up by the ship's meters.

Long said, "Do you want me to put our brand on?"

"Suits me. But you don't have to if you don't want to. It's my watch."

"I don't mind."

Long clambered into his suit and went out the lock. It was the surest sign of his newness to the game that he could count the number of times he had been out in space in a suit. This was the fifth time.

He went out along the nearest cable, hand over hand, feeling the vibration of the mesh against the metal of his mitten.

He burned their serial number in the smooth metal of the shell. There was nothing to oxidize the steel in the emptiness of space. It simply melted and vaporized, condensing some feet away from the energy beam, turning the surface it touched into a gray, powdery dullness.

Long swung back toward the ship.

Inside again, he took off his helmet, white and thick with frost that collected as soon as he had entered.

The first thing he heard was Swenson's voice coming over the radio in this almost unrecognizable rage: ". . . straight to the Commissioner. Damn it, there are rules to this game!"

Rioz sat back, unbothered. "Look, it hit my sector. I was late spotting it and I chased it into yours. You couldn't have gotten it with Mars for a backstop. That's all there is to it—You back, Long?"

He cut contact.

The signal button raged at him, but he paid no attention.

"He's going to the Commissioner?" Long asked.

"Not a chance. He just goes on like that because it breaks the monotony. He doesn't

mean anything by it. He knows it's our shell. And how do you like that hunk of stuff, Ted?"

"Pretty good."

"Pretty good? It's terrific! Hold on. I'm setting it swinging."

The side jets spat steam and the ship started a slow rotation about the shell. The shell followed it. In thirty minutes, they were a gigantic bolo spinning in emptiness. Long checked the *Ephemeris* for the position of Deimos.

At a precisely calculated moment, the cables released their magnetic field and the shell went streaking off tangentially in a trajectory that would, in a day or so, bring it within pronging distance of the shell stores on the Martian satellite.

Rioz watched it go. He felt good. He turned to Long. "This is one fine day for us."

"What about Hilder's speech?" asked Long.

"What? Who? Oh, that. Listen, if I had to worry about every thing some damned Grounder said, I'd never get any sleep. Forget it."

"I don't think we should forget it."

"You're nuts. Don't bother me about it, will you? Get some sleep instead."

4

Ted Long found the breadth and height of the city's main thoroughfare exhilarating. It had been two months since the Commissioner had declared a moratorium on scavenging and had pulled all ships out of space, but this feeling of a stretched-out vista had not stopped thrilling Long. Even the thought that the moratorium was called pending a decision on the part of Earth to enforce its new insistence on water economy, by deciding upon a ration limit for scavenging, did not cast him entirely down.

The roof of the avenue was painted a luminous light blue, perhaps as an old-fashioned imitation of Earth's sky. Ted wasn't sure. The walls were lit with the store windows that pierced it.

Off in the distance, over the hum of traffic and the sloughing noise of people's feet passing him, he could hear the intermittent blasting as new channels were being bored into Mars' crust. All his life he remembered such blastings. The ground he walked on had been part of solid, unbroken rock when he was born. The city was growing and would keep on growing—if Earth would only let it.

He turned off at a cross street, narrower, not quite as brilliantly lit, shop windows giving way to apartment houses, each with its row of lights along the front facade. Shoppers and traffic gave way to slower-paced individuals and to squawling youngsters who had as yet evaded the maternal summons to the evening meal.

At the last minute, Long remembered the social amenities and stopped off at a corner water store.

He passed over his canteen. "Fill 'er up."

The plump storekeeper unscrewed the cap, cocked an eye into the opening. He shook it a little and let it gurgle. "Not much left," he said cheerfully.

"No," agreed Long.

The storekeeper trickled water in, holding the neck of the canteen close to the hose tip to avoid spillage. The volume gauge whirred. He screwed the cap back on.

Long passed over the coins and took his canteen. It clanked against his hip now with a pleasing heaviness. It would never do to visit a family without a full canteen. Among the boys, it didn't matter. Not as much, anyway.

He entered the hallway of No. 27, climbed a short flight of stairs, and paused with his thumb on the signal.

The sound of voices could be heard quite plainly.

One was a woman's voice, somewhat shrill. "It's all right for you to have your Scavenger friends here, isn't it? I'm supposed to be thankful you manage to get home two months a year. Oh, it's quite enough that you spend a day or two with me. After that, it's the Scavengers again."

"I've been home for a long time now," said a male voice, "and this is business. For Mars' sake, let up, Dora. They'll be here soon."

Long decided to wait a moment before signaling. It might give them a chance to hit a more neutral topic.

"What do I care if they come?" retorted Dora. "Let them hear me. And I'd just as soon the Commissioner kept the moratorium on permanently. You hear me?"

"And what would we live on?" came the male voice hotly. "You tell me that."

"I'll tell you. You can make a decent, honorable living right here on Mars, just like everybody else. I'm the only one in this apartment house that's a Scavenger widow. That's what I am—a widow. I'm worse than a widow, because if I were a widow, I'd at least have a chance to marry someone else—What did you say?"

"Nothing. Nothing at all."

"Oh, I know what you said. Now listen here, Dick Swenson—"

"I only said," cried Swenson, "that now I know why Scavengers usually don't marry."

"You shouldn't have either. I'm tired of having every person in the neighborhood pity me and smirk and ask when you're coming home. Other people can be mining engineers and administrators and even tunnel borers. At least tunnel borers' wives have a decent home life and their children don't grow up like vagabonds. Peter might as well not have a father—"

A thin boy-soprano voice made its way through the door. It was somewhat more distant, as though it were in another room. "Hey, Mom, what's a vagabond?"

Dora's voice rose a notch. "Peter! You keep your mind on your homework."

Swenson said in a low voice, "It's not right to talk this way in front of the kid. What kind of notions will he get about me?"

"Stay home then and teach him better notions."

Peter's voice called out again. "Hey, Mom, I'm going to be a Scavenger when I grow up."

Footsteps sounded rapidly. There was a momentary hiatus in the sounds, then a piercing, "Mom! Hey, Mom! Leggo my ear! What did I do?" and a snuffling silence.

Long seized the chance. He worked the signal vigorously.

Swenson opened the door, brushing down his hair with both hands.

"Hello, Ted," he said in a subdued voice. Then loudly, "Ted's here, Dora. Where's Mario, Ted?"

Long said, "He'll be here in a while."

Dora came bustling out of the next room, a small, dark woman with a pinched nose, and hair, just beginning to show touches of gray, combed off the forehead.

"Hello, Ted. Have you eaten?"

"Quite well, thanks. I haven't interrupted you, have I?"

"Not at all. We finished ages ago. Would you like some coffee?"

"I think so." Ted unslung his canteen and offered it.

"Oh, goodness, that's all right. We've plenty of water."

"I insist."

"Well, then—"

Back into the kitchen she went. Through the swinging door, Long caught a glimpse of dishes sitting in Secoterg, the "waterless cleaner that soaks up and absorbs grease and dirt in a twinkling. One ounce of water will rinse eight square feet of dish surface clean as clean. Buy Secoterg. Secoterg just cleans it right, makes your dishes shiny bright, does away with water waste—"

The tune started whining through his mind and Long crushed it with speech. He said, "How's Pete?"

"Fine, fine. The kid's in the fourth grade now. You know I don't get to see him much. Well, sir, when I came back last time, he looked at me and said . . ."

It went on for a while and wasn't too bad as bright sayings of bright children as told by dull parents go.

The door signal burped and Mario Rioz came in, frowning and red.

Swenson stepped to him quickly. "Listen, don't say anything about shell-snaring. Dora still remembers the time you fingered a Class A shell out of my territory and she's in one of her moods now."

"Who the hell wants to talk about shells?" Rioz slung off a fur-lined jacket, threw it over the back of the chair, and sat down.

Dora came through the swinging door, viewed the newcomer with a synthetic smile, and said, "Hello, Mario. Coffee for you, too?"

"Yeah," he said, reaching automatically for his canteen.

"Just use some more of my water, Dora," said Long quickly. "He'll owe it to me."

"Yeah," said Rioz.

"What's wrong, Mario?" asked Long.

Rioz said heavily, "Go on. Say you told me so. A year ago when Hilder made that speech, you told me so. Say it."

Long shrugged.

Rioz said, "They've set up the quota. Fifteen minutes ago the news came out."

"Well?"

"Fifty thousand tons of water per trip."

"What?" yelled Swenson, burning. "You can't get off Mars with fifty thousand!"

"That's the figure. It's a deliberate piece of gutting. No more scavenging."

Dora came out with the coffee and set it down all around.

"What's all this about no more scavenging?" She sat down very firmly and Swenson looked helpless.

"It seems," said Long, "that they're rationing us at fifty thousand tons and that means we can't make any more trips."

"Well, what of it?" Dora sipped her coffee and smiled gaily. "If you want my opinion, it's a good thing. It's time all you Scavengers found yourselves a nice, steady job here on Mars. I mean it. It's no life to be running all over space—"

"Please, Dora," said Swenson.

Rioz came close to a snort.

Dora raised her eyebrows. "I'm just giving my opinions."

Long said, "Please feel free to do so. But I would like to say something. Fifty thousand is just a detail. We know that Earth—or at least Hilder's party—wants to make political capital out of a campaign for water economy, so we're in a bad hole. We've got to get water somehow or they'll shut us down altogether, right?"

"Well, sure," said Swenson.

"But the question is how, right?"

"If it's only getting water," said Rioz in a sudden gush of words, "there's only one thing to do and you know it. If the Grounders won't give us water, we'll take it. The water doesn't belong to them just because their fathers and grandfathers were too damned sick-yellow ever to leave their fat planet. Water belongs to people wherever they are. We're people and the water's ours, too. We have a right to it."

"How do you propose taking it?" asked Long.

"Easy! They've got oceans of water on Earth. They can't post a guard over every square mile. We can sink down on the night side of the planet any time we want, fill our shells, then get away. How can they stop us?"

"In half a dozen ways, Mario. How do you spot shells in space up to distances of a hundred thousand miles? One thin metal shell in all that space. How? By radar. Do you think there's no radar on Earth? Do you think that if Earth ever gets the notion we're engaged in waterlegging, it won't be simple for them to set up a radar network to spot ships coming in from space?"

Dora broke in indignantly. "I'll tell you one thing, Mario Rioz. My husband isn't going to be part of any raid to get water to keep up his scavenging with."

"It isn't just scavenging," said Mario. "Next they'll be cutting down on everything else. We've got to stop them now."

"But we don't need their water, anyway," said Dora. "We're not the Moon or Venus. We pipe enough water down from the polar caps for all we need. We have a water tap right in this apartment. There's one in every apartment on this block."

Long said, "Home use is the smallest part of it. The mines use water. And what do we do about the hydroponic tanks?"

"That's right," said Swenson. "What about the hydroponic tanks, Dora? They've got to have water and it's about time we arranged to grow our own fresh food instead of having to live on the condensed crud they ship us from Earth."

"Listen to him," said Dora scornfully. "What do you know about fresh food? You've never eaten any."

"I've eaten more than you think. Do you remember those carrots I picked up once?"

"Well, what was so wonderful about them? If you ask me, good baked protomeal is much better. And healthier, too. It just seems to be the fashion now to be talking fresh vegetables because they're increasing taxes for these hydroponics. Besides, all this will blow over."

Long said, "I don't think so. Not by itself, anyway. Hilder will probably be the next Co-ordinator, and then things may really get bad. If they cut down on food shipments, too—"

"Well, then," shouted Rioz, "what do we do? I still say take it! Take the water!"

"And I say we can't do that, Mario. Don't you see that what you're suggesting is the Earth way, the Grounder way? You're trying to hold on to the umbilical cord that ties Mars to Earth. Can't you get away from that? Can't you see the Martian way?"

"No, I can't. Suppose you tell me."

"I will, if you'll listen. When we think about the Solar System, what do we think about? Mercury, Venus, Earth, Moon, Mars, Phobos, and Deimos. There you are—

seven bodies, that's all. But that doesn't represent 1 per cent of the Solar System. We Martians are right at the edge of the other 99 per cent. Out there, farther from the Sun, there's unbelievable amounts of water!"

The others stared.

Swenson said uncertainly, "You mean the layers of ice on Jupiter and Saturn?"

"Not that specifically, but it *is* water, you'll admit. A thousand-mile-thick layer of water is a lot of water."

"But it's all covered up with layers of ammonia or—or something, isn't it?" asked Swenson. "Besides, we can't land on the major planets."

"I know that," said Long, "but I haven't said that was the answer. The major planets aren't the only objects out there. What about the asteroids and the satellites? Vesta is a two-hundred-mile-diameter asteroid that's hardly more than a chunk of ice. One of the moons of Saturn is mostly ice. How about that?"

Rioz said, "Haven't you ever been in space, Ted?"

"You know I have. Why do you ask?"

"Sure, I know you have, but you still talk like a Grounder. Have you thought of the distances involved? The average asteroid is a hundred twenty million miles from Mars at the closest. That's twice the Venus-Mars hop and you know that hardly any liners do even that in one jump. They usually stop off at Earth or the Moon. After all, how long do you expect anyone to stay in space, man?"

"I don't know. What's your limit?"

"You know the limit. You don't have to ask me. It's six months. That's handbook data. After six months, if you're still in space, you're psychotherapy meat. Right, Dick?"

Swenson nodded.

"And that's just the asteroids," Rioz went on. "From Mars to Jupiter is three hundred thirty million miles, and to Saturn it's seven hundred million. How can anyone handle that kind of distance? Suppose you hit standard velocity or, to make it even, say you get up to a good two hundred kilomiles an hour. It would take you—let's see, allowing time for acceleration and deceleration—about six or seven months to get to Jupiter and nearly a year to get to Saturn. Of course, you could hike the speed to a million miles an hour, theoretically, but where would you get the water to do that?"

"Gee," said a small voice attached to a smutty nose and round eyes. "Saturn!"

Dora whirled in her chair. "Peter, march right back into your room!"

"Aw, Ma."

"Don't 'Aw, Ma' me." She began to get out of the chair, and Peter scuttled away.

Swenson said, "Say, Dora, why don't you keep him company for a while? It's hard to keep his mind on homework if we're all out here talking."

Dora smiled obstinately and stayed put. "I'll sit right here until I find out what Ted Long is thinking of. I tell you right now I don't like the sound of it."

Swenson said nervously, "Well, never mind Jupiter and Saturn. I'm sure Ted isn't figuring on that. But what about Vesta? We could make it in ten or twelve weeks there and the same back. And two hundred miles in diameter. That's four million cubic miles of ice!"

"So what?" said Rioz. "What do we do on Vesta? Quarry the ice? Set up mining machinery? Say, do you know how long that would take?"

Long said, "I'm talking about Saturn, not Vesta."

Rioz addressed an unseen audience. "I tell him seven hundred million miles and he keeps on talking."

"All right," said Long, "suppose you tell me how you know we can only stay in space six months, Mario?"

"It's common knowledge, damn it."

"Because it's in the *Handbook of Space Flight*. It's data compiled by Earth scientists from experience with Earth pilots and spacemen. You're still thinking Grounder style. You won't think the Martian way."

"A Martian may be a Martian, but he's still a man."

"But how can you be so blind? How many times have you fellows been out for over six months without a break?"

Rioz said, "That's different."

"Because you're Martians? Because you're professional Scavengers?"

"No. Because we're not on a flight. We can put back for Mars any time we want to."

"But you *don't* want to. That's my point. Earthmen have tremendous ships with libraries of films, with a crew of fifteen plus passengers. Still, they can only stay out six months maximum. Martian Scavengers have a two-room ship with only one partner. But we can stick it out more than six months."

Dora said, "I suppose you want to stay in a ship for a year and go to Saturn."

"Why not, Dora?" said Long. "We can do it. Don't you see we can? Earthmen can't. They've got a real world. They've got open sky and fresh food, all the air and water they want. Getting into a ship is a terrible change for them. More than six months is too much for them for that very reason. Martians are different. We've been living on a ship our entire lives.

"That's all Mars is—a ship. It's just a big ship forty-five hundred miles across with one tiny room in it occupied by fifty thousand people. It's closed in like a ship. We breathe packaged air and drink packaged water, which we repurify over and over. We eat the same food rations we eat aboard ship. When we get into a ship, it's the same thing we've known all our lives. We can stand it for a lot more than a year if we have to."

Dora said, "Dick, too?"

"We all can."

"Well, Dick can't. It's all very well for you, Ted Long, and this shell stealer here, this Mario, to talk about jaunting off for a year. You're not married. Dick is. He has a wife and he has a child and that's enough for him. He can just get a regular job right here on Mars. Why, my goodness, suppose you go to Saturn and find there's no water there. How'll you get back? Even if you had water left, you'd be out of food. It's the most ridiculous thing I ever heard of."

"No. Now listen," said Long tightly. "I've thought this thing out. I've talked to Commissioner Sankov and he'll help. But we've got to have ships and men. I can't get them. The men won't listen to me. I'm green. You two are known and respected. You're veterans. If you back me, even if you don't go yourselves, if you'll just help me sell this thing to the rest, get volunteers—"

"First," said Rioz grumpily, "you'll have to do a lot more explaining. Once we get to Saturn, where's the water?"

"That's the beauty of it," said Long. "That's why it's got to be Saturn. The water there is just floating around in space for the taking."

5

When Hamish Sankov had come to Mars, there was no such thing as a native Martian. Now there were two-hundred-odd babies whose grandfathers had been born on Mars—native in the third generation.

When he had come as a boy in his teens, Mars had been scarcely more than a huddle of grounded spaceships connected by sealed underground tunnels. Through the years, he had seen buildings grow and burrow widely, thrusting blunt snouts up into the thin, unbreathable atmosphere. He had seen huge storage depots spring up into which spaceships and their loads could be swallowed whole. He had seen the mines grow from nothing to a huge gouge in the Martian crust, while the population of Mars grew from fifty to fifty thousand.

It made him feel old, these long memories—they and the even dimmer memories induced by the presence of this Earthman before him. His visitor brought up those long-forgotten scraps of thought about a soft-warm world that was as kind and gentle to mankind as the mother's womb.

The Earthman seemed fresh from that womb. Not very tall, not very lean; in fact, distinctly plump. Dark hair with a neat little wave in it, a neat little mustache, and neatly scrubbed skin. His clothing was right in style and as fresh and neatly turned as plastek could be.

Sankov's own clothes were of Martian manufacture, serviceable and clean, but many years behind the times. His face was craggy and lined, his hair was pure white, and his Adam's apple wobbled when he talked.

The Earthman was Myron Digby, member of Earth's General Assembly. Sankov was Martian Commissioner.

Sankov said, "This all hits us hard, Assemblyman."

"It's hit most of us hard, too, Commissioner."

"Uh-huh. Can't honestly say then that I can make it out. Of course, you understand, I don't make out that I can understand Earth ways, for all that I was born there. Mars is a hard place to live, Assemblyman, and you have to understand that. It takes a lot of shipping space just to bring us food, water, and raw materials so we can live. There's not much room left for books and news films. Even video programs can't reach Mars, except for about a month when Earth is in conjunction, and even then nobody has much time to listen.

"My office gets a weekly summary film from Planetary Press. Generally, I don't have time to pay attention to it. Maybe you'd call us provincial, and you'd be right. When something like this happens, all we can do is kind of helplessly look at each other."

Digby said slowly, "You can't mean that your people on Mars haven't heard of Hilder's anti-Waster campaign."

"No, can't exactly say that. There's a young Scavenger, son of a good friend of mine who died in space"—Sankov scratched the side of his neck doubtfully—"who makes a hobby out of reading up on Earth history and things like that. He catches video broadcasts when he's out in space and he listened to this man Hilder. Near as I can make out, that was the first talk Hilder made about Wasters.

"The young fellow came to me with that. Naturally, I didn't take him very serious. I kept an eye on the Planetary Press films for a while after that, but there wasn't much mention of Hilder and what there was made him out to look pretty funny."

"Yes, Commissioner," said Digby, "it all seemed quite a joke when it started."

Sankov stretched out a pair of long legs to one side of his desk and crossed them at the ankles. "Seems to me it's still pretty much of a joke. What's his argument? We're using up water. Has he tried looking at some figures? I got them all here. Had them brought to me when this committee arrived.

"Seems that Earth has four hundred million cubic miles of water in its oceans and each cubic mile weighs four and a half billion tons. That's a lot of water. Now we use some of that heap in space flight. Most of the thrust is inside Earth's gravitational field, and that means the water thrown out finds its way back to the oceans. Hilder doesn't figure that in. When he says a million tons of water is used up per flight, he's a liar. It's less than a hundred thousand tons.

"Suppose, now, we have fifty thousand flights a year. We don't, of course; not even fifteen hundred. But let's say there are fifty thousand. I figure there's going to be considerable expansion as time goes on. With fifty thousand flights, one cubic mile of water would be lost to space each year. That means that in a million years, Earth would lose *one quarter of 1 per cent* of its total water supply!"

Digby spread his hands, palms upward, and let them drop. "Commissioner, Interplanetary Alloys has used figures like that in their campaign against Hilder, but you can't fight a tremendous, emotion-filled drive with cold mathematics. This man Hilder has invented a name, 'Wasters.' Slowly he has built this name up into a gigantic conspiracy; a gang of brutal, profit-seeking wretches raping Earth for their own immediate benefit.

"He has accused the government of being riddled with them, the Assembly of being dominated by them, the press of being owned by them. None of this, unfortunately, seems ridiculous to the average man. He knows all too well what selfish men can do to Earth's resources. He knows what happened to Earth's oil during the Time of Troubles, for instance, and the way topsoil was ruined.

"When a farmer experiences a drought, he doesn't care that the amount of water lost in space flight isn't a droplet in a fog as far as Earth's over-all water supply is concerned. Hilder has given him something to blame and that's the strongest possible consolation for disaster. He isn't going to give that up for a diet of figures."

Sankov said, "That's where I get puzzled. Maybe it's because I don't know how things work on Earth, but it seems to me that there aren't just droughty farmers there. As near as I could make out from the news summaries, these Hilder people are a minority. Why is it Earth goes along with a few farmers and some crackpots that egg them on?"

"Because, Commissioner, there are such things as worried human beings. The steel industry sees that an era of space flight will stress increasingly the light, nonferrous alloys. The various miners' unions worry about extraterrestrial competition. Any Earthman who can't get aluminum to build a prefab is certain that it is because the aluminum is going to Mars. I know a professor of archaeology who's an anti-Waster because he can't get a government grant to cover his excavations. He's convinced that all government money is going into rocketry research and space medicine and he resents it."

Sankov said, "That doesn't sound like Earth people are much different from us here on Mars. But what about the General Assembly? Why do they have to go along with Hilder?"

Digby smiled sourly. "Politics isn't pleasant to explain. Hilder introduced this bill to set up a committee to investigate waste in space flight. Maybe three fourths or more of the General Assembly was against such an investigation as an intolerable and useless

extension of bureaucracy—which it is. But then how could any legislator be against a mere investigation of waste? It would sound as though he had something to fear or to conceal. It would sound as though he were himself profiting from waste. Hilder is not in the least afraid of making such accusations, and whether true or not, they would be a powerful factor with the voters in the next election. The bill passed.

"And then there came the question of appointing the members of the committee. Those who were against Hilder shied away from membership, which would have meant decisions that would be continually embarrassing. Remaining on the side lines would make that one that much less a target for Hilder. The result is that I am the only member of the committee who is outspokenly anti-Hilder and it may cost me re-election."

Sankov said, "I'd be sorry to hear that, Assemblyman. It looks as though Mars didn't have as many friends as we thought we had. We wouldn't like to lose one. But if Hilder wins out, what's he after, anyway?"

"I should think," said Digby, "that that is obvious. He wants to be the next Global Co-ordinator."

"Think he'll make it?"

"If nothing happens to stop him, he will."

"And then what? Will he drop this Waster campaign then?"

"I can't say. I don't know if he's laid his plans past the Co-ordinacy. Still, if you want my guess, he couldn't abandon the campaign and maintain his popularity. It's gotten out of hand."

Sankov scratched the side of his neck. "All right. In that case, I'll ask you for some advice. What can we folks on Mars do? You know Earth. You know the situation. We don't. Tell us what to do."

Digby rose and stepped to the window. He looked out upon the low domes of other buildings; red, rocky, completely desolate plain in between; a purple sky and a shrunken sun.

He said, without turning, "Do you people really like it on Mars?"

Sankov smiled. "Most of us don't exactly know any other world, Assemblyman. Seems to me Earth would be something queer and uncomfortable to them."

"But wouldn't Martians get used to it? Earth isn't hard to take after this. Wouldn't your people learn to enjoy the privilege of breathing air under an open sky? You once lived on Earth. You remember what it was like."

"I sort of remember. Still, it doesn't seem to be easy to explain. Earth is just there. It fits people and people fit it. People take Earth the way they find it. Mars is different. It's sort of raw and doesn't fit people. People got to make something out of it. They got to *build* a world, and not take what they find. Mars isn't much yet, but we're building, and when we're finished, we're going to have just what we like. It's sort of a great feeling to know you're building a world. Earth would be kind of unexciting after that."

The Assemblyman said, "Surely the ordinary Martian isn't such a philosopher that he's content to live this terribly hard life for the sake of a future that must be hundreds of generations away."

"No-o, not just like that." Sankov put his right ankle on his left knee and cradled it as he spoke. "Like I said, Martians are a lot like Earthmen, which means they're sort of human beings, and human beings don't go in for philosophy much. Just the same, there's something to living in a growing world, whether you think about it much or not.

"My father used to send me letters when I first came to Mars. He was an accountant and he just sort of stayed an accountant. Earth wasn't much different when he died from what it was when he was born. He didn't see anything happen. Every day was like

every other day, and living was just a way of passing time until he died.

"On Mars, it's different. Every day there's something new—the city's bigger, the ventilation system gets another kick, the water lines from the poles get slicked up. Right now, we're planning to set up a news-film association of our own. We're going to call it Mars Press. If you haven't lived when things are growing all about you, you'll never understand how wonderful it feels.

"No, Assemblyman, Mars is hard and tough and Earth is a lot more comfortable, but seems to me if you take our boys to Earth, they'll be unhappy. They probably wouldn't be able to figure out why, most of them, but they'd feel lost; lost and useless. Seems to me lots of them would never make the adjustment."

Digby turned away from the window and the smooth, pink skin of his forehead was creased into a frown. "In that case, Commissioner, I am sorry for you. For all of you."

"Why?"

"Because I don't think there's anything your people on Mars can do. Or the people on the Moon or Venus. It won't happen now; maybe it won't happen for a year or two, or even for five years. But pretty soon you'll all have to come back to Earth, unless—"

Sankov's white eyebrows bent low over his eyes. "Well?"

"Unless you can find another source of water besides the planet Earth."

Sankov shook his head. "Don't seem likely, does it?"

"Not very."

"And except for that, seems to you there's no chance?"

"Not at all."

Digby said that and left, and Sankov stared for a long time at nothing before he punched a combination of the local communiline.

After a while, Ted Long looked out at him.

Sankov said, "You were right, son. There's nothing they can do. Even the ones that mean well see no way out. How did you know?"

"Commissioner," said Long, "when you've read all you can about the Time of Troubles, particularly about the twentieth century, nothing political can come as a real surprise."

"Well, maybe. Anyway, son, Assemblyman Digby is sorry for us, quite a piece sorry, you might say, but that's all. He says we'll have to leave Mars—or else get water somewhere else. Only he thinks that we can't get water somewhere else."

"You know we can, don't you, Commissioner?"

"I know we *might*, son. It's a terrible risk."

"If I find enough volunteers, the risk is our business."

"How is it going?"

"Not bad. Some of the boys are on my side right now. I talked Mario Rioz into it, for instance, and you know he's one of the best."

"That's just it—the volunteers will be the best men we have. I hate to allow it."

"If we get back, it will be worth it."

"If! If's a big word, son."

"And a big thing we're trying to do."

"Well, I gave my word that if there was no help on Earth, I'll see that the Phobos water hole lets you have all the water you'll need. Good luck.

6

Half a million miles above Saturn, Mario Rioz was cradled on nothing and sleep was delicious. He came out of it slowly and for a while, alone in his suit, he counted the stars and traced lines from one to another.

At first, as the weeks flew past, it was scavenging all over again, except for the gnawing feeling that every minute meant an additional number of thousands of miles away from all humanity. That made it worse.

They had aimed high to pass out of the ecliptic while moving through the Asteroid Belt. That had used up water and had probably been unnecessary. Although tens of thousands of worldlets look as thick as vermin in two-dimensional projection upon a photographic plate, they are nevertheless scattered so thinly through the quadrillions of cubic miles that make up their conglomerate orbit that only the most ridiculous of coincidence would have brought about a collision.

Still, they passed over the Belt and someone calculated the chances of collision with a fragment of matter large enough to do damage. The value was so low, so impossibly low, that it was perhaps inevitable that the notion of the "space-float" should occur to someone.

The days were long and many, space was empty, only one man was needed at the controls at any one time. The thought was a natural.

First, it was a particularly daring one who ventured out for fifteen minutes or so. Then another who tried half an hour. Eventually, before the asteroids were entirely behind, each ship regularly had its off-watch member suspended in space at the end of a cable.

It was easy enough. The cable, one of those intended for operations at the conclusion of their journey, was magnetically attached at both ends, one to the space suit to start with. Then you clambered out the lock onto the ship's hull and attached the other end there. You paused awhile, clinging to the metal skin by the electromagnets in your boots. Then you neutralized those and made the slightest muscular effort.

Slowly, ever so slowly, you lifted from the ship and even more slowly the ship's larger mass moved an equivalently shorter distance downward. You floated incredibly, weightlessly, in solid, speckled black. When the ship had moved far enough away from you, your gauntleted hand, which kept touch upon the cable, tightened its grip slightly. Too tightly, and you would begin moving back toward the ship and it toward you. Just tightly enough, and friction would halt you. Because your motion was equivalent to that of the ship, it seemed as motionless below you as though it had been painted against an impossible background while the cable between you hung in coils that had no reason to straighten out.

It was a half-ship to your eye. One half was lit by the light of the feeble Sun, which was still too bright to look at directly without the heavy protection of the polarized space-suit visor. The other half was black on black, invisible.

Space closed in and it was like sleep. Your suit was warm, it renewed its air automatically, it had food and drink in special containers from which it could be sucked with a minimal motion of the head, it took care of wastes appropriately. Most of all, more than anything else, there was the delightful euphoria of weightlessness.

You never felt so well in your life. The days stopped being too long, they weren't long enough, and there weren't enough of them.

They had passed Jupiter's orbit at a spot some 30 degrees from its then position. For months, it was the brightest object in the sky, always excepting the glowing white pea that was the Sun. At its brightest, some of the Scavengers insisted they could make out Jupiter as a tiny sphere, one side squashed out of true by the night shadow.

Then over a period of additional months it faded, while another dot of light grew until it was brighter than Jupiter. It was Saturn, first as a dot of brilliance, then as an oval, glowing splotch.

("Why oval?" someone asked, and after a while, someone else said, "The rings, of course," and it was obvious.)

Everyone space-floated at all possible times toward the end, watching Saturn incessantly.

("Hey, you jerk, come on back in, damn it. You're on duty." "Who's on duty? I've got fifteen minutes more by my watch." "You set your watch back. Besides, I gave you twenty minutes yesterday." "You wouldn't give two minutes to your grandmother." "Come on in, damn it, or I'm coming out anyway." "All right, I'm coming. Holy howlers, what a racket over a lousy minute." But no quarrel could possibly be serious, not in space. It felt too good.)

Saturn grew until at last it rivaled and then surpassed the Sun. The rings, set at a broad angle to their trajectory of approach, swept grandly about the planet, only a small portion being eclipsed. Then, as they approached, the span of the rings grew still wider, yet narrower as the angle of approach constantly decreased.

The large moons showed up in the surrounding sky like serene fireflies.

Mario Rioz was glad he was awake so that he could watch again.

Saturn filled half the sky, streaked with orange, the night shadow cutting it fuzzily nearly one quarter of the way in from the right. Two round little dots in the brightness were shadows of two of the moons. To the left and behind them (he could look over his left shoulder to see, and as he did so, the rest of his body inched slightly to the right to conserve angular momentum) was the white diamond of the Sun.

Most of all he liked to watch the rings. At the left, they emerged from behind Saturn, a tight, bright triple band of orange light. At the right, their beginnings were hidden in the night shadow, but showed up closer and broader. They widened as they came, just like the flare of a horn, growing hazier as they approached, until, while the eye followed them, they seemed to fill the sky and lose themselves.

From the position of the Scavenger fleet just inside the outer rim of the outermost ring, the rings broke up and assumed their true identity as a phenomenal cluster of solid fragments rather than the tight, solid band of light they seemed.

Below him, or rather in the direction his feet pointed, some twenty miles away, was one of the ring fragments. It looked like a large, irregular splotch, marring the symmetry of space, three quarters in brightness and the night shadow cutting it like a knife. Other fragments were farther off, sparkling like star dust, dimmer and thicker, until, as you followed them down, they became rings once more.

The fragments were motionless, but that was only because the ships had taken up an orbit about Saturn equivalent to that of the outer edge of the rings.

The day before, Rioz reflected, he had been on that nearest fragment, working along with more than a score of others to mold it into the desired shape. Tomorrow he would be at it again.

Today—today he was space-floating.

"Mario?" The voice that broke upon his earphones was questioning.

Momentarily Rioz was flooded with annoyance. Damn it, he wasn't in the mood for company.

"Speaking," he said.

"I thought I had your ship spotted. How are you?"

"Fine. That you, Ted?"

"That's right," said Long.

"Anything wrong on the fragment?"

"Nothing. I'm out here floating."

"You?"

"It gets me, too, occasionally. Beautiful, isn't it?"

"Nice," agreed Rioz.

"You know, I've read Earth books—"

"Grounder books, you mean." Rioz yawned and found it difficult of resentment.

"—and sometimes I read descriptions of people lying on grass." continued Long. "You know that green stuff like thin, long pieces of paper they have all over the ground down there, and they look up at the blue sky with clouds in it. Did you ever see any films of that?"

"Sure. It didn't attract me. It looked cold."

"I suppose it isn't, though. After all, Earth is quite close to the Sun, and they say their atmosphere is thick enough to hold the heat. I must admit that personally I would hate to be caught under open sky with nothing on but clothes. Still, I imagine they like it."

"Grounders are nuts!"

"They talk about the trees, big brown stalks, and the winds, air movements, you know."

"You mean drafts. They can keep that, too."

"It doesn't matter. The point is they describe it beautifully, almost passionately. Many times I've wondered, 'What's it really like? Will I ever feel it or is this something only Earthmen can possibly feel?' I've felt so often that I was missing something vital. Now I know what it must be like. It's this. Complete peace in the middle of a beauty-drenched universe."

Rioz said, "They wouldn't like it. The Grounders, I mean. They're so used to their own lousy little world they wouldn't appreciate what it's like to float and look down on Saturn." He flipped his body slightly and began swaying back and forth about his center of mass, slowly, soothingly.

Long said, "Yes, I think so too. They're slaves to their planet. Even if they come to Mars, it will only be their children that are free. There'll be starships someday; great, huge things that can carry thousands of people and maintain their self-contained equilibrium for decades, maybe centuries. Mankind will spread through the whole Galaxy. But people will have to live their lives out on shipboard until new methods of interstellar travel are developed, so it will be Martians, not planet-bound Earthmen, who will colonize the Universe. That's inevitable. It's got to be. It's the Martian way."

But Rioz made no answer. He had dropped off to sleep again, rocking and swaying gently, half a million miles above Saturn.

7

The work shift of the ring fragment was the tail of the coin. The weightlessness, peace and privacy of the spacefloat gave place to something that had neither peace nor privacy. Even the weightlessness, which continued, became more a purgatory than a paradise under the new conditions.

Try to manipulate an ordinarily non-portable heat projector. It could be lifted despite the fact that it was six feet high and wide and almost solid metal, since it weighed only a fraction of an ounce. But its inertia was exactly what it had always been, which meant that if it wasn't moved into position very slowly, it would just keep on going, taking you with it. Then you would have to hike the pseudo-grav field of your suit and come down with a jar.

Keralski had hiked the field a little too high and he came down a little too roughly, with the projector coming down with him at a dangerous angle. His crushed ankle had been the first casualty of the expedition.

Rioz was swearing fluently and nearly continuously. He continued to have the impulse to drag the back of his hand across his forehead in order to wipe away the accumulating sweat. The few times that he had succumbed to the impulse, metal had met silicone with a clash that rang loudly inside his suit, but served no useful purpose. The desiccators within the suit were sucking at maximum and, of course, recovering the water and restoring ion-exchanged liquid, containing a careful proportion of salt, into the appropriate receptacle.

Rioz yelled, "Damn it, Dick, wait till I give the word, will you?"

And Swenson's voice rang in his ears, "Well, how long am I supposed to sit here?"

"Till I say," replied Rioz.

He strengthened pseudo-grav and lifted the projector a bit. He released pseudo-grav, insuring that the projector would stay in place for minutes even if he withdrew support altogether. He kicked the cable out of the way (it stretched beyond the close "horizon" to a power source that was out of sight) and touched the release.

The material of which the fragment was composed bubbled and vanished under its touch. A section of the lip of the tremendous cavity he had already carved into its substance melted away and a roughness in its contour had disappeared.

"Try it now," salled Rioz.

Swenson was in the ship that was hovering nearly over Rioz's head.

Swenson called, "All clear?"

"I told you to go ahead."

It was a feeble flicker of steam that issued from one of the ship's forward vents. The ship drifted down toward the ring fragment. Another flicker adjusted a tendency to drift sidewise. It came down straight.

A third flicker to the rear slowed it to a feather rate.

Rioz watched tensely. "Keep her coming. You'll make it. You'll make it."

The rear of the ship entered the hole, nearly filling it. The bellying walls came closer and closer to its rim. There was a grinding vibration as the ship's motion halted.

It was Swenson's turn to curse. "It doesn't fit," he said.

Rioz threw the projector groundward in a passion and went flailing up into space. The projector kicked up a white crystalline dust all about it, and when Rioz came down under pseudo-grav, he did the same.

He said, "You went in on the bias, you dumb Grounder."

"I hit it level, you dirt-eating farmer."

Backward-pointing side jets of the ship were blasting more strongly than before, and Rioz hopped to get out of the way.

The ship scraped up from the pit, then shot into space half a mile before forward jets could bring it to a halt.

Swenson said tensely, "We'll spring half a dozen plates if we do this once again. Get it right, will you?"

"I'll get it right. Don't worry about it. Just you come in right."

Rioz jumped upward and allowed himself to climb three hundred yards to get an over-all look at the cavity. The gouge marks of the ship were plain enough. They were concentrated at one point halfway down the pit. He would get that.

It began to melt outward under the blaze of the projector.

Half an hour later the ship snuggled neatly into its cavity, and Swenson, wearing his space suit, emerged to join Rioz.

Swenson said, "If you want to step in and climb out of the suit, I'll take care of the icing."

"It's all right," said Rioz. "I'd just as soon sit here and watch Saturn."

He sat down at the lip of the pit. There was a six-foot gap between it and the ship. In some places about the circle, it was two feet; in a few places, even merely a matter of inches. You couldn't expect a better fit out of handwork. The final adjustment would be made by steaming ice gently and letting it freeze into the cavity between the lip and the ship.

Saturn moved visibly across the sky, its vast bulk inching below the horizon.

Rioz said, "How many ships are left to put in place?"

Swenson said, "Last I heard, it was eleven. We're in now, so that leaves only ten. Seven of the ones that are placed are iced in. Two or three are dismantled."

"We're coming along fine."

"There's plenty to do yet. Don't forget the main jets at the other end. And the cables and the power lines. Sometimes I wonder if we'll make it. On the way out, it didn't bother me so much, but just now I was sitting at the controls and I was saying, 'We won't make it. We'll sit out here and starve and die with nothing but Saturn over us.' It makes me feel—"

He didn't explain how it made him feel. He just sat there.

Rioz said, "You think too damn much."

"It's different with you," said Swenson. "I keep thinking of Pete—and Dora."

"What for? She said you could go, didn't she? The Commissioner gave her that talk on patriotism and how you'd be a hero and set for life once you got back, and she said you could go. You didn't sneak out the way Adams did."

"Adams is different. That wife of his should have been shot when she was born. Some women can make hell for a guy, can't they? She didn't want him to go—but she'd probably rather he didn't come back if she can get his settlement pay."

"What's your kick, then? Dora wants you back, doesn't she?"

Swenson sighed. "I never treated her right."

"You turned over your pay, it seems to me. I wouldn't do that for any woman. Money for value received, not a cent more."

"Money isn't it. I get to thinking out here. A woman likes company. A kid needs his father. What am I doing 'way out here?"

"Getting set to go home."

"Ah-h, you don't understand."

8

Ted Long wandered over the ridged surface of the ring fragment with his spirits as icy as the ground he walked on. It had all seemed perfectly logical back on Mars, but that was Mars. He had worked it out carefully in his mind in perfectly reasonable steps. He could still remember exactly how it went.

It didn't take a ton of water to move a ton of ship. It was not mass equals mass, but mass times velocity equals mass times velocity. It didn't matter, in other words, whether you shot out a ton of water at a mile a second or a hundred pounds of water at twenty miles a second. You got the same final velocity out of the ship.

That meant the jet nozzles had to be made narrower and the steam hotter. But then drawbacks appeared. The narrower the nozzle, the more energy was lost in friction and turbulence. The hotter the steam, the more refractory the nozzle had to be and the shorter its life. The limit in that direction was quickly reached.

Then, since a given weight of water could move considerably more than its own weight under the narrow-nozzle conditions, it paid to be big. The bigger the water-storage space, the larger the size of the actual travel-head, even in proportion. So they started to make liners heavier and bigger. But then the larger the shell, the heavier the bracings, the more difficult the weldings, the more exacting the engineering requirements. At the moment, the limit in that direction had been reached also.

And then he had put his finger on what had seemed to him to be the basic flaw—the original unswervable conception that the fuel had to be placed *inside* the ship; the metal had to be built to encircle a million tons of water.

Why? Water did not have to be water. It could be ice, and ice could be shaped. Holes could be melted into it. Travel-heads and jets could be fitted into it. Cables could hold travel-heads and jets stiffly together under the influence of magnetic field-force grips.

Long felt the trembling of the ground he walked on. He was at the head of the fragment. A dozen ships were blasting in and out of sheaths carved in its substance, and the fragment shuddered under the continuing impact.

* * *

The ice didn't have to be quarried. It existed in proper chunks in the rings of Saturn. That's all the rings were—pieces of nearly pure ice, circling Saturn. So spectroscopy stated and so it had turned out to be. He was standing on one such piece now, over two miles long, nearly one mile thick. It was almost half a billion tons of water, all in one piece, and he was standing on it.

But now he was face to face with the realities of life. He had never told the men just how quickly he had expected to set up the fragment as a ship, but in his heart, he had imagined it would be two days. It was a week now and he didn't dare to estimate the remaining time. He no longer even had any confidence that the task was a possible one. Would they be able to control jets with enough delicacy through leads slung across two miles of ice to manipulate out of Saturn's dragging gravity?

Drinking water was low, though they could always distill more out of the ice. Still, the food stores were not in a good way either.

He paused, looking up into the sky, eyes straining. *Was* the object growing larger?

He ought to measure its distance. Actually, he lacked the spirit to add that trouble to the others. His mind slid back to greater immediacies.

Morale, at least, was high. The men seemed to enjoy being out Saturn-way. They were the first humans to penetrate this far, the first to pass the asteroids, the first to see Jupiter like a glowing pebble to the naked eye, the first to see Saturn—like that.

He didn't think fifty practical, case-hardened, shell-snatching Scavengers would take time to feel that sort of emotion. But they did. And they were proud.

Two men and a half-buried ship slid up the moving horizon as he walked.

He called crisply, "Hello, there!"

Rioz answered, "That you, Ted?"

"You bet. Is that Dick with you?"

"Sure. Come on, sit down. We were just getting ready to ice in and we were looking for an excuse to delay."

"I'm not," said Swenson promptly. "When will we be leaving, Ted?"

"As soon as we get through. That's no answer, is it?"

Swenson said dispiritedly, "I suppose there isn't any other answer."

Long looked up, staring at the irregular bright splotch in the sky.

Rioz followed his glance. "What's the matter?"

For a moment, Long did not reply. The sky was black otherwise and the ring fragments were an orange dust against it. Saturn was more than three fourths below the horizon and the rings were going with it. Half a mile away a ship bounded past the icy rim of the planetoid into the sky, was orange-lit by Saturn-light, and sank down again.

The ground trembled gently.

Rioz said, "Something bothering you about the Shadow?"

They called it that. It was the nearest fragment of the rings, quite close considering that they were at the outer rim of the rings, where the pieces spread themselves relatively thin. It was perhaps twenty miles off, a jagged mountain, its shape clearly visible.

"How does it look to you?" asked Long.

Rioz shrugged. "Okay, I guess. I don't see anything wrong."

"Doesn't it seem to be getting larger?"

"Why should it?"

"Well, doesn't it?" Long insisted.

Rioz and Swenson stared at it thoughtfully.

"It does look bigger," said Swenson.

"You're just putting the notion into our minds," Rioz argued. "If it were getting bigger, it would be coming closer."

"What's impossible about that?"

"These things are on stable orbits."

"They were when we came here," said Long. "There, did you feel that?"

The ground had trembled again.

Long said, "We've been blasting this thing for a week now. First, twenty-five ships landed on it, which changed its momentum right there. Not much, of course. Then we've been melting parts of it away and our ships have been blasting in and out of it—all at one end, too. In a week, we may have changed its orbit just a bit. The two fragments, this one and the Shadow, might be converging."

"It's got plenty of room to miss us in." Rioz watched it thoughtfully. "Besides, if we can't even tell for sure that it's getting bigger, how quickly can it be moving? Relative to us, I mean."

"It doesn't have to be moving quickly. Its momentum is as large as ours, so that, however gently it hits, we'll be nudged completely out of our orbit, maybe toward Saturn, where we don't want to go. As a matter of fact, ice has a very low tensile strength, so that both planetoids might break up into gravel."

Swenson rose to his feet. "Damn it, if I can tell how a shell is moving a thousand miles away, I can tell what a mountain is doing twenty miles away." He turned toward the ship.

Long didn't stop him.

Rioz said, "There's a nervous guy."

The neighboring planetoid rose to zenith, passed overhead, began sinking. Twenty minutes later, the horizon opposite that portion behind which Saturn had disappeared burst into orange flame as its bulk began lifting again.

Rioz called into his radio, "Hey, Dick, are you dead in there?"

"I'm checking," came the muffled response.

"Is it moving?" asked Long.

"Yes."

"Toward us?"

There was a pause. Swenson's voice was a sick one. "On the nose, Ted. Intersection of orbits will take place in three days."

"You're crazy!" yelled Rioz.

"I checked four times," said Swenson.

Long thought blankly, What do we do now?

9

Some of the men were having trouble with the cables. They had to be laid precisely; their geometry had to be very nearly perfect for the magnetic field to attain maximum strength. In space, or even in air, it wouldn't have mattered. The cables would have lined up automatically once the juice went on.

Here it was different. A gouge had to be plowed along the planetoid's surface and into it the cable had to be laid. If it were not lined up within a few minutes of arc of the calculated direction, a torque would be applied to the entire planetoid, with consequent loss of energy, none of which could be spared. The gouges then had to be redriven, the cables shifted and iced into the new positions.

The men plodded wearily through the routine.

And then the word reached them:

"All hands to the jets!"

Scavengers could not be said to be the type that took kindly to discipline. It was a grumbling, growling, muttering group that set about disassembling the jets of the ships that yet remained intact, carrying them to the tail end of the planetoid, grubbing them into position, and stringing the leads along the surface.

It was almost twenty-four hours before one of them looked into the sky and said, "Holy jeepers!" followed by something less printable.

His neighbor looked and said, "I'll be damned!"

Once they noticed, all did. It became the most astonishing fact in the Universe.

"Look at the Shadow!"

It was spreading across the sky like an infected wound. Men looked at it, found it had doubled its size, wondered why they hadn't noticed that sooner.

Work came to a virtual halt. They besieged Ted Long.

He said, "We can't leave. We don't have the fuel to see us back to Mars and we don't have the equipment to capture another planetoid. So we've got to stay. Now the Shadow is creeping in on us because our blasting has thrown us out of orbit. We've got to change that by continuing the blasting. Since we can't blast the front end any more without endangering the ship we're building, let's try another way."

They went back to work on the jets with a furious energy that received impetus every half hour when the Shadow rose again over the horizon, bigger and more menacing than before.

Long had no assurance that it would work. Even if the jets would respond to the distant controls, even if the supply of water, which depended upon a storage chamber opening directly into the icy body of the planetoid, with built-in heat projectors steaming the propulsive fluid directly into the driving cells, were adequate, there was still no certainty that the body of the planetoid without a magnetic cable sheathing would hold together under the enormously disruptive stresses.

"Ready!" came the signal in Long's receiver.

Long called, "Ready!" and depressed the contact.

The vibration grew about him. The star field in the visiplate trembled.

In the rearview, there was a distant gleaming spume of swiftly moving ice crystals.

"It's blowing!" was the cry.

It kept on blowing. Long dared not stop. For six hours, it blew, hissing, bubbling, steaming into space; the body of the planetoid converted to vapor and hurled away.

The Shadow came closer until men did nothing but stare at the mountain in the sky, surpassing Saturn itself in spectacularity. Its every groove and valley was a plain scar upon its face. But when it passed through the planetoid's orbit, it crossed more than half a mile behind its then position.

The steam jet ceased.

Long bent in his seat and covered his eyes. He hadn't eaten in two days. He could eat now, though. Not another planetoid was close enough to interrupt them, even if it began an approach that very moment.

Back on the planetoid's surface, Swenson said, "All the time I watched that damned rock coming down, I kept saying to myself, 'This can't happen. We can't let it happen.'"

"Hell," said Rioz, "we were all nervous. Did you see Jim Davis? He was green. I was a little jumpy myself."

"That's not it. It wasn't just—dying, you know. I was thinking—I know it's funny, but I can't help it—I was thinking that Dora warned me I'd get myself killed, she'll never let me hear the last of it. Isn't that a crummy sort of attitude at a time like that?"

"Listen," said Rioz, "you wanted to get married, so you got married. Why come to me with your troubles?"

10

The flotilla, welded into a single unit, was returning over its mighty course from Saturn to Mars. Each day it flashed over a length of space it had taken nine days outward.

Ted Long had put the entire crew on emergency. With twenty-five ships embedded in the planetoid taken out of Saturn's wings and unable to move or maneuver independently, the co-ordination of their power sources into unified blasts was a ticklish problem. The jarring that took place on the first day of travel nearly shook them out from under their hair.

That, at least, smoothed itself out as the velocity raced upward under the steady thrust from behind. They passed the one-hundred-thousand-mile-an-hour mark late on the second day, and climbed steadily toward the million-mile mark and beyond.

Long's ship, which formed the needle point of the frozen fleet, was the only one which possessed a five-way view of space. It was an uncomfortable position under the circumstances. Long found himself watching tensely, imagining somehow that the stars would slowly begin to slip backward, to whizz past them, under the influence of the multi-ship's tremendous rate of travel.

They didn't, of course. They remained nailed to the black backdrop, their distance scorning with patient immobility any speed mere man could achieve.

The men complained bitterly after the first few days. It was not only that they were deprived of the space-float. They were burdened by much more than the ordinary pseudo-gravity field of the ships, by the effects of the fierce acceleration under which they were living. Long himself was weary to death of the relentless pressure against hydraulic cushions.

They took to shutting off the jet thrusts one hour out of every four and Long fretted.

It had been just over a year that he had last seen Mars shrinking in an observation window from this ship, which had then been an independent entity. What had happened since then? Was the colony still there?

In something like a growing panic, Long sent out radio pulses toward Mars daily, with the combined power of twenty-five ships behind it. There was no answer. He expected none. Mars and Saturn were on opposite sides of the Sun now, and until he mounted high enough above the ecliptic to get the Sun well beyond the line connecting himself and Mars, solar interference would prevent any signal from getting through.

High above the outer rim of the Asteroid Belt, they reached maximum velocity. With short spurts of power from first one side jet, then another, the huge vessel reversed itself. The composite jet in the rear began its mighty roaring once again, but now the result was deceleration.

They passed a hundred million miles over the Sun, curving down to intersect the orbit of Mars.

A week out of Mars, answering signals were heard for the first time, fragmentary, ether-torn, and incomprehensible, but they were coming from Mars. Earth and Venus were at angles sufficiently different to leave no doubt of that.

Long relaxed. There were still humans on Mars, at any rate.

Two days out of Mars, the signal was strong and clear and Sankov was at the other end.

Sankov said, "Hello, son. It's three in the morning here. Seems like people have no consideration for an old man. Dragged me right out of bed."

"I'm sorry, sir."

"Don't be. They were following orders. I'm afraid to ask, son. Anyone hurt? Maybe dead?"

"No deaths, sir. Not one."

"And—and the water? Any left?"

Long said, with an effort at nonchalance, "Enough."

"In that case, get home as fast as you can. Don't take any chances, of course."

"There's trouble, then."

"Fair to middling. When will you come down?"

"Two days. Can you hold out that long?"

"I'll hold out."

Forty hours later Mars had grown to a ruddy-orange ball that filled the ports and they were in the final planet-landing spiral.

"Slowly," Long said to himself, "slowly." Under these conditions, even the thin atmosphere of Mars could do dreadful damage if they moved through it too quickly.

Since they came in from well above the ecliptic, their spiral passed from north to south. A polar cap shot whitely below them, then the much smaller one of the summer hemisphere, the larger one again, the small one, at longer and longer intervals. The planet approached closer, the landscape began to show features.

"Prepare for landing!" called Long.

11

Sankov did his best to look placid, which was difficult considering how closely the boys had shaved their return. But it had worked out well enough.

Until a few days ago, he had no sure knowledge that they had survived. It seemed more likely—inevitable, almost—that they were nothing but frozen corpses somewhere in the trackless stretches from Mars to Saturn, new planetoids that had once been alive.

The Committee had been dickering with him for weeks before the news had come. They had insisted on his signature to the paper for the sake of appearances. It would look like an agreement, voluntarily and mutually arrived at. But Sankov knew well that, given complete obstinacy on his part, they would act unilaterally and be damned with appearances. It seemed fairly certain that Hilder's election was secure now and they would take the chance of arousing a reaction of sympathy for Mars.

So he dragged out the negotiations, dangling before them always the possibility of surrender.

And then he heard from Long and concluded the deal quickly.

The papers had lain before him and he had made a last statement for the benefit of the reporters who were present.

He said, "Total imports of water from Earth are twenty million tons a year. This is declining as we develop our own piping system. If I sign this paper agreeing to an embargo, our industry will be paralyzed, any possibilities of expansion will halt. It looks to me as if that can't be what's in Earth's mind, can it?"

Their eyes met his and held only a hard glitter. Assemblyman Digby had already been replaced and they were unanimous against him.

The Committee Chairman impatiently pointed out, "You have said all this before."

"I know, but right now I'm kind of getting ready to sign and I want it clear in my head. Is Earth set and determined to bring us to an end here?"

"Of course not. Earth is interested in conserving its irreplaceable water supply, nothing else."

"You have one and a half quintillion tons of water on Earth."

The Committee Chairman said, "We cannot spare water." And Sankov had signed.

That had been the final note he wanted. Earth had one and a half quintillion tons of water and could spare none of it.

Now, a day and a half later, the Committee and the reporters waited in the spaceport dome. Through thick, curving windows, they could see the bare and empty grounds of Mars Spaceport.

The Committee Chairman asked with annoyance, "How much longer do we have to wait? And, if you don't mind, what are we waiting for?"

Sankov said, "Some of our boys have been out in space, out past the asteroids."

The Committee Chairman removed a pair of spectacles and cleaned them with a snowy-white handkerchief. "And they're returning?"

"They are."

The Chairman shrugged, lifted his eyebrows in the direction of the reporters.

In the smaller room adjoining, a knot of women and children clustered about another window. Sankov stepped back a bit to cast a glance toward them. He would much rather have been with them, been part of their excitement and tension. He, like them, had waited over a year now. He, like them, had thought, over and over again, that the men must be dead.

"You see that?" said Sankov, pointing.

"Hey!" cried a reporter. "It's a ship!"

A confused shouting came from the adjoining room.

It wasn't a ship so much as a bright dot obscured by a drifting white cloud. The cloud grew larger and began to have form. It was a double streak against the sky, the lower ends billowing out and upward again. As it dropped still closer, the bright dot at the upper end took on a crudely cylindrical form.

It was rough and craggy, but where the sunlight hit, brilliant high lights bounced back.

The cylinder dropped toward the ground with the ponderous slowness characteristic of space vessels. It hung suspended on those blasting jets and settled down upon the recoil of tons of matter hurling downward like a tired man dropping into his easy chair.

And as it did so, a silence fell upon all within the dome. The woman and children in one room, the politicians and reporters in the other remained frozen, heads craned incredulously upward.

The cylinder's landing flanges, extending far below the two rear jets, touched ground and sank into the pebbly morass. And then the ship was motionless and the jet action ceased.

But the silence continued in the dome. It continued for a long time.

Men came clambering down the sides of the immense vessel, inching down, down the two-mile trek to the ground, with spikes on their shoes and ice axes in their hands. They were gnats against the blinding surface.

One of the reporters croaked, "What is it?"

"That," said Sankov calmly, "happens to be a chunk of matter that spent its time scooting around Saturn as part of its rings. Our boys fitted it out with travel-head and jets and ferried it home. It just turns out the fragments in Saturn's rings are made up out of ice."

He spoke into a continuing deathlike silence. "That thing that looks like a spaceship is just a mountain of hard water. If it were standing like that on Earth, it would be melting into a puddle and maybe it would break under its own weight. Mars is colder and has less gravity, so there's no such danger.

"Of course, once we get this thing really organized, we can have water stations on the moons of Saturn and Jupiter and on the asteroids. We can scale in chunks of Saturn's rings and pick them up and send them on at the various stations. Our Scavengers are good at that sort of thing.

"We'll have all the water we need. That one chunk you see is just under a cubic mile—or about what Earth would send us in two hundred years. The boys used quite a bit of it coming back from Saturn. They made it in five weeks, they tell me, and used up about a hundred million tons. But, Lord, that didn't make any dent at all in that mountain. Are you getting all this, boys?"

He turned to the reporters. There was no doubt they were getting it.

He said, "Then get this, too. Earth is worried about its water supply. It only has one and a half quintillion tons. It can't spare us a single ton of it. Write down that we folks on Mars are worried about Earth and don't want anything to happen to Earth people. Write down that we'll sell water to Earth. Write down that we'll let them have million-ton lots for a reasonable fee. Write down that in ten years, we figure we can sell it in cubic-mile lots. Write down that Earth can quit worrying because Mars can sell it all the water it needs and wants."

The Committee Chairman was past hearing. He was feeling the future rushing in. Dimly he could see the reporters grinning as they wrote furiously.

Grinning.

He could hear the grin become laughter on Earth as Mars turned the tables so neatly on the anti-Wasters. He could hear the laughter thunder from every continent when word of the fiasco spread. And he could see the abyss, deep and black as space, into which would drop forever the political hopes of John Hilder and of every opponent of space flight left on Earth—his own included, of course.

In the adjoining room, Dora Swenson screamed with joy, and Peter, grown two inches, jumped up and down, calling, "Daddy! Daddy!"

Richard Swenson had just stepped off the extremity of the flange and, face showing clearly through the clear silicone of the headpiece, marched toward the dome.

"Did you ever see a guy look so happy?" asked Ted Long. "Maybe there's something in this marriage business."

"Ah, you've just been out in space too long," Rioz said.

Sally

Sally was coming down the lake road, so I waved to her and called her by name. I always liked to see Sally. I liked all of them, you understand, but Sally's the prettiest one of the lot. There just isn't any question about it.

She moved a little faster when I waved to her. Nothing undignified. She was never that. She moved just enough faster to show that she was glad to see me, too.

I turned to the man standing beside me. "That's Sally," I said.

He smiled at me and nodded.

Mrs. Hester had brought him in. She said, "This is Mr. Gellhorn, Jake. You remember he sent you the letter asking for an appointment."

That was just talk, really. I have a million things to do around the Farm, and one thing I just can't waste my time on is mail. That's why I have Mrs. Hester around. She lives pretty close by, she's good at attending to foolishness without running to me about it, and most of all, she likes Sally and the rest. Some people don't.

"Glad to see you, Mr. Gellhorn," I said.

"Raymond J. Gellhorn," he said, and gave me his hand, which I shook and gave back.

He was a largish fellow, half a head taller than I and wider, too. He was about half my age, thirtyish. He had black hair, plastered down slick, with a part in the middle, and a thin mustache, very neatly trimmed. His jawbones got big under his ears and made him look as if he had a slight case of mumps. On video he'd be a natural to play the villain, so I assumed he was a nice fellow. It goes to show that video can't be wrong all the time.

"I'm Jacob Folkers," I said. "What can I do for you?"

He grinned. It was a big, wide, white-toothed grin. "You can tell me a little about your Farm here, if you don't mind."

I heard Sally coming up behind me and I put out my hand. She slid right into it and the feel of the hard, glossy enamel of her fender was warm in my palm.

"A nice automatobile," said Gellhorn.

That's one way of putting it. Sally was a 2045 convertible with a Hennis-Carleton

positronic motor and an Armat chassis. She had the cleanest, finest lines I've ever seen on any model, bar none. For five years, she'd been my favorite, and I'd put everything into her I could dream up. In all that time, there'd never been a human being behind her wheel.

Not once.

"Sally," I said, patting her gently, "meet Mr. Gellhorn."

Sally's cylinder-purr keyed up a little. I listened carefully for any knocking. Lately, I'd been hearing motor-knock in almost all the cars and changing the gasoline hadn't done a bit of good. Sally was as smooth as her paint job this time, however.

"Do you have names for all your cars?" asked Gellhorn.

He sounded amused, and Mrs. Hester doesn't like people to sound as though they were making fun of the Farm. She said, sharply, "Certainly. The cars have real personalities, don't they, Jake? The sedans are all males and the convertibles are females."

Gellhorn was smiling again. "And do you keep them in separate garages, ma'am?"

Mrs. Hester glared at him.

Gellhorn said to me, "And now I wonder if I can talk to you alone, Mr. Folkers?"

"That depends," I said. "Are you a reporter?"

"No, sir. I'm a sales agent. Any talk we have is not for publication. I assure you I am interested in strict privacy."

"Let's walk down the road a bit. There's a bench we can use."

We started down. Mrs. Hester walked away. Sally nudged along after us.

I said, "You don't mind if Sally comes along, do you?"

"Not at all. She can't repeat what we say, can she?" He laughed at his own joke, reached over and rubbed Sally's grille.

Sally raced her motor and Gellhorn's hand drew away quickly.

"She's not used to strangers," I explained.

We sat down on the bench under the big oak tree where we could look across the small lake to the private speedway. It was the warm part of the day and the cars were out in force, at least thirty of them. Even at this distance I could see that Jeremiah was pulling his usual stunt of sneaking up behind some staid older model, then putting on a jerk of speed and yowling past with deliberately squealing brakes. Two weeks before he had crowded old Angus off the asphalt altogether, and I had turned off his motor for two days.

It didn't help though, I'm afraid, and it looks as though there's nothing to be done about it. Jeremiah is a sports model to begin with and that kind is awfully hot-headed.

"Well, Mr. Gellhorn," I said. "Could you tell me why you want the information?"

But he was just looking around. He said, "This *is* an amazing place, Mr. Folkers."

"I wish you'd call me Jake. Everyone does."

"All right, Jake. How many cars do you have here?"

"Fifty-one. We get one or two new ones every year. One year we got five. We haven't lost one yet. They're all in perfect running order. We even have a '15 model Mat-O-Mot in working order. One of the original automatics. It was the first car here."

Good old Matthew. He stayed in the garage most of the day now, but then he was the granddaddy of all positronic-motored cars. Those were the days when blind war veterans, paraplegics and heads of state were the only ones who drove automatics. But Samson Harridge was my boss and he was rich enough to be able to get one. I was his chauffeur at the time.

The thought makes me feel old. I can remember when there wasn't an automobile in the world with brains enough to find its own way home. I chauffeured dead lumps of

machines that needed a man's hand at their controls every minute. Every year machines like that used to kill tens of thousands of people.

The automatics fixed that. A positronic brain can react much faster than a human one, of course, and it paid people to keep hands off the controls. You got in, punched your destination and let it go its own way.

We take it for granted now, but I remember when the first laws came out forcing the old machines off the highways and limiting travel to automatics. Lord, what a fuss. They called it everything from communism to fascism, but it emptied the highways and stopped the killing, and still more people get around more easily the new way.

Of course, the automatics were ten to a hundred times as expensive as the hand-driven ones, and there weren't many that could afford a private vehicle. The industry specialized in turning out omnibus-automatics. You could always call a company and have one stop at your door in a matter of minutes and take you where you wanted to go. Usually, you had to drive with others who were going your way, but what's wrong with that?

Samson Harridge had a private car though, and I went to him the minute it arrived. The car wasn't Matthew to me then. I didn't know it was going to be the dean of the Farm some day. I only knew it was taking my job away and I hated it.

I said, "You won't be needing me any more, Mr. Harridge?"

He said, "What are you dithering about, Jake? You don't think I'll trust myself to a contraption like that, do you? You stay right at the controls."

I said, "But it works by itself, Mr. Harridge. It scans the road, reacts properly to obstacles, humans, and other cars, and remembers routes to travel."

"So they say. So they say. Just the same, you're sitting right behind the wheel in case anything goes wrong."

Funny how you can get to like a car. In no time I was calling it Matthew and was spending all my time keeping it polished and humming. A positronic brain stays in condition best when it's got control of its chassis at all times, which means it's worth keeping the gas tank filled so that the motor can turn over slowly day and night. After a while, it got so I could tell by the sound of the motor how Matthew felt.

In his own way, Harridge grew fond of Matthew, too. He had no one else to like. He'd divorced or outlived three wives and outlived five children and three grandchildren. So when he died, maybe it wasn't surprising that he had his estate converted into a Farm for Retired Automobiles, with me in charge and Matthew the first member of a distinguished line.

It's turned out to be my life. I never got married. You can't get married and still tend to automatics the way you should.

The newspapers thought it was funny, but after a while they stopped joking about it. Some things you can't joke about. Maybe you've never been able to afford an automatic and maybe you never will, either, but take it from me, you get to love them. They're hard-working and affectionate. It takes a man with no heart to mistreat one or to see one mistreated.

It got so that after a man had an automatic for a while, he would make provisions for having it left to the Farm, if he didn't have an heir he could rely on to give it good care.

I explained that to Gellhorn.

He said, "Fifty-one cars! That represents a lot of money."

"Fifty thousand minimum per automatic, original investment," I said. "They're worth a lot more now. I've done things for them."

"It must take a lot of money to keep up the Farm."

"You're right there. The Farm's a non-profit organization, which gives us a break on taxes and, of course, new automatics that come in usually have trust funds attached. Still, costs are always going up. I have to keep the place landscaped; I keep laying down new asphalt and keeping the old in repair; there's gasoline, oil, repairs, and new gadgets. It adds up."

"And you've spent a long time at it."

"I sure have, Mr. Gellhorn. Thirty-three years."

"You don't seem to be getting much out of it yourself."

"I don't? You surprise me, Mr. Gellhorn. I've got Sally and fifty others. Look at her."

I was grinning. I couldn't help it. Sally was so clean, it almost hurt. Some insect must have died on her windshield or one speck of dust too many had landed, so she was going to work. A little tube protruded and spurted Tergosol over the glass. It spread quickly over the silicone surface film and squeejees snapped into place instantly, passing over the windshield and forcing the water into the little channel that led it, dripping, down to the ground. Not a speck of water got onto her glistening apple-green hood. Squeejee and detergent tube snapped back into place and disappeared.

Gellhorn said, "I never saw an automatic do that."

"I guess not," I said. "I fixed that up specially on our cars. They're clean. They're always scrubbing their glass. They like it. I've even got Sally fixed up with wax jets. She polishes herself every night till you can see your face in any part of her and shave by it. If I can scrape up the money, I'd be putting it on the rest of the girls. Convertibles are very vain."

"I can tell you how to scrape up the money, if that interests you."

"That always does. How?"

"Isn't that obvious, Jake? Any of your cars is worth fifty thousand minimum, you said. I'll bet most of them top six figures."

"So?"

"Ever think of selling a few?"

I shook my head. "You don't realize it, I guess, Mr. Gellhorn, but I can't sell any of these. They belong to the Farm, not to me."

"The money would go to the Farm."

"The incorporation papers of the Farm provide that the cars receive perpetual care. They can't be sold."

"What about the motors, then?"

"I don't understand you."

Gellhorn shifted position and his voice got confidential. "Look here, Jake, let me explain the situation. There's a big market for private automatics if they could only be made cheaply enough. Right?"

"That's no secret."

"And ninety-five per cent of the cost is the motor. Right? Now, I know where we can get a supply of bodies. I also know where we can sell automatics at a good price—twenty or thirty thousand for the cheaper models, maybe fifty or sixty for the better ones. All I need are the motors. You see the solution?"

"I don't, Mr. Gellhorn." I did, but I wanted him to spell it out.

"It's right here. You've got fifty-one of them. You're an expert automatobile mechanic, Jake. You must be. You could unhook a motor and place it in another car so that no one would know the difference."

"It wouldn't be exactly ethical."

"You wouldn't be harming the cars. You'd be doing them a favor. Use your older cars. Use that old Mat-O-Mot."

"Well, now, wait a while, Mr. Gellhorn. The motors and bodies aren't two separate items. They're a single unit. Those motors are used to their own bodies. They wouldn't be happy in another car."

"All right, that's a point. That's a very good point, Jake. It would be like taking your mind and putting it in someone else's skull. Right? You don't think you would like that?"

"I don't think I would. No."

"But what if I took your mind and put it into the body of a young athlete. What about that, Jake? You're not a youngster anymore. If you had the chance, wouldn't you enjoy being twenty again? That's what I'm offering some of your positronic motors. They'll be put into new '57 bodies. The latest construction."

I laughed. "That doesn't make much sense, Mr. Gellhorn. Some of our cars may be old, but they're well-cared for. Nobody drives them. They're allowed their own way. They're *retired,* Mr. Gellhorn. I wouldn't want a twenty-year-old body if it meant I had to dig ditches for the rest of my new life and never have enough to eat . . . What do you think, Sally?"

Sally's two doors opened and then shut with a cushioned slam.

"What's that?" said Gellhorn.

"That's the way Sally laughs."

Gellhorn forced a smile. I guess he thought I was making a bad joke. He said, "Talk sense, Jake. Cars are *made* to be driven. They're probably not happy if you don't drive them."

I said, "Sally hasn't been driven in five years. She looks happy to me."

"I wonder."

He got up and walked toward Sally slowly. "Hi, Sally, how'd you like a drive?"

Sally's motor revved up. She backed away.

"Don't push her, Mr. Gellhorn," I said. "She's liable to be a little skittish."

Two sedans were about a hundred yards up the road. They had stopped. Maybe, in their own way, they were watching. I didn't bother about them. I had my eyes on Sally, and I kept them there.

Gellhorn said, "Steady now, Sally." He lunged out and seized the door handle. It didn't budge, of course.

He said, "It opened a minute ago."

I said, "Automatic lock. She's got a sense of privacy, Sally has."

He let go, then said, slowly and deliberately, "A car with a sense of privacy shouldn't go around with its top down."

He stepped back three or four paces, then quickly, so quickly I couldn't take a step to stop him, he ran forward and vaulted into the car. He caught Sally completely by surprise, because as he came down, he shut off the ignition before she could lock it in place.

For the first time in five years, Sally's motor was dead.

I think I yelled, but Gellhorn had the switch on "Manual" and locked that in place, too. He kicked the motor into action. Sally was alive again but she had no freedom of action.

He started up the road. The sedans were still there. They turned and drifted away, not very quickly. I suppose it was all a puzzle to them.

One was Giuseppe, from the Milan factories, and the other was Stephen. They

were always together. They were both new at the Farm, but they'd been here long enough to know that our cars just didn't have drivers.

Gellhorn went straight on, and when the sedans finally got it through their heads that Sally wasn't going to slow down, that she *couldn't* slow down, it was too late for anything but desperate measures.

They broke for it, one to each side, and Sally raced between them like a streak. Steve crashed through the lakeside fence and rolled to a halt on the grass and mud not six inches from the water's edge. Giuseppe bumped along the land side of the road to a shaken halt.

I had Steve back on the highway and was trying to find out what harm, if any, the fence had done him, when Gellhorn came back.

Gellhorn opened Sally's door and stepped out. Leaning back, he shut off the ignition a second time.

"There," he said. "I think I did her a lot of good."

I held my temper. "Why did you dash through the sedans? There was no reason for that."

"I kept expecting them to turn out."

"They did. One went through a fence."

"I'm sorry, Jake," he said. "I thought they'd move more quickly. You know how it is. I've been in lots of buses, but I've only been in a private automatic two or three times in my life, and this is the first time I ever drove one. That just shows you, Jake. It got me, driving one, and I'm pretty hard-boiled. I tell you, we don't have to go more than twenty percent below list price to reach a good market, and it would be ninety per cent profit."

"Which we would split?"

"Fifty-fifty. And I take all the risks, remember."

"All right. I listened to you. Now you listen to me." I raised my voice because I was just too mad to be polite anymore. "When you turn off Sally's motor, you hurt her. How would you like to be kicked unconscious? That's what you do to Sally, when you turn her off."

"You're exaggerating, Jake. The automatobuses get turned off every night."

"Sure, that's why I want none of my boys or girls in your fancy '57 bodies, where I won't know what treatment they'll get. Buses need major repairs in their positronic circuits every couple of years. Old Matthew hasn't had his circuits touched in twenty years. What can you offer him compared with that?"

"Well, you're excited now. Suppose you think over my proposition when you've cooled down and get in touch with me."

"I've thought it over all I want to. If I ever see you again, I'll call the police."

His mouth got hard and ugly. He said, "Just a minute, old-timer."

I said, "Just a minute, you. This is private property and I'm ordering you off."

He shrugged. "Well, then, goodbye."

I said, "Mrs. Hester will see you off the property. Make that goodbye permanent."

* * *

But it wasn't permanent. I saw him again two days later. Two and a half days, rather, because it was about noon when I saw him first and a little after midnight when I saw him again.

I sat up in bed when he turned the light on, blinking blindly till I made out what

was happening. Once I could see, it didn't take much explaining. In fact, it took none at all. He had a gun in his right fist, the nasty little needle barrel just visible between two fingers. I knew that all he had to do was to increase the pressure of his hand and I would be torn apart.

He said, "Put on your clothes, Jake."

I didn't move. I just watched him.

He said, "Look, Jake, I know the situation. I visited you two days ago, remember. You have no guards on this place, no electrified fences, no warning signals. Nothing."

I said, "I don't need any. Meanwhile there's nothing to stop you from leaving, Mr. Gellhorn. I would if I were you. This place can be very dangerous."

He laughed a little. "It is, for anyone on the wrong side of a fist gun."

"I see it," I said. "I know you've got one."

"Then get a move on. My men are waiting."

"No, sir, Mr. Gellhorn. Not unless you tell me what you want, and probably not then."

"I made you a proposition day before yesterday."

"The answer's still no."

"There's more to the proposition now. I've come here with some men and an automatobus. You have your chance to come with me and disconnect twenty-five of the positronic motors. I don't care which twenty-five you choose. We'll load them on the bus and take them away. Once they're disposed of, I'll see to it that you get your fair share of the money."

"I have your word on that, I suppose."

He didn't act as if he thought I was being sarcastic. He said, "You have."

I said, "No."

"If you insist on saying no, we'll go about it in our own way. I'll disconnect the motors myself, only I'll disconnect all fifty-one. Every one of them."

"It isn't easy to disconnect positronic motors, Mr. Gellhorn. Are you a robotics expert? Even if you are, you know, these motors have been modified by me."

"I know that, Jake. And to be truthful, I'm not an expert. I may ruin quite a few motors trying to get them out. That's why I'll have to work over all fifty-one if you don't cooperate. You see, I may only end up with twenty-five when I'm through. The first few I'll tackle will probably suffer the most. Till I get the hang of it, you see. And if I go it myself, I think I'll put Sally first in line."

I said, "I can't believe you're serious, Mr. Gellhorn."

He said, "I'm serious, Jake." He let it all dribble in. "If you want to help, you can keep Sally. Otherwise, she's liable to be hurt very badly. Sorry."

I said, "I'll come with you, but I'll give you one more warning. You'll be in trouble, Mr. Gellhorn."

He thought that was very funny. He was laughing very quietly as we went down the stairs together.

* * *

There was an automatobus waiting outside the driveway to the garage apartments. The shadows of three men waited beside it, and their flash beams went on as we approached.

Gellhorn said in a low voice, "I've got the old fellow. Come on. Move the truck up the drive and let's get started."

One of the others leaned in and punched the proper instructions on the control panel. We moved up the driveway with the bus following submissively.

"It won't go inside the garage," I said. "The door won't take it. We don't have buses here. Only private cars."

"All right," said Gellhorn. "Pull it over onto the grass and keep it out of sight."

I could hear the thrumming of the cars when we were still ten yards from the garage.

Usually they quieted down if I entered the garage. This time they didn't. I think they knew that strangers were about, and once the faces of Gellhorn and the others were visible they got noisier. Each motor was a warm rumble, and each motor was knocking irregularly until the place rattled.

The lights went up automatically as we stepped inside. Gellhorn didn't seem bothered by the car noise, but the three men with him looked surprised and uncomfortable. They had the look of the hired thug about them, a look that was not compounded of physical features so much as of a certain wariness of eye and hang-dogness of face. I knew the type and I wasn't worried.

One of them said, "Damn it, they're burning gas."

"My cars always do," I replied stiffly.

"Not tonight," said Gellhorn. "Turn them off."

"It's not that easy, Mr. Gellhorn," I said.

"Get started!" he said.

I stood there. He had his fist gun pointed at me steadily. I said, "I told you, Mr. Gellhorn, that my cars have been well-treated while they've been at the Farm. They're used to being treated that way, and they resent anything else."

"You have one minute," he said. "Lecture me some other time."

"I'm trying to explain something. I'm trying to explain that my cars can understand what I say to them. A positronic motor will learn to do that with time and patience. My cars have learned. Sally understood your proposition two days ago. You'll remember she laughed when I asked her opinion. She also knows what you did to her and so do the two sedans you scattered. And the rest know what to do about trespassers in general."

"Look, you crazy old fool—"

"All I have to say is—" I raised my voice. "Get them!"

One of the men turned pasty and yelled, but his voice was drowned completely in the sound of fifty-one horns turned loose at once. They held their notes, and within the four walls of the garage the echoes rose to a wild, metallic call. Two cars rolled forward, not hurriedly, but with no possible mistake as to their target. Two cars fell in line behind the first two. All the cars were stirring in their separate stalls.

The thugs stared, then backed.

I shouted, "Don't get up against a wall."

Apparently, they had that instinctive thought themselves. They rushed madly for the door of the garage.

At the door one of Gellhorn's men turned, brought up a fist gun of his own. The needle pellet tore a thin, blue flash toward the first car. The car was Giuseppe.

A thin line of paint peeled up Giuseppe's hood, and the right half of his windshield crazed and splintered but did not break through.

The men were out the door, running, and two by two the cars crunched out after them into the night, their horns calling the charge.

I kept my hand on Gellhorn's elbow, but I don't think he could have moved in any case. His lips were trembling.

I said, "That's why I don't need electrified fences or guards. My property protects itself."

Gellhorn's eyes swiveled back and forth in fascination as, pair by pair, they whizzed by. He said, "They're killers!"

"Don't be silly. They won't kill your men."

"They're killers!"

"They'll just give your men a lesson. My cars have been specially trained for cross-country pursuit for just such an occasion; I think what your men will get will be worse than an outright quick kill. Have you ever been chased by an automatobile?"

Gellhorn didn't answer.

I went on. I didn't want him to miss a thing. "They'll be shadows going no faster than your men, chasing them here, blocking them there, blaring at them, dashing at them, missing with a screech of brake and a thunder of motor. They'll keep it up till your men drop, out of breath and half-dead, waiting for the wheels to crunch over their breaking bones. The cars won't do that. They'll turn away. You can bet, though, that your men will never return here in their lives. Not for all the money you or ten like you could give them. Listen—"

I tightened my hold on his elbow. He strained to hear.

I said, "Don't you hear car doors slamming?"

It was faint and distant, but unmistakable.

I said, "They're laughing. They're enjoying themselves."

His face crumpled with rage. He lifted his hand. He was still holding his fist gun.

I said, "I wouldn't. One automatocar is still with us."

I don't think he had noticed Sally till then. She had moved up so quietly. Though her right front fender nearly touched me, I couldn't hear her motor. She might have been holding her breath.

Gellhorn yelled.

I said, "She won't touch you, as long as I'm with you. But if you kill me . . . You know, Sally doesn't like you."

Gellhorn turned the gun in Sally's direction.

"Her motor is shielded," I said, "and before you could ever squeeze the gun a second time she would be on top of you."

"All right, then," he yelled, and suddenly my arm was bent behind my back and twisted so I could hardly stand. He held me between Sally and himself, and his pressure didn't let up. "Back out with me and don't try to break loose, old-timer, or I'll tear your arm out of its socket."

I had to move. Sally nudged along with us, worried, uncertain what to do. I tried to say something to her and couldn't. I could only clench my teeth and moan.

Gellhorn's automatobus was still standing outside the garage. I was forced in. Gellhorn jumped in after me, locking the doors.

He said, "All right, now. We'll talk sense."

I was rubbing my arm, trying to get life back into it, and even as I did I was automatically and without any conscious effort studying the control board of the bus.

I said, "This is a rebuilt job."

"So?" he said caustically. "It's a sample of my work. I picked up a discarded chassis, found a brain I could use and spliced me a private bus. What of it?"

I tore at the repair panel, forcing it aside.

He said, "What the hell. Get away from that." The side of his palm came down numbingly on my left shoulder.

I struggled with him. "I don't want to do this bus any harm. What kind of a person do you think I am? I just want to take a look at some of the motor connections."

It didn't take much of a look. I was boiling when I turned to him. I said, "You're a hound and a bastard. You had no right installing this motor yourself. Why didn't you get a robotics man?"

He said, "Do I look crazy?"

"Even if it was a stolen motor, you had no right to treat it so. I wouldn't treat a man the way you treated that motor. Solder, tape, and pinch clamps! It's brutal!"

"It works, doesn't it?"

"Sure it works, but it must be hell for the bus. You could live with migraine headaches and acute arthritis, but it wouldn't be much of a life. This car is *suffering*."

"Shut up!" For a moment he glanced out the window at Sally, who had rolled up as close to the bus as she could. He made sure the doors and windows were locked.

He said, "We're getting out of here now, before the other cars come back. We'll stay away."

"How will that help you?"

"Your cars will run out of gas someday, won't they? You haven't got them fixed up so they can tank up on their own, have you? We'll come back and finish the job."

"They'll be looking for me," I said. "Mrs. Hester will call the police."

He was past reasoning with. He just punched the bus in gear. It lurched forward. Sally followed.

He giggled. "What can she do if you're here with me?"

Sally seemed to realize that, too. She picked up speed, passed us and was gone. Gellhorn opened the window next to him and spat through the opening.

The bus lumbered on over the dark road, its motor rattling unevenly. Gellhorn dimmed the periphery light until the phosphorescent green stripe down the middle of the highway, sparkling in the moonlight, was all that kept us out of the trees. There was virtually no traffic. Two cars passed ours, going the other way, and there was none at all on our side of the highway, either before or behind.

I heard the door-slamming first. Quick and sharp in the silence, first on the right and then on the left. Gellhorn's hands quivered as he punched savagely for increased speed. A beam of light shot out from among a scrub of trees, blinding us. Another beam plunged at us from behind the guard rails on the other side. At a crossover, four hundred yards ahead, there was a sque-e-e-e-e as a car darted across our path.

"Sally went for the rest," I said. "I think you're surrounded."

"So what? What can they do?"

He hunched over the controls, peering through the windshield.

"And don't *you* try anything, old-timer," he muttered.

I couldn't. I was bone-weary; my left arm was on fire. The motor sounds gathered and grew closer. I could hear the motors missing in odd patterns; suddenly it seemed to me that my cars were speaking to one another.

A medley of horns came from behind. I turned and Gellhorn looked quickly into the rear-view mirror. A dozen cars were following in both lanes.

Gellhorn yelled and laughed madly.

I cried, "Stop! Stop the car!"

Because not a quarter of a mile ahead, plainly visible in the light beams of two sedans on the roadside was Sally, her trim body plunked square across the road. Two cars shot into the opposite lane to our left, keeping perfect time with us and preventing Gellhorn from turning out.

But he had no intention of turning out. He put his finger on the full-speed-ahead button and kept it there.

He said, "There'll be no bluffing here. This bus outweighs her five to one, old-timer, and we'll just push her off the road like a dead kitten."

I knew he could. The bus was on manual and his finger was on the button. I knew he would.

I lowered the window, and stuck my head out. "Sally," I screamed. "Get out of the way. *Sally!*"

It was drowned out in the agonized squeal of maltreated brakebands. I felt myself thrown forward and heard Gellhorn's breath puff out of his body.

I said, "What happened?" It was a foolish question. We had stopped. That was what had happened. Sally and the bus were five feet apart. With five times her weight tearing down on her, she had not budged. The guts of her.

Gellhorn yanked at the Manual toggle switch. "It's got to," he kept muttering. "It's got to."

I said, "Not the way you hooked up the motor, expert. Any of the circuits could cross over."

He looked at me with a tearing anger and growled deep in his throat. His hair was matted over his forehead. He lifted his fist.

"That's all the advice out of you there'll ever be, old-timer."

And I knew the needle gun was about to fire.

I pressed back against the bus door, watching the fist come up, and when the door opened I went over backward and out, hitting the ground with a thud. I heard the door slam closed again.

I got to my knees and looked up in time to see Gellhorn struggle uselessly with the closing window, then aim his fist-gun quickly through the glass. He never fired. The bus got under way with a tremendous roar, and Gellhorn lurched backward.

Sally wasn't in the way any longer, and I watched the bus's rear lights flicker away down the highway.

I was exhausted. I sat down right there, right on the highway, and put my head down in my crossed arms, trying to catch my breath.

I heard a car stop gently at my side. When I looked up, it was Sally. Slowly—lovingly, you might say—her front door opened.

No one had driven Sally for five years—except Gellhorn, of course—and I know how valuable such freedom was to a car. I appreciated the gesture, but I said, "Thanks, Sally, but I'll take one of the newer cars."

I got up and turned away, but skillfully and neatly as a pirouette, she wheeled before me again. I couldn't hurt her feelings. I got in. Her front seat had the fine, fresh scent of an automatobile that kept itself spotlessly clean. I lay down across it, thankfully, and with even, silent, and rapid efficiency, my boys and girls brought me home.

* * *

Mrs. Hester brought me the copy of the radio transcript the next evening with great excitement.

"It's Mr. Gellhorn," she said. "The man who came to see you."

"What about him?"

I dreaded her answer.

"They found him dead," she said. "Imagine that. Just lying dead in a ditch."

"It might be a stranger altogether," I mumbled.

"Raymond J. Gellhorn," she said, sharply. "There can't be two, can there? The description fits, too. Lord, what a way to die? They found tire marks on his arms and body. Imagine! I'm glad it turned out to be a bus; otherwise they might have come poking around here."

"Did it happen near here?" I asked, anxiously.

"No . . . Near Cooksville. But, goodness, read about it yourself if you—What happened to Giuseppe?"

I welcomed the diversion. Giuseppe was waiting patiently for me to complete the repaint job. His windshield had been replaced.

After she left, I snatched up the transcript. There was no doubt about it. The doctor reported he had been running and was in a state of totally spent exhaustion. I wondered for how many miles the bus had played with him before the final lunge. The transcript had no notion of anything like that, of course.

They had located the bus and identified it by the tire tracks. The police had it and were trying to trace its ownership.

There was an editorial in the transcript about it. It had been the first traffic fatality in the state for that year and the paper warned strenuously against manual driving after night.

There was no mention of Gellhorn's three thugs and for that, at least, I was grateful. None of our cars had been seduced by the pleasure of the chase into killing.

That was all. I let the paper drop. Gellhorn had been a criminal. His treatment of the bus had been brutal. There was no question in my mind he deserved death. But still I felt a bit queasy over the manner of it.

A month has passed now and I can't get it out of my mind.

My cars talk to one another. I have no doubt about it anymore. It's as though they've gained confidence; as though they're not bothering to keep it secret anymore. Their engines rattle and knock continuously.

And they don't talk among themselves only. They talk to the cars and buses that come into the Farm on business. How long have they been doing that?

They must be understood, too. Gellhorn's bus understood them, for all it hadn't been on the grounds more than an hour. I can close my eyes and bring back that dash along the highway, with our cars flanking the bus on either side, clacking their motors at it till it understood, stopped, let me out, and ran off with Gellhorn.

Did my cars tell him to kill Gellhorn? Or was that his idea?

Can cars have such ideas? The motor designers say no. But they mean under ordinary conditions. Have they foreseen *everything?*

Cars get ill-used, you know.

Some of them enter the Farm and observe. They get told things. They find out that cars exist whose motors are never stopped, whom no one ever drives, whose every need is supplied.

Then maybe they go out and tell others. Maybe the word is spreading quickly. Maybe they're going to think that the Farm way should be the way all over the world. They don't understand. You couldn't expect them to understand about legacies and the whims of rich men.

There are millions of automatobiles on Earth, tens of millions. If the thought gets rooted in them that they're slaves; that they should do something about it . . . If they begin to think the way Gellhorn's bus did . . .

Maybe it won't be till after my time. And then they'll have to keep a few of us to take care of them, won't they? They wouldn't kill us all.

And maybe they would. Maybe they wouldn't understand about how someone would have to care for them. Maybe they won't wait.

Every morning I wake up and think, Maybe today . . .

I don't get as much pleasure out of my cars as I used to. Lately, I notice that I'm even beginning to avoid Sally.

The Fun They Had

Margie even wrote about it that night in her diary. On the page headed May 17, 2157, she wrote, "Today Tommy found a real book!"

It was a very old book. Margie's grandfather once said that when he was a little boy *his* grandfather told him that there was a time when all stories were printed on paper.

They turned the pages, which were yellow and crinkly, and it was awfully funny to read words that stood still instead of moving the way they were supposed to—on a screen, you know. And then, when they turned back to the page before, it had the same words on it that it had had when they read it the first time.

"Gee," said Tommy, "what a waste. When you're through with the book, you just throw it away, I guess. Our television screen must have had a million books on it and it's good for plenty more. I wouldn't throw *it* away."

"Same with mine," said Margie. She was eleven and hadn't seen as many telebooks as Tommy had. He was thirteen.

She said, "Where did you find it?"

"In my house." He pointed without looking, because he was busy reading. "In the attic."

"What's it about?"

"School."

Margie was scornful. "School? What's there to write about school? I hate school."

Margie always hated school, but now she hated it more than ever. The mechanical teacher had been giving her test after test in geography and she had been doing worse and worse until her mother had shaken her head sorrowfully and sent for the County Inspector.

He was a round little man with a red face and a whole box of tools with dials and wires. He smiled at Margie and gave her an apple, then took the teacher apart. Margie had hoped he wouldn't know how to put it together again, but he knew how all right, and, after an hour or so, there it was again, large and black and ugly, with a big screen on which all the lessons were shown and the questions were asked. That wasn't so bad. The part Margie hated most was the slot where she had to put homework and test

papers. She always had to write them out in a punch code they made her learn when she was six years old, and the mechanical teacher calculated the mark in no time.

The Inspector had smiled after he was finished and patted Margie's head. He said to her mother, "It's not the little girl's fault, Mrs. Jones. I think the geography sector was geared a little too quick. Those things happen sometimes. I've slowed it up to an average ten-year level. Actually, the over-all pattern of her progress is quite satisfactory." And he patted Margie's head again.

Margie was disappointed. She had been hoping they would take the teacher away altogether. They had once taken Tommy's teacher away for nearly a month because the history sector had blanked out completely.

So she said to Tommy, "Why would anyone write about school?"

Tommy looked at her with very superior eyes. "Because it's not our kind of school, stupid. This is the old kind of school that they had hundreds and hundreds of years ago." He added loftily, pronouncing the word carefully, "*Centuries* ago."

Margie was hurt. "Well, I don't know what kind of school they had all that time ago." She read the book over his shoulder for a while, then said, "Anyway, they had a teacher."

"Sure they had a teacher, but it wasn't a *regular* teacher. It was a man."

"A man? How could a man be a teacher?"

"Well, he just told the boys and girls things and gave them homework and asked them questions."

"A man isn't smart enough."

"Sure he is. My father knows as much as my teacher."

"He can't. A man can't know as much as a teacher."

"He knows almost as much, I betcha."

Margie wasn't prepared to dispute that. She said, "I wouldn't want a strange man in my house to teach me."

Tommy screamed with laughter. "You don't know much, Margie. The teachers didn't live in the house. They had a special building and all the kids went there."

"And all the kids learned the same thing?"

"Sure, if they were the same age."

"But my mother says a teacher has to be adjusted to fit the mind of each boy and girl it teaches and that each kid has to be taught differently."

"Just the same they didn't do it that way then. If you don't like it, you don't have to read the book."

"I didn't say I didn't like it," Margie said quickly. She wanted to read about those funny schools.

* * *

They weren't even half-finished when Margie's mother called, "Margie! School!"

Margie looked up. "Not yet, Mamma."

"Now!" said Mrs. Jones. "And it's probably time for Tommy, too."

Margie said to Tommy, "Can I read the book some more with you after school?"

"Maybe," he said nonchalantly. He walked away whistling, the dusty old book tucked beneath his arm.

Margie went into the schoolroom. It was right next to her bedroom, and the mechanical teacher was on and waiting for her. It was always on at the same time every

day except Saturday and Sunday, because her mother said little girls learned better if they learned at regular hours.

The screen was lit up, and it said: "Today's arithmetic lesson is on the addition of proper fractions. Please insert yesterday's homework in the proper slot."

Margie did so with a sigh. She was thinking about the old schools they had when her grandfather's grandfather was a little boy. All the kids from the whole neighborhood came, laughing and shouting in the schoolyard, sitting together in the schoolroom, going home together at the end of the day. They learned the same things, so they could help one another on the homework and talk about it.

And the teachers were people . . .

The mechanical teacher was flashing on the screen: "When we add the fractions ½ and ¼—"

Margie was thinking about how the kids must have loved it in the old days. She was thinking about the fun they had.

Franchise

Linda, age ten, was the only one of the family who seemed to enjoy being awake.

Norman Muller could hear her now through his own drugged, unhealthy coma. (He had finally managed to fall asleep an hour earlier but even then it was more like exhaustion than sleep.)

She was at his bedside now, shaking him. "Daddy, Daddy, wake up. Wake up!"

He suppressed a groan. "All right, Linda."

"But, Daddy, there's more policemen around than any time. Police cars and everything!"

Norman Muller gave up and rose blearily to his elbows. The day was beginning. It was faintly stirring toward dawn outside, the germ of a miserable gray that looked about as miserably gray as he felt. He could hear Sarah, his wife, shuffling about breakfast duties in the kitchen. His father-in-law, Matthew, was hawking strenuously in the bathroom. No doubt Agent Handley was ready and waiting for him.

This was *the* day.

Election Day!

* * *

To begin with, it had been like every other year. Maybe a little worse, because it was a presidential year, but no worse than other presidential years if it came to that.

The politicians spoke about the guh-reat electorate and the vast electuh-ronic intelligence that was its servant. The press analyzed the situation with industrial computers (the New York *Times* and the St. Louis *Post-Dispatch* had their own computers) and were full of little hints as to what would be forthcoming. Commentators and columnists pinpointed the crucial state and county in happy contradiction to one another.

The first hint that it would *not* be like every other year was when Sarah Muller said to her husband on the evening of October 4 (with Election Day exactly a month off), "Cantwell Johnson says that Indiana will be the state this year. He's the fourth one. Just think, *our* state this time."

Matthew Hortenweiler took his fleshy face from behind the paper, stared dourly at his daughter and growled, "Those fellows are paid to tell lies. Don't listen to them."

"Four of them, Father," said Sarah mildly. "They all say Indiana."

"Indiana *is* a key state, Matthew," said Norman, just as mildly, "on account of the Hawkins-Smith Act and this mess in Indianapolis. It—"

Matthew twisted his old face alarmingly and rasped out, "No one says Bloomington or Monroe County, do they?"

"Well—" said Norman.

Linda, whose little pointed-chinned face had been shifting from one speaker to the next, said pipingly, "You going to be voting this year, Daddy?"

Norman smiled gently and said, "I don't think so, dear."

But this was in the gradually growing excitement of an October in a presidential election year and Sarah had led a quiet life with dreams for her companions. She said longingly, "Wouldn't *that* be wonderful, though?"

"If I voted?" Norman Muller had a small blond mustache that had given him a debonair quality in the young Sarah's eyes, but which, with gradual graying, had declined merely to lack of distinction. His forehead bore deepening lines born of uncertainty and, in general, he had never seduced his clerkly soul with the thought that he was either born great or would under any circumstances achieve greatness. He had a wife, a job and a little girl, and except under extraordinary conditions of elation or depression was inclined to consider that to be an adequate bargain struck with life.

So he was a little embarrassed and more than a little uneasy at the direction his wife's thoughts were taking. "Actually, my dear," he said, "there are two hundred million people in the country, and, with odds like that, I don't think we ought to waste our time wondering about it."

His wife said, "Why, Norman, it's no such thing like two hundred million and you know it. In the first place, only people between twenty and sixty are eligible and it's always men, so that puts it down to maybe fifty million to one. Then, if it's really Indiana—"

"Then it's about one and a quarter million to one. You wouldn't want me to bet in a horse race against those odds, now, would you? Let's have supper."

Matthew muttered from behind his newspaper, "Damned foolishness."

Linda asked again, "You going to be voting this year, Daddy?"

Norman shook his head and they all adjourned to the dining room.

* * *

By October 20, Sarah's excitement was rising rapidly. Over the coffee, she announced that Mrs. Schultz, having a cousin who was the secretary of an Assemblyman, said that all the "smart money" was on Indiana.

"She says President Villers is even going to make a speech at Indianapolis."

Norman Muller, who had had a hard day at the store, nudged the statement with a raising of eyebrows and let it go at that.

Matthew Hortenweiler, who was chronically dissatisfied with Washington, said, "If Villers makes a speech in Indiana, that means he thinks Multivac will pick Arizona. He wouldn't have the guts to go closer, the mushhead."

Sarah, who ignored her father whenever she could decently do so, said, "I don't know why they don't announce the state as soon as they can, and then the county and

so on. Then the people who were eliminated could relax."

"If they did anything like that," pointed out Norman, "the politicians would follow the announcements like vultures. By the time it was narrowed down to a township, you'd have a Congressman or two at every street corner."

Matthew narrowed his eyes and brushed angrily at his sparse, gray hair. "They're vultures, anyhow. Listen—"

Sarah murmured, "Now, Father—"

Matthew's voice rumbled over her protest without as much as a stumble or hitch. "Listen, I was around when they set up Multivac. It would end partisan politics, they said. No more voters' money wasted on campaigns. No more grinning nobodies high-pressured and advertising-campaigned into Congress or the White House. So what happens. More campaigning then ever, only now they do it blind. They'll send guys to Indiana on account of the Hawkins-Smith Act and other guys to California in case it's the Joe Hammer situation that turns out crucial. I say, wipe out all that nonsense. Back to the good old—"

Linda asked suddenly, "Don't you want Daddy to vote this year, Grandpa?"

Matthew glared at the young girl. "Never you mind, now." He turned back to Norman and Sarah. "There was a time I voted. Marched right up to the polling booth, stuck my fist on the levers and voted. There was nothing to it. I just said: This fellow's my man and I'm voting for him. *That's* the way it should be."

Linda said excitedly, "You voted, Grandpa? You really did?"

Sarah leaned forward quickly to quiet what might easily become an incongruous story drifting about the neighborhood. "It's nothing, Linda. Grandpa doesn't really mean voted. Everyone did that kind of voting, your grandpa, too, but it wasn't *really* voting."

Matthew roared, "It wasn't when I was a little boy. I was twenty-two and I voted for Langley and it was real voting. My vote didn't count for much, maybe, but it was as good as anyone else's. *Anyone* else's. And no Multivac to—"

Norman interposed, "All right, Linda, time for bed. And stop asking questions about voting. When you grow up, you'll understand all about it."

He kissed her with antiseptic gentleness and she moved reluctantly out of range under maternal prodding and a promise that she might watch the bedside video till 9:15, *if* she was prompt about the bathing ritual.

Linda said, "Grandpa," and stood with her chin down and her hands behind her back until his newspaper lowered itself to the point where shaggy eyebrows and eyes, nested in fine wrinkles, showed themselves. It was Friday, October 31.

He said, "Yes?"

Linda came closer and put both her forearms on one of the old man's knees so that he had to discard his newspaper altogether.

She said, "Grandpa, did you really once vote?"

He said, "You heard me say I did, didn't you? Do you think I tell fibs?"

"N—no, but Mamma says everybody voted then."

"So they did."

"But how could they? How could *everybody* vote?"

Matthew stared at her solemnly, then lifted her and put her on his knee.

He even moderated the tonal qualities of his voice. He said, "You see, Linda, till about forty years ago, everybody always voted. Say we wanted to decide who was to be the new President of the United States. The Democrats and Republicans would both nominate someone, and everybody would say who they wanted. When Election Day

was over, they would count how many people wanted the Democrat and how many wanted the Republican. Whoever had more votes was elected. You see?"

Linda nodded and said, "How did all the people know who to vote for? Did Multivac tell them?"

Matthew's eyebrows hunched down and he looked severe. "They just used their own judgment, girl."

She edged away from him, and he lowered his voice again, "I'm not angry at you, Linda. But, you see, sometimes it took all night to count what everyone said and people were impatient. So they invented special machines which could look at the first few votes and compare them with the votes from the same places in previous years. That way the machine could compute how the total vote would be and who would be elected. You see?"

She nodded. "Like Multivac."

"The first computers were much smaller than Multivac. But the machines grew bigger and they could tell how the election would go from fewer and fewer votes. Then, at last, they built Multivac and it can tell from just one voter."

Linda smiled at having reached a familiar part of the story and said, "That's nice."

Matthew frowned and said, "No, it's not nice. I don't want a machine telling me how I would have voted just because some joker in Milwaukee says he's against higher tariffs. Maybe I wanted to vote cockeyed just for the pleasure of it. Maybe I don't want to vote. Maybe—"

But Linda had wriggled from his knee and was beating a retreat.

She met her mother at the door. Her mother, who was still wearing her coat and had not even had time to remove her hat, said breathlessly, "Run along, Linda. Don't get in Mother's way."

Then she said to Matthew, as she lifted her hat from her head and patted her hair back into place, "I've been at Agatha's."

Matthew stared at her censoriously and did not even dignify that piece of information with a grunt as he groped for his newspaper.

Sarah said, as she unbuttoned her coat, "Guess what she said?"

Matthew flattened out his newspaper for reading purposes with a sharp crackle and said, "Don't much care."

Sarah said, "Now, Father—" But she had no time for anger. The news had to be told and Matthew was the only recipient handy, so she went on, "Agatha's Joe is a policeman, you know, and he says a whole truckload of secret service men came into Bloomington last night."

"They're not after me."

"Don't you see, Father? Secret service agents, and it's almost election time. In *Bloomington*."

"Maybe they're after a bank robber."

"There hasn't been a bank robbery in town in ages . . . Father, you're hopeless."

She stalked away.

* * *

Nor did Norman Muller receive the news with noticeably greater excitement.

"Now, Sarah, how did Agatha's Joe know they were secret service agents?" he asked calmly. "They wouldn't go around with identification cards pasted on their foreheads."

But by next evening, with November a day old, she could say triumphantly, "It's just everyone in Bloomington that's waiting for someone local to be the voter. The Bloomington *News* as much as said so on video."

Norman stirred uneasily. He couldn't deny it, and his heart was sinking. If Bloomington was really to be hit by Multivac's lightning, it would mean newspapermen, video shows, tourists, all sorts of—strange upsets. Norman liked the quiet routine of his life, and the distant stir of politics was getting uncomfortably close.

He said, "It's all rumor. Nothing more."

"You wait and see, then. You just wait and see."

As things turned out, there was very little time to wait, for the doorbell rang insistently, and when Norman Muller opened it and said, "Yes?" a tall, grave-faced man said, "Are you Norman Muller?"

Norman said, "Yes," again, but in a strange dying voice. It was not difficult to see from the stranger's bearing that he was one carrying authority, and the nature of his errand suddenly became as inevitably obvious as it had, until the moment before, been unthinkably impossible.

The man presented credentials, stepped into the house, closed the door behind him and said ritualistically, "Mr. Norman Muller, it is necessary for me to inform you on the behalf of the President of the United States that you have been chosen to represent the American electorate on Tuesday, November 4, 2008."

* * *

Norman Muller managed, with difficulty, to walk unaided to his chair. He sat there, white-faced and almost insensible, while Sarah brought water, slapped his hands in panic and moaned to her husband between clenched teeth, "Don't be sick, Norman. *Don't* be sick. They'll pick someone else."

When Norman could manage to talk, he whispered, "I'm sorry, sir."

The secret service agent had removed his coat, unbuttoned his jacket and was sitting at ease on the couch.

"It's all right," he said, and the mark of officialdom seemed to have vanished with the formal announcement and leave him simply a large and rather friendly man. "This is the sixth time I've made the announcement and I've seen all kinds of reactions. Not one of them was the kind you see on the video. You know what I mean? A holy, dedicated look, and a character who says, 'It will be a great privilege to serve my country.' That sort of stuff." The agent laughed comfortingly.

Sarah's accompanying laugh held a trace of shrill hysteria.

The agent said, "Now you're going to have me with you for a while. My name is Phil Handley. I'd appreciate it if you call me Phil. Mr. Muller can't leave the house any more till Election Day. You'll have to inform the department store that he's sick, Mrs. Muller. You can go about your business for a while, but you'll have to agree not to say a word about this. Right, Mrs. Muller?"

Sarah nodded vigorously. "No, sir. Not a word."

"All right. But, Mrs. Muller," Handley looked grave, "we're not kidding now. Go out only if you must and you'll be followed when you do. I'm sorry but that's the way we must operate."

"Followed?"

"It won't be obvious. Don't worry. And it's only for two days till the formal announcement to the nation is made. Your daughter—"

"She's in bed," said Sarah hastily.

"Good. She'll have to be told I'm a relative or friend staying with the family. If she does find out the truth, she'll have to be kept in the house. Your father had better stay in the house in any case."

"He won't like that," said Sarah.

"Can't be helped. Now, since you have no others living with you—"

"You know all about us apparently," whispered Norman.

"Quite a bit," agreed Handley. "In any case, those are all my instructions to you for the moment. I'll try to co-operate as much as I can and be as little of a nuisance as possible. The government will pay for my maintenance so I won't be an expense to you. I'll be relieved each night by someone who will sit up in this room, so there will be no problem about sleeping accommodations. Now, Mr. Muller—"

"Sir?"

"You can call me Phil," said the agent again. "The purpose of the two-day preliminary before formal announcement is to get you used to your position. We prefer to have you face Multivac in as normal a state of mind as possible. Just relax and try to feel this is all in a day's work. Okay?"

"Okay," said Norman, and then shook his head violently. "But I don't want the responsibility. Why me?"

"All right," said Handley, "let's get that straight to begin with. Multivac weighs all sorts of known factors, billions of them. One factor isn't known, though, and won't be known for a long time. That's the reaction pattern of the human mind. All Americans are subjected to the molding pressure of what other Americans do and say, to the things that are done to him and the things he does to others. Any American can be brought to Multivac to have the bent of his mind surveyed. From that the bent of all other minds in the country can be estimated. Some Americans are better for the purpose than others at some given time, depending upon the happenings of that year. Multivac picked you as most representative this year. Not the smartest, or the strongest, or the luckiest, but just the most representative. Now we don't question Multivac, do we?"

"Couldn't it make a mistake?" asked Norman.

Sarah, who listened impatiently, interrupted to say, "Don't listen to him, sir. He's just nervous, you know. Actually, he's very well read and he always follows politics very closely."

Handley said, "Multivac makes the decisions, Mrs. Muller. It picked your husband."

"But does it know everything?" insisted Norman wildly. "Couldn't it have made a mistake?"

"Yes, it can. There's no point in not being frank. In 1993, a selected Voter died of a stroke two hours before it was time for him to be notified. Multivac didn't predict that; it couldn't. A Voter might be mentally unstable, morally unsuitable, or, for that matter, disloyal. Multivac can't know everything about everybody until he's fed all the data there is. That's why alternative selections are always held in readiness. I don't think we'll be using one this time. You're in good health, Mr. Muller, and you've been carefully investigated. You qualify."

Norman buried his face in his hands and sat motionless.

"By tomorrow morning, sir," said Sarah, "he'll be perfectly all right. He just has to get used to it, that's all."

"Of course," said Handley.

* * *

In the privacy of their bedchamber, Sarah Muller expressed herself in other and stronger fashion. The burden of her lecture was, "So get hold of yourself, Norman. You're trying to throw away the chance of a lifetime."

Norman whispered desperately, "It frightens me, Sarah. The whole thing."

"For goodness' sake, why? What's there to it but answering a question or two?"

"The responsibility is too great. I couldn't face it."

"What responsibility? There isn't any. Multivac picked you. It's Multivac's responsibility. Everyone knows that."

Norman sat up in bed in a sudden excess of rebellion and anguish. "Everyone is *supposed* to know that. But they don't. They—"

"Lower your voice," hissed Sarah icily. "They'll hear you downtown."

"They don't," said Norman, declining quickly to a whisper. "When they talk about the Ridgely administration of 1988, do they say he won them over with pie-in-the-sky promises and racist baloney? No! They talk about the 'goddam MacComber vote,' as though Humphrey MacComber was the only man who had anything to do with it because he faced Multivac. I've said it myself—only now I think the poor guy was just a truck farmer who didn't ask to be picked. Why was it his fault more than anyone else's? Now his name is a curse."

"You're just being childish," said Sarah.

"I'm being sensible. I tell you, Sarah, I won't accept. They can't make me vote if I don't want to. I'll say I'm sick. I'll say—"

But Sarah had had enough. "Now you listen to me," she whispered in a cold fury. "You don't have only yourself to think about. You know what it means to be Voter of the Year. A presidential year at that. It means publicity and fame and, maybe, buckets of money—"

"And then I go back to being a clerk."

"You will *not*. You'll have a branch managership at the least if you have any brains at all, and you *will* have, because I'll tell you what to do. You control the kind of publicity if you play your cards right, and you can force Kennell Stores, Inc., into a tight contract *and* an escalator clause in connection with your salary *and* a decent pension plan."

"That's not the point in being Voter, Sarah."

'That will be your point. If you don't owe anything to yourself or to me—I'm not asking for myself—you owe something to Linda."

Norman groaned.

"Well, don't you?" snapped Sarah.

"Yes, dear," murmured Norman.

* * *

On November 3, the official announcement was made and it was too late for Norman to back out even if he had been able to find the courage to make the attempt.

Their house was sealed off. Secret service agents made their appearance in the open, blocking off all approach.

At first the telephone rang incessantly, but Philip Handley with an engagingly

apologetic smile took all calls. Eventually, the exchange shunted all calls directly to the police station.

Norman imagined that, in that way, he was spared not only the bubbling (and envious?) congratulations of friends, but also the egregious pressure of salesmen scenting a prospect and the designing smoothness of politicians from all over the nation . . . Perhaps even death threats from the inevitable cranks.

Newspapers were forbidden to enter the house now in order to keep out weighted pressures, and television was gently but firmly disconnected, over Linda's loud protests.

Matthew growled and stayed in his room; Linda, after the first flurry of excitement, sulked and whined because she could not leave the house; Sarah divided her time between preparation of meals for the present and plans for the future; and Norman's depression lived and fed upon itself.

And the morning of Tuesday, November 4, 2008, came at last, and it was Election Day.

* * *

It was early breakfast, but only Norman Muller ate, and that mechanically. Even a shower and shave had not succeeded in either restoring him to reality or removing his own conviction that he was as grimy without as he felt grimy within.

Handley's friendly voice did its best to shed some normality over the gray and unfriendly dawn. (The weather prediction had been for a cloudy day with prospects of rain before noon.)

Handley said, "We'll keep this house insulated till Mr. Muller is back, but after that we'll be off your necks." The secret service agent was in full uniform now, including sidearms in heavily brassed holsters.

"You've been no trouble at all, Mr. Handley," simpered Sarah.

Norman drank through two cups of black coffee, wiped his lips with a napkin, stood up and said haggardly, "I'm ready."

Handley stood up, too. "Very well, sir. And thank you, Mrs. Muller, for your very kind hospitality."

* * *

The armored car purred down empty streets. They were empty even for that hour of the morning.

Handley indicated that and said, "They always shift traffic away from the line of drive ever since the attempted bombing that nearly ruined the Leverett Election of '92."

When the car stopped, Norman was helped out by the always polite Handley into an underground drive whose walls were lined with soldiers at attention.

He was led into a brightly lit room, in which thee white-uniformed men greeted him smilingly.

Norman said sharply, "But this is the hospital."

"There's no significance to that," said Handley at once. "It's just that the hospital has the necessary facilities."

"Well, what do I do?"

Handley nodded. One of the three men in white advanced and said, "I'll take over now, agent."

Handley saluted in an offhand manner and left the room.

The man in white said, "Won't you sit down, Mr. Muller? I'm John Paulson, Senior Computer. These are Samson Levine and Peter Dorogobuzh, my assistants."

Norman shook hands numbly all about. Paulson was a man of middle height with a soft face that seemed used to smiling and a very obvious toupee. He wore plastic-rimmed glasses of an old-fashioned cut, and he lit a cigarette as he talked. (Norman refused his offer of one.)

Paulson said, "In the first place, Mr. Muller, I want you to know we are in no hurry. We want you to stay with us all day if necessary, just so that you get used to your surroundings and get over any thought you might have that there is anything unusual in this, anything clinical, if you know what I mean."

"It's all right," said Norman. "I'd just as soon this were over."

"I understand your feelings. Still, we want you to know exactly what's going on. In the first place, Multivac isn't here."

"It isn't?" Somehow through all his depression, he had still looked forward to seeing Multivac. They said it was half a mile long and three stories high, that fifty technicians walked the corridors *within* its structure continuously. It was one of the wonders of the world.

Paulson smiled. "No. It's not portable, you know. It's located underground, in fact, and very few people know exactly where. You can understand that, since it is our greatest natural resource. Believe me, elections aren't the only things it's used for."

Norman thought he was being deliberately chatty and found himself intrigued all the same. "I thought I'd see it. I'd like to."

"I'm sure of that. But it takes a presidential order and even then it has to be countersigned by Security. However, we are plugged into Multivac right here by beam transmission. What Multivac says can be interpreted here and what we say is beamed directly to Multivac, so in a sense we're in its presence."

Norman looked about. The machines within the room were all meaningless to him.

"Now let me explain, Mr. Muller," Paulson went on. "Multivac already has most of the information it needs to decide all the elections, national, state and local. It needs only to check certain imponderable attitudes of mind and it will use you for that. We can't predict what questions it will ask, but they may not make much sense to you, or even to us. It may ask you how you feel about garbage disposal in your town; whether you favor central incinerators. It might ask you whether you have a doctor of your own or whether you make use of National Medicine, Inc. Do you understand?"

"Yes, sir."

"Whatever it asks, you answer in your own words in any way you please. If you feel you must explain quite a bit, do so. Talk an hour, if necessary."

"Yes, sir."

"Now, one more thing. We will have to make use of some simple devices which will automatically record your blood pressure, heartbeat, skin conductivity and brain-wave pattern while you speak. The machinery will seem formidable, but it's all absolutely painless. You won't even know it's going on."

The other two technicians were already busying themselves with smooth-gleaming apparatus on oiled wheels.

Norman said, "Is that to check on whether I'm lying or not?"

"Not at all, Mr. Muller. There's no question of lying. It's only a matter of emotional intensity. If the machine asks you your opinion of your child's school, you may say, 'I think it is overcrowded.' Those are only words. From the way your brain and heart and

hormones and sweat glands work, Multivac can judge exactly how intensely you feel about the matter. It will understand your feelings better than you yourself."

"I never heard of this," said Norman.

"No, I'm sure you didn't. Most of the details of Multivac's workings are top secret. For instance, when you leave, you will be asked to sign a paper swearing that you will never reveal the nature of the questions you were asked, the nature of your responses, what was done, or how it was done. The less is known about the Multivac, the less chance of attempted outside pressures upon the men who service it." He smiled grimly. "Our lives are hard enough as it is."

Norman nodded. "I understand."

"And now would you like anything to eat or drink?"

"No. Nothing right now."

"Do you have any questions?"

Norman shook his head.

"Then you tell us when you're ready."

"I'm ready right now."

"You're certain?"

"Quite."

Paulson nodded, and raised his hand in a gesture to the others. They advanced with their frightening equipment, and Norman Muller felt his breath come a little quicker as he watched.

* * *

The ordeal lasted nearly three hours, with one short break for coffee and an embarrassing session with a chamber pot. During all this time, Norman Muller remained encased in machinery. He was bone-weary at the close.

He thought sardonically that his promise to reveal nothing of what had passed would be an easy one to keep. Already the questions were a hazy mishmash in his mind.

Somehow he had thought Multivac would speak in a sepulchral, superhuman voice, resonant and echoing, but that, after all, was just an idea he had from seeing too many television shows, he now decided. The truth was distressingly undramatic. The questions were slips of a kind of metallic foil patterned with numerous punctures. A second machine converted the pattern into words and Paulson read the words to Norman, then gave him the question and let him read it for himself.

Norman's answers were taken down by a recording machine, played back to Norman for confirmation, with emendations and added remarks also taken down. All that was fed into a pattern-making instrument and that, in turn, was radiated to Multivac.

The one question Norman could remember at the moment was an incongruously gossipy: "What do you think of the price of eggs?"

Now it was over, and gently they removed the electrodes from various portions of his body, unwrapped the pulsating band from his upper arm, moved the machinery away.

He stood up, drew a deep, shuddering breath and said, "Is that all? Am I through?"

"Not quite." Paulson hurried to him, smiling in reassuring fashion. "We'll have to ask you to stay another hour."

"Why?" asked Norman sharply.

"It will take that long for Multivac to weave its new data into the trillions of items it has. Thousands of elections are concerned, you know. It's very complicated. And it may be that an odd contest here or there, a comptrollership in Phoenix, Arizona, or some council seat in Wilkesboro, North Carolina, may be in doubt. In that case, Multivac may be compelled to ask you a deciding question or two."

"No," said Norman. "I won't go through this again."

"It probably won't happen," Paulson said soothingly. "It rarely does. But, just in case, you'll have to stay." A touch of steel, just a touch, entered his voice. "You have no choice, you know. You must."

Norman sat down wearily. He shrugged.

Paulson said, "We can't let you read a newspaper, but if you'd care for a murder mystery, of if you'd like to play chess, or if there's anything we can do for you to help pass the time, I wish you'd mention it."

"It's all right. I'll just wait."

They ushered him into a small room just next to the one in which he had been questioned. He let himself sink into a plastic-covered armchair and closed his eyes.

As well as he could, he must wait out this final hour.

* * *

He sat perfectly still and slowly the tension left him. His breathing grew less ragged and he could clasp his hands without being quite so conscious of the trembling of his fingers.

Maybe there would be no questions. Maybe it was all over.

If it *were* over, then the next thing would be torchlight processions and invitations to speak at all sorts of functions. The Voter of the Year!

He, Norman Muller, ordinary clerk of a small department store in Bloomington, Indiana, who had neither been born great nor achieved greatness would be in the extraordinary position of having had greatness thrust upon him.

The historians would speak soberly of the Muller Election of 2008. That would be its name, the Muller Election.

The publicity, the better job, the flash flood of money that interested Sarah so much, occupied only a corner of his mind. It would all be welcome, of course. He couldn't refuse it. But at the moment something else was beginning to concern him.

A latent patriotism was stirring. After all, he was representing the entire electorate. He was the focal point for *them*. He was, in his own person, for this one day, all of America!

The door opened, snapping him to open-eyed attention. For a moment, his stomach constricted. Not more questions!

But Paulson was smiling. "That will be all, Mr. Muller."

"No more questions, sir?"

"None needed. Everything was quite clear-cut. You will be escorted back to your home and then you will be a private citizen once more. Or as much so as the public will allow."

"Thank you. Thank you." Norman flushed and said, "I wonder—who was elected?"

Paulson shook his head. "That will have to wait for the official announcement. The rules are quite strict. We can't even tell you. You understand."

"Of course. Yes." Norman felt embarrassed.

"Secret service will have the necessary papers for you to sign."

"Yes." Suddenly, Norman Muller felt proud. It was on him now in full strength. He was proud.

In this imperfect world, the sovereign citizens of the first and greatest Electronic Democracy had, through Norman Muller (through *him!*) exercised once again its free, untrammeled franchise.

The Last Question

The last question was asked for the first time, half in jest, on May 21, 2061, at a time when humanity first stepped into the light. The question came about as a result of a five-dollar bet over highballs, and it happened this way:

Alexander Adell and Bertram Lupov were two of the faithful attendants of Multivac. As well as any human beings could, they knew what lay behind the cold, clicking, flashing face—miles and miles of face—of that giant computer. They had at least a vague notion of the general plan of relays and circuits that had long since grown past the point where any single human could possibly have a firm grasp of the whole.

Multivac was self-adjusting and self-correcting. It had to be, for nothing human could adjust and correct it quickly enough or even adequately enough. —So Adell and Lupov attended the monstrous giant only lightly and superficially, yet as well as any men could. They fed it data, adjusted questions to its needs and translated the answers that were issued. Certainly they, and all others like them, were fully entitled to share in the glory that was Multivac's.

For decades, Multivac had helped design the ships and plot the trajectories that enabled man to reach the Moon, Mars, and Venus, but past that, Earth's poor resources could not support the ships. Too much energy was needed for the long trips. Earth exploited its coal and uranium with increasing efficiency, but there was only so much of both.

But slowly Multivac learned enough to answer deeper questions more fundamentally, and on May 14, 2061, what had been theory, became fact.

The energy of the sun was stored, converted, and utilized directly on a planet-wide scale. All Earth turned off its burning coal, its fissioning uranium, and flipped the switch that connected all of it to a small station, one mile in diameter, circling the Earth at half the distance of the Moon. All Earth ran by invisible beams of sunpower.

Seven days had not sufficed to dim the glory of it and Adell and Lupov finally managed to escape from the public functions, and to meet in quiet where no one would think of looking for them, in the deserted underground chambers, where portions of the mighty buried body of Multivac showed. Unattended, idling, sorting data

with contented lazy clickings, Multivac, too, had earned its vacation and the boys appreciated that. They had no intention, originally, of disturbing it.

They had brought a bottle with them, and their only concern at the moment was to relax in the company of each other and the bottle.

"It's amazing when you think of it," said Adell. His broad face had lines of weariness in it, and he stirred his drink slowly with a glass rod, watching the cubes of ice slur clumsily about. "All the energy we can possibly ever use for free. Enough energy, if we wanted to draw on it, to melt all Earth into a big drop of impure liquid iron, and still never miss the energy so used. All the energy we could ever use, forever and forever and forever."

Lupov cocked his head sideways. He had a trick of doing that when he wanted to be contrary, and he wanted to be contrary now, partly because he had had to carry the ice and glassware. "Not forever," he said.

"Oh, hell, just about forever. Till the sun runs down, Bert."

"That's not forever."

"All right, then. Billions and billions of years. Ten billion, maybe. Are you satisfied?"

Lupov put his fingers through his thinning hair as though to reassure himself that some was still left and sipped gently at his own drink. "Ten billion years isn't forever."

"Well, it will last our time, won't it?"

"So would the coal and uranium."

"All right, but now we can hook up each individual spaceship to the Solar Station, and it can go to Pluto and back a million times without ever worrying about fuel. You can't do *that* on coal and uranium. Ask Multivac, if you don't believe me."

"I don't have to ask Multivac. I know that."

"Then stop running down what Multivac's done for us," said Adell, blazing up, "It did all right."

"Who says it didn't? What I say is that a sun won't last forever. That's all I'm saying. We're safe for ten billion years, but then what?" Lupov pointed a slightly shaky finger at the other. "And don't say we'll switch to another sun."

There was a silence for a while. Adell put his glass to his lips only occasionally, and Lupov's eyes slowly closed. They rested.

Then Lupov's eyes snapped open. "You're thinking we'll switch to another sun when ours is done, aren't you?"

"I'm not thinking."

"Sure you are. You're weak on logic, that's the trouble with you. You're like the guy in the story who was caught in a sudden shower and who ran to a grove of trees and got under one. He wasn't worried, you see, because he figured when one tree got wet through, he would just get under another one."

"I get it," said Adell. "Don't shout. When the sun is done, the other stars will be gone, too."

"Darn right they will," muttered Lupov. "It all had a beginning in the original cosmic explosion, whatever that was, and it'll all have an end when all the stars run down. Some run down faster than others. Hell, the giants won't last a hundred million years. The sun will last ten billion years and maybe the dwarfs will last two hundred billion for all the good they are. But just give us a trillion years and everything will be dark. Entropy has to increase to maximum, that's all."

"I know all about entropy," said Adell, standing on his dignity.

"The hell you do."

"I know as much as you do."

"Then you know everything's got to run down someday."

"All right. Who says they won't?"

"You did, you poor sap. You said we had all the energy we needed, forever. You said 'forever.'"

It was Adell's turn to be contrary. "Maybe we can build things up again someday," he said.

"Never."

"Why not? Someday."

"Never."

"Ask Multivac."

"*You* ask Multivac. I dare you. Five dollars says it can't be done."

Adell was just drunk enough to try, just sober enough to be able to phrase the necessary symbols and operations into a question which, in words, might have corresponded to this: Will mankind one day without the net expenditure of energy be able to restore the sun to its full youthfulness even after it had died of old age?

Or maybe it could be put more simply like this: How can the net amount of entropy of the universe be massively decreased?

Multivac fell dead and silent. The slow flashing of lights ceased, the distant sounds of clicking relays ended.

Then, just as the frightened technicians felt they could hold their breath no longer, there was a sudden springing to life of the teletype attached to that portion of Multivac. Five words were printed: INSUFFICIENT DATA FOR MEANINGFUL ANSWER.

"No bet," whispered Lupov. They left hurriedly.

By next morning, the two, plagued with throbbing head and cottony mouth, had forgotten the incident.

* * *

Jerrodd, Jerrodine, and Jerrodette I and II watched the starry picture in the visiplate change as the passage through hyperspace was completed in its non-time lapse. At once, the even powdering of stars gave way to the predominance of a single bright shining disk, the size of a marble, centered on the viewing-screen.

"That's X-23," said Jerrodd confidently. His thin hands clamped tightly behind his back and the knuckles whitened.

The little Jerrodettes, both girls, had experienced the hyperspace passage for the first time in their lives and were self-conscious over the momentary sensation of inside-outness. They buried their giggles and chased one another wildly about their mother, screaming, "We've reached X-23—we've reached X-23—we've—"

"Quiet, children," said Jerrodine sharply. "Are you sure, Jerrodd?"

"What is there to be but sure?" asked Jerrodd, glancing up at the bulge of featureless metal just under the ceiling. It ran the length of the room, disappearing through the wall at either end. It was as long as the ship.

Jerrodd scarcely knew a thing about the thick rod of metal except that it was called a Microvac, that one asked it questions if one wished; that if one did not it still had its task of guiding the ship to a preordered destination; of feeding on energies from the various Sub-galactic Power Stations; of computing the equations for the hyperspatial jumps.

Jerrodd and his family had only to wait and live in the comfortable residence quarters of the ship.

Someone had once told Jerrodd that the "ac" at the end of "Microvac" stood for "automatic computer" in ancient English, but he was on the edge of forgetting even that.

Jerrodine's eyes were moist as she watched the visiplate. "I can't help it. I feel funny about leaving Earth."

"Why, for Pete's sake?" demanded Jerrodd. "We had nothing there. We'll have everything on X-23. You won't be alone. You won't be a pioneer. There are over a million people on the planet already. Good Lord, our great-grandchildren will be looking for new worlds because X-23 will be overcrowded." Then, after a reflective pause, "I tell you, it's a lucky thing the computers worked out interstellar travel the way the race is growing."

"I know, I know," said Jerrodine miserably.

Jerrodette I said promptly, "Our Microvac is the best Microvac in the world."

"I think so, too," said Jerrodd, tousling her hair.

It *was* a nice feeling to have a Microvac of your own and Jerrodd was glad he was part of his generation and no other. In his father's youth, the only computers had been tremendous machines taking up a hundred square miles of land. There was only one to a planet. Planetary ACs they were called. They had been growing in size steadily for a thousand years and then, all at once, came refinement. In place of transistors, had come molecular valves so that even the largest Planetary AC could be put into a space only half the volume of a spaceship.

Jerrodd felt uplifted, as he always did when he thought that his own personal Microvac was many times more complicated than the ancient and primitive Multivac that had first tamed the Sun, and almost as complicated as Earth's Planetary AC (the largest) that had first solved the problem of hyperspatial travel and had made trips to the stars possible.

"So many stars, so many planets," sighed Jerrodine, busy with her own thoughts. "I suppose families will be going out to new planets forever, the way we are now."

"Not forever," said Jerrodd, with a smile. "It will all stop someday, but not for billions of years. Many billions. Even the stars run down, you know. Entropy must increase."

"What's entropy, daddy?" shrilled Jerrodette II.

"Entropy, little sweet, is just a word which means the amount of running-down of the universe. Everything runs down, you know, like your little walkie-talkie robot, remember?"

"Can't you just put in a new power-unit, like with my robot?"

"The stars *are* the power-units, dear. Once they're gone, there are no more power-units."

Jerrodette I at once set up a howl. "Don't let them, daddy. Don't let the stars run down."

"Now look what you've done," whispered Jerrodine, exasperated.

"How was I to know it would frighten them?" Jerrodd whispered back.

"Ask the Microvac," wailed Jerrodette I. "Ask him how to turn the stars on again."

"Go ahead," said Jerrodine. "It will quiet them down." (Jerrodette II was beginning to cry, also.)

Jerrodd shrugged. "Now, now, honeys. I'll ask Microvac. Don't worry, he'll tell us."

He asked the Microvac, adding quickly, "Print the answer."

Jerrodd cupped the strip of thin cellufilm and said cheerfully, "See now, the Microvac says it will take care of everything when the time comes so don't worry."

Jerrodine said, "And now, children, it's time for bed. We'll be in our new home soon."

Jerrodd read the words on the cellufilm again before destroying it: INSUFFICIENT DATA FOR MEANINGFUL ANSWER.

He shrugged and looked at the visiplate. X-23 was just ahead.

* * *

VJ-23X of Lameth stared into the black depths of the three-dimensional, small-scale map of the Galaxy and said, "Are we ridiculous, I wonder, in being so concerned about the matter?"

MQ-17J of Nicron shook his head. "I think not. You know the Galaxy will be filled in five years at the present rate of expansion."

Both seemed in their early twenties, both were tall and perfectly formed.

"Still," said VJ-23X, "I hesitate to submit a pessimistic report to the Galactic Council."

"I wouldn't consider any other kind of report. Stir them up a bit. We've got to stir them up."

VJ-23X sighed. "Space is infinite. A hundred billion Galaxies are there for the taking. More."

"A hundred billion is *not* infinite and it's getting less infinite all the time. Consider! Twenty thousand years ago, mankind first solved the problem of utilizing stellar energy, and a few centuries later, interstellar travel became possible. It took mankind a million years to fill one small world and then only fifteen thousand years to fill the rest of the Galaxy. Now the population doubles every ten years—"

VJ-23X interrupted. "We can thank immortality for that."

"Very well. Immortality exists and we have to take it into account. I admit it has its seamy side, this immortality. The Galactic AC has solved many problems for us, but in solving the problem of preventing old age and death, it has undone all its other solutions."

"Yet you wouldn't want to abandon life, I suppose."

"Not at all," snapped MQ-17J, softening it at once to, "Not yet. I'm by no means old enough. How old are you?"

"Two hundred twenty-three. And you?"

"I'm still under two hundred. —But to get back to my point. Population doubles every ten years. Once this Galaxy is filled, we'll have filled another in ten years. Another ten years and we'll have filled two more. Another decade, four more. In a hundred years, we'll have filled a thousand Galaxies. In a thousand years, a million Galaxies. In ten thousand years, the entire known Universe. Then what?"

VJ-23X said, "As a side issue, there's a problem of transportation. I wonder how many sunpower units it will take to move Galaxies of individuals from one Galaxy to the next."

"A very good point. Already, mankind consumes two sunpower units per year."

"Most of it's wasted. After all, our own Galaxy alone pours out a thousand sunpower units a year and we only use two of those."

"Granted, but even with a hundred per cent efficiency, we only stave off the end. Our energy requirements are going up in a geometric progression even faster than our population. We'll run out of energy even sooner than we run out of Galaxies. A good point. A very good point."

"We'll just have to build new stars out of interstellar gas."

"Or out of dissipated heat?" asked MQ-17J, sarcastically.

"There may be some way to reverse entropy. We ought to ask the Galactic AC."

VJ-23X was not really serious, but MQ-17J pulled out his AC-contact from his pocket and placed it on the table before him.

"I've half a mind to," he said. "It's something the human race will have to face someday."

He stared somberly at his small AC-contact. It was only two inches cubed and nothing in itself, but it was connected through hyperspace with the great Galactic AC that served all mankind. Hyperspace considered, it was an integral part of the Galactic AC.

MQ-17J paused to wonder if someday in his immortal life he would get to see the Galactic AC. It was on a little world of its own, a spider webbing of force-beams holding the matter within which surges of submesons took the place of the old clumsy molecular valves. Yet despite its sub-etheric workings, the Galactic AC was known to be a full thousand feet across.

MQ-17J asked suddenly of his AC-contact, "Can entropy ever be reversed?"

VJ-23X looked startled and said at once, "Oh, say, I didn't really mean to have you ask that."

"Why not?"

"We both know entropy can't be reversed. You can't turn smoke and ash back into a tree."

"Do you have trees on your world?" asked MQ-17J.

The sound of the Galactic AC startled them into silence. Its voice came thin and beautiful out of the small AC-contact on the desk. It said: THERE IS INSUFFICIENT DATA FOR A MEANINGFUL ANSWER.

VJ-23X said, "See!"

The two men thereupon returned to the question of the report they were to make to the Galactic Council.

* * *

Zee Prime's mind spanned the new Galaxy with a faint interest in the countless twists of stars that powdered it. He had never seen this one before. Would he ever see them all? So many of them, each with its load of humanity. —But a load that was almost a dead weight. More and more, the real essence of men was to be found out here, in space.

Minds, not bodies! The immortal bodies remained back on the planets, in suspension over the eons. Sometimes they roused for material activity but that was growing rarer. Few new individuals were coming into existence to join the incredibly mighty throng, but what matter? There was little room in the Universe for new individuals.

Zee Prime was roused out of his reverie upon coming across the wispy tendrils of another mind.

"I am Zee Prime," said Zee Prime. "And you?"

"I am Dee Sub Wun. Your Galaxy?"

"We call it only the Galaxy. And you?"

"We call ours the same. All men call their Galaxy their Galaxy and nothing more. Why not?"

"True. Since all Galaxies are the same."

"Not all Galaxies. On one particular Galaxy the race of man must have originated. That makes it different."

Zee Prime said, "On which one?"

"I cannot say. The Universal AC would know."

"Shall we ask him? I am suddenly curious."

Zee Prime's perceptions broadened until the Galaxies themselves shrank and became a new, more diffuse powdering on a much larger background. So many hundreds of billions of them, all with their immortal beings, all carrying their load of intelligences with minds that drifted freely through space. And yet one of them was unique among them all in being the original Galaxy. One of them had, in its vague and distant past, a period when it was the only Galaxy populated by man.

Zee Prime was consumed with curiosity to see this Galaxy and he called out: "Universal AC! On which Galaxy did mankind originate?"

The Universal AC heard, for on every world and throughout space, it had its receptors ready, and each receptor lead through hyperspace to some unknown point where the Universal AC kept itself aloof.

Zee Prime knew of only one man whose thoughts had penetrated within sensing distance of Universal AC, and he reported only a shining globe, two feet across, difficult to see.

"But how can that be all of Universal AC?" Zee Prime had asked.

"Most of it," had been the answer, "is in hyperspace. In what form it is there I cannot imagine."

Nor could anyone, for the day had long since passed, Zee Prime knew, when any man had any part of the making of a Universal AC. Each Universal AC designed and constructed its successor. Each, during its existence of a million years or more accumulated the necessary data to build a better and more intricate, more capable successor in which its own store of data and individuality would be submerged.

The Universal AC interrupted Zee Prime's wandering thoughts, not with words, but with guidance. Zee Prime's mentality was guided into the dim sea of Galaxies and one in particular enlarged into stars.

A thought came, infinitely distant, but infinitely clear. "THIS IS THE ORIGINAL GALAXY OF MAN."

But it was the same after all, the same as any other, and Zee Prime stifled his disappointment.

Dee Sub Wun, whose mind had accompanied the other, said suddenly, "And is one of these stars the original star of Man?"

The Universal AC said, "MAN'S ORIGINAL STAR HAS GONE NOVA. IT IS A WHITE DWARF."

"Did the men upon it die?" asked Zee Prime, startled and without thinking.

The Universal AC said, "A NEW WORLD, AS IN SUCH CASES WAS CONSTRUCTED FOR THEIR PHYSICAL BODIES IN TIME."

"Yes, of course," said Zee Prime, but a sense of loss overwhelmed him even so. His mind released its hold on the original Galaxy of Man, let it spring back and lose itself among the blurred pin points. He never wanted to see it again.

Dee Sub Wun said, "What is wrong?"

"The stars are dying. The original star is dead."

"They must all die. Why not?"

"But when all energy is gone, our bodies will finally die, and you and I with them."

"It will take billions of years."

"I do not wish it to happen even after billions of years. Universal AC! How may stars be kept from dying?"

Dee Sub Wun said in amusement, "You're asking how entropy might be reversed in direction."

And the Universal AC answered: "THERE IS AS YET INSUFFICIENT DATA FOR A MEANINGFUL ANSWER."

Zee Prime's thoughts fled back to his own Galaxy. He gave no further thought to Dee Sub Wun, whose body might be waiting on a Galaxy a trillion light-years away, or on the star next to Zee Prime's own. It didn't matter.

Unhappily, Zee Prime began collecting interstellar hydrogen out of which to build a small star of his own. If the stars must someday die, at least some could yet be built.

* * *

Man considered with himself, for in a way, Man, mentally, was one. He consisted of a trillion, trillion, trillion ageless bodies, each in its place, each resting quiet and incorruptible, each cared for by perfect automatons, equally incorruptible, while the minds of all the bodies freely melted one into the other, indistinguishable.

Man said, "The Universe is dying."

Man looked about at the dimming Galaxies. The giant stars, spendthrifts, were gone long ago, back in the dimmest of the dim far past. Almost all stars were white dwarfs, fading to the end.

New stars had been built of the dust between the stars, some by natural processes, some by Man himself, and those were going, too. White dwarfs might yet be crashed together and of the mighty forces so released, new stars built, but only one star for every thousand white dwarfs destroyed, and those would come to an end, too.

Man said, "Carefully husbanded, as directed by the Cosmic AC, the energy that is even yet left in all the Universe will last for billions of years."

"But even so," said Man, "eventually it will all come to an end. However it may be husbanded, however stretched out, the energy once expended is gone and cannot be restored. Entropy must increase forever to the maximum."

Man said, "Can entropy not be reversed? Let us ask the Cosmic AC."

The Cosmic AC surrounded them but not in space. Not a fragment of it was in space. It was in hyperspace and made of something that was neither matter nor energy. The question of its size and nature no longer had meaning in any terms that Man could comprehend.

"Cosmic AC," said Man, "how may entropy be reversed?"

The Cosmic AC said, "THERE IS AS YET INSUFFICIENT DATA FOR A MEANINGFUL ANSWER."

Man said, "Collect additional data."

The Cosmic AC said, "I WILL DO SO. I HAVE BEEN DOING SO FOR A HUNDRED BILLION YEARS. MY PREDECESSORS AND I HAVE BEEN ASKED THIS QUESTION MANY TIMES. ALL THE DATA I HAVE REMAINS INSUFFICIENT."

"Will there come a time," said Man, "when data will be sufficient or is the problem insoluble in all conceivable circumstances?"

The Cosmic AC said, "NO PROBLEM IS INSOLUBLE IN ALL CONCEIVABLE CIRCUMSTANCES."

Man said, "When will you have enough data to answer the question?"

The Cosmic AC said, "THERE IS AS YET INSUFFICIENT DATA FOR A MEANINGFUL ANSWER."

"Will you keep working on it?" asked Man.

The Cosmic AC said, "I WILL."

Man said, "We shall wait."

* * *

The stars and Galaxies died and snuffed out, and space grew black after ten trillion years of running down.

One by one Man fused with AC, each physical body losing its mental identity in a manner that was somehow not a loss but a gain.

Man's last mind paused before fusion, looking over a space that included nothing but the dregs of one last dark star and nothing besides but incredibly thin matter, agitated randomly by the tag ends of heat wearing out, asymptotically, to the absolute zero.

Man said, "AC, is this the end? Can this chaos not be reversed into the Universe once more? Can that not be done?"

AC said, "THERE IS AS YET INSUFFICIENT DATA FOR A MEANINGFUL ANSWER."

Man's last mind fused and only AC existed—and that in hyperspace.

* * *

Matter and energy had ended and with it space and time. Even AC existed only for the sake of the one last question that it had never answered from the time a half-drunken computer ten trillion years before had asked the question of a computer that was to AC far less than was a man to Man.

All other questions had been answered, and until this last question was answered also, AC might not release his consciousness.

All collected data had come to a final end. Nothing was left to be collected.

But all collected data had yet to be completely correlated and put together in all possible relationships.

A timeless interval was spent in doing that.

And it came to pass that AC learned how to reverse the direction of entropy.

But there was now no man to whom AC might give the answer of the last question. No matter. The answer—by demonstration—would take care of that, too.

For another timeless interval, AC thought how best to do this. Carefully, AC organized the program.

The consciousness of AC encompassed all of what had once been a Universe and brooded over what was now Chaos. Step by step, it must be done.

And AC said, "LET THERE BE LIGHT!"

And there was light—

Profession

George Platen could not conceal the longing in his voice. It was too much to suppress. He said, "Tomorrow's the first of May. Olympics!"

He rolled over on his stomach and peered over the foot of his bed at his roommate. Didn't *he* feel it, too? Didn't *this* make some impression on him?

George's face was thin and had grown a trifle thinner in the nearly year and a half that he had been at the House. His figure was slight but the look in his blue eyes was as intense as it had ever been, and right now there was a trapped look in the way his fingers curled against the bedspread.

George's roommate looked up briefly from his book and took the opportunity to adjust the light-level of the stretch of wall near his chair. His name was Hali Omani and he was a Nigerian by birth. His dark brown skin and massive features seemed made for calmness, and mention of the Olympics did not move him.

He said, "I know, George."

George owed much to Hali's patience and kindness when it was needed, but even patience and kindness could be overdone. Was this a time to sit there like a statue built of some dark, warm wood?

George wondered if he himself would grow like that after ten years here and rejected the thought violently. No!

He said defiantly, "I think you've forgotten what May means."

The other said, "I remember very well what it means. It means nothing! You're the one who's forgotten that. May means nothing to you, George Platen, and," he added softly, "it means nothing to me, Hali Omani."

George said, "The ships are coming in for recruits. By June, thousands and thousands will leave with millions of men and women heading for any world you can name, and all that means nothing?"

"Less than nothing. What do you want me to do about it, anyway?" Omani ran his finger along a difficult passage in the book he was reading and his lips moved soundlessly.

George watched him. Damn it, he thought, yell, scream; you can do that much. Kick at me, do anything.

It was only that he wanted not to be so alone in his anger. He wanted not to be the only one so filled with resentment, not to be the only one dying a slow death.

It was better those first weeks when the Universe was a small shell of vague light and sound pressing down upon him. It was better before Omani had wavered into view and dragged him back to a life that wasn't worth living.

Omani! He was old! He was at least thirty. George thought: Will I be like that at thirty? Will I be like that in twelve years?

And because he was afraid he might be, he yelled at Omani, "Will you stop reading that fool book?"

Omani turned a page and read on a few words, then lifted his head with its skullcap of crisply curled hair and said, "What?"

"What good does it do you to read the book?" He stepped forward, snorted "More electronics," and slapped it out of Omani's hands.

Omani got up slowly and picked up the book. He smoothed a crumpled page without visible rancor. "Call it the satisfaction of curiosity," he said. "I understand a little of it today, perhaps a little more tomorrow. That's a victory in a way."

"A victory. What kind of a victory? Is that what satisfies you in life? To get to know enough to be a quarter of a Registered Electronician by the time you're sixty-five?"

"Perhaps by the time I'm thirty-five."

"And then who'll want you? Who'll use you? Where will you go?"

"No one. No one. Nowhere. I'll stay here and read other books."

"And that satisfies you? Tell me! You've dragged me to class. You've got me to reading and memorizing, too. For what? There's nothing in it that satisfies me."

"What good will it do you to deny yourself satisfaction?"

"It means I'll quit the whole farce. I'll do as I planned to do in the beginning before you dovey-lovied me out of it. I'm going to force them to—to—"

Omani put down his book. He let the other run down and then said, "To what, George?"

"To correct a miscarriage of justice. A frame-up. I'll get that Antonelli and force him to admit he—he—"

Omani shook his head. "Everyone who comes here insists it's a mistake. I thought you'd passed that stage."

"Don't call it a stage," said George violently. "In my case, it's a fact. I've told you—"

"You've told me, but in your heart you know no one made any mistake as far as you were concerned."

"Because no one will admit it? You think any of them would admit a mistake unless they were forced to? —Well, I'll force them."

It was May that was doing this to George; it was Olympics month. He felt it bring the old wildness back and he couldn't stop it. He didn't want to stop it. He had been in danger of forgetting.

He said, "I was going to be a Computer Programmer and I *can* be one. I could be one today, regardless of what they say analysis shows." He pounded his mattress. "They're wrong. They *must* be."

"The analysts are never wrong."

"They *must* be. Do you doubt my intelligence?"

"Intelligence hasn't one thing to do with it. Haven't you been told that often enough? Can't you understand that?"

George rolled away, lay on his back, and stared somberly at the ceiling.

"What did you want to be, Hali?"

"I had no fixed plans. Hydroponicist would have suited me, I suppose."


LINDAHN
1989

"Did you think you could make it?"

"I wasn't sure."

George had never asked personal questions of Omani before. It struck him as queer, almost unnatural, that other people had had ambitions and ended here. Hydroponicist!

He said, "Did you think you'd make *this*?"

"No, but here I am just the same."

"And you're satisfied. Really, really satisfied. You're happy. You love it. You wouldn't be anywhere else."

Slowly, Omani got to his feet. Carefully, he began to unmake his bed. He said, "George, you're a hard case. You're knocking yourself out because you won't accept the facts about yourself. George, you're here in what you call the House, but I've never heard you give it its full title. Say it, George, say it. Then go to bed and sleep this off."

George gritted his teeth and showed them. He choked out, "No!"

"Then I will," said Omani, and he did. He shaped each syllable carefully.

George was bitterly ashamed at the sound of it. He turned his head away.

* * *

For most of the first eighteen years of his life, George Platen had headed firmly in one direction, that of Registered Computer Programmer. There were those in his crowd who spoke wisely of Spationautics, Refrigeration Technology, Transportation Control, and even Administration. But George held firm.

He argued relative merits as vigorously as any of them, and why not? Education Day loomed ahead of them and was the great fact of their existence. It approached steadily, as fixed and certain as the calendar—the first day of November of the year following one's eighteenth birthday.

After that day, there were other topics of conversation. One could discuss with others some detail of the profession, or the virtues of one's wife and children, or the fate of one's space-polo team, or one's experiences in the Olympics. Before Education Day, however, there was only one topic that unfailingly and unwearyingly held everyone's interest, and that was Education Day.

"What are you going for? Think you'll make it? Heck, that's no good. Look at the records; quota's been cut. Logistics now—"

Or Hypermechanics now— Or Communications now— Or Gravitics now—

Especially Gravitics at the moment. Everyone had been talking about Gravitics in the few years just before George's Education Day because of the development of the Gravitic power engine.

Any world within ten light-years of a dwarf star, everyone said, would give its eyeteeth for any kind of Registered Gravitics Engineer.

The thought of that never bothered George. Sure it would; all the eyeteeth it could scare up. But George had also heard what had happened before in a newly developed technique. Rationalization and simplification followed in a flood. New models each year; new types of gravitic engines; new principles. Then all those eyeteeth gentlemen would find themselves out of date and superseded by later models with later educations. The first group would then have to settle down to unskilled labor or ship out to some backwoods world that wasn't quite caught up yet.

Now Computer Programmers were in steady demand year after year, century after century. The demand never reached wild peaks; there was never a howling bull market

for Programmers; but the demand climbed steadily as new worlds opened up and as older words grew more complex.

He had argued with Stubby Trevelyan about that constantly. As best friends, their arguments had to be constant and vitriolic and, of course, neither ever persuaded or was persuaded.

But then Trevelyan had had a father who was a Registered Metallurgist and had actually served on one of the Outworlds, and a grandfather who had also been a Registered Metallurgist. He himself was intent on becoming a Registered Metallurgist almost as a matter of family right and was firmly convinced that any other profession was a shade less than respectable.

"There'll always be metal," he said, "and there's an accomplishment in molding alloys to specification and watching structures grow. Now what's a Programmer going to be doing. Sitting at a coder all day long, feeding some fool mile-long machine."

Even at sixteen, George had learned to be practical. He said simply, "There'll be a million Metallurgists put out along with you."

"Because it's good. A good profession. The best."

"But you get crowded out, Stubby. You can be way back in line. Any world can tape out its own Metallurgists, and the market for advanced Earth models isn't so big. And it's mostly the small worlds that want them. You know what per cent of the turnout of Registered Metallurgists get tabbed for worlds with a Grade A rating. I looked it up. It's just 13.3 per cent. That means you'll have seven chances in eight of being stuck in some world that just about has running water. You may even be stuck on Earth; 2.3 per cent are."

Trevelyan said belligerently, "There's no disgrace in staying on Earth. Earth needs technicians, too. Good ones." His grandfather had been an Earth-bound Metallurgist, and Trevelyan lifted his finger to his upper lip and dabbed at an as yet nonexistent mustache.

George knew about Trevelyan's grandfather and, considering the Earth-bound position of his own ancestry, was in no mood to sneer. He said diplomatically, "No intellectual disgrace. Of course not. But it's nice to get into a Grade A world, isn't it?

"Now you take Programmers. Only the Grade A worlds have the kind of computers that really need first-class Programmers so they're the only ones in the market. And Programmer tapes are complicated and hardly any one fits. They need more Programmers than their own population can supply. It's just a matter of statistics. There's one first-class Programmer per million, say. A world needs twenty and has a population of ten million, they have to come to Earth for five to fifteen Programmers. Right?

"And you know how many Registered Computer Programmers went to Grade A planets last year? I'll tell you. Every last one. If you're a Programmer, you're a picked man. Yes, sir."

Trevelyan frowned. "If only one in a million makes it, what makes you think *you'll* make it?"

George said guardedly, "I'll make it."

He never dared tell anyone; not Trevelyan; not his parents; of exactly what he was doing that made him so confident. But he wasn't worried. He was simply confident (that was the worst of the memories he had in the hopeless days afterward). He was as blandly confident as the average eight-year-old kid approaching Reading Day—that childhood preview of Education Day.

* * *

Of course, Reading Day had been different. Partly, there was the simple fact of childhood. A boy of eight takes many extraordinary things in stride. One day you can't read and the next day you can. That's just the way things are. Like the sun shining.

And then not so much depended upon it. There were no recruiters just ahead, waiting and jostling for the lists and scores on the coming Olympics. A boy or girl who goes through the Reading Day is just someone who has ten more years of undifferentiated living upon Earth's crawling surface; just someone who returns to his family with one new ability.

By the time Education Day came, ten years later, George wasn't even sure of most of the details of his own Reading Day.

Most clearly of all, he remembered it to be a dismal September day with a mild rain falling. (September for Reading Day; November for Education Day; May for Olympics. They made nursery rhymes out of it.) George had dressed by the wall lights, with his parents far more excited than he himself was. His father was a Registered Pipe Fitter and had found his occupation on Earth. This fact had always been a humiliation to him, although, of course, as anyone could see plainly, most of each generation must stay on Earth in the nature of things.

There had to be farmers and miners and even technicians on Earth. It was only the late-model, high-specialty professions that were in demand on the Outworlds, and only a few millions a year out of Earth's eight billion population could be exported. Every man and woman on Earth couldn't be among that group.

But every man and woman could hope that at least one of his children could be one, and Platen, Senior, was certainly no exception. It was obvious to him (and, to be sure, to others as well) that George was notably intelligent and quick-minded. He would be bound to do well and he would have to, as he was an only child. If George didn't end on an Outworld, they would have to wait for grandchildren before a next chance would come along, and that was too far in the future to be much consolation.

Reading Day would not prove much, of course, but it would be the only indication they would have before the big day itself. Every parent on Earth would be listening to the quality of reading when his child came home with it; listening for any particularly easy flow of words and building that into certain omens of the future. There were few families that didn't have at least one hopeful who, from Reading Day on, was the great hope because of the way he handled his trisyllabics.

Dimly, George was aware of the cause of his parents' tension, and if there was any anxiety in his young heart that drizzly morning, it was only the fear that his father's hopeful expression might fade out when he returned home with his reading.

The children met in the large assembly room of the town's Education hall. All over Earth, in millions of local halls, throughout that month, similar groups of children would be meeting. George felt depressed by the grayness of the room and by the other children, strained and stiff in unaccustomed finery.

Automatically, George did as all the rest of the children did. He found the small clique that represented the children on his floor of the apartment house and joined them.

Trevelyan, who lived immediately next door, still wore his hair childishly long and was years removed from the sideburns and thin, reddish mustache that he was to grow as soon as he was physiologically capable of it.

Trevelyan (to whom George was then known as Jaw-jee) said, "Bet you're scared."

"I am not," said George. Then, confidentially, "My folks got a hunk of printing up on the dresser in my room, and when I come home, I'm going to read it for them."

(George's main suffering at the moment lay in the fact that he didn't quite know where to put his hands. He had been warned not to scratch his head or rub his ears or pick his nose or put his hands into his pockets. This eliminated almost every possibility.)

Trevelyan put *his* hands in his pockets and said, "My father isn't worried."

Trevelyan, Senior, had been a Metallurgist on Diporia for nearly seven years, which gave him a superior social status in his neighborhood even though he had retired and returned to Earth.

Earth discouraged these re-immigrants because of population problems, but a small trickle did return. For one thing the cost of living was lower on Earth, and what was a trifling annuity on Diporia, say, was a comfortable income on Earth. Besides, there were always men who found more satisfaction in displaying their success before the friends and scenes of their childhood than before all the rest of the Universe besides.

Trevelyan, Senior, further explained that if he stayed on Diporia, so would his children, and Diporia was a one-spaceship world. Back on Earth, his kids could end anywhere, even Novia.

Stubby Trevelyan had picked up that item early. Even before Reading Day, his conversation was based on the carelessly assumed fact that his ultimate home would be in Novia.

George, oppressed by thoughts of the other's future greatness and his own small-time contrast, was driven to belligerent defense at once.

"My father isn't worried either. He just wants to hear me read because he knows I'll be good. I suppose your father would just as soon not hear you because he knows you'll be all wrong."

"I will not be all wrong. Reading is *nothing*. On Novia, I'll *hire* people to read to me."

"Because *you* won't be able to read yourself, on account of you're *dumb!*"

"Then how come I'll be on Novia?"

And George, driven, made the great denial, "Who says you'll be on Novia? Bet you don't go anywhere."

Stubby Trevelyan reddened. "I won't be a Pipe Fitter like your old man."

"Take that back, you dumbhead."

"You take *that* back."

They stood nose to nose, not wanting to fight but relieved at having something familiar to do in this strange place. Furthermore, now that George had curled his hands into fists and lifted them before his face, the problem of what to do with his hands was, at least temporarily, solved. Other children gathered round excitedly.

But then it all ended when a woman's voice sounded loudly over the public address system. There was instant silence everywhere. George dropped his fists and forgot Trevelyan.

"Children," said the voice, "we are going to call out your names. As each child is called, he or she is to go to one of the men waiting along the side walls. Do you see them? They are wearing red uniforms so they will be easy to find. The girls will go to the right. The boys will go to the left. Now look about and see which man in red is nearest to you—"

George found his man at a glance and waited for his name to be called off. He had not been introduced before this to the sophistications of the alphabet, and the length of time it took to reach his own name grew disturbing.

The crowd of children thinned; little rivulets made their way to each of the red-clad guides.

When the name "George Platen" was finally called, his sense of relief was exceeded

only by the feeling of pure gladness at the fact that Stubby Trevelyan still stood in his place, uncalled.

George shouted back over his shoulder as he left, "Yay, Stubby, maybe they don't want you."

That moment of gaiety quickly left. He was herded into a line and directed down corridors in the company of strange children. They all looked at one another, large-eyed and concerned, but beyond a snuffling, "Quitcher pushing" and "Hey, watch out" there was no conversation.

They were handed little slips of paper which they were told must remain with them. George stared at his curiously. Little black marks of different shapes. He knew it to be printing but how could anyone make words out of it? He couldn't imagine.

He was told to strip; he and four other boys who were all that now remained together. All the new clothes came shucking off and four eight-year-olds stood naked and small, shivering more out of embarrassment than cold. Medical technicians came past, probing them, testing them with odd instruments, pricking them for blood. Each took the little cards and made additional marks on them with little black rods that produced the marks, all neatly lined up, with great speed. George stared at the new marks, but they were no more comprehensible than the old. The children were ordered back into their clothes.

They sat on separate little chairs then and waited again. Names were called again and "George Platen" came third.

He moved into a large room, filled with frightening instruments with knobs and glassy panels in front. There was a desk in the very center, and behind it a man sat, his eyes on the papers piled before him.

He said, "George Platen?"

"Yes, sir," said George, in a shaky whisper. All this waiting and all this going here and there was making him nervous. He wished it were over.

The man behind the desk said, "I am Dr. Lloyed, George. How are you?"

The doctor didn't look up as he spoke. It was as though he had said those words over and over again and didn't have to look up any more.

"I'm all right."

"Are you afraid, George?"

"N—no, sir," said George, sounding afraid even in his own ears.

"That's good," said the doctor, "because there's nothing to be afraid of, you know. Let's see, George. It says here on your card that your father is named Peter and that he's a Registered Pipe Fitter and your mother is named Amy and is a Registered Home Technician. Is that right?"

"Y—yes, sir."

"And your birthday is February 13, and you had an ear infection about a year ago. Right?"

"Yes, sir."

"Do you know how I know all these things?"

"It's on the card, I think, sir."

"That's right." The doctor looked up at George for the first time and smiled. He showed even teeth and looked much younger than George's father. Some of George's nervousness vanished.

The doctor passed the card to George. "Do you know what all those things there mean, George?"

Although George knew he did not he was startled by the sudden request into looking at the card as though he might understand now through some sudden stroke of

fate. But they were just marks as before and he passed the card back. "No, sir."

"Why not?"

George felt a sudden pang of suspicion concerning the sanity of this doctor. Didn't he know why not?

George said, "I can't read, sir."

"Would you like to read?"

"Yes, sir."

"Why, George?"

George stared, appalled. No one had ever asked him that. He had no answer. He said falteringly, "I don't know, sir."

"Printed information will direct you all through your life. There is so much you'll have to know even after Education Day. Cards like this one will tell you. Books will tell you. Television screens will tell you. Printing will tell you such useful things and such interesting things that not being able to read would be as bad as not being able to see. Do you understand?"

"Yes, sir."

"Are you afraid, George?"

"No, sir."

"Good. Now I'll tell you exactly what we'll do first. I'm going to put these wires on your forehead just over the corners of your eyes. They'll stick there but they won't hurt at all. Then, I'll turn on something that will make a buzz. It will sound funny and it may tickle you, but it won't hurt. Now if it does hurt, you tell me, and I'll turn it off right away, but it won't hurt. All right?"

George nodded and swallowed.

"Are you ready?"

George nodded. He closed his eyes while the doctor busied himself. His parents had explained this to him. They, too, had said it wouldn't hurt, but then there were always the older children. There were the ten- and twelve-year-olds who howled after the eight-year-olds waiting for Reading Day, "Watch out for the needle." There were the others who took you off in confidence and said, "They got to cut your head open. They use a sharp knife that big with a hook on it," and so on into horrifying details.

George had never believed them but he had had nightmares, and now he closed his eyes and felt pure terror.

He didn't feel the wires at his temple. The buzz was a distant thing, and there was the sound of his own blood in his ears, ringing hollowly as though it and he were in a large cave. Slowly he chanced opening his eyes.

The doctor had his back to him. From one of the instruments a strip of paper unwound and was covered with a thin, wavy purple line. The doctor tore off pieces and put them into a slot in another machine. He did it over and over again. Each time a little piece of film came out, which the doctor looked at. Finally, he turned toward George with a queer frown between his eyes.

The buzzing stopped.

George said breathlessly, "Is it over?"

The doctor said, "Yes," but he was still frowning.

"Can I read now?" asked George. He felt no different.

The doctor said, "What?" then smiled very suddenly and briefly. He said, "It works fine, George. You'll be reading in fifteen minutes. Now we're going to use another machine this time and it will take longer. I'm going to cover your whole head, and when I turn it on you won't be able to see or hear anything for a while, but it won't hurt. Just

to make sure I'm going to give you a little switch to hold in your hand. If anything hurts, you press the little button and everything shuts off. All right?"

In later years, George was told that the little switch was strictly a dummy; that it was introduced solely for confidence. He never did know for sure, however, since he never pushed the button.

A large smoothly curved helmet with a rubbery inner lining was placed over his head and left there. Three or four little knobs seemed to grab at him and bite into his skull, but there was only a little pressure that faded. No pain.

The doctor's voice sounded dimly. "Everything all right, George?"

And then, with no real warning, a layer of thick felt closed down all about him. He was disembodied, there was no sensation, no universe, only himself and a distant murmur at the very ends of nothingness telling him something—telling him—telling him—

He strained to hear and understand but there was all that thick felt between.

Then the helmet was taken off his head, and the light was so bright that it hurt his eyes while the doctor's voice drummed at his ears.

The doctor said, "Here's your card, George. What does it say?"

George looked at his card again and gave out a strangled shout. The marks weren't just marks at all. They made up words. They were words just as clearly as though something were whispering them in his ears. He could *hear* them being whispered as he looked at them.

"What does it say, George?"

"It says—it says—'Platen, George. Born 13 February 6492 of Peter and Amy Platen in . . .'" He broke off.

"You can read, George," said the doctor. "It's all over."

"For good? I won't forget how?"

"Of course not." The doctor leaned over to shake hands gravely. "You will be taken home now."

It was days before George got over this new and great talent of his. He read for his father with such facility that Platen, Senior, wept and called relatives to tell the good news.

George walked about town, reading every scrap of printing he could find and wondering how it was that none of it had ever made sense to him before.

He tried to remember how it was not to be able to read and he couldn't. As far as his feeling about it was concerned, he had always been able to read. Always.

* * *

At eighteen, George was rather dark, of medium height, but thin enough to look taller. Trevelyan, who was scarcely an inch shorter, had a stockiness of build that made "Stubby" more than ever appropriate, but in this last year he had grown self-conscious. The nickname could no longer be used without reprisal. And since Trevelyan disapproved of his proper first name even more strongly, he was called Trevelyan or any decent variant of that. As though to prove his manhood further, he had most persistently grown a pair of sideburns and a bristly mustache.

He was sweating and nervous now, and George, who had himself grown out of "Jaw-jee" and into the curt monosyllabic gutturality of "George," was rather amused by that.

They were in the same large hall they had been in ten years before (and not since). It was as if a vague dream of the past had come to sudden reality. In the first few minutes George had been distinctly surprised at finding everything seem smaller and more cramped than his memory told him; then he made allowance for his own growth.

The crowd was smaller than it had been in childhood. It was exclusively male this time. The girls had another day assigned them.

Trevelyan leaned over to say, "Beats me the way they make you wait."

"Red tape," said George. "You can't avoid it."

Trevelyan said, "What makes *you* so damned tolerant about it?"

"I've got nothing to worry about."

"Oh, brother, you make me sick. I hope you end up Registered Manure Spreader just so I can see your face when you do." His somber eyes swept the crowd anxiously.

George looked about, too. It wasn't quite the system they used on the children. Matters went slower, and instructions had been given out at the start in print (an advantage over the pre-Readers). The names Platen and Trevelyan were well down the alphabet still, but this time the two knew it.

Young men came out of the education rooms, frowning and uncomfortable, picked up their clothes and belongings, then went off to analysis to learn the results.

Each, as he came out, would be surrounded by a clot of the thinning crowd. "How was it?" "How'd it feel?" "Whatcha think ya made?" "Ya feel any different?"

Answers were vague and noncommittal.

George forced himself to remain out of those clots. You only raised your own blood pressure. Everyone said you stood the best chance if you remained calm. Even so, you could feel the palms of your hands grow cold. Funny that new tensions came with the years.

For instance, high-specialty professionals heading out for an Outworld were accompanied by a wife (or husband). It was important to keep the sex ratio in good balance on all worlds. And if you were going out to a Grade A world, what girl would refuse you? George had no specific girl in mind yet; he wanted none. Not now! Once he made Programmer; once he could add to his name, Registered Computer Programmer, he could take his pick, like a sultan in a harem. The thought excited him and he tried to put it away. Must stay calm.

Trevelyan muttered, "What's it all about anyway? First they say it works best if you're relaxed and at ease. Then they put you through this and make it impossible for you to be relaxed and at ease."

"Maybe that's the idea. They're separating the boys from the men to begin with. Take it easy, Trev."

"Shut up."

George's turn came. His name was not called. It appeared in glowing letters on the notice board.

He waved at Trevelyan. "Take it easy. Don't let it get you."

He was happy as he entered the testing chamber. Actually happy.

* * *

The man behind the desk said, "George Platen?"

For a fleeting instant there was a razor-sharp picture in George's mind of another man, ten years earlier, who had asked the same question, and it was almost as though

this were the same man and he, George, had turned eight again as he had stepped across the threshold.

But the man looked up and, of course, the face matched that of the sudden memory not at all. The nose was bulbous, the hair thin and stringy, and the chin wattled as though its owner had once been grossly overweight and had reduced.

The man behind the desk looked annoyed. "Well?"

George came to Earth. "I'm George Platen, sir."

"Say so, then. I'm Dr. Zachary Antonelli, and we're going to be intimately acquainted in a moment."

He stared at small strips of film, holding them up to the light owlishly.

George winced inwardly. Very hazily, he remembered that other doctor (he had forgotten the name) staring at such film. Could these be the same? The other doctor had frowned and this one was looking at him now as though he were angry.

His happiness was already just about gone.

Dr. Antonelli spread the pages of a thickish file before him now and put the films carefully to one side. "It says here you want to be a Computer Programmer."

"Yes, doctor."

"Still do?"

"Yes, sir."

"It's a responsible and exacting position. Do you feel up to it?"

"Yes, sir."

"Most pre-Educates don't put down any specific profession. I believe they are afraid of queering it."

"I think that's right, sir."

"Aren't you afraid of that?"

"I might as well be honest, sir."

Dr. Antonelli nodded, but without any noticeable lightening of his expression. "Why do you want to be a Programmer?"

"It's a responsible and exacting position as you said, sir. It's an important job and an exciting one. I like it and I think I can do it."

Dr. Antonelli put the papers away, and looked at George sourly. He said, "How do you know you like it? Because you think you'll be snapped up by some Grade A planet?"

George thought uneasily: He's trying to rattle you. Stay calm and stay frank.

He said, "I think a Programmer has a good chance, sir, but even if I were left on Earth, I know I'd like it." (That was true enough. I'm not lying, thought George.)

"All right, how do you know?"

He asked it as though he knew there was no decent answer and George almost smiled. He had one.

He said, "I've been reading about Programming, sir."

"You've been *what?*" Now the doctor looked genuinely astonished and George took pleasure in that.

"Reading about it, sir. I bought a book on the subject and I've been studying it."

"A book for Registered Programmers?"

"Yes, sir."

"But you couldn't understand it."

"Not at first. I got other books on mathematics and electronics. I made out all I could. I still don't know much, but I know enough to know I like it and to know I can make it." (Even his parents never found that secret cache of books or knew why he spent so much time in his own room or exactly what happened to the sleep he missed.)

The doctor pulled at the loose skin under his chin. "What was your idea in doing that, son?"

"I wanted to make sure I would be interested, sir."

"Surely you know that being interested means nothing. You could be devoured by a subject and if the physical make-up of your brain makes it more efficient for you to be something else, something else you will be. You know that, don't you?"

"I've been told that," said George cautiously.

"Well, believe it. It's true."

George said nothing.

Dr. Antonelli said, "Or do you believe that studying some subject will bend the brain cells in that direction, like that other theory that a pregnant woman need only listen to great music persistently to make a composer of her child. Do you believe that?"

George flushed. That had certainly been in his mind. By forcing his intellect constantly in the desired direction, he had felt sure that he would be getting a head start. Most of his confidence had rested on exactly that point.

"I never—" he began, and found no way of finishing.

"Well, it isn't true. Good Lord, youngster, your brain pattern is fixed at birth. It can be altered by a blow hard enough to damage the cells or by a burst blood vessel or by a tumor or by a major infection—each time, of course, for the worse. But it certainly can't be affected by your thinking special thoughts." He stared at George thoughtfully, then said, "Who told you to do this?"

George, now thoroughly disturbed, swallowed and said, "No one, doctor. My own idea."

"Who knew you were doing it after you started?"

"No one. Doctor, I meant to do no wrong."

"Who said anything about wrong? Useless is what I would say. Why did you keep it to yourself?"

"I—I thought they'd laugh at me." (He thought abruptly of a recent exchange with Trevelyan. George had very cautiously broached the thought, as of something merely circulating distantly in the very outermost reaches of his mind, concerning the possibility of learning something by ladling it into the mind by hand, so to speak, in bits and pieces. Trevelyan had hooted, "George, you'll be tanning your own shoes next and weaving your own shirts." He had been thankful then for his policy of secrecy.)

Dr. Antonelli shoved the bits of film he had first looked at from position to position in morose thought. Then he said, "Let's get you analyzed. This is getting me nowhere."

The wires went to George's temples. There was the buzzing. Again there came a sharp memory of ten years ago.

George's hands were clammy; his heart pounded. He should never have told the doctor about his secret reading.

It was his damned vanity, he told himself. He had wanted to show how enterprising he was, how full of initiative. Instead, he had showed himself superstitious and ignorant and aroused the hostility of the doctor. (He could tell the doctor hated him for a wise guy on the make.)

And now he had brought himself to such a state of nervousness, he was sure the analyzer would show nothing that made sense.

He wasn't aware of the moment when the wires were removed from his temples. The sight of the doctor, staring at him thoughtfully, blinked into his consciousness and that was that; the wires were gone. George dragged himself together with a tearing

effort. He had quite given up his ambition to be a Programmer. In the space of ten minutes, it had all gone.

He said dismally, "I suppose no?"

"No what?"

"No Programmer?"

The doctor rubbed his nose and said, "You get your clothes and whatever belongs to you and go to room 15-C. Your files will be waiting for you there. So will my report."

George said in complete surprise, "Have I been Educated already? I thought this was just to—"

Dr. Antonelli stared down at his desk. "It will all be explained to you. You do as I say."

George felt something like panic. What was it they couldn't tell him? He wasn't fit for anything but Registered Laborer. They were going to prepare him for that; adjust him to it.

He was suddenly certain of it and he had to keep from screaming by main force.

He stumbled back to his place of waiting. Trevelyan was not there, a fact for which he would have been thankful if he had had enough self-possession to be meaningfully aware of his surroundings. Hardly anyone was left, in fact, and the few who were looked as though they might ask him questions were it not that they were too worn out by their tail-of-the-alphabet waiting to buck the fierce, hot look of anger and hate he cast at them.

What right had *they* to be technicians and he, himself, a Laborer? Laborer! He was *certain!*

* * *

He was led by a red-uniformed guide along the busy corridors lined with separate rooms each containing its groups, here two, there five: the Motor Mechanics, the Construction Engineers, the Agronomists— There were hundreds of specialized Professions and most of them would be represented in this small town by one or two anyway.

He hated them all just then: the Statisticians, the Accountants, the lesser breeds and the higher. He hated them because they owned their smug knowledge now, knew their fate, while he himself, empty still, had to face some kind of further red tape.

He reached 15-C, was ushered in and left in an empty room. For one moment, his spirits bounded. Surely, if this were the Labor classification room, there would be dozens of youngsters present.

A door sucked into its recess on the other side of a waist-high partition and an elderly, white-haired man stepped out. He smiled and showed even teeth that were obviously false, but his face was still ruddy and unlined and his voice had vigor.

He said, "Good evening, George. Our own sector has only one of you this time, I see."

"Only one?" said George blankly.

"Thousands over the Earth, of course. Thousands. You're not alone."

George felt exasperated. He said, "I don't understand, sir. What's my classification? What's happening?"

"Easy, son. You're all right. It could happen to anyone." He held out his hand and George took it mechanically. It was warm and it pressed George's hand firmly. "Sit down, son. I'm Sam Ellenford."

George nodded impatiently. "I want to know what's going on, sir."

"Of course. To begin with, you can't be a Computer Programmer, George. You've guessed that, I think."

"Yes, I have," said George bitterly. "What will I be, then?"

"That's the hard part to explain, George." He paused, then said with careful distinctness, "Nothing."

"*What!*"

"Nothing!"

"But what does that mean? Why can't you assign me a profession?"

"We have no choice in the matter, George. It's the structure of your mind that decides that."

George went a sallow yellow. His eyes bulged. "There's something wrong with my mind?"

"There's *something* about it. As far as professional classification is concerned, I suppose you can call it wrong."

"But why?"

Ellenford shrugged. "I'm sure you know how Earth runs its Educational program, George. Practically any human being can absorb practically any body of knowledge, but each individual brain pattern is better suited to receiving some types of knowledge than others. We try to match mind to knowledge as well as we can within the limits of the quota requirements for each profession."

George nodded. "Yes, I know."

"Every once in a while, George, we come up against a young man whose mind is not suited to receiving a superimposed knowledge of any sort."

"You mean I can't be Educated?"

"That is what I mean."

"But that's crazy. I'm intelligent. I can understand—" He looked helplessly about as though trying to find some way of proving that he had a functioning brain.

"Don't misunderstand me, please," said Ellenford gravely. "You're intelligent. There's no question about that. You're even above average in intelligence. Unfortunately that has nothing to do with whether the mind ought to be allowed to accept superimposed knowledge or not. In fact, it is almost always the intelligent person who comes here."

"You mean I can't even be a Registered Laborer?" babbled George. Suddenly even that was better than the blank that faced him. "What's there to know to be a Laborer?"

"Don't underestimate the Laborer, young man. There are dozens of subclassifications and each variety has its own corpus of fairly detailed knowledge. Do you think there's no skill in knowing the proper manner of lifting a weight? Besides, for the Laborer, we must select not only minds suited to it, but bodies as well. You're not the type, George, to last long as a Laborer."

George was conscious of his slight build. He said, "But I've never heard of anyone without a profession."

"There aren't many," conceded Ellenford. "And we protect them."

"Protect them?" George felt confusion and fright grow higher inside him.

"You're a ward of the planet, George. From the time you walked through that door, we've been in charge of you." And he smiled.

It was a fond smile. To George it seemed the smile of ownership; the smile of a grown man for a helpless child.

He said, "You mean, I'm going to be in prison?"

"Of course not. You will simply be with others of your kind."

Your kind. The words made a kind of thunder in George's ear.

Ellenford said, "You need special treatment. We'll take care of you."

To George's own horror, he burst into tears. Ellenford walked to the other end of the room and faced away as though in thought.

George fought to reduce the agonized weeping to sobs and then to strangle those. He thought of his father and mother, of his friends, of Trevelyan, of his own shame—

He said rebelliously, "I learned to read."

"Everyone with a whole mind can do that. We've never found exceptions. It is at this stage that we discover—exceptions. And when you learned to read, George, we were concerned about your mind pattern. Certain peculiarities were reported even then by the doctor in charge."

"Can't you try Educating me? You haven't even tried. I'm willing to take the risk."

"The law forbids us to do that, George. But look, it will not be bad. We will explain matters to your family so they will not be hurt. At the place to which you'll be taken, you'll be allowed privileges. We'll get you books and you can learn what you will."

"Dab knowledge in by hand," said George bitterly. "Shred by shred. Then, when I die I'll know enough to be a Registered Junior Office Boy, Paper-Clip Division."

"Yet I understand you've already been studying books."

George froze. He was struck devastatingly by sudden understanding. "That's it . . ."

"What is?"

"That fellow Antonelli. He's knifing me."

"No, George. You're quite wrong."

"Don't tell me that." George was in an ecstasy of fury. "That lousy bastard is selling me out because he thought I was a little too wise for him. I read books and tried to get a head start toward programming. Well, what do you want to square things? Money? You won't get it. I'm getting out of here and when I finish broadcasting this—"

He was screaming.

Ellenford shook his head and touched a contact.

Two men entered on catfeet and got on either side of George. They pinned his arms to his sides. One of them used an air-spray hypodermic in the hollow of his right elbow and the hypnotic entered his vein and had an almost immediate effect.

His screams cut off and his head fell forward. His knees buckled and only the men on either side kept him erect as he slept.

* * *

They took care of George as they said they would; they were good to him and unfailingly kind—about the way, George thought, he himself would be to a sick kitten he had taken pity on.

They told him that he should sit up and take some interest in life; and then told him that most people who came there had the same attitude of despair at the beginning and that he would snap out of it.

He didn't even hear them.

Dr. Ellenford himself visited him to tell him that his parents had been informed that he was away on special assignment.

George muttered, "Do they know—"

Ellenford assured him at once, "We gave no details."

At first George had refused to eat. They fed him intravenously. They hid sharp objects and kept him under guard. Hali Omani came to be his roommate and his stolidity had a calming effect.

One day, out of sheer desperate boredom, George asked for a book. Omani, who himself read books constantly, looked up, smiling broadly. George almost withdrew the request then, rather than give any of them satisfaction, then thought: What do I care?

He didn't specify the book and Omani brought one on chemistry. It was in big print, with small words and many illustrations. It was for teen-agers. He threw the book violently against the wall.

That's what he would be always. A teen-ager all his life. A pre-Educate forever and special books would have to be written for him. He lay smoldering in bed, staring at the ceiling, and after an hour had passed, he got up sulkily, picked up the book, and began reading.

* * *

It took him a week to finish it and then he asked for another.

"Do you want me to take the first one back?" asked Omani.

George frowned. There were things in the book he had not understood, yet he was not so lost to shame as to say so.

But Omani said, "Come to think of it, you'd better keep it. Books are meant to be read and reread."

It was that same day that he finally yielded to Omani's invitation that he tour the place. He dogged at the Nigerian's feet and took in his surroundings with quick hostile glances.

The place was no prison certainly. There were no walls, no locked doors, no guards. But it was a prison in that the inmates had no place to go outside.

It was somehow good to see others like himself by the dozen. It was so easy to believe himself to be the only one in the world so—maimed.

He mumbled, "How many people here anyway?"

"Two hundred and five, George, and this isn't the only place of the sort in the world. There are thousands."

Men looked up as he passed, wherever he went; in the gymnasium, along the tennis courts; through the library (he had never in his life imagined books could exist in such numbers; they were stacked, actually stacked, along long shelves). They stared at him curiously and he returned the looks savagely. At least *they* were no better than he; no call for *them* to look at him as though he were some sort of curiosity.

Most of them were in their twenties. George said suddenly, "What happens to the older ones?"

Omani said, "This place specializes in the younger ones." Then, as though he suddenly recognized an implication in George's question that he had missed earlier, he shook his head gravely and said, "They're not put out of the way, if that's what you mean. There are other Houses for older ones."

"Who cares?" mumbled George, who felt he was sounding too interested and in danger of slipping into surrender.

"You might. As you grow older, you will find yourself in a House with occupants of both sexes."

That surprised George somehow. "Women, too?"

"Of course. Do you suppose women are immune to this sort of thing?"

George thought of that with more interest and excitement than he had felt for anything since before that day when— He forced his thought away from that.

Omani stopped at the doorway of a room that contained a small closed-circuit television set and a desk computer. Five or six men sat about the television. Omani said, "This is a classroom."

George said, "What's that?"

"The young men in there are being educated. Not," he added, quickly, "in the usual way."

"You mean they're cramming it in bit by bit."

"That's right. This is the way everyone did it in ancient times."

This was what they kept telling him since he had come to the House but what of it? Suppose there had been a day when mankind had not known the diatherm-oven. Did that mean he should be satisfied to eat meat raw in a world where others ate it cooked?

He said, "Why do they want to go through that bit-by-bit stuff?"

"To pass the time, George, and because they're curious."

"What good does it do them?"

"It makes them happier."

George carried that thought to bed with him.

The next day he said to Omani ungraciously, "Can you get me into a classroom where I can find out something about programming?"

Omani replied heartily, "Sure."

* * *

It was slow and he resented it. Why should someone have to explain something and explain it again? Why should he have to read and reread a passage, then stare at a mathematical relationship and not understand it at once? That wasn't how other people had to be.

Over and over again, he gave up. Once he refused to attend classes for a week.

But always he returned. The official in charge, who assigned reading, conducted the television demonstrations, and even explained difficult passages and concepts, never commented on the matter.

George was finally given a regular task in the gardens and took his turn in the various kitchen and cleaning details. This was represented to him as being an advance, but he wasn't fooled. The place might have been far more mechanized than it was, but they deliberately made work for the young men in order to give them the illusion of worth-while occupation, of usefulness. George wasn't fooled.

They were even paid small sums of money out of which they could buy certain specified luxuries or which they could put aside for a problematical use in a problematical old age. George kept his money in an open jar, which he kept on a closet shelf. He had no idea how much he had accumulated. Nor did he care.

He made no real friends though he reached the stage where a civil good day was in order. He even stopped brooding (or almost stopped) on the miscarriage of justice that had placed him there. He would go weeks without dreaming of Antonelli, of his gross nose and wattled neck, of the leer with which he would push George into a boiling quicksand and hold him under, till he woke screaming with Omani bending over him in concern.

Omani said to him on a snowy day in February, "It's amazing how you're adjusting."

But that was February, the thirteenth to be exact, his nineteenth birthday. March came, then April, and with the approach of May he realized he hadn't adjusted at all.

The previous May had passed unregarded while George was still in his bed, drooping and ambitionless. This May was different.

All over Earth, George knew, Olympics would be taking place and young men would be competing, matching their skills against one another in the fight for a place on a new world. There would be the holiday atmosphere, the excitement, the news reports, the self-contained recruiting agents from the worlds beyond space, the glory of victory or the consolations of defeat.

How much of fiction dealt with these motifs; how much of his own boyhood excitement lay in following the events of Olympics from year to year; how many of his own plans—

George Platen could not conceal the longing in his voice. It was too much to suppress. He said, "Tomorrow's the first of May. Olympics!"

And that led to his first quarrel with Omani and to Omani's bitter enunciation of the exact name of the institution in which George found himself.

Omani gazed fixedly at George and said distinctly, "A House for the Feeble-minded."

* * *

George Platen flushed. Feeble-minded!

He rejected it desperately. He said in a monotone, "I'm leaving." He said it on impulse. His conscious mind learned it first from the statement as he uttered it.

Omani, who had returned to his book, looked up. "What?"

George knew what he was saying now. He said it fiercely, "I'm leaving."

"That's ridiculous. Sit down, George, calm yourself."

"Oh, no. I'm here on a frame-up, I tell you. This doctor, Antonelli, took a dislike to me. It's the sense of power these petty bureaucrats have. Cross them and they wipe out your life with a stylus mark on some card file."

"Are you back to that?"

"And staying there till it's all straightened out. I'm going to get to Antonelli somehow, break him, force the truth out of him." George was breathing heavily and he felt feverish. Olympics month was here and he couldn't let it pass. If he did, it would be the final surrender and he would be lost for all time.

Omani threw his legs over the side of his bed and stood up. He was nearly six feet tall and the expression on his face gave him the look of a concerned Saint Bernard. He put his arm about George's shoulder, "If I hurt your feeling—"

George shrugged him off. "You just said what you thought was the truth, and I'm going to prove it isn't the truth, that's all. Why not? The door's open. There aren't any locks. No one ever said I couldn't leave. I'll just walk out."

"All right, but where will you go?"

"To the nearest air terminal, then to the nearest Olympics center. I've got money." He seized the open jar that held the wages he had put away. Some of the coins jangled to the floor.

"That will last you a week maybe. Then what?"

"By then I'll have things settled."

"By then you'll come crawling back here," said Omani earnestly, "with all the progress you've made to do over again. You're mad, George."

"Feeble-minded is the word you used before."

"Well, I'm sorry I did. Stay here, will you?"

"Are you going to try to stop me?"

Omani compressed his full lips. "No, I guess I won't. This is your business. If the only way you can learn is to buck the world and come back with blood on your face, go ahead. —Well, go ahead."

George was in the doorway now, looking back over his shoulder. "I'm going,"—he came back to pick up his pocket grooming set slowly—"I hope you don't object to my taking a few personal belongings."

Omani shrugged. He was in bed again reading, indifferent.

George lingered at the door again, but Omani didn't look up. George gritted his teeth, turned and walked rapidly down the empty corridor and out into the night-shrouded grounds.

He had expected to be stopped before leaving the grounds. He wasn't. He had stopped at an all-night diner to ask directions to an air terminal and expected the proprietor to call the police. That didn't happen. He summoned a skimmer to take him to the airport and the driver asked no questions.

Yet he felt no lift at that. He arrived at the airport sick at heart. He had not realized how the outer world would be. He was surrounded by professionals. The diner's proprietor had had his name inscribed on the plastic shell over the cash register. So and so, Registered Cook. The man in the skimmer had his license up, Registered Chauffeur. George felt the bareness of his name and experienced a kind of nakedness because of it; worse, he felt skinned. But no one challenged him. No one studied him suspiciously and demanded proof of professional rating.

George thought bitterly: Who would imagine any human being without one?

He bought a ticket to San Francisco on the 3 A.M. plane. No other plane for a sizable Olympics center was leaving before morning and he wanted to wait as little as possible. As it was, he sat huddled in the waiting room, watching for the police. They did not come.

He was in San Francisco before noon and the noise of the city struck him like a blow. This was the largest city he had ever seen and he had been used to silence and calm for a year and a half now.

Worse, it was Olympics month. He almost forgot his own predicament in his sudden awareness that some of the noise, excitement, confusion was due to that.

The Olympics boards were up at the airport for the benefit of the incoming travelers, and crowds jostled around each one. Each major profession had its own board. Each listed directions to the Olympics Hall where the contest for that day for that profession would be given; the individuals competing and their city of birth; the Outworld (if any) sponsoring it.

It was a completely stylized thing. George had read descriptions often enough in the newsprints and films, watched matches on television, and even witnessed a small Olympics in the Registered Butcher classification at the county seat. Even that, which had no conceivable Galactic implication (there was no Outworlder in attendance, of course) aroused excitement enough.

Partly, the excitement was caused simply by the fact of competition, partly by the spur of local pride (oh, when there was a hometown boy to cheer for, though he might be a complete stranger), and, of course, partly by betting. There was no way of stopping the last.

George found it difficult to approach the board. He found himself looking at the scurrying, avid onlookers in a new way.

There must have been a time when they themselves were Olympic material. What had *they* done? Nothing!

If they had been winners, they would be far out in the Galaxy somewhere, not stuck here on Earth. Whatever they were, their professions must have made them Earth-bait from the beginning; or else they had made themselves Earth-bait by inefficiency at whatever high-specialized professions they had had.

Now these failures stood about and speculated on the chances of newer and younger men. Vultures!

How he wished they were speculating on him.

He moved down the line of boards blankly, clinging to the outskirts of the groups about them. He had eaten breakfast on the strato and he wasn't hungry. He was afraid, though. He was in a big city during the confusion of the beginning of Olympics competition. That was protection, sure. The city was full of strangers. No one would question George. No one would care about George.

No one would care. Not even the House, thought George bitterly. They cared for him like a sick kitten, but if a sick kitten up and wanders off, well, too bad, what can you do?

And now that he was in San Francisco, what did he do? His thoughts struck blankly against a wall. See someone? Whom? How? Where would he even stay? The money he had left seemed pitiful.

The first shamefaced thought of going back came to him. He could go to the police— He shook his head violently as though arguing with a material adversary.

A word caught his eye on one of the boards, gleaming there: *Metallurgist.* In smaller letters, *nonferrous.* At the bottom of a long list of names, in flowing script, *sponsored by Novia.*

It induced painful memories: himself arguing with Trevelyan, so certain that he himself would be a Programmer, so certain that a Programmer was superior to a Metallurgist, so certain that he was following the right course, so certain that he was clever—

So clever that he had to boast to that small-minded, vindictive Antonelli. He had been so sure of himself that moment when he had been called and had left the nervous Trevelyan standing there, so cocksure.

George cried out in a short, incoherent high-pitched gasp. Someone turned to look at him, then hurried on. People brushed past impatiently pushing him this way and that. He remained staring at the board, openmouthed.

It was as though the board had answered his thought. He was thinking "Trevelyan" so hard that it had seemed for a moment that of course the board would say "Trevelyan" back at him.

But that *was* Trevelyan, up there. And *Armand* Trevelyan (Stubby's hated first name; up in lights for everyone to see) and the right hometown. What's more, Trev had wanted Novia, aimed for Novia, insisted on Novia; and this competition was sponsored by Novia.

This had to be Trev; good old Trev. Almost without thinking, he noted the directions for getting to the place of competition and took his place in line for a skimmer.

Then he thought somberly: Trev made it! He wanted to be a Metallurgist, and he made it!

George felt colder, more alone than ever.

* * *

There was a line waiting to enter the hall. Apparently, Metallurgy Olympics was to be an exciting and closely fought one. At least, the illuminated sky sign above the hall said so, and the jostling crowd seemed to think so.

It would have been a rainy day, George thought, from the color of the sky, but San Francisco had drawn the shield across its breadth from bay to ocean. It was an expense to do so, of course, but all expenses were warranted where the comfort of Outworlders was concerned. They would be in town for the Olympics. They were heavy spenders. And for each recruit taken, there would be a fee both to Earth and to the local government from the planet sponsoring the Olympics. It paid to keep Outworlders in mind of a particular city as a pleasant place in which to spend Olympics time. San Francisco knew what it was doing.

George, lost in thought, was suddenly aware of a gentle pressure on his shoulder blade and a voice saying, "Are you in line here, young man?"

The line had moved up without George's having noticed the widening gap. He stepped forward hastily and muttered, "Sorry, sir."

There was the touch of two fingers on the elbow of his jacket and he looked about furtively.

The man behind him nodded cheerfully. He had iron-gray hair, and under his jacket he wore an old-fashioned sweater that buttoned down the front. He said, "I didn't mean to sound sarcastic."

"No offense."

"All right, then." He sounded cozily talkative. "I wasn't sure you might not simply be standing there, entangled with the line, so to speak, only by accident. I thought you might be a—"

"A what?" said George sharply.

"Why, a contestant, of course. You look young."

George turned away. He felt neither cozy nor talkative, and bitterly impatient with busybodies.

A thought struck him. Had an alarm been sent out for him? Was his description known, or his picture? Was Gray-hair behind him trying to get a good look at his face?

He hadn't seen any news reports. He craned his neck to see the moving strip of news headlines parading across one section of the city shield, somewhat lackluster against the gray of the cloudy afternoon sky. It was no use. He gave up at once. The headlines would never concern themselves with him. This was Olympics time and the only news worth headlining was the comparative scores of the winners and the trophies won by continents, nations, and cities.

It would go on like that for weeks, with scores calculated on a per capita basis and every city finding some way of calculating itself into a position of honor. His own town had once placed third in an Olympics covering Wiring Technician; third in the whole state. There was still a plaque saying so in Town Hall.

George hunched his head between his shoulders and shoved his hands in his pocket and decided that made him more noticeable. He relaxed and tried to look unconcerned, and felt no safer. He was in the lobby now, and no authoritative hand had yet been laid on his shoulder. He filed into the hall itself and moved as far forward as he could.

It was with an unpleasant shock that he noticed Gray-hair next to him. He looked

away quickly and tried reasoning with himself. The man had been right behind him in line after all.

Gray-hair, beyond a brief and tentative smile, paid no attention to him and, besides, the Olympics was about to start. George rose in his seat to see if he could make out the position assigned to Trevelyan and at the moment that was all his concern.

* * *

The hall was moderate in size and shaped in the classical long oval, with the spectators in the two balconies running completely about the rim and the contestants in the linear trough down the center. The machines were set up, the progress boards above each bench were dark, except for the name and contest number of each man. The contestants themselves were on the scene, reading, talking together; one was checking his fingernails minutely. (It was, of course, considered bad form for any contestant to pay any attention to the problem before him until the instant of the starting signal.)

George studied the program sheet he found in the appropriate slot in the arm of his chair and found Trevelyan's name. His number was twelve and, to George's chagrin, that was at the wrong end of the hall. He could make out the figure of Contestant Twelve, standing with his hands in his pockets, back to his machine, and staring at the audience as though he were counting the house. George couldn't make out the face.

Still, that was Trev.

George sank back in his seat. He wondered if Trev would do well. He hoped, as a matter of conscious duty, that he would, and yet there was something within him that felt rebelliously resentful. George, professionless, here, watching. Trevelyan, Registered Metallurgist, Nonferrous, there, competing.

George wondered if Trevelyan had competed in his first year. Sometimes men did, if they felt particularly confident—or hurried. It involved a certain risk. However efficient the Educative process, a preliminary year on Earth ("oiling the stiff knowledge," as the expression went) insured a higher score.

If Trevelyan was repeating, maybe he wasn't doing so well. George felt ashamed that the thought pleased him just a bit.

He looked about. The stands were almost full. This would be a well-attended Olympics, which meant greater strain on the contestants—or greater drive, perhaps, depending on the individual.

Why Olympics, he thought suddenly? He had never known. Why was bread called bread?

Once he had asked his father: "Why do they call it Olympics, Dad?"

And his father had said: "Olympics means competition."

George had said: "Is when Stubby and I fight an Olympics, Dad?"

Platen, Senior, had said: "No. Olympics is a special kind of competition and don't ask silly questions. You'll know all you have to know when you get Educated."

George, back in the present, sighed and crowded down into his seat.

All you have to know!

Funny that the memory should be so clear now. "When you get Educated." No one ever said, "*If* you get Educated."

He always had asked silly questions, it seemed to him now. It was as though his mind had some instinctive foreknowledge of its inability to be Educated and had gone about asking questions in order to pick up scraps here and there as best it could.

And at the House they encouraged him to do so because they agreed with his mind's instinct. It was the only way.

He sat up suddenly. What the devil was he doing? Falling for that lie? Was it because Trev was there before him, an Educee, competing in the Olympics that he himself was surrendering?

He *wasn't* feeble-minded! *No!*

And the shout of denial in his mind was echoed by the sudden clamor in the audience as everyone got to his feet.

The box seat in the very center of one long side of the oval was filling with an entourage wearing the colors of Novia, and the word "Novia" went up above them on the main board.

Novia was a Grade A world with a large population and a thoroughly developed civilization, perhaps the best in the Galaxy. It was the kind of world that every Earthman wanted to live in someday; or, failing that, to see his children live in. (George remembered Trevelyan's insistence on Novia as a goal—and there he was competing for it.)

The lights went out in that section of the ceiling above the audience and so did the wall lights. The central trough, in which the contestants waited, became floodlit.

Again George tried to make out Trevelyan. Too far.

The clear, polished voice of the announcer sounded. "Distinguished Novian sponsors. Ladies. Gentlemen. The Olympics competition for Metallurgist, Nonferrous, is about to begin. The contestants are—"

Carefully and conscientiously, he read off the list in the program. Names. Home towns. Educative years. Each name received its cheers, the San Franciscans among them receiving the loudest. When Trevelyan's name was reached, George surprised himself by shouting and waving madly. The gray-haired man next to him surprised him even more by cheering likewise.

George could not help but stare in astonishment and his neighbor leaned over to say (speaking loudly in order to be heard over the hubbub), "No one here from my home town; I'll root for yours. Someone you know?"

George shrank back. "No."

"I noticed you looking in that direction. Would you like to borrow my glasses?"

"No. Thank you." (Why didn't the old fool mind his own business?)

The announcer went on with other formal details concerning the serial number of the competition, the method of timing and scoring and so on. Finally, he approached the meat of the matter and the audience grew silent as it listened.

"Each contestant will be supplied with a bar of nonferrous alloy of unspecified composition. He will be required to sample and assay the bar, reporting all results correctly to four decimals in per cent. All will utilize for this purpose a Beeman Microspectrograph, Model FX-2, each of which is, at the moment, not in working order."

There was an appreciative shout from the audience.

"Each contestant will be required to analyze the fault of his machine and correct it. Tools and spare parts are supplied. The spare part necessary may not be present, in which case it must be asked for, and time of delivery thereof will be deducted from final time. Are all contestants ready?"

The board above Contestant Five flashed a frantic red signal. Contestant Five ran off the floor and returned a moment later. The audience laughed good-naturedly.

"Are all contestants ready?"

The boards remained blank.

"Any questions?"

Still blank.

"You may begin."

* * *

There was, of course, no way anyone in the audience could tell how any contestant was progressing except for whatever notations went up on the notice board. But then, that didn't matter. Except for what professional Metallurgists there might be in the audience, none would understand anything about the contest professionally in any case. What was important was who won, who was second, who was third. For those who had bets on the standings (illegal, but unpreventable) that was all-important. Everything else might go hang.

George watched as eagerly as the rest, glancing from one contestant to the next, observing how this one had removed the cover from his microspectrograph with deft strokes of a small instrument; how that one was peering into the face of the thing; how still a third was setting his alloy bar into its holder; and how a fourth adjusted a vernier with such small touches that he seemed momentarily frozen.

Trevelyan was as absorbed as the rest. George had no way of telling how he was doing.

The notice board over Contestant Seventeen flashed: Focus plate out of adjustment.

The audience cheered wildly.

Contestant Seventeen might be right and he might, of course, be wrong. If the latter, he would have to correct his diagnosis later and lose time. Or he might never correct his diagnosis and be unable to complete his analysis or, worse still, end with a completely wrong analysis.

Never mind. For the moment, the audience cheered.

Other boards lit up. George watched for Board Twelve. That came on finally: "Sample holder off-center. New clamp depresser needed."

An attendant went running to him with a new part. If Trevelyan was wrong, it would mean useless delay. Nor would the time elapsed in waiting for the part be deducted. George found himself holding his breath.

Results were beginning to go up on Board Seventeen, in gleaming letters: aluminum, 41.2649; magnesium, 22.1914; copper, 10.1001.

Here and there, other boards began sprouting figures.

The audience was in bedlam.

George wondered how the contestants could work in such pandemonium, then wondered if that were not even a good thing. A first-class technician should work best under pressure.

Seventeen rose from his place as his board went red-rimmed to signify completion. Four was only two seconds behind him. Another, then another.

Trevelyan was still working, the minor constituents of his alloy bar still unreported. With nearly all contestants standing, Trevelyan finally rose, also. Then, tailing off, Five rose, and received an ironic cheer.

It wasn't over. Official announcements were naturally delayed. Time elapsed was something, but accuracy was just as important. And not all diagnoses were of equal difficulty. A dozen factors had to be weighed.

Finally, the announcer's voice sounded, "Winner in the time of four minutes and twelve seconds, diagnosis correct, analysis correct within an average of zero point seven parts per hundred thousand, Contestant Number—*Seventeen*, Henry Anton Schmidt of—"

What followed was drowned in the screaming. Number Eight was next and then Four, whose good time was spoiled by a five part in ten thousand error in the niobium figure. Twelve was never mentioned. He was an also-ran.

George made his way through the crowd to the Contestant's Door and found a large clot of humanity ahead of him. There would be weeping relatives (joy or sorrow, depending) to greet them, newsmen to interview the top-scorers, or the home-town boys, autograph hounds, publicity seekers and the just plain curious. Girls, too, who might hope to catch the eye of a top-scorer, almost certainly headed for Novia (or perhaps a low-scorer who needed consolation and had the cash to afford it).

George hung back. He saw no one he knew. With San Francisco so far from home, it seemed pretty safe to assume that there would be no relatives to condole with Trev on the spot.

Contestants emerged, smiling weakly, nodding at shouts of approval. Policemen kept the crowds far enough away to allow a lane for walking. Each high-scorer drew a portion of the crowd off with him, like a magnet pushing through a mound of iron filings.

When Trevelyan walked out, scarcely anyone was left. (George felt somehow that he had delayed coming out until just that had come to pass.) There was a cigarette in his dour mouth and he turned, eyes downcast, to walk off.

It was the first hint of home George had had in what was almost a year and a half and seemed almost a decade and a half. He was almost amazed that Trevelyan hadn't aged, that he was the same Trev he had last seen.

George sprang forward. *"Trev!"*

Trevelyan spun about, astonished. He stared at George and then his hand shot out. "George Platen, *what* the devil—"

And almost as soon as the look of pleasure had crossed his face, it left. His hand dropped before George had quite the chance of seizing it.

"Were you in there?" A curt jerk of Trev's head indicated the hall.

"I was."

"To see me?"

"Yes."

"Didn't do so well, did I?" He dropped his cigarette and stepped on it, staring off to the street, where the emerging crowd was slowly eddying and finding its way into skimmers, while new lines were forming for the next scheduled Olympics.

Trevelyan said heavily, "So what? It's only the second time I missed. Novia can go shove after the deal I got today. There are planets that would jump at me fast enough— But, listen, I haven't seen you since Education Day. Where did you go? Your folks said you were on special assignment but gave no details and you never wrote. You might have written."

"I should have," said George uneasily. "Anyway, I came to say I was sorry the way things went just now."

"Don't be," said Trevelyan. "I told you. Novia can go shove— At least that I should have known. They've been saying for weeks that the Beeman machine would be used. All the wise money was on Beeman machines. The damned Education tapes they ran through me were for Henslers and who uses Henslers? The worlds in the Goman

Cluster if you want to call them worlds. Wasn't *that* a nice deal they gave me?"

"Can't you complain to—"

"Don't be a fool. They'll tell my my brain was built for Henslers. Go argue. *Everything* went wrong. I was the only one who had to send out for a piece of equipment. Notice that?"

"They deducted the time for that, though."

"Sure, but I lost time wondering if I could be right in my diagnosis when I noticed there wasn't any clamp depresser in the parts they had supplied. They don't deduct for that. If it had been a Hensler, I would have *known* I was right. How could I match up then? The top winner was a San Franciscan. So were three of the next four. And the fifth guy was from Los Angeles. They get big-city Educational tapes. The best available. Beeman spectrographs and all. How do I compete with them? I came all the way out here just to get a chance at a Novian-sponsored Olympics in my classification and I might just as well have stayed home. I knew it, I tell you, and that settles it. Novia isn't the only chunk of rock in space. Of all the damned—"

He wasn't speaking to George. He wasn't speaking to anyone. He was just uncorked and frothing. George realized that.

George said, "If you knew in advance that the Beemans were going to be used, couldn't you have studied up on them?"

"They weren't in my tapes, I tell you."

"You could have read—books."

The last word had tailed off under Trevelyan's suddenly sharp look.

Trevelyan said, "Are you trying to make a big laugh out of this? You think this is funny? How do you expect me to read some book and try to memorize enough to match someone else who *knows*."

"I thought—"

"You try it. You try—" Then, suddenly, "What's your profession, by the way?" He sounded thoroughly hostile.

"Well—"

"Come on, now. If you're going to be a wise guy with me, let's see what you've done. You're still on Earth, I notice, so you're not a Computer Programmer and your special assignment can't be much."

George said, "Listen, Trev, I'm late for an appointment." He backed away, trying to smile.

"No, you don't." Trevelyan reached out fiercely, catching hold of George's jacket. "You answer my question. Why are you afraid to tell me? What is it with you? Don't come here rubbing a bad showing in my face, George, unless you can take it, too. Do you hear me?"

He was shaking George in frenzy and they were struggling and swaying across the floor, when the Voice of Doom struck George's ear in the form of a policeman's outraged call.

"All right now. *All* right. Break it up."

George's heart turned to lead and lurched sickeningly. The policeman would be taking names, asking to see identity cards, and George lacked one. He would be questioned and his lack of profession would show at once; and before Trevelyan, too, who ached with the pain of the drubbing he had taken and would spread the news back home as a salve for his own hurt feelings.

George couldn't stand that. He broke away from Trevelyan and made to run, but the policeman's heavy hand was on his shoulder. "Hold on, there. Let's see your identity card."

Trevelyan was fumbling for his, saying harshly, "I'm Armand Trevelyan, Metallurgist, Nonferrous. I was just competing in the Olympics. You better find out about him, though, officer."

George faced the two, lips dry and throat thickened past speech.

Another voice sounded, quiet, well-mannered. "Officer. One moment."

The policeman stepped back. "Yes, sir?"

"This young man is my guest. What is the trouble?"

George looked about in wild surprise. It was the gray-haired man who had been sitting next to him. Gray-hair nodded benignly at George.

Guest? Was he mad?

The policeman was saying, "These two were creating a disturbance, sir."

"Any criminal charges? Any damages?"

"No, sir."

"Well, then, I'll be responsible." He presented a small card to the policeman's view and the latter stepped back at once.

Trevelyan began indignantly, "Hold on, now—" but the policeman turned on him.

"All right, now. Got any charges?"

"I just—"

"On your way. The rest of you—move on." A sizable crowd had gathered, which now, reluctantly, unknotted itself and raveled away.

George let himself be led to a skimmer but balked at entering.

He said, "Thank you, but I'm not your guest." (Could it be a ridiculous case of mistaken identity?)

But Gray-hair smiled and said, "You weren't but you are now. Let me introduce myself, I'm Ladislas Ingenescu, Registered Historian."

"But—"

"Come, you will come to no harm, I assure you. After all, I only wanted to spare you some trouble with a policeman."

"But why?"

"Do you want a reason? Well, then, say that we're honorary towns-mates, you and I. We both shouted for the same man, remember, and we townspeople must stick together, even if the tie is only honorary. Eh?"

And George, completely unsure of this man, Ingenescu, and of himself as well, found himself inside the skimmer. Before he could make up his mind that he ought to get off again, they were off the ground.

He thought confusedly: The man has some status. The policeman deferred to him.

He was almost forgetting that his real purpose here in San Francisco was not to find Trevelyan but to find some person with enough influence to force a reappraisal of his own capacity of Education.

It could be that Ingenescu was such a man. And right in George's lap.

Everything could be working out fine—fine. Yet it sounded hollow in his thought. He was uneasy.

* * *

During the short skimmer-hop, Ingenescu kept up an even flow of small-talk, pointing out the landmarks of the city, reminiscing about past Olympics he had seen. George, who paid just enough attention to make vague sounds during the pauses, watched the route of flight anxiously.

Would they head for one of the shield-openings and leave the city altogether?

No, they headed downward, and George sighed his relief softly. He felt safer in the city.

The skimmer landed at the roof-entry of a hotel and, as he alighted, Ingenescu said, "I hope you'll eat dinner with me in my room?"

George said, "Yes," and grinned unaffectedly. He was just beginning to realize the gap left within him by a missing lunch.

Ingenescu let George eat in silence. Night closed in and the wall lights went on automatically. (George thought: I've been on my own almost twenty-four hours.)

And then over the coffee, Ingenescu finally spoke again. He said, "You've been acting as though you think I intend you harm."

George reddened, put down his cup and tried to deny it, but the older man laughed and shook his head.

"It's so. I've been watching you closely since I first saw you and I think I know a great deal about you now."

George half rose in horror.

Ingenescu said, "But sit down. I only want to help you."

George sat down but his thoughts were in a whirl. If the old man knew who he was, why had he not left him to the policeman? On the other hand, why should he volunteer help?

Ingenescu said, "You want to know why I should want to help you? Oh, don't look alarmed. I can't read minds. It's just that my training enables me to judge the little reactions that give minds away, you see. Do you understand that?"

George shook his head.

Ingenescu said, "Consider my first sight of you. You were waiting in line to watch an Olympics, and your micro-reactions didn't match what you were doing. The expression of your face was wrong, the action of your hands was wrong. It meant that something, in general, was wrong, and the interesting thing was that, whatever it was, it was nothing common, nothing obvious. Perhaps, I thought, it was something of which your own conscious mind was unaware.

"I couldn't help but follow you, sit next to you. I followed you again when you left and eavesdropped on the conversation between your friend and yourself. After that, well, you were far too interesting an object of study—I'm sorry if that sounds cold-blooded—for me to allow you to be taken off by a policeman. —Now tell me, what is it that troubles you?"

George was in an agony of indecision. If this was a trap, why should it be such an indirect, roundabout one? And he *had* to turn to someone. He had come to the city to find help and here was help being offered. Perhaps what was wrong was that it was being offered. It came too easy.

Ingenescu said, "Of course, what you tell me as a Social Scientist is a privileged communication. Do you know what that means?"

"No, sir."

"It means, it would be dishonorable for me to repeat what you say to anyone for any purpose. Moreover no one has the legal right to compel me to repeat it."

George said, with sudden suspicion, "I thought you were a Historian."

"So I am."

"Just now you said you were a Social Scientist."

Ingenescu broke into loud laughter and apologized for it when he could talk. "I'm sorry, young man, I shouldn't laugh, and I wasn't really laughing at you. I was laughing

at Earth and its emphasis on physical science, and the practical segments of it at that. I'll bet you can rattle off every subdivision of construction technology or mechanical engineering and yet you're a blank on social science."

"Well, then what *is* social science?"

"Social science studies groups of human beings and there are many high-specialized branches to it, just as there are to zoology, for instance. For instance, there are Culturists, who study the mechanics of cultures, their growth, development, and decay. Cultures," he added, forestalling a question, "are all the aspects of a way of life. For instance it includes the way we make our living, the things we enjoy and believe, what we consider good and bad and so on. Do you understand?"

"I think I do."

"An Economist—not an Economic Statistician, now, but an Economist—specializes in the study of the way a culture supplies the bodily needs of its individual members. A Psychologist specializes in the individual member of a society and how he is affected by the society. A Futurist specializes in planning the future course of a society, and a Historian— That's where I come in, now."

"Yes, sir."

"A Historian specializes in the past development of our own society and of societies with other cultures."

George found himself interested. "Was it different in the past?"

"I should say it was. Until a thousand years ago, there was no Education; not what we call Education, at least."

George said, "I know. People learned in bits and pieces out of books."

"Why, how do you know this?"

"I've heard it said," said George cautiously. Then, "Is there any use in worrying about what's happened long ago? I mean, it's all done with, isn't it?"

"It's never done with, my boy. The past explains the present. For instance, why is our Educational system what it is?"

George stirred restlessly. The man kept bringing the subject back to that. He said snappishly, "Because it's best."

"Ah, but why is it best? Now you listen to me for one moment and I'll explain. Then you can tell me if there is any use in history. Even before interstellar travel was developed—" He broke off at the look of complete astonishment on George's face. "Well, did you think we always had it?"

"I never gave it any thought, sir."

"I'm sure you didn't. But there was a time, four or five thousand years ago when mankind was confined to the surface of Earth. Even then, his culture had grown quite technological and his numbers had increased to the point where any failure in technology would have meant mass starvation and disease. To maintain the technological level and advance it in the face of an increasing population, more and more technicians and scientists had to be trained, and yet, as science advanced, it took longer and longer to train them.

"As first interplanetary and then intersteller travel was developed, the problem grew more acute. In fact, actual colonization of extra-Solar planets was impossible for about fifteen hundred years because of a lack of properly trained men.

"The turning point came when the mechanics of the storage of knowledge within the brain was worked out. Once that had been done, it became possible to devise Educational tapes that would modify the mechanics in such a way as to place within the mind a body of knowledge ready-made so to speak. But you know about *that*.

"Once that was done, trained men could be turned out by the thousands and millions, and we could begin what someone has since called the 'Filling of the Universe.' There are now fifteen hundred inhabited planets in the Galaxy and there is no end in sight.

"Do you see all that is involved? Earth exports Education tapes for low-specialized professions and that keeps the Galactic culture unified. For instance, the Reading tapes insure a single language for all of us. —Don't look so surprised, other languages are possible, and in the past were used. Hundreds of them.

"Earth also exports high-specialized professionals and keeps its own population at an endurable level. Since they are shipped out in a balanced sex ratio, they act as self-reproductive units and help increase the populations on the Outworlds where an increase is needed. Furthermore, tapes and men are paid for in material which we much need and on which our economy depends. *Now* do you understand why our Education is the best way?"

"Yes, sir."

"Does it help you to understand, knowing that without it, interstellar colonization was impossible for fifteen hundred years?"

"Yes, sir."

"Then you see the uses of history." The Historian smiled. "And now I wonder if you see why I'm interested in you?"

George snapped out of time and space back to reality. Ingenescu, apparently, didn't talk aimlessly. All this lecture had been a device to attack him from a new angle.

He said, once again withdrawn, hesitating. "Why?"

"Social Scientists work with societies and societies are made up of people."

"All right."

"But people aren't machines. The professionals in physical science work with machines. There is only a limited amount to know about a machine and the professionals know it all. Furthermore, all machines of a given sort are just about alike so that there is nothing to interest them in any given individual machine. But people, ah— They are so complex and so different one from another that a Social Scientist never knows all there is to know or even a good part of what there is to know. To understand his own specialty, he must always be ready to study people; particularly unusual specimens."

"Like me," said George tonelessly.

"I shouldn't call you a specimen, I suppose, but you are unusual. You're worth studying, and if you will allow me that privilege then, in return, I will help you if you are in trouble and if I can."

There were pin wheels whirring in George's mind. —All this talk about people and colonization made possible by Education. It was as though caked thoughts within him were being broken up and strewn about mercilessly.

He said, "Let me think," and clamped his hands over his ears.

He took them away and said to the Historian, "Will you do something for me, sir?"

"If I can," said the Historian amiably.

"And everything I say in this room is a privileged communication. You said so."

"And I meant it."

"Then get me an interview with an Outworld official, with—with a Novian."

Ingenescu looked startled. "Well, now—"

"You can do it," said George earnestly. "You're an important official. I saw the policeman's look when you put that card in front of his eyes. If you refuse, I—I won't let you study me."

It sounded a silly threat in George's own ears, one without force. On Ingenescu, however, it seemed to have a strong effect.

He said, "That's an impossible condition. A Novian in Olympics month—"

"All right, then, get me a Novian on the phone and I'll make my own arrangements for an interview."

"Do you think you can?"

"I know I can. Wait and see."

Ingenescu stared at George thoughtfully and then reached for the visiphone.

George waited, half drunk with this new outlook on the whole problem and the sense of power it brought. It couldn't miss. It *couldn't* miss. He would be a Novian yet. He would leave Earth in triumph despite Antonelli and the whole crew of fools at the House for the (he almost laughed aloud) Feeble-minded.

* * *

George watched eagerly as the visiplate lit up. It would open up a window into a room of Novians, a window into a small patch of Novia transplanted to Earth. In twenty-four hours, he had accomplished that much.

There was a burst of laughter as the plate unmisted and sharpened, but for the moment no single head could be seen but rather the fast passing of the shadows of men and women, this way and that. A voice was heard, clear-worded over a background of babble. "Ingenescu? He wants me?"

Then there he was, staring out of the plate. A Novian. A genuine Novian. (George had not an atom of doubt. There was something completely Outworldly about him. Nothing that could be completely defined, or even momentarily mistaken.)

He was swarthy in complexion with a dark wave of hair combed rigidly back from his forehead. He wore a thin black mustache and a pointed beard, just as dark, that scarcely reached below the lower limit of his narrow chin, but the rest of his face was so smooth that it looked as though it had been depilated permanently.

He was smiling. "Ladislas, this goes too far. We fully expect to be spied on, within reason, during our stay on Earth, but mind reading is out of bounds."

"Mind reading, Honorable?"

"Confess! You knew I was going to call you this evening. You knew I was only waiting to finish this drink." His hand moved up into view and his eye peered through a small glass of a faintly violet liqueur. "I can't offer you one, I'm afraid."

George, out of range of Ingenescu's transmitter could not be seen by the Novian. He was relieved at that. He wanted time to compose himself and he needed it badly. It was as though he were made up exclusively of restless fingers, drumming, drumming—

But he was right. He hadn't miscalculated. Ingenescu *was* important. The Novian called him by his first name.

Good! Things worked well. What George had lost on Antonelli, he would make up, with advantage, on Ingenescu. And someday, when he was on his own at last, and could come back to Earth as powerful a Novian as this one who could negligently joke with Ingenescu's first name and be addressed as "Honorable" in turn—when he came back, he would settle with Antonelli. He had a year and a half to pay back and he—

He all but lost his balance on the brink of the enticing daydream and snapped back in sudden anxious realization that he was losing the thread of what was going on.

The Novian was saying, "—doesn't hold water. Novia has a civilization as complicated and advanced as Earth's. We're not Zeston, after all. It's ridiculous that we have to come here for individual technicians."

Ingenescu said soothingly, "Only for new models. There is never any certainty that new models will be needed. To buy the Educational tapes would cost you the same price as a thousand technicians and how do you know you would need that many?"

The Novian tossed off what remained of his drink and laughed. (It displeased George, somehow, that a Novian should be this frivolous. He wondered uneasily if perhaps the Novian ought not to have skipped that drink and even the one or two before that.)

The Novian said, "That's typical pious fraud, Ladislas. You know we can make use of all the late models we can get. I collected five Metallurgists this afternoon—"

"I know," said Ingenescu. "I was there."

"Watching me! Spying!" cried the Novian. "I'll tell you what it is. The new-model Metallurgists I got differed from the previous model only in knowing the use of Beeman Spectrographs. The tapes couldn't be modified that much, not that much" (he held up two fingers close together) "from last year's model. You introduce the new models only to *make* us buy and spend and come here hat in hand."

"We don't *make* you buy."

"No, but you sell late-model technicians to Landonum and so we have to keep pace. It's a merry-go-round you have us on, you pious Earthmen, but watch out, there may be an exit somewhere." There was a sharp edge to his laugh, and it ended sooner than it should have.

Ingenescu said, "In all honesty, I hope there is. Meanwhile, as to the purpose of my call—"

"That's right, *you* called. Oh, well, I've said my say and I suppose next year there'll be a new model of Metallurgist anyway for us to spend goods on, probably with a new gimmick for niobium assays and nothing else altered and the next year— But go on, what is it you want?"

"I have a young man here to whom I wish you to speak."

"Oh?" The Novian looked not completely pleased with that. "Concerning what?"

"I can't say. He hasn't told me. For that matter he hasn't even told me his name and profession."

The Novian frowned. "Then why take up my time?"

"He seems quite confident that you will be interested in what he has to say."

"I dare say."

"And," said Ingenescu, "as a favor to me."

The Novian shrugged. "Put him on and tell him to make it short."

Ingenescu stepped aside and whispered to George, "Address him as 'Honorable.'"

George swallowed with difficulty. This was it.

* * *

George felt himself going moist with perspiration. The thought had come so recently, yet it was in him now so certainly. The beginnings of it had come when he had spoken to Trevelyan, then everything had fermented and billowed into shape while Ingenescu had prattled, and then the Novian's own remarks had seemed to nail it all into place.

George said, "Honorable, I've come to show you the exit from the merry-go-round." Deliberately, he adoped the Novian's own metaphor.

The Novian stared at him gravely. "What merry-go-round?"

"You yourself mentioned it, Honorable. The merry-go-round that Novia is on when you come to Earth to—to get technicians." (He couldn't keep his teeth from chattering; from excitement, not fear.)

The Novian said, "You're trying to say that you know a way by which we can avoid patronizing Earth's mental super-market. Is that it?"

"Yes, sir. You can control your own Educational system."

"Umm. Without tapes?"

"Y—yes, Honorable."

The Novian, without taking his eyes from George, called out, "Ingenescu, get into view."

The Historian moved to where he could be seen over George's shoulder.

The Novian said, "What is this? I don't seem to penetrate."

"I assure you solemnly," said Ingenescu, "that whatever this is it is being done on the young man's own initiative, Honorable. I have not inspired this. I have nothing to do with it."

"Well, then, what is the young man to you? Why do you call me on his behalf?"

Ingenescu said, "He is an object of study, Honorable. He has value to me and I humor him."

"What kind of value?"

"It's difficult to explain; a matter of my profession."

The Novian laughed shortly. "Well, to each his profession." He nodded to an invisible person or persons outside plate range. "There's a young man here, a protégé of Ingenescu or some such thing, who will explain to us how to Educate without tapes." He snapped his fingers, and another glass of pale liqueur appeared in his hand. "Well, young man?"

The faces on the plate were multiple now. Men and women, both, crammed in for a view of George, their faces molded into various shades of amusement and curiosity.

George tried to look disdainful. They were all, in their own ways, Novians as well as the Earthman, "studying" him as though he were a bug on a pin. Ingenescu was sitting in a corner, now, watching him owl-eyed.

Fools, he thought tensely, one and all. But they would have to understand. He would *make* them understand.

He said, "I was at the Metallurgist Olympics this afternoon."

"You, too?" said the Novian blandly. "It seems all Earth was there."

"No, Honorable, but I was. I had a friend who competed and who made out very badly because you were using the Beeman machines. His education had included only the Henslers, apparently an older model. You said the modification involved was slight." George held up two fingers close together in conscious mimicry of the other's previous gesture. "And my friend had known some time in advance that knowledge of the Beeman machines would be required."

"And what does that signify?"

"It was my friend's lifelong ambition to qualify for Novia. He already knew the Henslers. He had to know the Beemans to qualify and he knew that. To learn about the Beemans would have taken just a few more facts, a bit more data, a small amount of practice perhaps. With a life's ambition riding the scale, he might have managed this—"

"And where would he have obtained a tape for the additional facts and data? Or

has Education become a private matter for home study here on Earth?"

There was dutiful laughter from the faces in the background.

George said, "That's why he didn't learn, Honorable. He thought he needed a tape. He wouldn't even try without one, no matter what the prize. He refused to try without a tape."

"Refused, eh? Probably the type of fellow who would refuse to fly without a skimmer." More laughter and the Novian thawed into a smile and said, "The fellow is amusing. Go on. I'll give you another few moments."

George said tensely, "Don't think this is a joke. Tapes are actually bad. They teach too much; they're too painless. A man who learns that way doesn't know how to learn any other way. He's frozen into whatever position he's been taped. Now if a person *weren't* given tapes but were forced to learn by hand, so to speak, from the start; why, then he'd get the habit of learning, and continue to learn. Isn't that reasonable? Once he has the habit well developed he can be given just a small amount of tape-knowledge, perhaps, to fill in gaps or fix details. Then he can make further progress on his own. You can make Beeman Metallurgists out of your own Hensler Metallurgists in that way and not have to come to Earth for new models."

The Novian nodded and sipped at his drink. "And where does everyone get knowledge without tapes? From interstellar vacuum?"

"From books. By studying the instruments themselves. By *thinking*."

"Books? How does one understand books without Education?"

"Books are in words. Words can be understood for the most part. Specialized words can be explained by the technicians you already have."

"What about reading? Will you allow reading tapes?"

"Reading tapes are all right, I suppose, but there's no reason you can't learn to read the old way, too. At least in part."

The Novian said, "So that you can develop good habits from the start?"

"Yes, yes," George said gleefully. The man was beginning to understand.

"And what about mathematics?"

"That's the easiest of all, sir—Honorable. Mathematics is different from other technical subjects. It starts with certain simple principles and proceeds by steps. You can start with nothing and learn. It's practically designed for that. Then, once you know the proper types of mathematics, other technical books become quite understandable. Especially if you start with easy ones."

"Are there easy books?"

"Definitely. Even if there weren't, the technicians you now have can try to write easy books. Some of them might be able to put some of their knowledge into words and symbols."

"Good Lord," said the Novian to the men clustered about him. "The young devil has an answer for everything."

"I have. I have," shouted George. "Ask me."

"Have you tried learning from books yourself? Or is this just theory with you?"

George turned to look quickly at Ingenescu, but the Historian was passive. There was no sign of anything but gentle interest in his face.

George said, "I have."

"And do you find it works?"

"Yes, Honorable," said George eagerly. "Take me with you to Novia. I can set up a program and direct—"

"Wait, I have a few more questions. How long would it take, do you suppose, for

you to become a Metallurgist capable of handling a Beeman machine, supposing you started from nothing and did not use Educational tapes?"

George hesitated. "Well—years, perhaps."

"Two years? Five? Ten?"

"I can't say, Honorable."

"Well, there's a vital question to which you have no answer, have you? Shall we say five years? Does that sound reasonable to you?"

"I suppose so."

"All right. We have a technician studying metallurgy according to this method of yours for five years. He's no good to us during that time, you'll admit, but he must be fed and housed and paid all that time."

"But—"

"Let me finish. Then when he's done and can use the Beeman, five years have passed. Don't you suppose we'll have modified Beemans then which he *won't* be able to use?"

"But by then he'll be expert on learning. He could learn the new details necessary in a matter of days."

"So you say. And suppose this friend of yours, for instance, had studied up on Beemans on his own and managed to learn it; would he be as expert in its use as a competitor who had learned it off the tapes?"

"Maybe not—" began George.

"Ah," said the Novian.

"Wait, let *me* finish. Even if he doesn't know something as well, it's the ability to learn further that's important. He may be able to think up things, new things that no tape-Educated man would. You'll have a reservoir of original thinkers—"

"In your studying," said the Novian, "have you thought up any new things?"

"No, but I'm just one man and I haven't studied long—"

"Yes. —Well, ladies, gentlemen, have we been sufficiently amused?"

"Wait," cried George, in sudden panic. "I want to arrange a personal interview. There are things I can't explain over the visiphone. There are details—"

The Novian looked past George. "Ingenescu! I think I have done you your favor. Now, really, I have a heavy schedule tomorrow. Be well!"

The screen went blank.

* * *

George's hands shot out toward the screen, as though in a wild impulse to shake life back into it. He cried out, "He didn't believe me. He didn't believe me."

Ingenescu said, "No, George. Did you really think he would?"

George scarcely heard him. "But why not? It's all true. It's all so much to his advantage. No risk. I and a few men to work with— A dozen men training for years would cost less than one technician. —He was drunk! Drunk! He didn't understand."

George looked about breathlessly. "How do I get to him? I've got to. This was wrong. Shouldn't have used the visiphone. I need time. Face to face. How do I—"

Ingenescu said, "He won't see you, George. And if he did, he wouldn't believe you."

"He will, I tell you. When he isn't drinking. He—" George turned squarely toward the Historian and his eyes widened. "Why do you call me George?"

"Isn't that your name? George Platen?"

"You know me?"

"All about you."

George was motionless except for the breath pumping his chest wall up and down.

Ingenescu said, "I want to help you, George. I told you that. I've been studying you and I want to help you."

George screamed, "I don't need help. I'm not feeble-minded. The whole world is, but I'm not." He whirled and dashed madly for the door.

He flung it open and two policemen roused themselves suddenly from their guard duty and seized him.

For all George's straining, he could feel the hypo-spray at the fleshy point just under the corner of his jaw, and that was it. The last thing he remembered was the face of Ingenescu, watching with gentle concern.

* * *

George opened his eyes to the whiteness of a ceiling. He remembered what had happened. He remembered it distantly as though it had happened to somebody else. He stared at the ceiling till the whiteness filled his eyes and washed his brain clean, leaving room, it seemed, for new thought and new ways of thinking.

He didn't know how long he lay there so, listening to the drift of his own thinking.

There was a voice in his ear. "Are you awake?"

And George heard his own moaning for the first time. Had he been moaning? He tried to turn his head.

The voice said, "Are you in pain, George?"

George whispered, "Funny. I was so anxious to leave Earth. I didn't understand."

"Do you know where you are?"

"Back in the—the House." George managed to turn. The voice belonged to Omani.

George said, "It's funny I didn't understand."

Omani smiled gently, "Sleep again—"

George slept.

* * *

And woke again. His mind was clear.

Omani sat at the bedside reading, but he put down the book as George's eyes opened.

George struggled to a sitting position. He said, "Hello."

"Are you hungry?"

"You bet." He stared at Omani curiously. "I was followed when I left, wasn't I?"

Omani nodded. "You were under observation at all times. We were going to maneuver you to Antonelli and let you discharge your aggressions. We felt that to be the only way you could make progress. Your emotions were clogging your advance."

George said, with a trace of embarrassment, "I was all wrong about him."

"It doesn't matter now. When you stopped to stare at the Metallurgy notice board at the airport, one of our agents reported back the list of names. You and I had talked about your past sufficiently so that I caught the significance of Trevelyan's name there. You asked for directions to the Olympics; there was the possibility that this might

result in the kind of crisis we were hoping for; we sent Ladislas Ingenescu to the hall to meet you and take over."

"He's an important man in the government, isn't he?"

"Yes, he is."

"And you had him take over. It makes me sound important."

"You *are* important, George."

A thick stew had arrived, steaming, fragrant. George grinned wolfishly and pushed his sheets back to free his arms. Omani helped arrange the bed-table. For a while, George ate silently.

Then George said, "I woke up here once before just for a short time."

Omani said, "I know. I was here."

"Yes, I remember. You know, everything was changed. It was as though I was too tired to feel emotion. I wasn't angry any more. I could just think. It was as though I had been drugged to wipe out emotion."

"You weren't," said Omani. "Just sedation. You had rested."

"Well, anyway, it was all clear to me, as though I had known it all the time but wouldn't listen to myself. I thought: What was it I had wanted Novia to let me do? I had wanted to go to Novia and take a batch of un-Educated youngsters and teach them out of books. I had wanted to establish a House for the Feeble-minded—like here—and Earth already has them—many of them."

Omani's white teeth gleamed as he smiled. "The Institute of Higher Studies is the correct name for places like this."

"Now I see it," said George, "so easily I am amazed at my blindness before. After all, who invents the new instrument models that require new-model technicians? Who invented the Beeman spectrographs, for instance? A man called Beeman, I suppose, but he couldn't have been tape-Educated or how could he have made the advance?"

"Exactly."

"Or who makes Educational tapes? Special tape-making technicians? Then who makes the tapes to train *them?* More advanced technicians? Then who makes the tapes— You see what I mean. Somewhere there has to be an end. Somewhere there must be men and women with capacity for original thought."

"Yes, George."

George leaned back, stared over Omani's head, and for a moment there was the return of something like restlessness to his eyes.

"Why wasn't I told all this at the beginning?"

"Oh, if we could," said Omani, "the trouble it would save us. We can analyze a mind, George, and say this one will make an adequate architect and that one a good woodworker. We know of no way of detecting the capacity for original, creative thought. It is too subtle a thing. We have some rule-of-thumb methods that mark out individuals who may possibly or potentially have such a talent.

"On Reading Day, such individuals are reported. You were, for instance. Roughly speaking, the number so reported comes to one in ten thousand. By the time Education Day arrives, these individuals are checked again, and nine out of ten of them turn out to have been false alarms. Those who remain are sent to places like this."

George said, "Well, what's wrong with telling people that one out of—of a hundred thousand will end at places like these? Then it won't be such a shock to those who do."

"And those who don't? The ninety-nine thousand nine hundred and ninety-nine that don't? We can't have all those people considering themselves failures. They aim at the professions and one way or another they all make it. Everyone can place after his or

her name: Registered something-or-other. In one fashion or another every individual has his or her place in society and this is necessary."

"But we?" said George. "The one in ten thousand exception?"

"You can't be told. That's exactly it. It's the final test. Even after we've thinned out the possibilities on Education Day, nine out of ten of those who come here are not quite the material of creative genius, and there's no way we can distinguish those nine from the tenth that we want by any form of machinery. The tenth one must tell us himself."

"How?"

"We bring you here to a House for the Feeble-minded and the man who won't accept that is the man we want. It's a method that can be cruel, but it works. It won't do to say to a man, 'You can create. Do so.' It is much safer to wait for a man to say, 'I can create, and I will do so whether you wish it or not.' There are ten thousand men like you, George, who support the advancing technology of fifteen hundred worlds. We can't allow ourselves to miss one recruit to that number or waste our efforts on one member who doesn't measure up."

George pushed his empty plate out of the way and lifted a cup of coffee to his lips.

"What about the people here who don't—measure up?"

"They are taped eventually and become our Social Scientists. Ingenescu is one. I am a Registered Psychologist. We are second echelon, so to speak."

George finished his coffee. He said, "I still wonder about one thing?"

"What is that?"

George threw aside the sheet and stood up. "Why do they call them Olympics?"

The Ugly Little Boy

Edith Fellowes smoothed her working smock as she always did before opening the elaborately locked door and stepping across the invisible dividing line between the *is* and the *is not*. She carried her notebook and her pen although she no longer took notes except when she felt the absolute need for some report.

This time she also carried a suitcase. ("Games for the boy," she had said, smiling, to the guard—who had long since stopped even thinking of questioning her and who waved her on.)

And, as always, the ugly little boy knew that she had entered and came running to her, crying, "Miss Fellowes— Miss Fellowes—" in his soft, slurring way.

"Timmie," she said, and passed her hand over the shaggy, brown hair on his misshapen little head. "What's wrong?"

He said, "Will Jerry be back to play again? I'm sorry about what happened."

"Never mind that now, Timmie. Is that why you've been crying?"

He looked away. "Not just about that, Miss Fellowes. I dreamed again."

"The same dream?" Miss Fellowes' lips set. Of course, the Jerry affair would bring back the dream.

He nodded. His too large teeth showed as he tried to smile and the lips of his forward-thrusting mouth stretched wide. "When will I be big enough to go out there, Miss Fellowes?"

"Soon," she said softly, feeling her heart break. "Soon."

Miss Fellowes let him take her hand and enjoyed the warm touch of the thick dry skin of his palm. He led her through the three rooms that made up the whole of Stasis Section One—comfortable enough, yes, but an eternal prison for the ugly little boy all the seven (was it seven?) years of his life.

He led her to the one window, looking out onto a scrubby woodland section of the world of *is* (now hidden by night), where a fence and painted instructions allowed no men to wander without permission.

He pressed his nose against the window. "Out there, Miss Fellowes?"

"Better places. Nicer places," she said sadly as she looked at his poor little imprisoned face outlined in profile against the window. The forehead retreated flatly and

his hair lay down in tufts upon it. The back of his skull bulged and seemed to make the head overheavy so that it sagged and bent forward, forcing the whole body into a stoop. Already, bony ridges were beginning to bulge the skin above his eyes. His wide mouth thrust forward more prominently than did his wide and flattened nose and he had no chin to speak of, only a jawbone that curved smoothly down and back. He was small for his years and his stumpy legs were bowed.

He was a very ugly little boy and Edith Fellowes loved him dearly.

Her own face was behind his line of vision, so she allowed her lips the luxury of a tremor.

They would *not* kill him. She would do anything to prevent it. Anything. She opened the suitcase and began taking out the clothes it contained.

* * *

Edith Fellowes had crossed the threshold of Stasis, Inc. for the first time just a little over three years before. She hadn't, at that time, the slightest idea as to what Stasis meant or what the place did. No one did then, except those who worked there. In fact, it was only the day after she arrived that the news broke upon the world.

At the time, it was just that they had advertised for a woman with knowledge of physiology, experience with clinical chemistry, and a love for children. Edith Fellowes had been a nurse in a maternity ward and believed she fulfilled those qualifications.

Gerald Hoskins, whose name plate on the desk included a Ph.D. after the name, scratched his cheek with his thumb and looked at her steadily.

Miss Fellowes automatically stiffened and felt her face (with its slightly asymmetric nose and its a-trifle-too-heavy eyebrows) twitch.

He's no dreamboat himself, she thought resentfully. He's getting fat and bald and he's got a sullen mouth. —But the salary mentioned had been considerably higher than she had expected, so she waited.

Hoskins said, "Now do you really love children?"

"I wouldn't say I did if I didn't."

"Or do you just love pretty children? Nice chubby children with cute little button-noses and gurgly ways?"

Miss Fellowes said, "Children are children, Dr. Hoskins, and the ones that aren't pretty are just the ones who may happen to need help most."

"Then suppose we take you on—"

"You mean you're offering me the job now?"

He smiled briefly, and for a moment, his broad face had an absent-minded charm about it. He said, "I make quick decisions. So far the offer is tentative, however. I may make as quick a decision to let you go. Are you ready to take the chance?"

Miss Fellowes clutched at her purse and calculated just as swiftly as she could, then ignored calculations and followed impulse. "All right."

"Fine. We're going to form the Stasis tonight and I think you had better be there to take over at once. That will be at 8 P.M. and I'd appreciate it if you could be here at 7:30."

"But what—"

"Fine. Fine. That will be all now." On signal, a smiling secretary came in to usher her out.

Miss Fellowes stared back at Dr. Hoskins' closed door for a moment. What was

Stasis? What had this large barn of a building—with its badged employees, its makeshift corridors, and its unmistakable air of engineering—to do with children?

She wondered if she should go back that evening or stay away and teach that arrogant man a lesson. But she knew she would be back if only out of sheer frustration. She would have to find out about the children.

* * *

She came back at 7:30 and did not have to announce herself. One after another, men and women seemed to know her and to know her function. She found herself all but placed on skids as she was moved inward.

Dr. Hoskins was there, but he only looked at her distantly and murmured, "Miss Fellowes."

He did not even suggest that she take a seat, but she drew one calmly up to the railing and sat down.

They were on a balcony, looking down into a large pit, filled with instruments that looked like a cross between the control panel of a spaceship and the working face of a computer. On one side were partitions that seemed to make up an unceilinged apartment, a giant dollhouse into the rooms of which she could look from above.

She could see an electronic cooker and a freeze-space unit in one room and a washroom arrangement off another. And surely the object she made out in another room could only be part of a bed, a small bed.

Hoskins was speaking to another man and, with Miss Fellowes, they made up the total occupancy of the balcony. Hoskins did not offer to introduce the other man, and Miss Fellowes eyed him surreptitiously. He was thin and quite fine-looking in a middle-aged way. He had a small mustache and keen eyes that seemed to busy themselves with everything.

He was saying, "I won't pretend for one moment that I understand all this, Dr. Hoskins; I mean, except as a layman, a reasonably intelligent layman, may be expected to understand it. Still, if there's one part I understand less than another, it's this matter of selectivity. You can only reach out so far; that seems sensible; things get dimmer the further you go; it takes more energy. —But then, you can only reach out so near. That's the puzzling part."

"I can make it seem less paradoxical, Deveney, if you will allow me to use an analogy."

(Miss Fellowes placed the new man the moment she heard his name, and despite herself was impressed. This was obviously Candide Deveney, the science writer of the Telenews, who was notoriously at the scene of every major scientific break-through. She even recognized his face as one she saw on the news-plate when the landing on Mars had been announced. —So Dr. Hoskins must have something important here.

"By all means use an analogy," said Deveney ruefully, "if you think it will help."

"Well, then, you can't read a book with ordinary-sized print if it is held six feet from your eyes, but you can read it if you hold it one foot from your eyes. So far, the closer the better. If you bring the book to within one inch of your eyes, however, you've lost it again. There is such a thing as being too close, you see."

"Hmm," said Deveney.

"Or take another example. Your right shoulder is about thirty inches from the tip of your right forefinger and you can place your right forefinger on your right shoulder.

Your right elbow is only half the distance from the tip of your right forefinger; it should by all ordinary logic be easier to reach, and yet you cannot place your right finger on your right elbow. Again, there is such a thing as being too close."

Deveney said, "May I use these analogies in my story?"

"Well, of course. Only too glad. I've been waiting long enough for someone like you to have a story. I'll give you anything else you want. It is time, finally, that we want the world looking over our shoulder. They'll see something."

(Miss Fellowes found herself admiring his calm certainty despite herself. There was strength there.)

Deveney said, "How far out will you reach?"

"Forty thousand years."

Miss Fellowes drew in her breath sharply.

Years?

There was tension in the air. The men at the controls scarcely moved. One man at a microphone spoke into it in a soft monotone, in short phrases that made no sense to Miss Fellowes.

Deveney, leaning over the balcony railing with an intent stare, said, "Will we see anything, Dr. Hoskins?"

"What? No. Nothing till the job is done. We detect indirectly, something on the principle of radar, except that we use mesons rather than radiation. Mesons reach backward under the proper conditions. Some are reflected and we must analyze the reflections."

"That sounds difficult."

Hoskins smiled again, briefly as always. "It is the end product of fifty years of research; forty years of it before I entered the field. —Yes, it's difficult."

The man at the microphone raised one hand.

Hoskins said, "We've had the fix on one particular moment in time for weeks; breaking it, remaking it after calculating our own movements in time; making certain that we could handle time-flow with sufficient precision. This must work now."

But his forehead glistened.

Edith Fellowes found herself out of her seat and at the balcony railing, but there was nothing to see.

The man at the microphone said quietly, "Now."

There was a space of silence sufficient for one breath and then the sound of a terrified little boy's scream from the dollhouse rooms. Terror! Piercing terror!

Miss Fellowes' head twisted in the direction of the cry. A child was involved. She had forgotten.

And Hoskins' fist pounded on the railing and he said in a tight voice, trembling with triumph, "*Did* it."

* * *

Miss Fellowes was urged down the short, spiral flight of steps by the hard press of Hoskins' palm between her shoulder blades. He did not speak to her.

The men who had been at the controls were standing about now, smiling, smoking, watching the three as they entered on the main floor. A very soft buzz sounded from the direction of the dollhouse.

Hoskins said to Deveney, "It's perfectly safe to enter Stasis. I've done it a thousand

times. There's a queer sensation which is momentary and means nothing."

He stepped through an open door in mute demonstration, and Deveney, smiling stiffly and drawing an obviously deep breath, followed him.

Hoskins said, "Miss Fellowes! Please!" He crooked his forefinger impatiently.

Miss Fellowes nodded and stepped stiffly through. It was as though a ripple went through her, an internal tickle.

But once inside all seemed normal. There was the smell of the fresh wood of the dollhouse and—of—of soil somehow.

There was silence now, no voice at least, but there was the dry shuffling of feet, a scrabbling as of a hand over wood—then a low moan.

"Where is it?" asked Miss Fellowes in distress. Didn't these fool men *care?*

* * *

The boy was in the bedroom; at least the room with the bed in it.

It was standing naked, with its small, dirt-smeared chest heaving raggedly. A bushel of dirt and coarse grass spread over the floor at his bare brown feet. The smell of soil came from it and a touch of something fetid.

Hoskins followed her horrified glance and said with annoyance, "You can't pluck a boy cleanly out of time, Miss Fellowes. We had to take some of the surroundings with it for safety. Or would you have preferred to have it arrive here minus a leg or with only half a head?"

"Please!" said Miss Fellowes, in an agony of revulsion. "Are we just to stand here? The poor child is frightened. And it's *filthy."*

She was quite correct. It was smeared with encrusted dirt and grease and had a scratch on its thigh that looked red and sore.

As Hoskins approached him, the boy, who seemed to be something over three years in age, hunched low and backed away rapidly. He lifted his upper lip and snarled in a hissing fashion like a cat. With a rapid gesture, Hoskins seized both the child's arms and lifted him, writhing and screaming, from the floor.

Miss Fellowes said, "Hold him, now. He needs a warm bath first. He needs to be cleaned. Have you the equipment? If so, have it brought here, and I'll need to have help in handling him just at first. Then, too, for heaven's sake, have all this trash and filth removed."

She was giving the orders now and she felt perfectly good about that. And because now she was an efficient nurse, rather than a confused spectator, she looked at the child with a clinical eye—and hesitated for one shocked moment. She saw past the dirt and shrieking, past the thrashing of limbs and useless twisting. She saw the boy himself.

It was the ugliest little boy she had ever seen. It was horribly ugly from misshapen head to bandy legs.

* * *

She got the boy cleaned with three men helping her and with others milling about in their efforts to clean the room. She worked in silence and with a sense of outrage, annoyed by the continued strugglings and outcries of the boy and by the undignified drenchings of soapy water to which she was subjected.

Dr. Hoskins had hinted that the child would not be pretty, but that was far from stating that it would be repulsively deformed. And there was a stench about the boy that soap and water was only alleviating little by little.

She had the strong desire to thrust the boy, soaped as he was, into Hoskins' arms and walk out; but there was the pride of profession. She had accepted an assignment after all. —And there would be the look in his eyes. A cold look that would read: Only pretty children, Miss Fellowes?

He was standing apart from them, watching coolly from a distance with a half-smile on his face when he caught her eyes, as though amused at her outrage.

She decided she would wait a while before quitting. To do so now would only demean her.

Then, when the boy was a bearable pink and smelled of scented soap, she felt better anyway. His cries changed to whimpers of exhaustion as he watched carefully, eyes moving in quick frightened suspicion from one to another of those in the room. His cleanness accentuated his thin nakedness as he shivered with cold after his bath.

Miss Fellowes said sharply, "Bring me a nightgown for the child!"

A nightgown appeared at once. It was as though everything were ready and yet nothing were ready unless she gave orders; as though they were deliberately leaving this in her charge without help, to test her.

The newsman, Deveney, approached and said, "I'll hold him, Miss. You won't get it on yourself."

"Thank you," said Miss Fellowes. And it was a battle indeed, but the nightgown went on, and when the boy made as though to rip it off, she slapped his hand sharply.

The boy reddened, but did not cry. He stared at her and the splayed fingers of one hand moved slowly across the flannel of the nightgown, feeling the strangeness of it.

Miss Fellowes thought desperately: Well, what next?

Everyone seemed in suspended animation, waiting for her—even the ugly little boy.

Miss Fellowes said sharply, "Have you provided food? Milk?"

They had. A mobile unit was wheeled in, with its refrigeration compartment containing three quarts of milk, with a warming unit and a supply of fortifications in the form of vitamin drops, copper-cobalt-iron syrup and others she had no time to be concerned with. There was a variety of canned self-warming junior foods.

She used milk, simply milk, to begin with. The radar unit heated the milk to a set temperature in a matter of ten seconds and clicked off, and she put some in a saucer. She had a certainty about the boy's savagery. He wouldn't know how to handle a cup.

Miss Fellowes nodded and said to the boy, "Drink. Drink." She made a gesture as though to raise the milk to her mouth. The boy's eyes followed but he made no move.

Suddenly, the nurse resorted to direct measures. She seized the boy's upper arm in one hand and dipped the other in the milk. She dashed the milk across his lips, so that it dripped down cheeks and receding chin.

For a moment, the child uttered a high-pitched cry, then his tongue moved over his wetted lips. Miss Fellowes stepped back.

The boy approached the saucer, bent toward it, then looked up and behind sharply as though expecting a crouching enemy; bent again and licked at the milk eagerly, like a cat. He made a slurping noise. He did not use his hands to lift the saucer.

Miss Fellowes allowed a bit of the revulsion she felt show on her face. She couldn't help it.

Deveney caught that, perhaps. He said, "Does the nurse know, Dr. Hoskins?"

"Know what?" demanded Miss Fellowes.

Deveney hesitated, but Hoskins (again that look of detached amusement on his face) said, "Well, tell her."

Deveney addressed Miss Fellowes. "You may not suspect it, Miss, but you happen to be the first civilized woman in history ever to be taking care of a Neanderthal youngster."

She turned on Hoskins with a kind of controlled ferocity. "You might have told me, Doctor."

"Why? What difference does it make?"

"You said a child."

"Isn't that a child? Have you ever had a puppy or a kitten, Miss Fellowes? Are those closer to the human? If that were a baby chimpanzee, would you be repelled? You're a nurse, Miss Fellowes. Your record places you in a maternity ward for three years. Have you ever refused to take care of a deformed infant?"

Miss Fellowes felt her case slipping away. She said, with much less decision, "You might have told me."

"And you would have refused the position? Well, do you refuse it now?" He gazed at her coolly, while Deveney watched from the other side of the room, and the Neanderthal child, having finished the milk and licked the plate, looked up at her with a wet face and wide, longing eyes.

The boy pointed to the milk and suddenly burst out in a short series of sounds repeated over and over; sounds made up of gutturals and elaborate tongue-clickings.

Miss Fellowes said, in surprise, "Why, he talks."

"Of course," said Hoskins. "Homo neanderthalensis is not a truly separate species, but rather a subspecies of Homo sapiens. Why shouldn't he talk? He's probably asking for more milk."

Automatically, Miss Fellowes reached for the bottle of milk, but Hoskins seized her wrist. "Now, Miss Fellowes, before we go any further, are you staying on the job?"

Miss Fellowes shook free in annoyance, "Won't you feed him if I don't? I'll stay with him—for a while."

She poured the milk.

Hoskins said, "We are going to leave you with the boy, Miss Fellowes. This is the only door to Stasis Number One and it is elaborately locked and guarded. I'll want you to learn the details of the lock which will, of course, be keyed to your fingerprints as they are already keyed to mine. The spaces overhead" (he looked upward to the open ceilings of the dollhouse) "are also guarded and we will be warned if anything untoward takes place in here."

Miss Fellowes said indignantly, "You mean I'll be under view." She thought suddenly of her own survey of the room interiors from the balcony.

"No, no," said Hoskins seriously, "your privacy will be respected completely. The view will consist of electronic symbolism only, which only a computer will deal with. Now you will stay with him tonight, Miss Fellowes, and every night until further notice. You will be relieved during the day according to some schedule you will find convenient. We will allow you to arrange that."

Miss Fellowes looked about the dollhouse with a puzzled expression. "But why all this, Dr. Hoskins? Is the boy dangerous?"

"It's a matter of energy, Miss Fellowes. He must never be allowed to leave these rooms. Never. Not for an instant. Not for any reason. Not to save his life. Not even to save *your* life, Miss Fellowes. Is that clear?"

Miss Fellowes raised her chin. "I understand the orders, Dr. Hoskins, and the nursing profession is accustomed to placing its duties ahead of self-preservation."

"Good. You can always signal if you need anyone." And the two men left.

* * *

Miss Fellowes turned to the boy. He was watching her and there was still milk in the saucer. Laboriously, she tried to show him how to lift the saucer and place it to his lips. He resisted, but let her touch him without crying out.

Always, his frightened eyes were on her, watching, watching for the one false move. She found herself soothing him, trying to move her hand very slowly toward his hair, letting him see it every inch of the way, see there was no harm in it.

And she succeeded in stroking his hair for an instant.

She said, "I'm going to have to show you how to use the bathroom. Do you think you can learn?"

She spoke quietly, kindly, knowing he would not understand the words but hoping he would respond to the calmness of the tone.

The boy launched into a clicking phrase again.

She said, "May I take your hand?"

She held out hers and the boy looked at it. She left it outstretched and waited. The boy's own hand crept forward toward hers.

"That's right," she said.

It approached within an inch of hers and then the boy's courage failed him. He snatched it back.

"Well," said Miss Fellowes calmly, "we'll try again later. Would you like to sit down here?" She patted the mattress of the bed.

The hours passed slowly and progress was minute. She did not succeed either with bathroom or with the bed. In fact, after the child had given unmistakable signs of sleepiness he lay down on the bare ground and then, with a quick movement, rolled beneath the bed.

She bent to look at him and his eyes gleamed out at her as he tongue-clicked at her.

"All right," she said, "if you feel safer there, you sleep there."

She closed the door to the bedroom and retired to the cot that had been placed for her use in the largest room. At her insistence, a makeshift canopy had been stretched over it. She thought: Those stupid men will have to place a mirror in this room and a larger chest of drawers and a separate washroom if they expect me to spend nights here.

* * *

It was difficult to sleep. She found herself straining to hear possible sounds in the next room. He couldn't get out, could he? The walls were sheer and impossibly high but suppose the child could climb like a monkey? Well, Hoskins said there were observational devices watching through the ceiling.

Suddenly she thought: Can he be dangerous? Physically dangerous?

Surely, Hoskins couldn't have meant that. Surely, he would not have left her alone, if—

She tried to laugh at herself. He was only a three- or four-year-old child. Still, she had not succeeded in cutting his nails. If he should attack her with nails and teeth while she slept—

Her breath came quickly. Oh, ridiculous, and yet—

She listened with painful attentiveness, and this time she heard the sound.

The boy was crying.

Not shrieking in fear or anger; not yelling or screaming. It was crying softly, and the cry was the heartbroken sobbing of a lonely, lonely child.

For the first time, Miss Fellowes thought with a pang: Poor thing!

Of course, it was a child; what did the shape of its head matter? It was a child that had been orphaned as no child had ever been orphaned before. Not only its mother and father were gone, but all its species. Snatched callously out of time, it was now the only creature of its kind in the world. The last. The only.

She felt pity for it strengthen, and with it shame at her own callousness. Tucking her own nightgown carefully about her calves (incongruously, she thought: Tomorrow I'll have to bring in a bathrobe) she got out of bed and went into the boy's room.

"Little boy," she called in a whisper. "Little boy."

She was about to reach under the bed, but she thought of a possible bite and did not. Instead, she turned on the night light and moved the bed.

The poor thing was huddled in the corner, knees up against his chin, looking up at her with blurred and apprehensive eyes.

In the dim light, she was not aware of his repulsiveness.

"Poor boy," she said, "poor boy." She felt him stiffen as she stroked his hair, then relax. "Poor boy. May I hold you?"

She sat down on the floor next to him and slowly and rhythmically stroked his hair, his cheek, his arm. Softly, she began to sing a slow and gentle song.

He lifted his head at that, staring at her mouth in the dimness, as though wondering at the sound.

She maneuvered him closer while he listened to her. Slowly, she pressed gently against the side of his head, until it rested on her shoulder. She put her arm under his thighs and with a smooth and unhurried motion lifted him into her lap.

She continued singing, the same simple verse over and over, while she rocked back and forth, back and forth.

He stopped crying, and after a while the smooth burr of his breathing showed he was asleep.

With infinite care, she pushed his bed back against the wall and laid him down. She covered him and stared down. His face looked so peaceful and little-boy as he slept. It didn't matter so much that it was so ugly. Really.

She began to tiptoe out, then thought: If he wakes up?

She came back, battled irresolutely with herself, then sighed and slowly got into bed with the child.

It was too small for her. She was cramped and uneasy at the lack of canopy, but the child's hand crept into hers and, somehow, she fell asleep in that position.

* * *

She awoke with a start and a wild impulse to scream. The latter she just managed to suppress into a gurgle. The boy was looking at her, wide-eyed. It took her a long

moment to remember getting into bed with him, and now, slowly, without unfixing her eyes from his, she stretched one leg carefully and let it touch the floor, then the other one.

She cast a quick and apprehensive glance toward the open ceiling, then tensed her muscles for quick disengagement.

But at that moment, the boy's stubby fingers reached out and touched her lips. He said something.

She shrank at the touch. He was terribly ugly in the light of day.

The boy spoke again. He opened his own mouth and gestured with his hand as though something were coming out.

Miss Fellowes guessed at the meaning and said tremulously, "Do you want me to sing?"

The boy said nothing but stared at her mouth.

In a voice slightly off key with tension, Miss Fellowes began the little song she had sung the night before and the ugly little boy smiled. He swayed clumsily in rough time to the music and made a little gurgly sound that might have been the beginnings of a laugh.

Miss Fellowes sighed inwardly. Music hath charms to soothe the savage breast. It might help—

She said, "You wait. Let me get myself fixed up. It will just take a minute. Then I'll make breakfast for you."

She worked rapidly, conscious of the lack of ceiling at all times. The boy remained in bed, watching her when she was in view. She smiled at him at those times and waved. At the end, he waved back, and she found herself being charmed by that.

Finally, she said, "Would you like oatmeal with milk?" It took a moment to prepare, and then she beckoned to him.

Whether he understood the gesture or followed the aroma, Miss Fellowes did not know, but he got out of bed.

She tried to show him how to use a spoon but he shrank away from it in fright. (Time enough, she thought.) She compromised on insisting that he lift the bowl in his hands. He did it clumsily enough and it was incredibly messy but most of it did get into him.

She tried the drinking milk in a glass this time, and the little boy whined when he found the opening too small for him to get his face into conveniently. She held his hand, forcing it around the glass, making him tip it, forcing his mouth to the rim.

Again a mess but again most went into him, and she was used to messes.

The washroom, to her surprise and relief, was a less frustrating matter. He understood what it was she expected him to do.

She found herself patting his head, saying, "Good boy. Smart boy."

And to Miss Fellowes' exceeding pleasure, the boy smiled at that.

She thought: When he smiles, he's quite bearable. Really.

Later in the day, the gentlemen of the press arrived.

She held the boy in her arms and he clung to her wildly while across the open door they set cameras to work. The commotion frightened the boy and he began to cry, but it was ten minutes before Miss Fellowes was allowed to retreat and put the boy in the next room.

She emerged again, flushed with indignation, walked out of the apartment (for the first time in eighteen hours) and closed the door behind her. "I think you've had enough. It will take me a while to quiet him. Go away."

"Sure, sure," said the gentleman from the *Times-Herald.* "But is that really a Neanderthal or is this some kind of gag?"

"I assure you," said Hoskins' voice, suddenly, from the background, "that this is no gag. The child is authentic Homo neanderthalensis."

"Is it a boy or a girl?"

"Boy," said Miss Fellowes briefly.

"Ape-boy," said the gentleman from the *News.* "That's what we've got here. Ape-boy. How does he act, Nurse?"

"He acts exactly like a little boy," snapped Miss Fellowes, annoyed into the defensive, "and he is not an ape-boy. His name is—is Timothy, Timmie—and he is perfectly normal in his behavior."

She had chosen the name Timothy at a venture. It was the first that had occurred to her.

"Timmie the Ape-boy," said the gentleman from the *News* and, as it turned out, Timmie the Ape-boy was the name under which the child became known to the world.

The gentleman from the *Globe* turned to Hoskins and said, "Doc, what do you expect to do with the ape-boy?"

Hoskins shrugged. "My original plan was completed when I proved it possible to bring him here. However, the anthropologists will be very interested, I imagine, and the physiologists. We have here, after all, a creature which is at the edge of being human. We should learn a great deal about ourselves and our ancestry from him."

"How long will you keep him?"

"Until such a time as we need the space more than we need him. Quite a while, perhaps."

The gentleman from the *News* said, "Can you bring it out into the open so we can set up sub-etheric equipment and put on a real show?"

"I'm sorry, but the child cannot be removed from Stasis."

"Exactly what is Stasis?"

"Ah." Hoskins permitted himself one of his short smiles. "That would take a great deal of explanation, gentlemen. In Stasis, time as we know it doesn't exist. Those rooms are inside an invisible bubble that is not exactly part of our Universe. That is why the child could be plucked out of time as it was."

"Well, wait now," said the gentleman from the *News* discontentedly, "what are you giving us? The nurse goes into the room and out of it."

"And so can any of you," said Hoskins matter-of-factly. "You would be moving parallel to the lines of temporal force and no great energy gain or loss would be involved. The child, however, was taken from the far past. It moved across the lines and gained temporal potential. To move it into the Universe and into our own time would absorb enough energy to burn out every line in the place and probably blank out all power in the city of Washington. We had to store trash brought with him on the premises and will have to remove it little by little."

The newsmen were writing down sentences busily as Hoskins spoke to them. They did not understand and they were sure their readers would not, but it sounded scientific and that was what counted.

The gentleman from the *Times-Herald* said, "Would you be available for an all-circuit interview tonight?"

"I think so," said Hoskins at once, and they all moved off.

Miss Fellowes looked after them. She understood all this about Stasis and temporal force as little as the newsmen but she managed to get this much. Timmie's imprisonment (she found herself suddenly thinking of the little boy as Timmie) was a real one

and not one imposed by the arbitrary fiat of Hoskins. Apparently, it was impossible to let him out of Stasis at all, ever.

Poor child. Poor child.

She was suddenly aware of his crying and she hastened in to console him.

* * *

Miss Fellowes did not have a chance to see Hoskins on the all-circuit hookup, and though his interview was beamed to every part of the world and even to the outpost on the Moon, it did not penetrate the apartment in which Miss Fellowes and the ugly little boy lived.

But he was down the next morning, radiant and joyful.

Miss Fellowes said, "Did the interview go well?"

"Extremely. And how is—Timmie?"

Miss Fellowes found herself pleased at the use of the name. "Doing quite well. Now come out here, Timmie, the nice gentleman will not hurt you."

But Timmie stayed in the other room, with a lock of his matted hair showing behind the barrier of the door and, occasionally, the corner of an eye.

"Actually," said Miss Fellowes, "he is settling down amazingly. He is quite intelligent."

"Are you surprised?"

She hesitated just a moment, then said, "Yes, I am. I suppose I thought he was an ape-boy."

"Well, ape-boy or not, he's done a great deal for us. He's put Stasis, Inc. on the map. We're in, Miss Fellowes, we're in." It was as though he had to express his triumph to someone, even if only to Miss Fellowes.

"Oh?" She let him talk.

He put his hands in his pockets and said, "We've been working on a shoestring for ten years, scrounging funds a penny at a time wherever we could. We had to shoot the works on one big show. It was everything, or nothing. And when I say the works, I mean it. This attempt to bring in a Neanderthal took every cent we could borrow or steal, and some of it *was* stolen—funds for other projects, used for this one without permission. If that experiment hadn't succeeded, I'd have been through."

Miss Fellowes said abruptly, "Is that why there are no ceilings?"

"Eh?" Hoskins looked up.

"Was there no money for ceilings?"

"Oh. Well, that wasn't the only reason. We didn't really know in advance how old the Neanderthal might be exactly. We can detect only dimly in time, and he might have been large and savage. It was possible we might have had to deal with him from a distance, like a caged animal."

"But since that hasn't turned out to be so, I suppose you can build a ceiling now."

"Now, yes. We have plenty of money, now. Funds have been promised from every source. This is all wonderful, Miss Fellowes." His broad face gleamed with a smile that lasted and when he left, even his back seemed to be smiling.

Miss Fellowes thought: He's quite a nice man when he's off guard and forgets about being scientific.

She wondered for an idle moment if he was married, then dismissed the thought in self-embarrassment.

"Timmie," she called. "Come here, Timmie."

* * *

In the months that passed, Miss Fellowes felt herself grow to be an integral part of Stasis, Inc. She was given a small office of her own with her name on the door, an office quite close to the dollhouse (as she never stopped calling Timmie's Stasis bubble). She was given a substantial raise. The dollhouse was covered by a ceiling; its furnishings were elaborated and improved; a second washroom was added—and even so, she gained an apartment of her own on the institute grounds and, on occasion, did not stay with Timmie during the night. An intercom was set up between the dollhouse and her apartment and Timmie learned how to use it.

Miss Fellowes got used to Timmie. She even grew less conscious of his ugliness. One day she found herself staring at an ordinary boy in the street and finding something bulgy and unattractive in his high domed forehead and jutting chin. She had to shake herself to break the spell.

It was more pleasant to grow used to Hoskins' occasional visits. It was obvious he welcomed escape from his increasingly harried role as head of Stasis, Inc., and that he took a sentimental interest in the child who had started it all, but it seemed to Miss Fellowes that he also enjoyed talking to her.

(She had learned some facts about Hoskins, too. He had invented the method of analyzing the reflection of the past-penetrating mesonic beam; he had invented the method of establishing Stasis; his coldness was only an effort to hide a kindly nature; and, oh yes, he *was* married.)

What Miss Fellowes could *not* get used to was the fact that she was engaged in a scientific experiment. Despite all she could do, she found herself getting personally involved to the point of quarreling with the physiologists.

On one occasion, Hoskins came down and found her in the midst of a hot urge to kill. They had no right; they had no *right!*— Even if he *was* a Neanderthal, he still wasn't an animal.

She was staring after them in a blind fury; staring out the open door and listening to Timmie's sobbing, when she noticed Hoskins standing before her. He might have been there for minutes.

He said, "May I come in?"

She nodded curtly, then hurried to Timmie, who clung to her, curling his little bandy legs—still thin, so thin—about her.

Hoskins watched, then said gravely, "He seems quite unhappy."

Miss Fellowes said, "I don't blame him. They're at him every day now with their blood samples and their probings. They keep him on synthetic diets that I wouldn't feed a pig."

"It's the sort of thing they can't try on a human, you know."

"And they can't try it on Timmie, either. Dr. Hoskins, I insist. You told me it was Timmie's coming that put Stasis, Inc. on the map. If you have any gratitude for that at all, you've *got* to keep them away from the poor thing at least until he's old enough to understand a little more. After he's had a bad session with them, he has nightmares, he can't sleep. Now I warn you," (she reached a sudden peak of fury) "I'm not letting them in here any more."

(She realized that she had screamed that, but she couldn't help it.)

She said more quietly, "I know he's Neanderthal but there's a great deal we don't appreciate about Neanderthals. I've read up on them. They had a culture of their own. Some of the greatest human inventions arose in Neanderthal times. The domestication of animals, for instance; the wheel; various techniques in grinding stone. They even had spiritual yearnings. They buried their dead and buried possessions with the body, showing they believed in a life after death. It amounts to the fact that they invented religion. Doesn't that mean Timmie has a right to human treatment?"

She patted the little boy gently on his buttocks and sent him off into his playroom. As the door was opened, Hoskins smiled briefly at the display of toys that could be seen.

Miss Fellowes said defensively, "The poor child deserves his toys. It's all he has and he earns them with what he goes through."

"No, no. No objections, I assure you. I was just thinking how you've changed since the first day, when you were quite angry I had foisted a Neanderthal on you."

Miss Fellowes said in a low voice, "I suppose I didn't—" and faded off.

Hoskins changed the subject, "How old would you say he is, Miss Fellowes?"

She said, "I can't say, since we don't know how Neanderthals develop. In size, he'd only be three but Neanderthals are smaller generally and with all the tampering they do with him, he probably isn't growing. The way he's learning English, though, I'd say he was well over four."

"Really? I haven't noticed anything about learning English in the reports."

"He won't speak to anyone but me. For now, anyway. He's terribly afraid of others, and no wonder. But he can ask for an article of food; he can indicate any need practically; and he understands almost anything I say. Of course," (she watched him shrewdly, trying to estimate if this was the time), "his development may not continue."

"Why not?"

"Any child needs stimulation and this one lives a life of solitary confinement. I do what I can, but I'm not with him all the time and I'm not all he needs. What I mean, Dr. Hoskins, is that he needs another boy to play with."

Hoskins nodded slowly. "Unfortunately, there's only one of him, isn't there? Poor child."

Miss Fellowes warmed to him at once. She said, "You do like Timmie, don't you?" It was so nice to have someone else feel like that.

"Oh, yes," said Hoskins, and with his guard down, she could see the weariness in his eyes.

Miss Fellowes dropped her plans to push the matter at once. She said, with real concern, "You look worn out, Dr. Hoskins."

"Do I, Miss Fellowes? I'll have to practice looking more lifelike then."

"I suppose Stasis, Inc. is very busy and that that keeps you very busy."

Hoskins shrugged. "You suppose right. It's a matter of animal, vegetable, and mineral in equal parts, Miss Fellowes. But then, I suppose you haven't ever seen our displays."

"Actually, I haven't. —But it's not because I'm not interested. It's just that I've been so busy."

"Well, you're not all that busy right now," he said with impulsive decision. "I'll call for you tomorrow at eleven and give you a personal tour. How's that?"

She smiled happily. "I'd love it."

He nodded and smiled in his turn and left.

Miss Fellowes hummed at intervals for the rest of the day. Really—to think so was ridiculous, of course—but really, it was almost like—like making a date.

* * *

He was quite on time the next day, smiling and pleasant. She had replaced her nurse's uniform with a dress. One of conservative cut, to be sure, but she hadn't felt so feminine in years.

He complimented her on her appearance with staid formality and she accepted with equally formal grace. It was really a perfect prelude, she thought. And then the additional thought came, prelude to what?

She shut that off by hastening to say good-by to Timmie and to assure him she would be back soon. She made sure he knew all about what and where lunch was.

Hoskins took her into the new wing, into which she had never yet gone. It still had the odor of newness about it and the sound of construction, softly heard, was indication enough that it was still being extended.

"Animal, vegetable, and mineral," said Hoskins, as he had the day before. "Animal right there; our most spectacular exhibits."

The space was divided into many rooms, each a separate Stasis bubble. Hoskins brought her to the view-glass of one and she looked in. What she saw impressed her first as a scaled, tailed chicken. Skittering on two thin legs it ran from wall to wall with its delicate birdlike head, surmounted by a bony keel like the comb of a rooster, looking this way and that. The paws on its small forelimbs clenched and unclenched constantly.

Hoskins said, "It's our dinosaur. We've had it for months. I don't know when we'll be able to let go of it."

"Dinosaur?"

"Did you expect a giant?"

She dimpled. "One does, I suppose. I know some of them are small."

"A small one is all we aimed for, believe me. Generally, it's under investigation, but this seems to be an open hour. Some interesting things have been discovered. For instance, it is not entirely cold-blooded. It has an imperfect method of maintaining internal temperatures higher than that of its environment. Unfortunately, it's a male. Ever since we brought it in we've been trying to get a fix on another that may be female, but we've had no luck yet."

"Why female?"

He looked at her quizzically. "So that we might have a fighting chance to obtain fertile eggs, and baby dinosaurs."

"Of course."

He led her to the trilobite section. "That's Professor Dwayne of Washington University," he said. "He's a nuclear chemist. If I recall correctly, he's taking an isotope ratio on the oxygen of the water."

"Why?"

"It's primeval water; at least half a billion years old. The isotope ratio gives the temperature of the ocean at that time. He himself happens to ignore the trilobites, but others are chiefly concerned in dissecting them. They're the lucky ones because all they need are scalpels and microscopes. Dwayne has to set up a mass spectrograph each time he conducts an experiment."

"Why's that? Can't he—"

"No, he can't. He can't take anything out of the room as far as can be helped."

There were samples of primordial plant life too and chunks of rock formations.

Those were the vegetable and mineral. And every specimen had its investigator. It was like a museum; a museum brought to life and serving as a superactive center of research.

"And you have to supervise all of this, Dr. Hoskins?"

"Only indirectly, Miss Fellowes. I have subordinates, thank heaven. My own interest is entirely in the theoretical aspects of the matter: the nature of Time, the technique of mesonic intertemporal detection and so on. I would exchange all this for a method of detecting objects closer in Time than ten thousand years ago. If we could get into historical times—"

He was interrupted by a commotion at one of the distant booths, a thin voice raised querulously. He frowned, muttered hastily, "Excuse me," and hastened off.

Miss Fellowes followed as best she could without actually running.

An elderly man, thinly-bearded and red-faced, was saying, "I had vital aspects of my investigations to complete. Don't you understand that?"

A uniformed technician with the interwoven SI monogram (for Stasis, Inc.) on his lab coat, said, "Dr. Hoskins, it was arranged with Professor Ademewski at the beginning that the specimen could only remain here two weeks."

"I did not know then how long my investigations would take. I'm not a prophet," said Ademewski heatedly.

Dr. Hoskins said, "You understand, Professor, we have limited space; we must keep specimens rotating. That piece of chalcopyrite must go back; there are men waiting for the next specimen."

"Why can't I have it for myself, then? Let me take it out of there."

"You know you can't have it."

"A piece of chalcopyrite; a miserable five-kilogram piece? Why not?"

"We can't afford the energy expense!" said Hoskins brusquely. "You know that."

The technician interrupted. "The point is, Dr. Hoskins, that he tried to remove the rock against the rules and I almost punctured Stasis while he was in there, not knowing he was in there."

There was a short silence and Dr. Hoskins turned on the investigator with a cold formality. "Is that so, Professor?"

Professor Ademewski coughed. "I saw no harm—"

Hoskins reached up to a hand-pull dangling just within reach, outside the specimen room in question. He pulled it.

Miss Fellowes, who had been peering in, looking at the totally undistinguished sample of rock that occasioned the dispute, drew in her breath sharply as its existence flickered out. The room was empty.

Hoskins said, "Professor, your permit to investigate matters in Stasis will be permanently voided. I am sorry."

"But wait—"

"I am sorry. You have violated one of the stringent rules."

"I will appeal to the International Association—"

"Appeal away. In a case like this, you will find I can't be overruled."

He turned away deliberately, leaving the professor still protesting and said to Miss Fellowes (his face still white with anger), "Would you care to have lunch with me, Miss Fellowes?"

* * *

He took her into the small administration alcove of the cafeteria. He greeted others and introduced Miss Fellowes with complete ease, although she herself felt painfully self-conscious.

What must they think, she thought, and tried desperately to appear businesslike.

She said, "Do you have that kind of trouble often, Dr. Hoskins? I mean like that you had with the professor?" She took her fork in hand and began eating.

"No," said Hoskins forcefully. "That was the first time. Of course I'm always having to argue men out of removing specimens but this the first time one actually tried to *do* it."

"I remember you once talked about the energy it would consume."

"That's right. Of course, we've tried to take it into account. Accidents will happen and so we've got special power sources designed to stand the drain of accidental removal from Stasis, but that doesn't mean we want to see a year's supply of energy gone in half a second—or can afford to without having our plans of expansion delayed for years. —Besides, imagine the professor's being in the room while Stasis was about to be punctured."

"What would have happened to him if it had been?"

"Well, we've experimented with inanimate objects and with mice and they've disappeared. Presumably they've traveled back in time; carried along, so to speak, by the pull of the object simultaneously snapping back into its natural time. For that reason, we have to anchor objects within Stasis that we don't want to move and that's a complicated procedure. The professor would not have been anchored and he would have gone back to the Pliocene at the moment when we abstracted the rock—plus, of course, the two weeks it had remained here in the present."

"How dreadful it would have been."

"Not on account of the professor, I assure you. If he were fool enough to do what he did, it would serve him right. But imagine the effect it would have on the public if the fact came out. All people would need is to become aware of the dangers involved and funds could be choked off like that." He snapped his fingers and played moodily with his food.

Miss Fellowes said, "Couldn't you get him back? The way you got the rock in the first place?"

"No, because once an object is returned, the original fix is lost unless we deliberately plan to retain it and there was no reason to do that in this case. There never is. Finding the professor again would mean relocating a specific fix and that would be like dropping a line into the oceanic abyss for the purpose of dredging up a particular fish. —My God, when I think of the precautions we take to prevent accidents, it makes me mad. We have every individual Stasis unit set up with its own puncturing device—we have to, since each unit has its separate fix and must be collapsible independently. The point is, though, none of the puncturing devices is ever activated until the last minute. And then we deliberately make activation impossible except by the pull of a rope carefully led outside the Stasis. The pull is a gross mechanical motion that requires a strong effort, not something that is likely to be done accidentally."

Miss Fellowes said, "But doesn't it—change history to move something in and out of Time?"

Hoskins shrugged. "Theoretically, yes; actually, except in unusual cases, no. We move objects out of Stasis all the time. Air molecules. Bacteria. Dust. About 10 per cent of our energy consumption goes to make up micro-losses of that nature. But moving even large objects in Time sets up changes that damp out. Take that chalcopyrite from

the Pliocene. Because of its absence for two weeks some insect didn't find the shelter it might have found and is killed. That could initiate a whole series of changes, but the mathematics of Stasis indicates that this is a converging series. The amount of change diminishes with time and then things are as before."

"You mean, reality heals itself?"

"In a manner of speaking. Abstract a human from Time or send one back, and you make a larger wound. If the individual is an ordinary one, that wound still heals itself. Of course, there are a great many people who write to us each day and want us to bring Abraham Lincoln into the present, or Mohammed, or Lenin. *That* can't be done, of course. Even if we could find them, the change in reality in moving one of the history molders would be too great to be healed. There are ways of calculating when a change is likely to be too great and we avoid even approaching that limit."

Miss Fellowes said, "Then, Timmie—"

"No, he presents no problem in that direction. Reality is safe. But—" He gave her a quick, sharp glance, then went on, "But never mind. Yesterday you said Timmie needed companionship."

"Yes," Miss Fellowes smiled her delight. "I didn't think you paid that any attention."

"Of course I did. I'm fond of the child. I appreciate your feelings for him and I was concerned enough to want to explain to you. Now I have; you've seen what we do; you've gotten some insight into the difficulties involved; so you know why, with the best will in the world, we can't supply companionship for Timmie."

"You can't?" said Miss Fellowes, with sudden dismay.

"But I've just explained. We couldn't possibly expect to find another Neanderthal his age without incredible luck, and if we could, it wouldn't be fair to multiply risks by having another human being in Stasis."

Miss Fellowes put down her spoon and said energetically, "But, Dr. Hoskins, that is not at all what I meant. I don't want you to bring another Neanderthal into the present. I know that's impossible. But it isn't impossible to bring another child to play with Timmie."

Hoskins stared at her in concern. "A *human* child?"

"*Another* child," said Miss Fellowes, completely hostile now. "Timmie is human."

"I couldn't dream of such a thing."

"Why not? Why couldn't you? What is wrong with the notion? You pulled that child out of Time and made him an eternal prisoner. Don't you owe him something? Dr. Hoskins, if there is any man who, in this world, is that child's father in every sense but the biological, it is you. Why can't you do this little thing for him?"

Hoskins said, "His *father?*" He rose, somewhat unsteadily, to his feet. "Miss Fellowes, I think I'll take you back now, if you don't mind."

They returned to the dollhouse in a complete silence that neither broke.

* * *

It was a long time after that before she saw Hoskins again, except for an occasional glimpse in passing. She was sorry about that at times; then, at other times, when Timmie was more than usually woebegone or when he spent silent hours at the window with its prospect of little more than nothing, she thought, fiercely: Stupid man.

Timmie's speech grew better and more precise each day. It never entirely lost a certain soft, slurriness that Miss Fellowes found rather endearing. In times of excitement, he fell back into tongue-clicking but those times were becoming fewer. He must

be forgetting the days before he came into the present—except for dreams.

As he grew older, the physiologists grew less interested and the psychologists more so. Miss Fellowes was not sure that she did not like the new group even less than the first. The needles were gone; the injections and withdrawals of fluid; the special diets. But now Timmie was made to overcome barriers to reach food and water. He had to lift panels, move bars, reach for cords. And the mild electric shocks made him cry and drove Miss Fellowes to distraction.

She did not wish to appeal to Hoskins; she did not wish to have to go to him; for each time she thought of him, she thought of his face over the luncheon table that last time. Her eyes moistened and she thought: Stupid, *stupid* man.

And then one day Hoskins' voice sounded unexpectedly, calling into the dollhouse, "Miss Fellowes."

She came out coldly, smoothing her nurse's uniform, then stopped in confusion at finding herself in the presence of a pale woman, slender and of middle height. The woman's fair hair and complexion gave her an appearance of fragility. Standing behind her and clutching at her skirt was a round-faced, large-eyed child of four.

Hoskins said, "Dear, this is Miss Fellowes, the nurse in charge of the boy. Miss Fellowes, this is my wife."

(Was this his wife? She was not as Miss Fellowes had imagined her to be. But then, why not? A man like Hoskins would choose a weak thing to be his foil. If that was what he wanted—)

She forced a matter-of-fact greeting. "Good afternoon, Mrs. Hoskins. Is this your—your little boy?"

(*That* was a surprise. She had thought of Hoskins as a husband, but not as a father, except, of course— She suddenly caught Hoskins' grave eyes and flushed.)

Hoskins said, "Yes, this is my boy, Jerry. Say hello to Miss Fellowes, Jerry."

(Had he stressed the word "this" just a bit? Was he saying *this* was his son and not—)

Jerry receded a bit further into the folds of the maternal skirt and muttered his hello. Mrs Hoskins' eyes were searching over Miss Fellowes' shoulders, peering into the room, looking for something.

Hoskins said, "Well, let's go in. Come, dear. There's a trifling discomfort at the threshold, but it passes."

Miss Fellowes said, "Do you want Jerry to come in, too?"

"Of course. He is to be Timmie's playmate. You said that Timmie needed a playmate. Or have you forgotten?"

"But—" She looked at him with a colossal, surprised wonder. "*Your* boy?"

He said peevishly, "Well, whose boy, then? Isn't this what you want? Come on in, dear. Come on in."

Mrs. Hoskins lifted Jerry into her arms with a distinct effort and, hesitantly, stepped over the threshold. Jerry squirmed as she did so, disliking the sensation.

Mrs. Hoskins said in a thin voice, "Is the creature here? I don't see him."

Miss Fellowes called, "Timmie. Come out."

Timmie peered around the edge of the door, staring up at the little boy who was visiting him. The muscles in Mrs. Hoskins' arms tensed visibly.

She said to her husband, "Gerald, are you sure it's safe?"

Miss Fellowes said at once, "If you mean is Timmie safe, why, of course he is. He's a gentle little boy."

"But he's a sa—savage."

(The ape-boy stories in the newspapers!) Miss Fellowes said emphatically, "He is

not a savage. He is just as quiet and reasonable as you can possibly expect a five-and-a-half-year-old to be. It is very generous of you, Mrs. Hoskins, to agree to allow your boy to play with Timmie but please have no fears about it."

Mrs. Hoskins said with mild heat, "I'm not sure that I agree."

"We've had it out, dear," said Hoskins. "Let's not bring up the matter for new argument. Put Jerry down."

Mrs. Hoskins did so and the boy backed against her, staring at the pair of eyes which were staring back at him from the next room.

"Come here, Timmie," said Miss Fellowes. "Don't be afraid."

Slowly, Timmie stepped into the room. Hoskins bent to disengage Jerry's fingers from his mother's skirt. "Step back, dear. Give the children a chance."

The youngsters faced one another. Although the younger, Jerry was nevertheless an inch taller, and in the presence of his straightness and his high-held, well-proportioned head, Timmie's grotesqueries were suddenly almost as pronounced as they had been in the first days.

Miss Fellowes' lips quivered.

It was the little Neanderthal who spoke first, in childish treble. "What's your name?" And Timmie thrust his face suddenly forward as though to inspect the other's features more closely.

Startled, Jerry responded with a vigorous shove that sent Timmie tumbling. Both began crying loudly and Mrs. Hoskins snatched up her child, while Miss Fellowes, flushed with repressed anger, lifted Timmie and comforted him.

Mrs. Hoskins said, "They just instinctively don't like one another."

"No more instinctively," said her husband wearily, "than any two children dislike each other. Now put Jerry down and let him get used to the situation. In fact, we had better leave. Miss Fellowes can bring Jerry to my office after a while and I'll have him taken home."

* * *

The two children spent the next hour very aware of each other. Jerry cried for his mother, struck out at Miss Fellowes and, finally, allowed himself to be comforted with a lollipop. Timmie sucked at another, and at the end of an hour, Miss Fellowes had them playing with the same set of blocks, though at opposite ends of the room.

She found herself almost maudlinly grateful to Hoskins when she brought Jerry to him.

She searched for ways to thank him but his very formality was a rebuff. Perhaps he could not forgive her for making him feel like a cruel father. Perhaps the bringing of his own child was an attempt, after all, to prove himself both a kind father to Timmie and, also, not his father at all. Both at the same time!

So all she could say was, "Thank you. Thank you very much."

And all he could say was, "It's all right. Don't mention it."

It became a settled routine. Twice a week, Jerry was brought in for an hour's play, later extended to two hours' play. The children learned each other's names and ways and played together.

And yet, after the first rush of gratitude, Miss Fellowes found herself disliking Jerry. He was larger and heavier and in all things dominant, forcing Timmie into a completely

secondary role. All that reconciled her to the situation was the fact that, despite difficulties, Timmie looked forward with more and more delight to the periodic appearances of his playfellow.

It was all he had, she mourned to herself.

And once, as she watched them, she thought: Hoskins' two children, one by his wife and one by Stasis.

While she herself—

Heavens, she thought, putting her fists to her temples and feeling ashamed: I'm jealous!

* * *

"Miss Fellowes," said Timmie (carefully, she had never allowed him to call her anything else) "when will I go to school?"

She looked down at those eager brown eyes turned up to hers and passed her hand softly through his thick, curly hair. It was the most disheveled portion of his appearance, for she cut his hair herself while he sat restlessly under the scissors. She did not ask for professional help, for the very clumsiness of the cut served to mask the retreating fore part of the skull and the bulging hinder part.

She said, "Where did you hear about school?"

"Jerry goes to school. Kin-der-gar-ten." He said it carefully. "There are lots of places he goes. Outside. When can I go outside, Miss Fellowes?"

A small pain centered in Miss Fellowes' heart. Of course, she saw, there would be no way of avoiding the inevitability of Timmie's hearing more and more of the outer world he could never enter.

She said, with an attempt at gaiety, "Why, whatever would you do in kindergarten, Timmie?"

"Jerry says they play games, they have picture tapes. He says there are lots of children. He says—he says—" A thought, then a triumphant upholding of both small hands with the fingers splayed apart. "He says this many."

Miss Fellowes said, "Would you like picture tapes? I can get you picture tapes. Very nice ones. And music tapes, too."

So that Timmie was temporarily comforted.

* * *

He pored over the picture tapes in Jerry's absence and Miss Fellowes read to him out of ordinary books by the hours.

There was so much to explain in even the simplest story, so much that was outside the perspective of his three rooms. Timmie took to having his dreams more often now that the outside was being introduced to him.

They were always the same, about the outside. He tried haltingly to describe them to Miss Fellowes. In his dreams, he was outside, an empty outside, but very large, with children and queer indescribable objects half-digested in his thoughts out of bookish descriptions half-understood, or out of distant Neanderthal memories half-recalled.

But the children and objects ignored him and though he was in the world, he was never part of it, but was as alone as though he were in his own room—and would wake up crying.

Miss Fellowes tried to laugh at the dreams, but there were nights in her own apartment when she cried, too.

One day, as Miss Fellowes read, Timmie put his hand under her chin and lifted it gently so that her eyes left the book and met his.

He said, "How do you know what to say, Miss Fellowes?"

She said, "You see these marks? They tell me what to say. These marks make words."

He stared at them long and curiously, taking the book out of her hands. "Some of these marks are the same."

She laughed with pleasure at this sign of his shrewdness and said, "So they are. Would you like to have me show you how to make the marks?"

"All right. That would be a nice game."

It did not occur to her that he could learn to read. Up to the very moment that he read a book to her, it did not occur to her that he could learn to read.

Then, weeks later, the enormity of what had been done struck her. Timmie sat in her lap, following word by word the printing in a child's book, reading to her. He was reading to her!

She struggled to her feet in amazement and said, "Now Timmie, I'll be back later. I want to see Dr. Hoskins."

Excited nearly to frenzy, it seemed to her she might have an answer to Timmie's unhappiness. If Timmie could not leave to enter the world, the world must be brought into those three rooms to Timmie—the whole world in books and film and sound. He must be educated to his full capacity. So much the world owed him.

* * *

She found Hoskins in a mood that was oddly analogous to her own; a kind of triumph and glory. His offices were unusually busy, and for a moment, she thought she would not get to see him, as she stood abashed in the anteroom.

But he saw her, and a smile spread over his broad face. "Miss Fellowes, come here."

He spoke rapidly into the intercom, then shut it off. "Have you heard? —No, of course, you couldn't have. We've done it. We've actually done it. We have intertemporal detection at close range."

"You mean," she tried to detach her thought from her own good news for a moment, "that you can get a person from historical times into the present?"

"That's just what I mean. We have a fix on a fourteenth-century individual right now. Imagine. *Imagine!* If you could only know how glad I'll be to shift from the eternal concentration on the Mesozoic, replace the paleontologists with the historians— But there's something you wish to say to me, eh? Well, go ahead; go ahead. You find me in a good mood. Anything you want you can have."

Miss Fellowes smiled. "I'm glad. Because I wonder if we might not establish a system of instruction for Timmie?"

"Instruction? In what?"

"Well, in everything. A school. So that he might learn."

"But *can* he learn?"

"Certainly, he *is* learning. He can read. I've taught him so much myself."

Hoskins sat there, seeming suddenly depressed. "I don't know, Miss Fellowes."

She said, "You just said that anything I wanted—"

"I know and I should not have. You see, Miss Fellowes, I'm sure you must realize that we cannot maintain the Timmie experiment forever."

She stared at him with sudden horror, not really understanding what he had said. How did he mean "cannot maintain"? With an agonizing flash of recollection, she recalled Professor Ademewski and his mineral specimen that was taken away after two weeks. She said, "But you're talking about a boy. Not about a rock—"

Dr. Hoskins said uneasily, "Even a boy can't be given undue importance, Miss Fellowes. Now that we expect individuals out of historical time, we will need Stasis space, all we can get."

She didn't grasp it. "But you can't. Timmie—Timmie—"

"Now, Miss Fellowes, please don't upset yourself. Timmie won't go right away; perhaps not for months. Meanwhile we'll do what we can."

She was still staring at him.

"Let me get you something, Miss Fellowes."

"No," she whispered. "I don't need anything." She arose in a kind of nightmare and left.

Timmie, she thought, you will *not* die. You will *not* die.

* * *

It was all very well to hold tensely to the thought that Timmie must not die, but how was that to be arranged? In the first weeks, Miss Fellowes clung only to the hope that the attempt to bring forward a man from the fourteenth century would fail completely. Hoskins' theories might be wrong or his practice defective. Then things could go on as before.

Certainly, that was not the hope of the rest of the world and, irrationally, Miss Fellowes hated the world for it. "Project Middle Ages" reached a climax of white-hot publicity. The press and the public had hungered for something like this. Stasis, Inc. had lacked the necessary sensation for a long time now. A new rock or another ancient fish failed to stir them. But *this* was *it*.

A historical human; an adult speaking a known language; someone who could open a new page of history to the scholar.

Zero-time was coming and this time it was not a question of three onlookers from a balcony. This time there would be a world-wide audience. This time the technicians of Stasis, Inc. would play their role before nearly all of mankind.

Miss Fellowes was herself all but savage with waiting. When young Jerry Hoskins showed up for his scheduled playtime with Timmie, she scarcely recognized him. He was not the one she was waiting for.

(The secretary who brought him left hurriedly after the barest nod for Miss Fellowes. She was rushing for a good place from which to watch the climax of Project Middle Ages. —And so ought Miss Fellowes with far better reason, she thought bitterly, if only that stupid girl would arrive.)

Jerry Hoskins sidled toward her, embarrassed. "Miss Fellowes?" He took the reproduction of a news-strip out of his pocket.

"Yes? What is it, Jerry?"

"Is this a picture of Timmie?"

Miss Fellowes stared at him, then snatched the strip from Jerry's hand. The excitement of Project Middle Ages had brought about a pale revival of interest in Timmie on the part of the press.

Jerry watched her narrowly, then said, "It says Timmie is an ape-boy. What does that mean?"

Miss Fellowes caught the youngster's wrist and repressed the impulse to shake him. "Never say that, Jerry. Never, do you understand? It is a nasty word and you mustn't use it."

Jerry struggled out of her grip, frightened.

Miss Fellowes tore up the news-strip with a vicious twist of the wrist. "Now go inside and play with Timmie. He's got a new book to show you."

And then, finally, the girl appeared. Miss Fellowes did not know her. None of the usual stand-ins she had used when business took her elsewhere was available now, not with Project Middle Ages at climax, but Hoskins' secretary had promised to find *someone* and this must be the girl.

Miss Fellowes tried to keep querulousness out of her voice. "Are you the girl assigned to Stasis Section One?"

"Yes, I'm Mandy Terris. You're Miss Fellowes, aren't you?"

"That's right."

"I'm sorry I'm late. There's just so much excitement."

"I know. Now I want you—"

Mandy said, "You'll be watching, I suppose." Her thin, vacuously pretty face filled with envy.

"Never mind that. Now I want you to come inside and meet Timmie and Jerry. They will be playing for the next two hours so they'll be giving you no trouble. They've got milk handy and plenty of toys. In fact, it will be better if you leave them alone as much as possible. Now I'll show you where everything is located and—"

"Is it Timmie that's the ape-b—"

"Timmie is the Stasis subject," said Miss Fellowes firmly.

"I mean, he's the one who's not supposed to get out, is that right?"

"Yes. Now, come in. There isn't much time."

And when she finally left, Mandy Terris called after her shrilly, "I hope you get a good seat and, golly, I sure hope it works."

Miss Fellowes did not trust herself to make a reasonable response. She hurried on without looking back.

* * *

But the delay meant she did *not* get a good seat. She got no nearer then the wall-viewing-plate in the assembly hall. Bitterly, she regretted that. If she could have been on the spot; if she could somehow have reached out for some sensitive portion of the instrumentations; if she were in some way able to wreck the experiment—

She found the strength to beat down her madness. Simple destruction would have done no good. They would have rebuilt and reconstructed and made the effort again. And she would never be allowed to return to Timmie.

Nothing would help. Nothing but that the experiment itself fail; that it break down irretrievably.

So she waited through the countdown, watching every move on the giant screen, scanning the faces of the technicians as the focus shifted from one to the other, watching for the look of worry and uncertainty that would mark something going unexpectedly wrong; watching, watching—

There was no such look. The count reached zero, and very quietly, very unassumingly, the experiment succeeded!

In the new Stasis that had been established there stood a bearded, stoop-shouldered peasant of indeterminate age, in ragged dirty clothing and wooden shoes, staring in dull horror at the sudden mad change that had flung itself over him.

And while the world went mad with jubilation, Miss Fellowes stood frozen in sorrow, jostled and pushed, all but trampled; surrounded by triumph while bowed down with defeat.

And when the loud-speaker called her name with strident force, it sounded it three times before she responded.

"Miss Fellowes. Miss Fellowes. You are wanted in Stasis Section One immediately. Miss Fellowes. Miss Fell—"

"Let me through!" she cried breathlessly, while the loud-speaker continued its repetitions without pause. She forced her way through the crowds with wild energy, beating at it, striking out with closed fists, flailing, moving toward the door in a nightmare slowness.

* * *

Mandy Terris was in tears. "I don't know how it happened. I just went down to the edge of the corridor to watch a pocket-viewing-plate they had put up. Just for a minute. And then before I could move or do anything—" She cried out in sudden accusation, "You said they would make no trouble; you *said* to leave them alone—"

Miss Fellowes, disheveled and trembling uncontrollably, glared at her. "Where's Timmie?"

A nurse was swabbing the arm of a wailing Jerry with disinfectant and another was preparing an anti-tetanus shot. There was blood on Jerry's clothes.

"He bit me, Miss Fellowes," Jerry cried in rage. "He *bit* me."

But Miss Fellowes didn't even see him.

"What did you do with Timmie?" she cried out.

"I locked him in the bathroom," said Mandy. "I just threw the little monster in there and locked him in."

Miss Fellowes ran into the dollhouse. She fumbled at the bathroom door. It took an eternity to get it open and to find the ugly little boy cowering in the corner.

"Don't whip me, Miss Fellowes," he whispered. His eyes were red. His lips were quivering. "I didn't mean to do it."

"Oh, Timmie, who told you about whips?" She caught him to her, hugging him wildly.

He said tremulously, "She said, with a long rope. She said you would hit me and hit me."

"You won't be. She was wicked to say so. But what happened? What happened?"

"He called me an ape-boy. He said I wasn't a real boy. He said I was an animal." Timmie dissolved in a flood of tears. "He said he wasn't going to play with a monkey anymore. I said I wasn't a monkey; I *wasn't* a monkey. He said I was all funny-looking. He said I was horrible ugly. He kept saying and saying and I bit him."

They were both crying now. Miss Fellowes sobbed, "But it isn't true. You know that, Timmie. You're a real boy. You're a dear real boy and the best boy in the world. And no one, *no* one will ever take you away from me."

* * *

It was easy to make up her mind, now; easy to know what to do. Only it had to be done quickly. Hoskins wouldn't wait much longer, with his own son mangled—

No, it would have to be done this night, *this* night; with the place four-fifths asleep and the remaining fifth intellectually drunk over Project Middle Ages.

It would be an unusual time for her to return but not an unheard of one. The guard knew her well and would not dream of questioning her. He would think nothing of her carrying a suitcase. She rehearsed the noncommittal phrase, "Games for the boy," and the calm smile.

Why shouldn't he believe that?

He did. When she entered the dollhouse again, Timmie was still awake, and she maintained a desperate normality to avoid frightening him. She talked about his dreams with him and listened to him ask wistfully after Jerry.

There would be few to see her afterward, none to question the bundle she would be carrying. Timmie would be very quiet and then it would be a *fait accompli*. It would be done and what would be the use of trying to undo it. They would leave her be. They would leave them both be.

She opened the suitcase, took out the overcoat, the woolen cap with the ear-flaps and the rest.

Timmie said, with the beginning of alarm, "Why are you putting all these clothes on me, Miss Fellowes?"

She said, "I am going to take you outside, Timmie. To where your dreams are."

"My dreams?" His face twisted in sudden yearning, yet fear was there, too.

"You won't be afraid. You'll be with me. You won't be afraid if you're with me, will you, Timmie?"

"No, Miss Fellowes." He buried his little misshapen head against her side, and under her enclosing arm she could feel his small heart thud.

It was midnight and she lifted him into her arms. She disconnected the alarm and opened the door softly.

And she screamed, for facing her across the open door was Hoskins!

* * *

There were two men with him and he stared at her, as astonished as she.

Miss Fellowes recovered first by a second and made a quick attempt to push past him; but even with the second's delay he had time. He caught her roughly and hurled her back against a chest of drawers. He waved the men in and confronted her, blocking the door.

"I didn't expect this. Are you completely insane?"

She had managed to interpose her shoulder so that it, rather than Timmie, had struck the chest. She said pleadingly, "What harm can it do if I take him, Dr. Hoskins? You can't put energy loss ahead of a human life?"

Firmly, Hoskins took Timmie out of her arms. "An energy loss this size would mean millions of dollars lost out of the pockets of investors. It would mean a terrible setback for Stasis, Inc. It would mean eventual publicity about a sentimental nurse destroying all that for the sake of an ape-boy."

"*Ape-boy!*" said Miss Fellowes, in helpless fury.

"That's what the reporters would call him," said Hoskins.

One of the men emerged now, looping a nylon rope through eyelets along the upper portion of the wall.

Miss Fellowes remembered the rope that Hoskins had pulled outside the room containing Professor Ademewski's rock specimen so long ago.

She cried out, "No!"

But Hoskins put Timmie down and gently removed the overcoat he was wearing. "You stay here, Timmie. Nothing will happen to you. We're just going outside for a moment. All right?"

Timmie, white and wordless, managed to nod.

Hoskins steered Miss Fellowes out of the dollhouse ahead of himself. For the moment, Miss Fellowes was beyond resistance. Dully, she noticed the hand-pull being adjusted outside the dollhouse.

"I'm sorry, Miss Fellowes," said Hoskins. "I would have spared you this. I planned it for the night so that you would know only when it was over."

She said in a weary whisper, "Because your son was hurt. Because he tormented this child into striking out at him."

"No. Believe me. I understand about the incident today and I know it was Jerry's fault. But the story has leaked out. It would have to with the press surrounding us on this day of all days. I can't risk having a distorted story about negligence and savage Neanderthalers, so-called, distract from the success of Project Middle Ages. Timmie has to go soon anyway; he might as well go now and give the sensationalists as small a peg as possible on which to hang their trash."

"It's not like sending a rock back. You'll be killing a human being."

"Not killing. There'll be no sensation. He'll simply be a Neanderthal boy in a Neanderthal world. He will no longer be a prisoner and alien. He will have a chance at a free life."

"What chance? He's only seven years old, used to being taken care of, fed, clothed, sheltered. He will be alone. His tribe may not be at the point where he left them now that four years have passed. And if they were, they would not recognize him. He will have to take care of himself. How will he know how?"

Hoskins shook his head in hopeless negative. "Lord, Miss Fellowes, do you think we haven't thought of that? Do you think we would have brought in a child if it weren't that it was the first successful fix of a human or near-human we made and that we did not dare to take the chance of unfixing him and finding another fix as good? Why do you suppose we kept Timmie as long as we did, if it were not for our reluctance to send a child back into the past. It's just"—his voice took on a desperate urgency—"that we can wait no longer. Timmie stands in the way of expansion! Timmie is a source of possible bad publicity; we are on the threshold of great things, and I'm sorry, Miss Fellowes, but we can't let Timmie block us. We cannot. We cannot. I'm sorry, Miss Fellowes."

"Well, then," said Miss Fellowes sadly. "Let me say good-by. Give me five minutes to say good-by. Spare me that much."

Hoskins hesitated. "Go ahead."

* * *

Timmie ran to her. For the last time he ran to her and for the last time Miss Fellowes clasped him in her arms.

For a moment, she hugged him blindly. She caught at a chair with the toe of one food, moved it against the wall, sat down.

"Don't be afraid, Timmie."

"I'm not afraid if you're here, Miss Fellowes. Is that man mad at me, the man out there?"

"No, he isn't. He just doesn't understand about us. —Timmie, do you know what a mother is?"

"Like Jerry's mother?"

"Did he tell you about his mother?"

"Sometimes. I think maybe a mother is a lady who takes care of you and who's very nice to you and who does good things."

"That's right. Have you ever wanted a mother, Timmie?"

Timmie pulled his head away from her so that he could look into her face. Slowly, he put his hand to her cheek and hair and stroked her, as long, long ago she had stroked him. He said, "Aren't you my mother?"

"Oh, Timmie."

"Are you angry because I asked?"

"No. Of course not."

"Because I know your name is Miss Fellowes, but—but sometimes, I call you 'Mother' inside. Is that all right?"

"Yes. Yes. It's all right. And I won't leave you anymore and nothing will hurt you. I'll be with you to care for you always. Call me Mother, so I can hear you."

"Mother," said Timmie contentedly, leaning his cheek against hers.

She rose, and, still holding him, stepped up on the chair. The sudden beginning of a shout from outside went unheard and, with her free hand, she yanked with all her weight at the cord where it hung suspended between two eyelets.

And Stasis was punctured and the room was empty.

Unto the Fourth Generation

At ten of noon, Sam Marten hitched his way out of the taxicab, trying as usual to open the door with one hand, hold his briefcase in another and reach for his wallet with a third. Having only two hands, he found it a difficult job and, again as usual, he thudded his knee against the cab-door and found himself still groping uselessly for his wallet when his feet touched pavement.

The traffic of Madison Avenue inched past. A red truck slowed its crawl reluctantly, then moved on with a rasp as the light changed. White script on its side informed an unresponsive world that its ownership was that of *F. Lewkowitz and Sons, Wholesaler Clothiers.*

Levkowich, thought Marten with brief inconsequence, and finally fished out his wallet. He cast an eye on the meter as he clamped his briefcase under his arm. Dollar sixty-five, make that twenty cents more as a tip, two singles gone would leave him only one for emergencies, better break a fiver.

"Okay," he said, "take out one-eighty-five, bud."

"Thanks," said the cabbie with mechanical insincerity and made the change.

Marten crammed three singles into his wallet, put it away, lifted his briefcase and breasted the human currents on the sidewalk to reach the glass doors of the building.

Levkovich? he thought sharply, and stopped. A passerby glanced off his elbow.

"Sorry," muttered Marten, and made for the door again.

Levkovich? That wasn't what the sign on the truck had said. The name had read Lewkowitz, Loo-koh-itz. Why did he *think* Levkovich? Even with his college German in the near past changing the w's to v's, where did he get the "-ich" from?

Levkovich? He shrugged the whole matter away roughly. Give it a chance and it would haunt him like a Hit Parade tinkle.

Concentrate on business. He was here for a luncheon appointment with this man, Naylor. He was here to turn a contract into an account and begin, at twenty-three, the smooth business rise which, as he planned it, would marry him to Elizabeth in two years and make him a paterfamilias in the suburbs in ten.

He entered the lobby with grim firmness and headed for the banks of elevators, his eye catching at the white-lettered directory as he passed.

It was a silly habit of his to want to catch suite numbers as he passed, without slowing, or (heaven forbid) coming to a full halt. With no break in his progress, he told himself, he could maintain the impression of belonging, of knowing his way around, and that was important to a man whose job involved dealing with other human beings.

Kulin-etts was what he wanted, and the word amused him. A firm specializing in the production of minor kitchen gadgets, striving manfully for a name that was significant, feminine, and coy, all at once—

His eyes snagged at the M's and moved upward as he walked. Mandel, Lusk, Lippert Publishing Company (two full floors), Lafkowitz, Kulin-etts. There it was—1024. Tenth floor. OK.

And then, after all, he came to a dead halt, turned in reluctant fascination, returned to the directory, and stared at it as though he were an out-of-towner.

Lafkowitz?

What kind of spelling was that?

It was clear enough. Lafkowitz, Henry J., 701. With an A. That was no good. That was useless.

Useless? Why useless? He gave his head one violent shake as though to clear it of mist. Damn it, what did he care how it was spelled? He turned away, frowning and angry, and hastened to an elevator door, which closed just before he reached it, leaving him flustered.

Another door opened and he stepped in briskly. He tucked his briefcase under his arm and tried to look bright alive—junior executive in its finest sense. He had to make an impression on Alex Naylor, with whom so far he had communicated only by telephone. If he was going to brood about Lewkowitzes and Lafkowitzes—

The elevator slid noiselessly to a halt at seven. A youth in shirt-sleeves stepped off, balancing what looked like a desk-drawer in which were three containers of coffee and three sandwiches.

Then, just as the doors began closing, frosted glass with black lettering loomed before Marten's eyes. It read: 701—HENRY J. LEFKOWITZ—IMPORTER and was pinched off by the inexorable coming together of the elevator doors.

Marten leaned forward in excitement. It was his impulse to say: Take me back down to 7.

But there were others in the car. And after all, he had no reason.

Yet there was a tingle of excitement within him. The Directory *had* been wrong. It wasn't A, it was E. Some fool of a non-spelling menial with a packet of small letters to go on the board and only one hind foot to do it with.

Lefkowitz. Still not right, though.

Again, he shook his head. Twice. Not right for what?

The elevator stopped at ten and Marten got off.

Alex Naylor of Kulin-etts turned out to be a bluff, middle-aged man with a shock of white hair, a ruddy complexion, and a broad smile. His palms were dry and rough, and he shook hands with a considerable pressure, putting his left hand on Marten's shoulder in an earnest display of friendliness.

He said, "Be with you in two minutes. How about eating right here in the building? Excellent restaurant, and they've got a boy who makes a good martini. That sound all right?"

"Fine. Fine." Marten pumped up enthusiasm from a somehow-clogged reservoir.

It was nearer ten minutes than two, and Marten waited with the usual uneasiness of a man in a strange office. He stared at the upholstery on the chairs and at the little

cubby-hole within which a young and bored switchboard operator sat. He gazed at the pictures on the wall and even made a half-hearted attempt to glance through a trade journal on the table next to him.

What he did not do was think of Lev—

He did *not* think of it.

* * *

The restaurant was good, or it would have been good if Marten had been perfectly at ease. Fortunately, he was freed of the necessity of carrying the burden of the conversation. Naylor talked rapidly and loudly, glanced over the menu with a practiced eye, recommended the Eggs Benedict, and commented on the weather and the miserable traffic situation.

On occasion, Marten tried to snap out of it, to lose that edge of fuzzed absence of mind. But each time the restlessness would return. Something was wrong. The name was wrong. It stood in the way of what he had to do.

With main force, he tried to break through the madness. In sudden verbal clatter, he led the conversation into the subject of wiring. It was reckless of him. There was no proper foundation; the transition was too abrupt.

But the lunch had been a good one; the dessert was on its way; and Naylor responded nicely.

He admitted dissatisfaction with existing arrangements. Yes, he had been looking into Marten's firm and, actually, it seemed to him that, yes, there was a chance, a good chance, he thought, that—

A hand came down on Naylor's shoulder as a man passed behind his chair. "How's the boy, Alex?"

Naylor looked up, grin ready-made and flashing. "Hey, Lefk, how's business?"

"Can't complain. See you at the—" He faded into the distance.

Marten wasn't listening. He felt his knees trembling, as he half-rose. "Who was that man?" he asked, intensely. It sounded more peremptory than he intended.

"Who? Lefk? Jerry Lefkovitz. You know him?" Naylor stared with cool surprise at his lunch companion.

"No. How do you spell his name?"

"L-E-F-K-O-V-I-T-Z, I think. Why?"

'With a V?"

"An F . . . Oh, there's a V in it, too." Most of the good nature had left Naylor's face.

Marten drove on. "There's a Lefkowitz in the building. With a W. You know, Lef-COW-itz."

"Oh?"

"Room 701. This is not the same one?"

"Jerry doesn't work in this building. He's got a place across the street. I don't know this other one. This is a big building, you know. I don't keep tabs on every one in it. What is all this, anyway?"

Marten shook his head and sat back. He didn't know what all this was, anyway. Or at least, if he did, it was nothing he dared explain. Could he say: I'm being haunted by all manner of Lefkowitzes today.

He said, "We were talking about wiring."

Naylor said, "Yes. Well, as I said, I've been considering your company. I've got to

talk it over with the production boys, you understand. I'll let you know."

"Sure," said Marten, infinitely depressed. Naylor wouldn't let him know. The whole thing was shot.

And yet, through and beyond his depression, there was still that restlessness.

The hell with Naylor. All Marten wanted was to break this up and get on with it. (*Get on with what?* But the question was only a whisper. Whatever did the questioning inside him was ebbing away, dying down . . .)

The lunch frayed to an ending. If they had greeted each other like long-separated friends at last reunited, they parted like strangers.

Marten felt only relief.

He left with pulses thudding, threading through the tables, out of the haunted building, onto the haunted street.

Haunted? Madison Avenue at 1:20 P.M. in an early fall afternoon with the sun shining brightly and ten thousand men and women be-hiving its long straight stretch.

But Marten felt the haunting. He tucked his briefcase under his arm and headed desperately northward. A last sigh of the normal within him warned him he had a three o'clock appointment on 36th Street. Never mind. He headed uptown. Northward.

* * *

At 54th Street, he crossed Madison and walked west, came abruptly to a halt and looked upward.

There was a sign on the window, three stories up. He could make it out clearly: A. S. LEFKOWICH, CERTIFIED ACCOUNTANT.

It had an F and an OW, but it was the first "-ich" ending he had seen. The first one. He was getting closer. He turned north again on Fifth Avenue, hurrying through the unreal streets of an unreal city, panting with the chase of something, while the crowds about him began to fade.

A sign in a ground floor window, M. R. LEFKOWICZ, M.D.

A small gold-leaf semi-circle of letters in a candy-store window: JACOB LEVKOW.

(Half a name, he thought savagely. Why is he disturbing me with half a name?)

The streets were empty now except for the varying clan of Lefkowitz, Levkowitz, Lefkowicz to stand out in the vacuum.

He was dimly aware of the park ahead, standing out in painted motionless green. He turned west. A piece of newspaper fluttered at the corner of his eyes, the only movement in a dead world. He veered, stooped, and picked it up, without slackening his pace.

It was in Yiddish, a torn half-page.

He couldn't read it. He couldn't make out the blurred Hebrew letters, and could not have read it if they were clear. But one word was clear. It stood out in dark letters in the center of the page, each letter clear in its every serif. And it said Lefkovitsch, he knew, and as he said it to himself, he placed its accent on the second syllable: Lef-KUH-vich.

He let the paper flutter away and entered the empty park.

The trees were still and the leaves hung in odd, suspended attitudes. The sunlight was a dead weight upon him and gave no warmth.

He was running, but his feet kicked up no dust and a tuft of grass on which he placed his weight did not bend.

* * *

And there on a bench was an old man; the only man in the desolate park. He wore a dark felt cap, with a visor shading his eyes. From underneath it, tufts of gray hair protruded. His grizzled beard reached the uppermost button of his rough jacket. His old trousers were patched, and a strip of burlap was wrapped about each worn and shapeless shoe.

Marten stopped. It was difficult to breathe. He could only say one word and he used it to ask his question: "Levkovich?"

He stood there, while the old man rose slowly to his feet; brown old eyes peering close.

"Marten," he sighed. "Samuel Marten. You have come." The words sounded with an effect of double exposure, for under the English, Marten heard the faint sigh of a foreign tongue. Under the "Samuel" was the unheard shadow of a "Schmu-el."

The old man's rough, veined hands reached out, then withdrew as though he were afraid to touch. "I have been looking but there are so many people in this wilderness of a city-that-is-to-come. So many Martins and Martines and Mortons and Mertons. I stopped at last when I found greenery, but for a moment only—I would not commit the sin of losing faith. And then you came."

"It is I," said Marten, and knew it was. "And you are Phinehas Levkovich. Why are we here?"

"I am Phinehas ben Jehudah, assigned the name Levkovich by the ukase of the Tsar that ordered family names for all. And we are here," the old man said, softly, "because I prayed. When I was already old, Leah, my only daughter, the child of my old age, left for America with her husband, left the knouts of the old for the hope of the new. And my sons died, and Sarah, the wife of my bosom, was long dead and I was alone. And the time came when I, too, must die. But I had not seen Leah since her leaving for the far country and word had come but rarely. My soul yearned that I might see sons born unto her; sons of my seed; sons in whom my soul might yet live and not die."

His voice was steady and the soundless shadow of sound beneath his words was the stately roll of an ancient language.

"And I was answered and two hours were given me that I might see the first son of my line to be born in a new land and in a new time. My daughter's daughter's daughter's son, have I found you, then, amidst the splendor of this city?"

"But why the search? Why not have brought us together at once?"

"Because there is pleasure in the hope of the seeking, my son," said the old man, radiantly, "and in the delight of the finding. I was given two hours in which I might seek, two hours in which I might find . . . and behold, thou art here, and I have found that which I had not looked to see in life." His voice was old, caressing. "Is it well with thee, my son?"

"It is well, my father, now that I have found thee," said Marten, and dropped to his knees. "Give me thy blessing, my father, that it may be well with me all the days of my life, and with the maid whom I am to take to wife and the little ones yet to be born of my seed and thine."

He felt the old hand resting lightly on his head and there was only the soundless whisper.

Marten rose.

The old man's eyes gazed into his yearningly. Were they losing focus?

"I go to my fathers now in peace, my son," said the old man, and Marten was alone in the empty park.

There was an instant of renewing motion, of the Sun taking up its interrupted task, of the wind reviving, and even with that first instant of sensation, all slipped back—

At ten of noon, Sam Marten hitched his way out of the taxicab, and found himself groping uselessly for his wallet while traffic inched on.

A red truck slowed, then moved on. A white script on its side announced: *F. Lewkowitz and Sons, Wholesale Clothiers.*

Marten didn't see it. Yet somehow he knew that all would be well with him. Somehow, as never before, he knew . . .

Thiotimoline and the Space Age

(Transcript of a speech delivered at the 12th annual meeting of the American Chronochemical Society.)

Gentlemen:

I have been called the founder of chronochemistry and in response I cannot resist a certain sense of pride. To have originated a new science is a privilege given to very few.

I can still remember, quite clearly, that day in 1947 when I first dropped a pinch of thiotimoline into water and thought I noticed something odd. To be sure, it dissolved rapidly; but I was used to that. It always seemed to vanish the instant it touched the water.

But I had never handled a sample of thiotimoline quite as pure as the pinch I had obtained that July day and, as I watched the white powder drop toward the water, I distinctly remember myself thinking, "Why, that dissolved *before* it hit the water."

Well, it's an old story to you, I know, though I still like to linger on the thrill of the slow awakening of certainty; of the measurements taken; of the first crude timings by eye; of the more delicate work of the original endochronometer—the same instrument now at the Smithsonian.

The announcement of endochronicity, of the fact that a substance existed which dissolved in water 1.12 seconds *before* the water was added created a stir. You all remember it, I'm sure. And yet, somehow, the impression arose that thiotimoline was a hoax. There was a distinct air of amusement in many of the comments in the learned journals. Private communications reaching me showed a distressing tendency to describe experiments which obviously lacked all scientific validity and which, I could but conclude, were meant as some sort of joke. Perhaps the final proof of the damage this has done is that after twelve years of existence, the American Chronochemical Society can muster an audience of exactly fifteen people to hear this talk.

It has been an expensive joke, gentlemen, one that has cost us our lead in the race for space. For while American researchers have, but with difficulty, obtained grants to

continue their investigations of thiotimoline and have been starved into small-scale experiments, while withering under the genial air of disbelief on the part of their colleagues, the Soviet Union has established the town Khruschevsk in the Urals, whose popular nickname of "Tiotimolingrad" will well describe the nature of the activities that go on behind the walls of the modern and well-equipped scientific laboratories that have been established there.

That the Soviet Union has taken thiotimoline seriously and has done something about it is as sure as can be, and yet we remain sunk in complacency. No important political figure has viewed the matter with alarm. If they have said anything at all for publication, it is simply, "What's thiotimoline?" I intend now to explain to these near-sighted politicos just what thiotimoline means to our space effort.

Thiotimoline research graduated from what we might now call the "classical" stage, to the "modern" with the development of the "telechronic battery" by Anne McLaren and Donald Michie of the University of Edinburgh. If you have read about it anywhere, you can only be clairvoyant, for the popular press and much of the learned press maintained a stubborn silence. In fact, the original paper appeared only in the small, though highly respected, *Journal of Irreproducible Results*, edited by that able gentleman Alexander Kohn. Let me describe the telechronic battery.

A simple endochronometer—with which we are all acquainted—is a device which will automatically deliver water into a small tube containing thiotimoline. The thiotimoline will dissove 1.12 seconds before the water is delivered.

Imagine the endochronometer so connected with a second similar unit that the solution of the thiotimoline in the first activates the water-delivering pipette of the second. The thiotimoline of the second unit will dissolve 1.12 seconds before that water is delivered, and therefore 2.24 seconds before the water is delivered to the first unit.

An indefinite number of endochronometers can thus be hooked up, the thiotimoline of each of the series dissolving 1.12 seconds before the preceding member. A battery consisting of about 77,000 such units would yield a final sample of thiotimoline which dissolved a full day before the initial quantity of water was delivered.

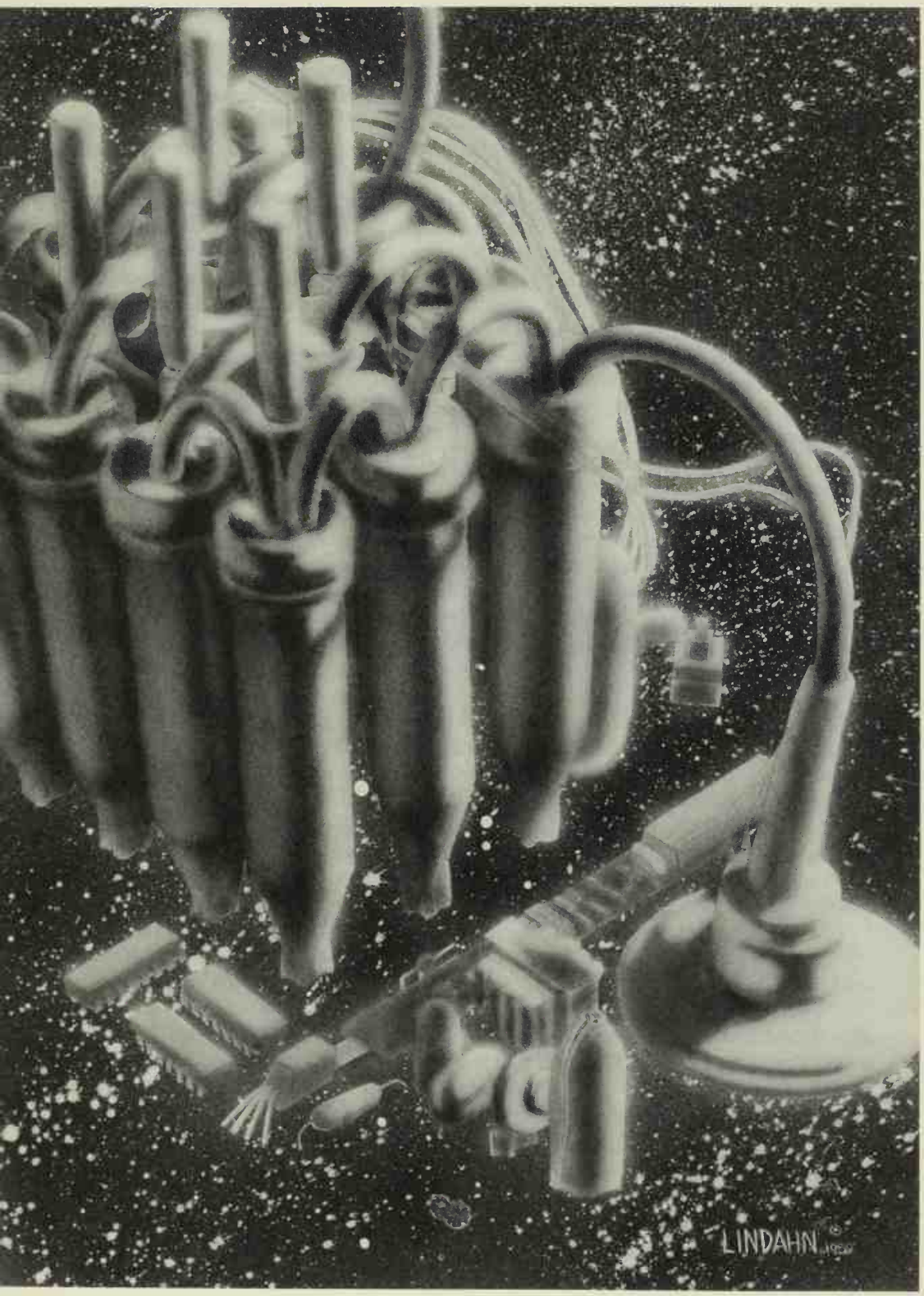
Such batteries have now been developed both at Edinburgh and in my own laboratories in Boston in extremely compact models, through use of printed circuits and advanced miniaturization. A device of not more than a cubic foot in volume can afford a twenty-four hour endochronic interval. There is strong, if indirect, evidence that the Soviet Union possesses even more sophisticated devices and is turning them out in commercial quantities.

The obvious practical application of the telechronic battery is that of weather prediction. In other words, if the first element of a battery is exposed to the air in such a way that rain, if any, will fall upon it, the final element will dissolve the day before and thus offer a foolproof method of predicting rain—or lack of rain—one day ahead.

I trust you will all see, gentlemen, that the telechronic battery can be used for generalized predictions as well.

Suppose, to take a frivolous example, you were interested in a particular horse race. Suppose you intended to place a wager that a particular horse would win that race. Twenty-four hours in advance of the race, you could make up your mind quite firmly that if the horse were to win the next day, you would, immediately upon receiving the news, add water to the first element of a telechronic battery. If it did not win, you would not.

Having made that decision, you need then but observe the last element. If the


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thiotimoline in that last element dissolves—followed by a chain of solutions all along the battery at 1.12 second intervals, with which you need not be concerned—you will know that the horse will win beyond doubt. You might even, if you were in a flamboyant mood, allow the solution of the final element to activate a flashing light, a fire gong, a charge of explosive; anything that will unmistakably attract your attention.

You laugh, gentlemen, and yet can this system not be applied, without change, to the launching of a satellite?

Suppose that four hours after launching, an automatic device on board the satellite telemeters a signal to the launching base. Suppose, next, that this radio signal is designed to activate the first element of a telechronic battery.

Do you see the consequences? The sending of the signal four hours after launching can only mean that the satellite is safely in orbit. If it were not, it would have plunged to destruction before the four hours had elapsed. If then, the final element of the telechronic battery dissolves today, we can be certain that there will be a successful launching tomorrow and all may proceed.

If the final element does not dissolve, the launching will not be successful and there must, therefore, be something wrong with the satellite assembly. A team of technicians will begin checking the device and at the moment when the defective item is corrected, the telechronic battery will operate. The launching will then be scheduled in the full expectation of success.

Do you still laugh, gentlemen?

Is this not the only feasible explanation for the consistent Soviet successes as compared with our own very spotty record? It is customary, of course, to attribute the appearance of unfailing success of Soviet launchings to the fact that they have been deliberately hiding many failures, but does this stand up? Have they not, with remarkable consistency, managed to score successes at such time as would most profit themselves?

Sputnik I went up within a month of the hundredth birthday of Tsiolkovsky, the Soviet rocket pioneer. Sputnik II went up to celebrate the fortieth anniversary of the Russian Revolution. Lunik II went up just before Khrushchev's visit to the United States. Lunik III went up on the second anniversary of Sputnik I.

Coincidence? Or did they simply have the foreknowledge of their telechronic batteries? Have they tested a number of possible rocket assemblies and selected that one for which success was forecast? How else can one explain that the United States has not yet succeeded in launching any of their many rockets on some significant day?

Nor, remember, do the Soviets invariably hold their announcements back until they are certain they have achieved success, as, some have suggested. In at least one case, they announced an achievement in advance.

When Lunik III was on its way to circle the Moon, the Soviet scientists confidently announced it would take pictures of the hidden side of the Moon as it progressed round that body in its orbit. As far as the orbit of Lunik III was concerned, they were safe. From its motion and from the positions of Earth, Moon and Lunik, the orbit of Lunik III could be calculated with absolute precision.

How could the Soviet scientists, however, be so sure that the intricacies of the camera assemblage would work to perfection? Could it be that the successful completion of the camera-task was set to activate a telechronic battery at the launching base? Could its activation have allowed them to make their announcement a day before the pictures were taken with the full knowledge that success and a prestige-victory would result?

I say the answer is: Obviously, yes.

And what of future attempts to send a man into space? Suppose the man were to agree to send a signal, manually, after a certain time had elapsed after firing. A telechronic battery would then tell us, while the astronaut was still on the ground and unlaunched, that not only would he be in orbit but that he would be alive and at least well enough to send the message.

If the telechronic battery remains inactive, the man will not be sent up. It is as simple as that. Since it is the chance of harm to an astronaut that is the deciding factor holding back the step of "man into space," it seems certain that the Soviet Union will achieve this goal first, thanks to our government's obtuseness with respect to thiotimoline.

Presumably, one can extend the principle to all manner of scientific and non-scientific investigations. Gigantic mega-batteries can even be built—in theory—to predict the result of an election to be held the following year—but I have labored the point long enough. Let me, instead, make a few remarks concerning the great dangers, as well as the great benefits, which are involved in thiotimoline research.

* * *

These begin with the oldest of all paradoxes of thiotimoline—the paradox of fooling. In other words, the chance of having thiotimoline dissolve and then being fooled by a refusal to add the water. The original argument against such a notion, as elucidated in my laboratory, involved the theory of the endochronic atom—which has since been confirmed by half a dozen other investigators. One pair of the bonds of one or more of the carbon atoms in the thiotimoline molecule are forced, through supersteric hindrance, to a point in the temporal plane. One bond extends 1.12 seconds into the past and one extends 1.12 seconds into the future. When the future end of a thiotimoline molecule dissolves and drags the rest of the molecule with it, it is therefore not predicting a possible future event. It is recording an actual future event.

Nevertheless, it has been shown that fooling thiotimoline is possible in theory. Using Heisenberg's principle of uncertainty, it can be demonstrated that one cannot say with certainty that an individual molecule of thiotimoline will dissolve before the water is added and that, in fact, the probability of its not doing so is quite appreciable.

That is undoubtedly true—for an individual molecule. When, however, quintillions of molecules are involved as is the case with even the most microscopic samples of thiotimoline actually used in the individual units of even the most sophisticated telechronic batteries, the chance that all of those quintillions, or even a detectable fraction of them, will fail to dissolve is infinitesimal.

To be sure, in setting up a telechronic battery, in which many thousands of units are involved, the failure of the instrument will depend on the failure to dissolve of any one of those units. The chance of "Heisenberg failure," as it is called, can be calculated and some estimates at least seem to show that a battery will give a false positive one time out of rather more than a million.

In such a case, the final unit in a telechronic battery will dissolve even though water is not added to the first. Somewhat more often, the converse will be true; that the final unit will not dissolve in advance even though water is added to the first. Naturally the former alternative is more interesting from the theoretical viewpoint, the question arising: Then where did the water come from?

An attempt was made in my laboratories to actually record such a false negative involving solution without subsequent addition of water. The possibility of creation of matter out of nothing existed and this would be of great importance in connection with the Gold-Hoyle theory of the steady-state universe.

The principle involved in the attempt was simple. One of my students would set up a battery adjusted for the manual addition of water the next day, intending in all honesty to allow the experiment to take its course. The final unit would, theoretically, dissolve. I would then place the first student at a different task and put a second student in charge of the battery with instructions not to add water.

Our first great surprise was to find that the final unit actually dissolved, under these circumstances, about once in twenty efforts. This was a far greater incidence than could possibly be explained by "Heisenberg failure." But, as it rapidly turned out, the thiotimoline was not "fooled." Something, in every case, brought about the addition of water. In the first case, the original student returned to add the water and did so before he could be stopped. In another case, there was accidental spillage. In another, a janitor—

But it would be tedious to describe the manner in which thiotimoline, so to speak, refused to be fooled. Suffice it that we did not have one true case of "Heisenberg failure."

With time, of course, we began to guard against ordinary accidents and the incidence of "pseudofailure" declined. For instance, we placed the battery in closed, desiccated vessels; but, during pseudofailure, these cracked and broke.

In our final experiment we thought that surely we had a "Heisenberg failure" but in the end, the experiment was not reported in the literature. I tried instead, and without success, to report the implications of it to appropriate officials. Let me describe the experiment to you now.

* * *

We placed the battery in a welded steel container after it had registered solution.

And as we waited for the moment when the water should be added but would not, Hurricane Diane struck New England. That was in August of 1955. The hurricane had been predicted, its course had been followed and we were ready for it. There had been several hurricanes in New England in '54 and '55 and we were hardened to it.

At one point, though, the Weather Bureau announced the danger to be passed, the hurricane was blowing out to sea. We all sighed with relief as we waited for zero minute.

However, if any of you were in New England that day you will remember that the Weather Bureau announced later that it had "lost" the hurricane; that the backlash struck surprisingly; that five inches of rain or more fell in many places within an hour; that rivers rose and extensive flooding began.

I watched that rain; it was a deluge. I watched the small river running across our campus become a torrent and begin to spread up and out across the lawns while the lines of shrubbery seemed to grow out of roiled sheets of water.

I shouted for an axe. One of my students brought one, remarking afterward that I sounded so wild he was almost afraid I had turned homicidal maniac.

I smashed that steel container. I removed the telechronic battery and in the flickering gray light of that storm-lashed day, I filled a beaker of water and waited for zero

minute, ready to douse the battery at the proper moment.

As I did so, the rain slackened, the hurricane moved off.

I do not say we caused the hurricane to return and yet—water had to be added to that battery somehow. If the stainless steel container had to be floated away on a rising flood and smashed by wind and water to have that done, it would be done. The original solution of the final unit predicted that; or else it predicted my deliberate subversion of the experiment. I chose the latter.

As a result of all this, I can envisage what I can only call a "peace bomb." Enemy agents working within a particular nation, can assemble telechronic batteries, operate them until a case occurs in which the final unit dissolves. That battery can then be encased in a steel capsule and placed near a stream well above high-water mark. Twenty-four hours later, a disastrous flood is bound to occur, since only so can water reach the container. This will be accompanied by high winds since only so can the container be smashed.

Damage will undoubtedly be as great in its way as would result from an H-Bomb blast and yet the telechronic battery would be a "peace bomb" for its use will not bring on retaliation and war. There would be no reason to suspect anything but an act of God.

Such a bomb requires little in the way of technology or expense. The smallest nation, the smallest of revolutionary or dissident groups could manage it.

Sometimes in my more morbid moment, I wonder if perhaps Noah's flood—the prototype of which actually has been recorded in Mesopotamian sediments—was not brought about by thiotimoline experiments among the ancient Sumerians.

I tell you, gentlemen, if we have one urgent task ahead of us now it is to convince our government to press for international control of all sources of thiotimoline. It is boundlessly useful when used properly; boundlessly harmful when used improperly.

Not a milligram of it must be allowed to reach irresponsible hands.

Gentlemen, I call you to a crusade for the safety of the world!

The Machine That Won the War

The celebration had a long way to go and even in the silent depths of Multivac's underground chambers, it hung in the air.

If nothing else, there was the mere fact of isolation and silence. For the first time in a decade, technicians were not scurrying about the vitals of the giant computer, the soft lights did not wink out their erratic patterns, the flow of information in and out had halted.

It would not be halted long, of course, for the needs of peace would be pressing. Yet now, for a day, perhaps for a week, even Multivac might celebrate the great time, and rest.

Lamar Swift took off the military cap he was wearing and looked down the long and empty main corridor of the enormous computer. He sat down rather wearily in one of the technician's swing-stools, and his uniform, in which he had never been comfortable, took on a heavy and wrinkled appearance.

He said, "I'll miss it all after a grisly fashion. It's hard to remember when we weren't at war with Deneb, and it seems against nature now to be at peace and to look at the stars without anxiety."

The two men with the Executive Director of the Solar Federation were both younger than Swift. Neither was as gray. Neither looked quite as tired.

John Henderson, thin-lipped and finding it hard to control the relief he felt in the midst of triumph, said, "They're destroyed! They're destroyed! It's what I keep saying to myself over and over and I still can't believe it. We all talked so much, over so many years, about the menace hanging over Earth and all its worlds, over every human being, and all the time it was true, every word of it. And now we're alive and it's the Denebians who are shattered and destroyed. They'll be no menace now, ever again."

"Thanks to Multivac," said Swift, with a quiet glance at the imperturbable Jablonsky, who through all the war had been Chief Interpreter of science's oracle. "Right, Max?"

Jablonsky shrugged. Automatically, he reached for a cigarette and decided against it. He alone, of all the thousands who had lived in the tunnels within Multivac, had

been allowed to smoke, but toward the end he had made definite efforts to avoid making use of the privilege.

He said, "Well, that's what *they* say." His broad thumb moved in the direction of his right shoulder, aiming upward.

"Jealous, Max?"

"Because they're shouting for Multivac? Because Multivac is the big hero of mankind in this war?" Jablonsky's craggy face took on an air of suitable contempt. "What's that to me? Let Multivac be the machine that won the war, if it pleases them."

Henderson looked at the other two out of the corners of his eyes. In this short interlude that the three had instinctively sought out in the one peaceful corner of a metropolis gone mad; in this entr'acte between the dangers of war and the difficulties of peace; when, for one moment, they might all find surcease; he was conscious only of his weight of guilt.

Suddenly, it was as though that weight were too great to be borne longer. It had to be thrown off, along with the war; now!

Henderson said, "Multivac had nothing to do with victory. It's just a machine."

"A big one," said Swift.

"Then just a big machine. No better than the data fed it." For a moment, he stopped, suddenly unnerved at what he was saying.

Jablonsky looked at him, his thick fingers once again fumbling for a cigarette and once again drawing back. "You should know. You supplied the data. Or is it just that you're taking the credit?"

"*No*," said Henderson, angrily. "There is no credit. What do you know of the data Multivac had to use; predigested from a hundred subsidiary computers here on Earth, on the Moon, on Mars, even on Titan. With Titan always delayed and always that feeling that its figures would introduce an unexpected bias."

"It would drive anyone mad," said Swift, with gentle sympathy.

Henderson shook his head. "It wasn't just that. I admit that eight years ago when I replaced Lepont as Chief Programmer, I was nervous. But there was an exhilaration about things in those days. The war was still long-range; an adventure without real danger. We hadn't reached the point where manned vessels had had to take over and where interstellar warps could swallow up a planet clean, if aimed correctly. But then, when the real difficulties began—"

Angrily—he could finally permit anger—he said, "You know nothing about it."

"Well," said Swift. "Tell us. The war is over. We've won."

"Yes." Henderson nodded his head. He had to remember that. Earth had won so all had been for the best. "Well, the data became meaningless."

"Meaningless? You mean that literally?" said Jablonsky.

"Literally. What would you expect? The trouble with you was that you weren't out in the thick of it. You never left Multivac, Max, and you, Mr. Director, never left the Mansion except on state visits where you saw exactly what they wanted you to see."

"I was not as unaware of that," said Swift, "as you may have thought."

"Do you know," said Henderson, "to what extent data concerning our production capacity, our resource potential, our trained manpower—everything of importance to the war effort, in fact—had become unreliable and untrustworthy during the last half of the war? Group leaders, both civilian and military, were intent on projecting their own improved image, so to speak, so they obscured the bad and magnified the good. Whatever the machines might do, the men who programmed them and interpreted the results had their own skins to think of and competitors to stab. There was no way of stopping that. I tried, and failed."

"Of course," said Swift, in quiet consolation. "I can see that you would."

This time Jablonsky decided to light his cigarette. "Yet I presume you provided Multivac with data in your programming. You said nothing to us about unreliability."

"How could I tell you? And if I did, how could you afford to believe me?" demanded Henderson, savagely. "Our entire war effort was geared to Multivac. It was the one great weapon on our side, for the Denebians had nothing like it. What else kept up morale in the face of doom but the assurance that Multivac would always predict and circumvent any Denebian move, and would always direct and prevent the circumvention of our moves? Great Space, after our Spy-warp was blasted out of hyperspace we lacked any reliable Denebian data to feed Multivac and we didn't dare make *that* public."

"True enough," said Swift.

"Well, then," said Henderson, "if I told you the data was unreliable, what could you have done but replace me and refuse to believe me? I couldn't allow that."

"What did you do?" said Jablonsky.

"Since the war is won, I'll tell you what I did. I corrected the data."

"How?" asked Swift.

"Intuition, I presume. I juggled them till they looked right. At first, I hardly dared. I changed a bit here and there to correct what were obvious impossibilities. When the sky didn't collapse about us, I got braver. Toward the end, I scarcely cared. I just wrote out the necessary data as it was needed. I even had the Multivac Annex prepare data for me according to a private programming pattern I had devised for the purpose."

"Random figures?" said Jablonsky.

"Not at all. I introduced a number of necessary biases."

Jablonsky smiled, quite unexpectedly, his dark eyes sparkling behind the crinkling of the lower lids. "Three times a report was brought me about unauthorized uses of the Annex, and I let it go each time. If it had mattered, I would have followed it up and spotted you, John, and found out what you were doing. But, of course, nothing about Multivac mattered in those days, so you got away with it."

"What do you mean, nothing mattered?" asked Henderson, suspiciously.

"Nothing did. I suppose if I had told you this at the time, it would have spared you your agony, but then if you had told me what you were doing, it would have spared me mine. What made you think Multivac was in working order, whatever the data you supplied it?"

"Not in working order?" said Swift.

"Not really. Not reliably. After all, where were my technicians in the last years of the war? I'll tell you, they were feeding computers on a thousand different space devices. They were gone! I had to make do with kids I couldn't trust and veterans who were out-of-date. Besides, do you think I could trust the solid-state components coming out of Cryogenics in the last years? Cryogenics wasn't any better placed as far as personnel was concerned than I was. To me, it didn't matter whether the data being supplied Multivac were reliable or not. The *results* weren't reliable. That much I knew."

"What did you do?" asked Henderson.

"I did what you did, John. I introduced the bugger factor. I adjusted matters in accordance with intuition—and that's how the machine won the war."

Swift leaned back in the chair and stretched his legs out before him. "Such revelations. It turns out then that the material handed me to guide me in my decision-making capacity was a man-made interpretation of man-made data. Isn't that right?"

"It looks so," said Jablonsky.

"Then I perceive I was correct in not placing too much reliance upon it," said Swift.

"You didn't?" Jablonsky, despite what he had just said, managed to look professionally insulted.

"I'm afraid I didn't. Multivac might seem to say, Strike here, not there; do this, not that; wait, don't act. But I could never be certain that what Multivac seemed to say, it really did say; or what it really said, it really meant. I could never be certain."

"But the final report was always plain enough, sir," said Jablonsky.

"To those who did not have to make the decision, perhaps. Not to me. The horror of the responsibility of such decisions was unbearable and not even Multivac was sufficient to remove the weight. But the point is I was justified in doubting and there is tremendous relief in that."

Caught up in the conspiracy of mutual confession, Jablonsky put titles aside, "What was it you did then, Lamar? After all, you did make decisions. How?"

"Well, it's time to be getting back perhaps but—I'll tell you first. Why not? I did make use of a computer, Max, but an older one than Multivac, much older."

He groped in his own pocket for cigarettes, and brought out a package along with a scattering of small change; old-fashioned coins dating to the first years before the metal shortage had brought into being a credit system tied to a computer-complex.

Swift smiled rather sheepishly. "I still need these to make money seem substantial to me. An old man finds it hard to abandon the habits of youth." He put a cigarette between his lips and dropped the coins one by one back into his pocket.

He held the last coin between his fingers, staring absently at it. "Multivac is not the first computer, friends, nor the best-known, nor the one that can most efficiently lift the load of decision from the shoulders of the executive. A machine *did* win the war, John; at least a very simple computing device did; one that I used every time I had a particularly hard decision to make."

With a faint smile of reminiscence, he flipped the coin he held. It glinted in the air as it spun and came down in Swift's outstretched palm. His hand closed over it and brought it down on the back of his left hand. His right hand remained in place, hiding the coin.

"Heads or tails, gentlemen?" said Swift.

My Son, the Physicist

Her hair was a light apple-green in color, very subdued, very old-fashioned. You could see she had a delicate hand with the dye, the way they did thirty years ago, before the streaks and stipples came into fashion.

She had a sweet smile on her face, too, and a calm look that made something serene out of elderliness.

And, by comparison, it made something shrieking out of the confusion that enfolded her in the huge government building.

A girl passed her at a half-run, stopped and turned toward her with a blank stare of astonishment. "How did you get in?"

The woman smiled. "I'm looking for my son, the physicist."

"Your son, the—"

"He's a communications engineer, really. Senior Physicist Gerard Cremona."

"Dr. Cremona. Well, he's— Where's your pass?"

"Here it is. I'm his mother."

"Well, Mrs. Cremona, I don't know. I've got to— His office is down there. You just ask someone." She passed on, running.

Mrs. Cremona shook her head slowly. Something had happened, she supposed. She hoped Gerard was all right.

She heard voices much farther down the corridor and smiled happily. She could tell Gerard's.

She walked into the room and said, "Hello, Gerard."

Gerard was a big man, with a lot of hair still and the gray just beginning to show because he didn't use dye. He said he was too busy. She was very proud of him and the way he looked.

Right now, he was talking volubly to a man in army uniform. She couldn't tell the rank, but she knew Gerard could handle him.

Gerard looked up and said, "What do you— Mother! What are you doing here?"

"I was coming to visit you today."

"Is today Thursday? Oh Lord, I forgot. Sit down, Mother, I can't talk now. Any seat. Any seat. Look, General."

General Reiner looked over his shoulder and one hand slapped against the other in the region of the small of his back. "Your mother?"

"Yes."

"Should she be here?"

"Right now, no, but I'll vouch for her. She can't even read a thermometer so nothing of this will mean anything to her. Now look, General. They're on Pluto. You see? They are. The radio signals can't be of natural origin so they must originate from human beings, from our men. You'll have to accept that. Of all the expeditions we've sent out beyond the asteroid belt, one turns out to have made it. And they've reached Pluto."

"Yes, I understand what you're saying, but isn't it impossible just the same? The men who are on Pluto now were launched four years ago with equipment that could not have kept them alive more than a year. That is my understanding. They were aimed at Ganymede and seem to have gone eight times the proper distance."

"Exactly. And we've got to know how and why. They may—just—have—had—help."

"What kind? How?"

Cremona clenched his jaws for a moment as though praying inwardly. "General," he said, "I'm putting myself out on a limb but it is just barely possible non-humans are involved. Extra-terrestrials. We've got to find out. We don't know how long contact can be maintained."

"You mean" (the General's grave face twitched into an almost-smile) "they may have escaped from custody and they may be recaptured again at any time."

"Maybe. Maybe. The whole future of the human race may depend on our knowing exactly what we're up against. Knowing it *now*."

"All right. What is it you want?"

"We're going to need Army's Multivac computer at once. Rip out every problem it's working on and start programming our general semantic problem. Every communications engineer you have must be pulled off anything he's on and placed into coordination with our own."

"But why? I fail to see the connection."

A gentle voice interrupted. "General, would you like a piece of fruit? I brought some oranges?"

Cremona said, "Mother! Please! Later! General, the point is a simple one. At the present moment Pluto is just under four billion miles away. It takes six hours for radio waves, traveling at the speed of light, to reach from here to there. If we say something, we must wait twelve hours for an answer. If they say something and we miss it and say 'what' and they repeat—bang, goes a day."

"There's no way to speed it up?" said the General.

"Of course not. It's the fundamental law of communications. No information can be transmitted at more than the speed of light. It will take months to carry on the same conversation with Pluto that would take hours between the two of us right now."

"Yes, I see that. And you really think extra-terrestrials are involved?"

"I do. To be honest, not everyone here agrees with me. Still, we're straining every nerve, every fiber, to devise some method of concentrating communication. We must get in as many bits per second as possible and pray we get what we need before we lose contact. And there's where I need Multivac and your men. There must be some communications strategy we can use that will reduce the number of signals we need send out. Even an increase of ten per cent in efficiency can mean perhaps a week of time saved."

The gentle voice interrupted again. "Good grief, Gerard, are you trying to get some talking done?"

"Mother! Please!"

"But you're going about it the wrong way. Really."

"Mother." There was a hysterical edge to Cremona's voice.

"Well, all right, but if you're going to say something and then wait twelve hours for an answer, you're silly. You shouldn't."

The General snorted. "Dr. Cremona, shall we consult—"

"Just one moment, General," said Cremona. "What are you getting at, Mother?"

"While you're waiting for an answer," said Mrs. Cremona, earnestly, "just keep on transmitting and tell them to do the same. You talk all the time and they talk all the time. You have someone listening all the time and they do, too. If either one of you says anything that needs an answer, you can slip one in at your end, but chances are, you'll get all you need without asking."

Both men stared at her.

Cremona whispered, "Of course. Continuous conversation. Just twelve hours out of phase, that's all. God, we've got to get going."

He strode out of the room, virtually dragging the General with him, then strode back in.

"Mother," he said, "if you'll excuse me, this will take a few hours, I think. I'll send in some girls to talk to you. Or take a nap, if you'd rather."

"I'll be all right, Gerard," said Mrs. Cremona.

"Only, how did you think of this, Mother? What made you suggest this?"

"But, Gerard, all women know it. Any two women—on the videophone, or on the stratowire, or just face to face—know that the whole secret to spreading the news is, no matter what, to Just Keep Talking."

Cremona tried to smile. Then, his lower lip trembling, he turned and left.

Mrs. Cremona looked fondly after him. Such a fine man, her son, the physicist. Big as he was and important as he was, he still knew that a boy should always listen to his mother.

T-Formation

I have been accused of having a mad passion for large numbers and this is perfectly true. I wouldn't dream of denying it. However, may I point out that I am not the only one?

For instance, in a book entitled *Mathematics and the Imagination* (published in 1940) the authors, Edward Kasner and James Newman, introduced a number called the "googol," which is good and large and which was promptly taken up by writers of books and articles on popular mathematics.

Personally, I think it is an awful name, but the young child of one of the authors invented it, and what could a proud father do? Thus, we are afflicted forever with that baby-talk number.

The googol was defined as the number 1 followed by a hundred zeros, and so here (unless I have miscounted or the Noble Printer has goofed) is the googol, written out in full:

10,000,000,000

* * *

The trouble, it seems to me, is that we are using the number 10 to build upon. That was good enough for cave men, I suppose, but we moderns are terribly sophisticated and we know lots better numbers than that.

For instance, the annual budget of the United States of America is in the neighborhood, now, of $100,000,000,000 (a hundred billion dollars). That means 1,000,000,000,000 (one trillion) dimes.

Why don't we, then, use the number, one trillion, as a base? To be sure, we can't visualize a trillion, but why should that stop us? We can't even visualize fifty-three. At least if someone were to show us a group of objects and tell us there are fifty-three of them altogether, we couldn't tell whether he were right or wrong without counting them. That makes a trillion no less unreal than fifty-three, for we have to count both numbers and both are equally countable. To be sure, it would take us much longer to count one trillion than to count fifty-three, but the principle is the same and I, as anyone will tell you, am a man of principle.

The important thing is to associate a number with something physical that can be grasped and this we have done. The number 1,000,000,000,000 is roughly equal to the number of dimes taken from your pocket and mine (mostly mine, I sometimes sullenly think) each year by kindly, jovial Uncle Sam to build missiles and otherwise run the government and the country.

Then, once we have it firmly fixed in our mind as to what a trillion is, it takes very little effort of imagination to see what a trillion trillion is; a trillion trillion trillion, and so on. In order to keep from drowning in a stutter of trillions, let's use an abbreviated system that, as far as I know, is original with me.[2]

Let's call a trillion T-1; a trillion trillion T-2; a trillion trillion trillion T-3, and form large numbers in this fashion. (And there's the "T-formation" of the title! Surely you didn't expect football?)

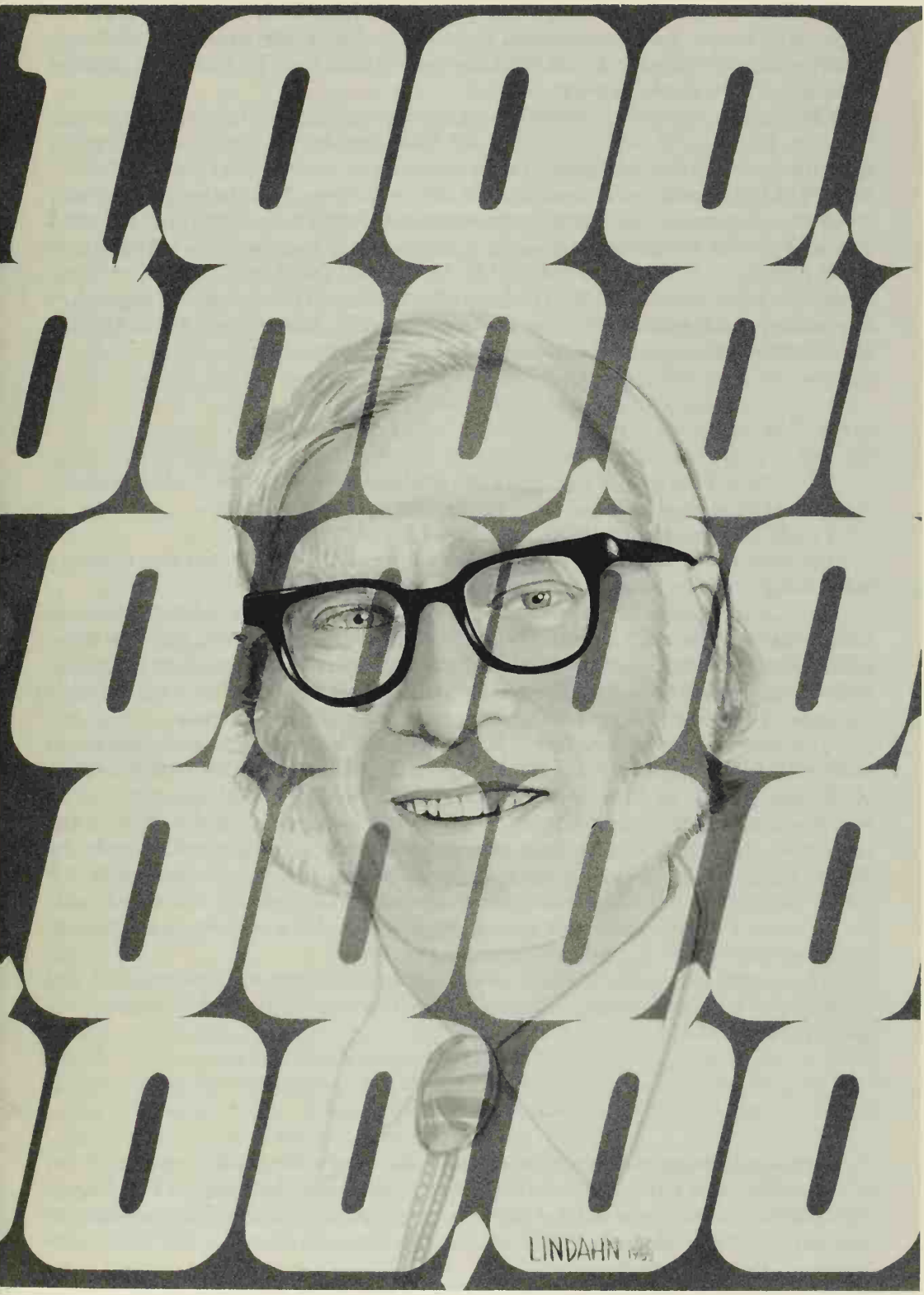
Shall we see how these numbers can be put to use? I have already said that T-1 is the number of dimes it takes to run the United States for one year. In that case, T-2 would represent the number of dimes it would take to run the United States for a trillion years. Since this length of time is undoubtedly longer than the United States will endure (if I may be permitted this unpatriotic sentiment) and, in all likelihood, longer than the planet earth will endure, we see that we have run out of financial applications of the Asimovian (ahem!) T-numbers long before we have even reached T-2.

Let's try something else. The mass of any object is proportional to its content of protons and neutrons which, together, may be referred to as nucleons. Now T-1 nucleons make up a quantity of mass far too small to see in even the best optical microscope and even T-2 nucleons make up only 1⅔ grams of mass, or about 1/16 of an ounce.

Now we've got room, it would seem, to move way up the T-scale. How massive, for instance, are T-3 nucleons? Since T-3 is a trillion times as large as T-2, T-3 nucleons have a mass of 1.67 trillion grams, or a little under two million tons. Maybe there's not as much room as we thought.

In fact, the T-numbers build up with breath-taking speed. T-4 nucleons equals the mass of all the earth's ocean, and T-5 nucleons equals the mass of a thousand solar systems. If we insist on continuing upward, T-6 nucleons equal the mass of ten thousand galaxies the size of ours, and T-7 nucleons are far, far more massive than the entire known universe.

[2]Actually, Archimedes set up a system of numbers based on the myriad, and spoke of a myriad myriad, a myriad myriad myriad and so on. But a myriad is only 10,000 and I'm using 1,000,000,000,000, so I don't consider Archimedes to be affecting my originality. Besides, he only beat me out by less than twenty-two centuries.


LINDAHN

Nucleons are not the only subatomic particles there are, of course, but even if we throw in electrons, mesons, neutrinos, and all the other paraphernalia of subatomic structure, we cannot reach T-7. In short, there are far less than T-7 subatomic particles of all sorts in the visible universe.

Clearly, the system of T-numbers is a powerful method of expressing large numbers. How does it work for the googol? Well, consider the method of converting ordinary exponential numbers into T-numbers and vice versa. T-1 is equal to a trillion, or 10^{12}; T-2 is equal to a trillion trillion, or 10^{24}, and so on. Well, then, you need only divide an exponent by 12 to have the numerical portion of a T-number; and you need only multiply the numerical portion of a T-number by 12 to get a ten-based exponent.

If a googol is 10^{100}, then divide 100 by 12, and you see at once that it can be expressed at T-8½. Notice that T-8½ is larger than T-7 and T-7 is in turn far larger than the number of subatomic particles in the known universe. It would take a billion trillion universes like our own to contain a googol of subatomic particles.

* * *

When then is the good of a googol, if it is too large to be useful in counting even the smallest material objects spread through the largest known volume?

I could answer: For its own sheer, abstract beauty—

But then you would all throw rocks at me. Instead, then, let me say that there are more things to be counted in this universe than material objects.

For instance, consider an ordinary deck of playing cards. In order to play, you shuffle the deck, the cards fall into a certain order, and you deal a game. Into how many different orders can the deck be shuffled? (Since it is impossible to have more essentially different game-situations than there are orders-of-cards in a shuffled deck, this is a question that should interest your friendly neighborhood poker-player.)

The answer is easily found (if you know where to look, and I do) and comes out to 80,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000, or 8×10^{67}. In T-numbers, this is something like T-5⅔. With an ordinary deck of cards, then, we can count arrangements and reach a value equal to that of the number of subatomic particles in a galaxy, more or less. If, instead of 52 cards, we played with 70 cards (and this is not unreasonable; canasta, I understand, uses 108 cards), then the number of different orders after shuffling, just tops the googol mark.

So when it comes to analyzing card games (let alone chess, economics, and nuclear war), numbers like the googol and beyond are met with.

Mathematicians, in fact, are interested in many varieties of numbers (with and without practical applications) in which vastnesses far, far beyond the googol are quickly reached.

* * *

Consider Leonardo Fibonacci, for instance, the most accomplished mathematician of the Middle Ages. (He was born in Pisa, so he is often called Leonardo of Pisa.) About 1200, when Fibonacci was in his prime, Pisa was a great commercial city, engaged in commerce with the Moors in North Africa. Leonardo had a chance to visit that region and profit from a Moorish education.

The Moslem world had by that time learned of a new system of numeration from the Hindus. Fibonacci picked it up and in a book, *Liber Abaci,* published in 1202, introduced these "Arabic numbers" and passed them on to a Europe still suffering under the barbarism of the Roman numerals. (Since Arabic numerals are only about a trillion times as useful as Roman numerals, it took a mere couple of centuries to convince European merchants to make the change.)

In this same book Fibonacci introduces the following problem: "How many rabbits can be produced from a single pair in a year if every month each pair begets a new pair, which from the second month on become productive, and no deaths occur?" (It is also assumed that each pair consists of a male and female and that rabbits have no objection to incest.)

In the first month we begin with a pair of immature rabbits, and in the second month we still have one pair, but now they are mature. By the third month they have produced a new pair, so there are two pairs, one mature, one immature. By the fourth month the immature pair has become mature and the first pair has produced another immature pair, so there are three pairs, two mature and one immature.

You can go on if you wish, reasoning out how many pairs of rabbits there will be each month, but I will give you the series of numbers right now and save you the trouble. It is:

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144

At the end of the year, you see, there would be 144 pairs of rabbits and that is the answer to Fibonacci's problem.

The series of numbers evolved out of the problem is the "Fibonacci series" and the individual numbers of the series are the "Fibonacci numbers." If you look at the series, you will see that each number (from the third member on) is the sum of the two preceeding numbers.

This means we needn't stop the series at the twelfth Fibonacci number (F_{12}). We can construct F_{13} easily enough by adding F_{11} and F_{12}. Since 89 and 144 are 233, that is F_{13}. Adding 144 and 233 gives us 377 or F_{14}. We can continue with F_{15} equal to 610, F_{16} equal to 987, and so on for as far as we care to go. Simple arithmetic, nothing more than addition, will give us all the Fibonacci numbers we want.

To be sure, the process gets tedious after a while as the Fibonacci numbers stretch into more and more digits and the chances of arithmetical error increase. One arithmetical error anywhere in the series, if uncorrected, throws off all the later members of the series.

But why should anyone want to carry the Fibonacci sequence on and on and on into large numbers? Well, the series has its applications. It is connected with cumulative growth, as the rabbit problem shows, and, as a matter of fact, the distribution of leaves spirally about a lengthening stem, the scales distributed about a pine cone, the seeds distributed in the sunflower center, all have an arrangement related to the Fibonacci series. The series is also related to the "golden section," which is important to art and aesthetics as well as to mathematics.

But beyond all that, there are always people who are fascinated by large numbers. (I can't explain the fascination but believe me it exists.) And if fascination falls short of working away night after night with pen and ink, it is possible, these days, to program a computer to do the work, and get large numbers that it would be impractical to try to work out in the old-fashioned way.

The October 1962 issue of *Recreational Mathematics Magazine*[3] lists the first 571 Fibonacci numbers as worked out on an IBM 7090 computer. The fifty-fifth Fibonacci number passes the trillion mark, so that we can say that F_{55} is greater than T-1.

From that point on, every interval of fifty-five or so Fibonacci numbers (the interval slowly lengthens) passes another T-number. Indeed, F_{481} is larger than a googol. It is equal to almost one and a half googols, in fact.

Those multiplying rabbits, in other words, will quickly surpass any conceivable device to encourage their multiplication. They will outrun any food supply that can be dreamed up, any room that can be imagined. There might be only 144 at the end of a year, but there would be nearly 50,000 at the end of two years, 15,000,000 at the end of three years, and so on. In thirty years there would be more rabbits than there are subatomic particles in the known universe, and in forty years there would be more than a googol of rabbits.

To be sure, human beings do not multiply as quickly as Fibonacci's rabbits, and old human beings do die. Nevertheless, the principle remains. What those rabbits can do in a few years, we can do in a few centuries or millenniums. Soon enough. Think of that when you tend to minimize the population explosion.

For the fun of it, I would like to write F_{571}, which is the largest number given in the article. (There will be larger numbers later, but I will not write them out!) Anyway, F_{571} is: 960412006189225538239428833609248650261049174118770678168222647890290143783084788641925890841852543316376461830080746 29. This vast number is not quite equal to T-10.[4]

* * *

For another example of large numbers, consider the primes. These are numbers like 7, or 641, or 5237, which can be divided evenly only by themselves and 1. They have no other factors. You might suppose that as one goes higher and higher in the scale of numbers, the primes gradually peter out because there would be more and more smaller numbers to serve as possible factors.

This, however, does not happen, and even the ancient Greeks knew that. Euclid was able to prove quite simply that if all the primes are listed up to a "largest prime," it is always possible to construct a still larger number which is either prime itself or has a prime factor that is larger than the "largest prime." It follows then there is no such thing as a "largest prime" and the number of primes is infinite.

Yet even if we can't work out a largest prime, there is an allied problem. What is the largest prime we know? It would be pleasant to point to a large number and say: "This is a prime. There are an infinite number of larger primes, but we don't know which numbers they are. This is the largest number we *know* to be a prime."

Once that is done, you see, then some venturesome amateur mathematician may find a still larger prime.

Finding a really large prime is by no means easy. Earlier, for instance, I said that 5237 is prime. Suppose you doubted that, how would you check me? The only practical way is to try all the prime numbers smaller than the square root of 5237 and see which, if any, are factors. This is tedious but possible for 5237. It is simply impractical for really large numbers—except for computers.

Mathematicians have sought formulas, therefore, that would construct primes. It might not give them every prime in the book, so that it could not be used to test a given

[3]This is a fascinating little periodical which I heartily recommend to any nut congruent to myself.

[4]Since this was written, the editor of *Recreational Mathematics* wrote to say that he had new Fibonacci numbers, up to F_{1000}. This F_{1000}, with 209 digits, is something over T-17.

number for prime-hood. However, it could construct primes of any desired size, and after that the task of finding a record-high prime would become trivial and could be abandoned.

However, such a formula has never been found. About 1600, a French friar named Marin Mersenne proposed a formula of partial value which would occasionally, but not always, produce a prime. This formula is $2^p - 1$, where p is itself a prime number. (You understand, I hope, that 2^p represents a number formed by multiplying p two's together, so that 2^8 is $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$, or 256.)

Mersenne maintained that the formula would produce primes when p was equal to 2, 3, 5, 7, 13, 17, 19, 31, 67, 127, or 257. This can be tested for the lower numbers easily enough. For instance, if p equals 3, then the formula becomes $2^3 - 1$, or 7, which is indeed prime. If p equals 7, then $2^7 - 1$ equals 127, which is prime. You can check the equation for any of the other values of p you care to.

The numbers obtained by substituting prime numbers for p in Mersenne's equation are called "Mersenne numbers" and if the number happens to be prime it is a "Mersenne prime." They are symbolized by the capital letter M and the value of p. Thus M_3 equals 7; M_7 equals 127, and so on.

I don't know what system Mersenne used to decide what primes would yield Mersenne primes in his equation, but whatever it was, it was wrong. The Mersenne numbers M_2, M_3, M_5, M_7, M_{13}, M_{17}, M_{19}, M_{31}, and M_{127} are indeed primes, so that Mersenne had put his finger on no less than nine Mersenne primes. However, M_{67} and M_{257}, which Mersenne said were primes, proved on painstaking examination to be no primes at all. On the other hand, M_{61}, M_{89}, and M_{107}, which Mersenne did not list as primes, are primes, and this makes a total of twelve Mersenne primes.

In recent years, thanks to computer work, eight more Mersenne primes have been located (according to the April 1962 issue of *Recreational Mathematics*). These are M_{521}, M_{607}, M_{1279}, M_{2203}, M_{2281}, M_{3217}, M_{4253}, and M_{4423}. What's more, since that issue, three even larger Mersenne primes have been discovered by Donald B. Gillies of the University of Illinois. These are M_{9689}, M_{9941}, and M_{11213}.

The smallest of these newly discovered Mersenne primes, M_{521}, is obtained by working out the formula $2^{521} - 1$. You take 521 two's, multiply them together, and subtract one. The result is far, far higher than a googol. In fact, it is higher than T-13.

Not to stretch out the suspense, the largest known Mersenne prime, M_{11213}, and, I believe, the largest prime known at present, has 3375 digits and is therefore just about T-281¼. The googol, in comparison to that, is a trifle so small that there is no reasonable way to describe its smallness.

* * *

The Greeks played many games with numbers, and one of them was to add up the factors of particular integers. For instance, the factors of 12 (not counting the number itself) are 1, 2, 3, 4, and 6. Each of these numbers, but no others, will go evenly into 12. The sum of these factors is 16, which is greater than the number 12 itself, so that 12 is an "abundant number."

The factors of 10, on the other hand, are 1, 2, and 5, which yield a sum of 8. This is less than the number itself, so that 10 is a "deficient number." (All primes are obviously badly deficient.)

But consider 6. Its factors are 1, 2, and 3, and this adds up to 6. When the factors

add up to the number itself, that number is a "perfect number."

Nothing has ever come of the perfect numbers in two thousand years, but the Greeks were fascinated by them, and those of them who were mystically inclined revered them. For instance, it could be argued (once Greek culture had penetrated Judeo-Christianity) that God had created the world in six days because six is a perfect number. (Its factors are the first three numbers, and not only is their sum six, but their product is also six, and God couldn't be expected to resist all that.)

I don't know whether the mystics also made a point of the fact that the lunar month is just a trifle over twenty-eight days long, since 28, with factors of 1, 2, 4, 7, and 14 (which add up to 28), is another perfect number. Alas, the days of the lunar month are actually 29½ and the mystics may have been puzzled over this slipshod arrangement on the part of the Creator.

But how many of these wonderful perfect numbers are there? Considering that by the time you reach 28, you have run into two of them, you might think there were many. However, they are rare indeed; far rarer than almost any other well-known kind of number. The third perfect number is 496, and the fourth is 8128, and throughout ancient and medieval times, those were the only perfect numbers known.

The fifth perfect number was not discovered until about 1460 (the name of the discoverer is not known) and it is 33,550,336. In modern times, thanks to the help of the computer, more and more perfect numbers have been discovered and the total now is twenty. The twentieth and largest of these is a number with 2663 digits, and this is almost equal to T-222.

* * *

But in a way, I have been unfair to Kasner and Newman. I have said they invented the googol and I then went on to show that it was easy to deal with numbers far higher than the googol. However, I should also add they invented another number, far, far larger than the googol. This second number is the "googolplex," which is defined as equal to 10^{googol}. The exponent, then, is a 1 followed by a hundred zeros, and I could write that, but I won't. Instead, I'll say that a googolplex can be written as:

$$10^{10^{100}} \text{ or even } 10^{10^{10^2}}$$

The googol itself can be written out easily. I did it at the beginning of the article and it only took up a few lines. Even the largest number previously mentioned in this article can be written out with ease. The largest Mersenne prime, if written out in full, would take up less than two pages of this book.

The googolplex, however, cannot be written out—literally *cannot*. It is a 1 followed by a googol zeros, and this book will not hold as many as a googol zeros no matter how small, within reason, those zeros are printed. In fact, you could not write the number on the entire surface of the earth, if you made each zero no larger than an atom. In fact, if you represented each zero by a nucleon, there wouldn't be enough nucleons in the entire known universe or in a trillion like it to supply you with sufficient zeros.

You can see then that the googolplex is incomparably larger than anything I have yet dealt with. And yet I can represent it in T-numbers without much trouble.

Consider! The T-numbers go up through the digits, T-1, T-2, T-3, and so on, and eventually reach T-1,000,000,000,000. (This is a number equivalent to saying "a trillion trillion trillion trillion . . ." and continuing until you have repeated the word *trillion* a

trillion times. It will take you umpty-ump lifetimes to do it, but the principle remains.) Since we have decided to let a trillion be written as T-1, the number T-1,000,000,000,000 can be written T-(T-1).

Remember that we must multiply the numerical part of the T-number by 12 to get a ten-based exponent. Therefore T-(T-1) is equal to $10^{12,000,000,000,000}$, which is more than $10^{10^{13}}$.

In the same way, we can calculate that T-(T-2) is more than $10^{10^{25}}$, and if we continue we finally find that T-(T-8) is nearly a googolplex. As for T-(T-9), that is far larger than a googolplex; in fact, it is far larger than a googol googolplexes.

One more item and I am through.

In a book called *The Lore of Large Numbers*, by Philip J. Davis, a number called "Skewes' number" is given. This number was obtained by S. Skewes, a South African mathematician who stumbled upon it while working out a complex theorem on prime numbers. The number is described as "reputed to be the largest number that has occurred in a mathematical proof." It is given as:

$$10^{10^{10^{34}}}$$

Since the googolplex is only $10^{10^{10^2}}$, Skewes' number is incomparably the greater of the two.

And how can Skewes' number be put into T-formation?

Well, at this point, even I rebel. I'm not going to do it.

I will leave it to you, O Gentle Reader, and I will tell you this much as a hint. It seems to me to be obviously greater than T-[T-(T-1)].

From there on in, the track is yours and the road to madness is unobstructed. Full speed ahead, all of you.

As for me, I shall hang back and stay sane; or, at least, as sane as I ever am, which isn't much.

Author! Author!

It occurred to Graham Dorn, and not for the first time, either, that there was one serious disadvantage in swearing you'll go through fire and water for a girl, however beloved. Sometimes she takes you at your miserable word.

This is one way of saying that he had been waylaid, shanghaied and dragooned by his fiancée into speaking at her maiden aunt's Literary Society. Don't laugh! It's not funny from the speaker's rostrum. Some of the faces you have to look at!

To race through the details, Graham Dorn had been jerked onto a platform and forced upright. He had read a speech on "The Place of the Mystery Novel in American Literature" in an appalled tone. Not even the fact that his own eternally precious June had written it (part of the bribe to get him to speak in the first place) could mask the fact that it was essentially tripe.

And then when he was weltering, figuratively speaking, in his own mental gore, the harpies closed in, for lo, it was time for the informal discussion and assorted feminine gush.

—Oh, Mr. Dorn, do you work from inspiration? I mean, do you just sit down and then an idea strikes you—all at once? And you must sit up all night and drink black coffee to keep you awake till you get it down?

—Oh, yes. Certainly. (His working hours were two to four in the afternoon every other day, and he drank milk.)

—Oh, Mr. Dorn, you must do the most awful research to get all those bizarre murders. About how much must you do before you can write a story?

—About six months, usually. (The only reference books he ever used were a six-volume encyclopedia and year-before-last's World Almanac.)

—Oh, Mr. Dorn, did you make up your Reginald de Meister from a real character? You must have. He's oh, so convincing in his every detail.

—He's modeled after a very dear boyhood chum of mine. (Dorn had never known *anyone* like de Meister. He lived in continual fear of meeting someone like him. He had even a cunningly fashioned ring containing a subtle Oriental poison for use just in case he did. So much for de Meister.)

Somewhat past the knot of women, June Billings sat in her seat and smiled with sickening and proprietary pride.

Graham passed a finger over his throat and went through the pantomime of choking to death as unobtrusively as possible. June smiled, nodded, threw him a delicate kiss, and did nothing.

Graham decided to pass a stern, lonely, woman-less life and to have nothing but villainesses in his stories forever after.

He was answering in monosyllables, alternating yesses and noes. Yes, he did take cocaine on occasion. He found it helped the creative urge. No, he didn't think he could allow Hollywood to take over de Meister. He thought movies weren't true expressions of real Art. Besides, they were just a passing fad. Yes, he would read Miss Crum's manuscripts if she brought them. Only too glad to. Reading amateur manuscripts was such fun, and editors are really such brutes.

And then refreshments were announced, and there was a sudden vacuum. It took a split-second for Graham's head to clear. The mass of femininity had coalesced into a single specimen. She was four feet ten and about eighty-five pounds in weight. Graham was six-two and two hundred ten worth of brawn. He could probably have handled her without difficulty, especially since both her arms were occupied with a pachyderm of a purse. Still, he felt a little delicate, to say nothing of queasy, about knocking her down. It didn't seem quite the thing to do.

She was advancing, with admiration and fervor disgustingly clear in her eyes, and Graham felt the wall behind him. There was no doorway within armreach on either side.

"Oh, Mr. de Meister—do, do please let me call you Mr. de Meister. Your creation is so real to me, that I can't think of you as simply Graham Dorn. You don't mind, do you?"

"No, no, of course not," gargled Graham, as well as he could through thirty-two teeth simultaneously set on edge. "I often think of myself as Reginald in my more frivolous moments."

"Thank you. You can have no idea, *dear* Mr. de Meister, how I have looked *forward* to meeting you. I have read *all* your works, and I think they are wonderful."

"I'm glad you think so." He went automatically into the modesty routine. "Really nothing, you know. Ha, ha, ha! Like to please the readers, but lots of room for improvement. Ha, ha, ha!"

"But you really are, you know." This was said with intense earnestness. "I mean good, *really* good. I think it is wonderful to be an author like you. It must be almost like being God."

Graham stared blankly. "Not to editors, sister."

Sister didn't get the whisper. She continued, "To be able to create living characters out of nothing; to unfold souls to all the world; to put thoughts into words; to build pictures and create worlds. I have often thought that an author was the most gloriously gifted person in creation. Better as inspired author starving in a garret than a king upon his throne. Don't you think so?"

"Definitely," lied Graham.

"What are the crass material goods of the world to the wonders of weaving emotions and deeds into a little world of its own?"

"What, indeed?"

"And posterity, think of posterity!"

"Yes, yes. I often do."

She seized his hand. "There's only one little request. You might," she blushed faintly, "you might give poor Reginald—if you will allow me to call him that just once—a chance to marry Letitia Reynolds. You make her just a little too cruel to him. I'm sure I weep over it for hours together sometimes. But then he is too, too real to me."

And from somewhere, a lacy frill of handkerchief made its appearance, and went to her eyes. She removed it, smiled bravely, and scurried away. Graham Dorn inhaled, closed his eyes, and gently collapsed into June's arms.

His eyes opened with a jerk. "You may consider," he said severely, "our engagement frazzled to the breaking point. Only my consideration for your poor, aged parents prevents your being known henceforward as the ex-fiancée of Graham Dorn."

"Darling, you are so noble." She massaged his sleeve with her cheek. "Come, I'll take you home and bathe your poor wounds."

"All right, but you'll have to carry me. Has your precious, loveable aunt got an axe?"

"But why?"

"For one thing, she had the gall to introduce me as the brain-father, God help me, of the famous Reginald de Meister."

"And aren't you?"

"Let's get out of this creep-joint. And get this. I'm no relative by brain or otherwise, of that character. I disown him. I cast him into the darkness. I spit upon him. I declare him an illegitimate son, a foul degenerate, and the offspring of a hound, and I'll be damned if he ever pokes his lousy patrician nose into my typewriter again."

They were in the taxi, and June straightened his tie. "All right, Sonny, let's see the letter."

"What letter?"

She held out her hand. "The one from the publishers."

Graham snarled and flipped it out of his jacket pocket. "I've thought of inviting myself to his house for tea, the damned flintheart. He's got a rendezvous with a pinch of strychnine."

"You may rave later. What does he say? Hmm—uh-huh—'doesn't quite come up to what is expected—feel that de Meister isn't in his usual form—a little revision perhaps towards—feel sure the novel can be adjusted—are returning under separate cover—'"

She tossed it aside. "I told you you shouldn't have killed off Sancha Rodriguez. She was what you needed. You're getting skimpy on the love interest."

"*You* write it! I'm through with de Meister. It's getting so clubwomen call me Mr. de Meister, and my picture is printed in newspapers with the caption Mr. de Meister. I have no individuality. No one ever heard of Graham Dorn. I'm always: Dorn, Dorn, you know, the guy who writes the de Meister stuff, *you* know."

June squealed, "Silly! You're jealous of your own detective."

"I am not jealous of my own character. Listen! I hate detective stories. I never read them after I got into the two-syllable words. I wrote the first as a clever, trenchant, biting satire. It was to blast the entire false school of mystery writers. That's why I invented this de Meister. He was the detective to end all detectives. The Compleat Ass, by Graham Dorn.

"So the public, along with snakes, vipers, and ungrateful children takes this filth to its bosom. I wrote mystery after mystery trying to convert the public—"

Graham Dorn drooped a little at the futility of it all.

"Oh, well." He smiled wanly, and the great soul rose above adversity. "Don't you see? I've got to write other things. I can't waste my life. But who's going to read a serious novel by Graham Dorn, now that I'm so thoroughly identified with de Meister?"

"You can use a pseudonym."

"I will not use a pseudonym. I'm proud of my name."

"But you can't drop de Meister. Be sensible, dear."

"A normal fiancée," Graham said bitterly, "would want her future husband to write something really worthwhile and become a great name in literature."

"Well, I do want you to, Graham. But just a little de Meister once in a while to pay the bills that accumulate."

"Ha!" Graham knocked his hat over his eyes to hide the sufferings of a strong spirit in agony. "Now you say that I can't reach prominence unless I prostitute my art to that unmentionable. Here's your place. Get out. I'm going home and write a good scorching letter on asbestos to our senile Mr. MacDunlap."

"Do exactly as you want to, cookie," soothed June. "And tomorrow when you feel better, you'll come and cry on my shoulder, and we'll plan a revision of *Death on the Third Deck* together, shall we?"

"The engagement," said Graham, loftily, "is broken."

"Yes, dear. I'll be home tomorrow at eight."

"That is of no possible interest to me. Good-bye!"

* * *

Publishers and editors are untouchables, of course. Theirs is a heritage of the outstretched hand and the well-toothed smile; the nod of the head and the slap of the back.

But perhaps somewhere, in the privacy of the holes to which authors scurry when the night falls, a private revenge is taken. There, phrases may be uttered where no one can overhear, and letters may be written that need not be mailed, and perhaps a picture of an editor, smiling pensively, is enshrined above the typewriter to act the part of bulls-eye in an occasional game of darts.

Such a picture of MacDunlap, so used, enlightened Graham Dorn's room. And Graham Dorn himself, in his usual writing costume (streetclothes and typewriter), scowled at the fifth sheet of paper in his typewriter. The other four were draped over the edge of the wastebasket, condemned for their milk-and-watery mildness.

He began:

"Dear Sir—" and added slowly and viciously, "or Madam, as the case may be."

He typed furiously as the inspiration caught him, disregarding the faint wisp of smoke curling upward from the overheated keys:

"You say you don't think much of de Meister in this story. Well, I don't think much of de Meister, period. You can handcuff your slimy carcass to his and jump off the Brooklyn Bridge. And I hope they drain the East River just before you jump.

"From now on, my works will be aimed higher than your scurvy press. And the day will come when I can look back on this period of my career with the loathing that is its just—"

Someone had been tapping Graham on the shoulder during the last paragraph. Graham twitched it angrily and ineffectively at intervals.

Now he stopped, turned around, and addressed the stranger in his room courteously: "Who the devilish damnation are you? And you can leave without bothering to answer. I won't think you rude."

The newcomer smiled graciously. His nod wafted the delicate aroma of some

unobtrusive hair-oil toward Graham. His lean, hard-bitten jaw stood out keenly, and he said in a well-modulated voice:

"De Meister is the name. Reginald de Meister."

Graham rocked to his mental foundations and heard them creak.

"Glub," he said.

"Pardon?"

Graham recovered. "I said, 'glub,' a little code word meaning *which* de Meister."

"*The* de Meister," explained de Meister, kindly.

"My character? My detective?"

De Meister helped himself to a seat, and his finely-chiseled features assumed that air of well-bred boredom so admired in the best circles. He lit a Turkish cigarette, which Graham at once recognized as his detective's favorite brand, tapping it slowly and carefully against the back of his hand first, a mannerism equally characteristic.

"Really, old man," said de Meister. "This is really excruciatin'ly funny. I suppose I am your charcter, y'know, but let's not work on that basis. It would be so devastatin'ly awkward."

"Glub," said Graham again, by way of rejoinder.

His mind was feverishly setting up alternatives. He didn't drink, more, at the moment, was the pity, so he wasn't drunk. He had a chrome-steel digestion and he wasn't overheated, so it wasn't a hallucination. He never dreamed, and his imagination —as befitted a paying commodity—was under strict control. And since, like all authors, he was widely considered more than half a screwball, insanity was out of the question.

Which left de Meister simply an impossibility, and Graham felt relieved. It's a very poor author indeed who hasn't learned the fine art of ignoring impossibilities in writing a book.

He said smoothly, "I have here a volume of my latest work. Do you mind naming your page and crawling back into it. I'm a busy man and God knows I have enough of you in the tripe I write."

"But I'm here on business, old chap. I've got to come to a friendly arrangement with you first. Things are deucedly uncomfortable as they are."

"Look, do you know you're bothering me? I'm not in the habit of talking to mythical characters. As a general thing, I don't pal around with them. Besides which, it's time your mother told you that you really don't exist."

"My dear fellow, I always existed. Existence is such a subjective thing. What a mind thinks exists, *does* exist. I existed in your mind, for instance, ever since you first thought of me."

Graham shuddered. "But the question is, what are you doing *out* of my mind? Getting a little narrow for you? Want elbow room?"

"Not at all. Rather satisfact'ry mind in its way, but I achieved a more concrete existence only this afternoon, and so I seize the opportunity to engage you face to face in the aforementioned business conversation. You see, that thin, sentimental lady of your society—"

"What society?" questioned Graham hollowly. It was all awfully clear to him now.

"The one at which you made a speech—" de Meister shuddered in his turn—"on the detective novel. She believed in my existence, so naturally, I exist."

He finished his cigarette and flicked it out with a negligent twist of the wrist.

"The logic," declared Graham, "is inescapable. Now, what do you want and the answer is no."

"Do you realize, old man, that if you stop writing de Meister stories, my existence

will become that dull, wraithlike one of all superannuated fictional detectives. I'd have to gibber through the gray mists of Limbo with Holmes, Lecocq, and Dupin."

"A very fascinating thought, I think. A very fitting fate."

Reginald de Meister's eyes turned icy, and Graham suddenly remembered the passage on page 123 of *The Case of the Broken Ashtray:*

His eyes, hitherto lazy and unattentive, hardened into twin pools of blue ice and transfixed the butler, who staggered back, a stifled cry on his lips.

Evidently, de Meister lost none of his characteristics out of the novels he adorned.

Graham staggered back, a stifled cry on his lips.

De Meister said menacingly, "It would be better for you if the de Meister mysteries continue. Do you understand?"

Graham recovered and summoned a feeble indignation. "Now, wait a while. You're getting out of hand. Remember: in a way, I'm your father. That's right. Your mental father. You can't hand me ultimatums or make threats. It isn't filial. It's lacking in the proper respect and love."

"And another thing," said de Meister, unmoved. "We've got to straighten out this business of Letitia Reynolds. It's gettin' deucedly borin', y'know."

"Now you're getting silly. My love scenes have been widely heralded as miracles of tenderness and sentiment not found in one murder mystery out of a thousand. —Wait, I'll get you a few reviews. I don't mind your attempts to dictate my actions so much, but I'm damned if you'll criticize my writing."

"Forget the reviews. Tenderness and all that rot is what I don't want. I've been driftin' after the fair lady for five volumes now, and behavin' the most insufferable ass. This has got to stop."

"In what way?"

"I've got to marry her in your present story. Either that, or make her a good, respectable mistress. And you'll have to stop making me so damned Victorian and gentlemanly towards ladies. I'm only human, old man."

"Impossible!" said Graham, "and that includes your last remark."

De Meister grew severe. "Really, old chap, for an author, you display the most appallin' lack of concern for the well-bein' of a character who has supported you for a good many years."

Graham choked eloquently. "Supported me? In other words, you think I couldn't sell real novels, hey? Well, I'll show you. I wouldn't write another de Meister story for a million dollars. Not even for a fifty percent royalty and all television rights. How's that?"

De Meister frowned and uttered those words that had been the sound of doom to so many criminals: "We shall see, but you are not yet done with me."

With firmly jutting jaw, he vanished.

Graham's twisted face straightened out, and slowly—very slowly—he brought his hands up to his cranium and felt carefully.

For the first time in a long and reasonably ribald mental life, he felt that his enemies were right and that a good dry cleaning would not hurt his mind at all.

The *things* that existed in it!

* * *

Graham Dorn shoved the doorbell with his elbow a second time. He distinctly remembered her saying she would be home at eight.

The peep-hole shoved open. "Hello!"

"Hello!"

Silence!

Graham said plaintively, "It's raining outside. Can't I come in to dry?"

"I don't know. Are we engaged, Mr. Dorn?"

"If I'm not," was the stiff reply, "then I've been turning down the frenzied advances of a hundred passion-stricken girls—beautiful ones, all of them—for no apparent reason."

"Yesterday, you said—"

"Ah, but who listens to what I say? I'm just quaint that way. Look, I brought you posies." He flourished roses before the peep-hole.

June opened the door. "Roses! How plebeian. Come in, cookie, and sully the sofa. Whoa, whoa, before you move a step, what have you got under the other arm? Not the manuscript of *Death on the Third Deck?*"

"Correct. Not that excrescence of a manuscript. This is something different."

June's tone chilled. "That isn't your precious novel, is it?"

Graham flung his head up, "How did you know about it?"

"You slobbered the plot all over me at MacDunlap's silver anniversary party."

"I did not. I couldn't unless I were drunk."

"Oh, but you were. Stinking is the term. And on two cocktails too."

"Well, if I was drunk, I couldn't have told you the right plot."

"Is the setting a coal-mine district?"

"—Uh—yes."

"And are the people concerned real, earthy, unartificial, down-to-earth characters, speaking and thinking just like you and me? Is it a story of basic economic forces? Are the human characters lifted up and thrown down and whirled around, all at the mercy of the coal mine and mechanized industry of today?"

"—Uh—yes."

She nodded her head retrospectively. "I remember distinctly. First, you got drunk and were sick. Then you got better, and told me the first few chapters. Then I got sick."

She approached the glowering author. "Graham." She leant her golden head upon his shoulder and cooed softly. "Why don't you continue with the de Meister stories? You get such pretty checks out of them."

Graham writhed out of her grasp. "You are a mercenary wretch, incapable of understanding an author's soul. You may consider our engagement broken."

He sat down hard on the sofa, and folded his arms. "Unless you will consent to read the script of my novel and give me the usual story analysis."

"May I give you my analysis of *Death on the Third Deck* first?"

"No."

"Good! In the first place, your love interest is becoming sickening."

"It is not." Graham pointed his finger indignantly. "It breathes a sweet and sentimental fragrance, as of an older day. I've got the review here that says it." He fumbled in his wallet.

"Oh, bullfeathers. Are you going to start quoting that guy in the Pillsboro (Okla.) Clarion? He's probably your second cousin. You know that your last two novels were completely below par in royalties. And *Third Deck* isn't even being sold."

"So much the better—Ow!" He rubbed his head violently. "What did you do that for?"

"Because the only place I could hit as hard as I wanted to, without disabling you, was your head. Listen! The public is tired of your corny Letitia Reynolds. Why don't you let her soak her 'gleaming golden crown of hair' in kerosene and get familiar with a match?"

"But June, that character is drawn from life. From you!"

"Graham Dorn! I am not here to listen to insults. The mystery market today is swinging towards action and hot, honest love and you're still in the sweet, sentimental stickiness of five years ago."

"But that's Reginald de Meister's character."

"Well, change his character. Listen! You introduce Sancha Rodriguez. That's fine. I approve of her. She's Mexican, flaming, passionate, sultry, and in love with him. So what do you do? First he behaves the impeccable gentleman, and then you kill her off in the middle of the story."

"Hmm, I see— You really think it would improve things to have de Meister forget himself. A kiss or so—"

June clenched her lovely teeth and her lovely fists. "Oh, darling, how glad I am love is blind! If it ever peeked one tiny little bit, I couldn't stand it. Look, you squirrel's blue plate special, you're going to have de Meister and Rodriguez fall in love. They're going to have an affair through the entire book and you can put your horrible Letitia into a nunnery. She'll probably be happier there from the way you make her sound."

"That's all *you* know about it, my sweet. It so happens that Reginald de Meister is in love with Letitia Reynolds and wants *her*, not this Rodriguez person."

"And what makes you think that?"

"He told me so."

"Who told you so?"

"Reginald de Meister."

"What Reginald de Meister?"

"*My* Reginald de Meister."

"What do you mean, your Reginald de Meister?"

"My *character*, Reginald de Meister."

June got up, indulged in some deep-breathing and then said in a very calm voice, "Let's start all over."

She disappeared for a moment and returned with an aspirin. "Your Reginald de Meister, from your books, told you, in person, he was in love with Letitia Reynolds?"

"That's right."

June swallowed the aspirin.

"Well, I'll explain, June, the way he explained it to me. All characters really exist—at least, in the minds of the authors. But when people really begin to believe in them, they begin to exist in reality, because what people believe in, is, so far as they're concerned, and what is existence anyway?"

June's lips trembled. "Oh, Gramie, please don't. Mother will never let me marry you if they put you in an asylum."

"Don't call me Gramie, June, for God's sake. I tell you he was there, trying to tell me what to write and how to write it. He was almost as bad as you. Aw, come on, Baby, don't cry."

"I can't help it. I always thought you were crazy, but I never thought you were *crazy!*"

"All right, what's the difference? Let's not talk about it, any more. I'm never going to write another mystery novel. After all—" (he indulged in a bit of indignation)—"when

it gets so that my own character—my *own* character—tries to tell me what to do, it's going too far."

June looked over her handkerchief. "How do you know it was really de Meister?"

"Oh, golly. As soon as he tapped his Turkish cigarette on the back of his hand and started dropping g's like snowflakes in a blizzard, I knew the worst had come."

The telephone rang. June leaped up. "Don't answer, Graham. It's probably from the asylum. I'll tell them you're not here. Hello. Hello. Oh, Mr. MacDunlap." She heaved a sigh of relief, then covered the mouthpiece and whispered hoarsely, "It might be a trap."

"Hello, Mr. MacDunlap! . . . No, he's not here. . . . Yes, I think I can get in touch with him. . . . At Martin's tomorrow, noon. . . . I'll tell him . . . With who? . . . With who???" She hung up suddenly.

"Graham, you're to lunch with MacDunlap tomorrow."

"At his expense! Only at his expense!"

Her great blue eyes got greater and bluer. "And Reginald de Meister is to dine with you."

"What Reginald de Meister?"

"Your Reginald de Meister."

"*My* Reg—"

"Oh, Gramie, *don't.*" Her eyes misted, "Don't you see, Gramie, now they'll put us both in an insane asylum—and Mr. MacDunlap, too. And they'll probably put us all in the same padded cell. Oh, Gramie, three is such a dreadful crowd."

And her face crumpled into tears.

* * *

Grew S. MacDunlap (that the S. stands for "Some" is a vile untruth spread by his enemies) was alone at the table when Graham Dorn entered. Out of this fact, Graham extracted a few fleeting drops of pleasure.

It was not so much, you understand, the presence of MacDunlap that did it, as the absence of de Meister.

MacDunlap looked at him over his spectacles and swallowed a liver pill, his favorite sweetmeat.

"Aha. You're here. What is this corny joke you're putting over on me? You had no right to mix me up with a person like de Meister without warning me he was real. I might have taken precautions. I could have hired a bodyguard. I could have bought a revolver."

"He's *not* real. God damn it! Half of him was *your* idea."

"That," returned MacDunlap with heat, "is libel. And what do you mean, he's not real? When he introduced himself, I took three liver pills at once and he didn't disappear. Do you know what three pills are? Three pills, the kind I've got (the doctor should only drop dead), could make an elephant disappear—if he weren't real. I *know.*"

Graham said wearily, "Just the same, he exists only in my mind."

"In your mind, I know he exists. Your mind should be investigated by the Pure Food and Drugs Act."

The several polite rejoinders that occurred simultaneously to Graham were dismissed almost immediately as containing too great a proportion of pithy Anglo-Saxon expletives. After all—ha, ha—a publisher is a publisher however Anglo-Saxony he may be.

Graham said, "The question arises, then, how we're to get rid of de Meister."

"Get rid of de Meister?" MacDunlap jerked the glasses off his nose in his sudden start, and caught them in one hand. His voice thickened with emotion. "Who wants to get rid of him?"

"Do you want him around?"

"God forbid," MacDunlap said between shudders. "Next to him, my brother-in-law is an angel."

"He has no business outside my books."

"For my part, he has no business inside them. Since I started reading your manuscripts, my doctor added kidney pills and cough syrups to my medicines." He looked at his watch, and took a kidney pill. "My worst enemy should be a book publisher only once a year."

"Then why," asked Graham patiently, "don't you want to get rid of de Meister?"

"Because he is publicity."

Graham stared blankly.

"Look! What other writer has a real detective? All the others are fictional. Everyone knows that. But yours—*yours* is real. We can let him solve cases and have big newspaper writeups. He'll make the Police Department look silly. He'll make—"

"That," interrupted Graham, categorically, "is by all odds the most obscene proposal I have ever had my ears manured with."

"It will make money."

"Money isn't everything."

"Name one thing it isn't . . . Shh!" He kicked a near-fracture into Graham's left ankle and rose to his feet with a convulsive smile, "Mr. de Meister!"

"Sorry, old dear," came a lethargic voice. "Couldn't quite make it, you know. Loads of engagements. Must have been most borin' for you."

Graham Dorn's ears quivered spasmodically. He looked over his shoulder and reeled backward as far as a person could reel while in a sitting position. Reginald de Meister had sprouted a monocle since his last visitation, and his monocular glance was calculated to freeze blood.

De Meister's greeting was casual. "My dear Watson! So glad to meet you. Overjoyed deucedly."

"Why don't you go to hell?" Graham asked curiously.

"My dear fellow. Oh, my dear fellow."

MacDunlap cackled, "That's what I like. Jokes! Fun! Makes everything pleasant to start with. Now shall we get down to business?"

"Certainly. The dinner is on the way, I trust? Then I'll just order a bottle of wine. The usual, Henry." The waiter ceased hovering, flew away, and skimmed back with a bottle that opened and gurgled into a glass.

De Meister sipped delicately, "So nice of you, old chap, to make me a habitué of this place in your stories. It holds true even now, and it is most convenient. The waiters all know me. Mr. MacDunlap, I take it you have convinced Mr. Dorn of the necessity of continuing the de Meister stories."

"Yes," said MacDunlap.

"No," said Graham.

"Don't mind him," said MacDunlap. "He's temperamental. You know these authors."

"Don't mind him," said Graham. "He's microcephalic. You know these publishers."

"Look, old chappie. I take it MacDunlap hasn't pointed out to you the unpleasanter side of acting stubborn."

"For instance what, old stinkie?" asked Graham, courteously.

"Well, have you ever been haunted?"

"Like coming behind me and saying, Boo!"

"My dear fellow, I say. I'm much more subtle than that. I can really haunt one in modern, up-to-date methods. For instance, have you ever had your individuality submerged?"

He snickered.

There was something familiar about that snicker. Graham suddenly remembered. It was on page 103 of *Murder Rides the Range:*

His lazy eyelids flicked down and up. He laughed lightly and melodiously, and though he said not a word, Hank Marslowe cowered. There was hidden menace and hidden power in that light laugh, and somehow the burly rancher did not dare reach for his guns.

To Graham it still sounded like a nasty snicker, but he cowered, and did not dare reach for his guns.

MacDunlap plunged through the hole the momentary silence had created.

"You see, Graham. Why play around with ghosts? Ghosts aren't reasonable things. They're not *human!* If it's more royalties, you want—"

Graham fired up. "Will you refrain from speaking of money? From now on, I write only great novels of tearing human emotions."

MacDunlap's flushed face changed suddenly.

"No," he said.

"In fact, to change the subject just a moment—" and Graham's tone became surpassingly sweet, as the words got all sticky with maple syrup—"I have a manuscript here for you to look at."

He grasped the perspiring MacDunlap by the lapel firmly. "It is a novel that is the work of five years. A novel that will grip you with its intensity. A novel that will shake you to the core of your being. A novel that will open a new world. A novel that will—"

"No," said MacDunlap.

"A novel that will blast the falseness of this world. A novel that pierces to the truth. A novel—"

MacDunlap, being able to stretch his hand no higher, took the manuscript.

"No," he said.

"Why the bloody hell don't you read it?" inquired Graham.

"Now?"

"Well, start it."

"Look, supposing I read it tomorrow, or even the next day. I have to take my cough syrup now."

"You haven't coughed once since I got here."

"I'll let you know immediately—"

"This," said Graham, "is the first page. Why don't you begin it? It will grip you instantly."

MacDunlap read two paragraphs and said, "Is this laid in a coal-mining town?"

"Yes."

"Then I can't read it. I'm allergic to coal dust."

"But it's not real coal dust, MacIdiot."

"That," pointed out MacDunlap, "is what you said about de Meister."

Reginald de Meister tapped a cigarette carefully on the back of his hand in a subtle

manner which Graham immediately recognized as betokening a sudden decision.

"That is all devastatin'ly borin', you know. Not quite gettin' to the point, you might say. Go ahead, MacDunlap, this is no time for half measures."

MacDunlap girded his spiritual loins and said, "All right Mister Dorn, with you it's no use being nice. Instead of de Meister, I'm getting coal dust. Instead of the best publicity in fifty years, I'm getting social significance. All right, Mister Smartaleck Dorn, if in one week you don't come to terms with me, *good* terms, you will be blacklisted in every reputable publishing firm in the United States and foreign parts." He shook his finger and added in a shout, "Including Scandinavian."

Graham Dorn laughed lightly, "Pish," he said, "tush. I happen to be an officer of the Author's Union, and if you try to push me around I'll have *you* blacklisted. How do you like that?"

"I like it fine. Because supposing I can prove you're a plagiarist."

"Me," gasped Graham, recovering narrowly from merry suffocation. "Me, the most original writer of the decade."

"Is that so? And maybe you don't remember that in each case you write up, you casually mention de Meister's notebooks on previous cases."

"So what?"

"So he has them. Reginald, my boy, show Mister Dorn your notebook of your last case. —You see that. That's *Mystery of the Milestones* and it has, in detail, every incident in your book—and dated the year before the book was published. Very authentic."

"Again so what?"

"Have you maybe got the right to copy his notebook and call it an original murder mystery?"

"Why, you case of mental poliomyelitis, that notebook is my invention."

"Who says so? It's in de Meister's handwriting, as any expert can prove. And maybe you have a piece of paper, some little contract or agreement, you know, that gives you the right to use his notebooks?"

"How can I have an agreement with a mythical personage?"

"What mythical personage?"

"You and I know de Meister doesn't exist."

"Ah, but does the jury know? When I testify that I took three strong liver pills and he didn't disappear, what twelve men will say he doesn't exist?"

"This is blackmail."

"Certainly. I'll give you a week. Or in other words, seven days."

Graham Dorn turned desperately to de Meister. "You're in on this, too. In my books I give you the keenest sense of honor. Is this honorable?"

De Meister shrugged. "My dear fellow. All this—and haunting, too."

Graham rose.

"Where are you going?"

"Home to write you a letter." Graham's brows beetled defiantly. "And this time I'll mail it. I'm not giving in. I'll fight to the last ditch. And, de Meister, you let loose with one single little haunt and I'll rip your head out of its socket and spurt the blood all over MacDunlap's new suit."

He stalked out, and as he disappeared through the door, de Meister disappeared through nothing at all.

MacDunlap let out a soft yelp and then took a liver pill, a kidney pill, and a tablespoon of cough syrup in rapid succession.

* * *

Graham Dorn sat in June's front parlor, and having long since consumed his fingernails, was starting on the first knuckles.

June, at the moment, was not present, and this, Graham felt, was just as well. A dear girl; in fact, a dear, sweet girl. But his mind was not on her.

It was concerned instead with a miasmic series of flashbacks over the preceding six days:

—Say, Graham, I met your side-kick at the club yesterday. You know, de Meister. Got an awful shock. I always had the idea he was a sort of Sherlock Holmes that didn't exist. That's one on me, boy. Didn't know— Hey, where are you going?

—Hey, Dorn, I hear your boss de Meister is back in town. Ought to have material for more stories soon. You're lucky you've got someone to grind out your plots ready-made— Huh? Well, good-bye."

—Why, Graham, darling, wherever were you last night? Ann's affair didn't get *anywhere* without you; or at least, it wouldn't have, if it hadn't been for Reggie de Meister. He asked after you; but then, I guess he felt lost without his Watson. It must feel wonderful to Watson for such— *Mister* Dorn! And the same to you, sir!

—You put one over on me. I thought you made up those wild things. Well, truth is stranger than fiction, ha, ha!

—Police officials deny that the famous amateur criminologist Reginald de Meister has interested himself in this case. Mr. de Meister himself could not be reached by our reporters for comment. Mr. de Meister is best known to the public for his brilliant solutions to over a dozen crimes, as chronicled in fiction form by his so-called "Watson," Mr. Grayle Doone.

Graham quivered and his arms trembled in an awful desire for blood. De Meister was haunting him—but good. He was losing his individuality, exactly as had been threatened.

It gradually dawned upon Graham that the monotonous ringing noise he heard was not in his head, but, on the contrary, from the front door.

Such seemed likewise the opinion of Miss June Billings, whose piercing call shot down the stairs and biffed Graham a sharp uppercut to the ear-drums.

"Hey, dope, see who's at the front door, before the vibration tears the house down. I'll be down in half an hour."

"Yes, dear!"

Graham shuffled his way to the front door and opened it.

"Ah, there. Greetin's," said de Meister, and brushed past.

Graham's dull eyes stared, and then fired high, as an animal snarl burst from his lips. He took up that gorilla posture, so comforting to red-blooded American males at moments like this, and circled the slightly-confused detective.

"My dear fellow, are you ill?"

"I," explained Graham, "am not ill, but you will soon be past all interest in that, for I am going to bathe my hands in your heart's reddest blood."

"But I say, you'll only have to wash them afterwards. It would be such an obvious clue, wouldn't it?"

"Enough of this gay banter. Have you any last words?"

"Not particularly."

"It's just as well. I'm not interested in your last words."

He thundered into action, bearing down upon the unfortunate de Meister like a bull elephant. De Meister faded to the left, shot out an arm and a foot, and Graham described a parabolic arc that ended in the total destruction of an end table, a vase of flowers, a fish-bowl, and a five-foot section of wall.

Graham blinked, and brushed away a curious goldfish from his left eyebrow.

"My dear fellow," murmured de Meister, "oh, my dear fellow."

Too late, Graham remembered that passage in *Pistol Parade:*

De Meister's arms were whipcord lightning, as with sure, rapid thrusts, he rendered the two thugs helpless. Not by brute force, but by his expert knowledge of judo, he defeated them easily without hastening his breath. The thugs groaned in pain.

Graham groaned in pain.

He lifted his right thigh an inch or so to let his femur slip back into place.

"Hadn't you better get up, old chap?"

"I will stay here," said Graham with dignity, "and contemplate the floor in profile view, until such time as it suits me or until such time as I find myself capable of moving a muscle. I don't care which. And now, before I proceed to take further measures with you, what the hell do you want?"

Reginald de Meister adjusted his monocle to a nicety. "You know, I suppose, that MacDunlap's ultimatum expires tomorrow?"

"And you and he with it, I trust."

"You will not reconsider."

"Ha!"

"Really," de Meister sighed, "this is borin' no end. You have made things comfortable for me in this world. After all, in your books you've made me well-known in all the clubs and better restaurants, the bosom friend, y'know, of the mayor and commissioner of police, the owner of a Park Avenue penthouse and a magnificent art collection. And it all lingers over, old chap. Really quite affectin'."

"It is remarkable," mused Graham, "the intensity with which I am not listening and the distinctness with which I do not hear a word you say."

"Still," said de Meister, "there is no denyin' my book world suits me better. It is somehow more fascinatin', freer from dull logic, more apart from the necessities of the world. In short, I must go back, and to active participation. You have till tomorrow!"

Graham hummed a gay little tune with flat little notes.

"Is this a new threat, de Meister?"

"It is the old threat intensified. I'm going to rob you of every vestige of your personality. And eventually public opinion will force you to write as, to paraphrase you, de Meister's Compleat Stooge. Did you see the name the newspaper chappies pinned on you today, old man?"

"Yes, Mr. Filthy de Meister, and did you read a half-column item on page ten in the same paper. I'll read it *for* you: 'Noted Criminologist in 1-A. Will be inducted shortly draft board says.'"

For a moment, de Meister said and did nothing. And then one, after another, he did the following things: removed his monocle slowly, sat down heavily, rubbed his chin abstractedly, and lit a cigarette after long and careful tamping. Each of these Graham Dorn's trained authorial eye recognized as singly representing perturbation and distress on the part of his character.

And never, in any of his books, did Graham remember a time when de Meister had gone through all four consecutively.

Finally, de Meister spoke. "Why you had to bring up draft registrations in your last book, I really don't know. This urge to be topical; this fiendish desire to be up to the minute with the news is the curse of the mystery novel. A true mystery is timeless; should have no relation to current events; should—"

"There is one way," said Graham, "to escape induction—"

"You might at least have mentioned a deferred classification on some vital ground."

"There is one way," said Graham, "to escape induction—"

"Criminal negligence," said de Meister.

"Look! Go back to the books and you'll never be filled with lead."

"Write them and I'll do it."

"Think of the war."

"Think of your ego."

Two strong men stood face to face (or would have, if Graham weren't still horizontal) and neither flinched.

Impasse!

And the sweet, feminine voice of June Billings interrupted and snapped the tension:

"May I ask, Graham Dorn, what you are doing on the floor. It's been swept today and you're not complimenting me by attempting to improve the job."

"I am not sweeping the floor. If you looked carefully," replied Graham gently, "you would see that your own adored fiancé is lying here a mass of bruises and a hotbed of pains and aches."

"You've ruined my end table!"

"I've broken my leg."

"And my best lamp."

"And two ribs."

"And my fishbowl."

"And my Adam's apple."

"And you haven't introduced your friend."

"And my cervical verte—What friend?"

"This friend."

"Friend! Ha!" And a mist came over his eyes. She was so young, so fragile to come into contact with hard, brutal facts of life. "This," he muttered brokenly, "is Reginald de Meister."

De Meister at this point broke a cigarette sharply in two, a gesture pregnant with the deepest emotion.

June said slowly, "Why—why, you're different from what I had thought."

"How had you expected me to look?" asked de Meister, in soft, thrilling tones.

"I don't know. Differently than you do,—from the stories I heard."

"You remind me, somehow, Miss Billings, of Letitia Reynolds."

"I think so. Graham said he drew her from me."

"A very poor imitation, Miss Billings. Devastatin'ly poor."

They were six inches apart now, eyes fixed with a mutual glue, and Graham yelled sharply. He sprang upright as memory smote him a nasty smite on the forehead.

A passage from *Case of the Muddy Overshoe* occurred to him. Likewise one from *The Primrose Murders*. Also one from *The Tragedy of Hartley Manor, Death of a Hunter, White Scorpion* and, to put it in a small nutshell, from every one of the others.

The passage read:

There was a certain fascination about de Meister that appealed irresistibly to women.

And June Billings was—as it had often, in Graham's idler moments, occurred to him—a woman.

And fascination simply gooed out of her ears and coated the floor six inches deep.

"Get out of this room, June," he ordered.

"I will not."

"There is something I must discuss with Mr. de Meister, man to man. I demand that you leave this room."

"Please go, Miss Billings," said de Meister.

June hesitated, and in a very small voice said, "Very well."

"Hold on," shouted Graham. "Don't let him order you about. I demand that you stay."

She closed the door very gently behind her.

The two men faced each other. There was that in either pair of eyes that indicated a strong man brought to bay. There was stubborn, undying antagonism; no quarter; no compromise. It was exactly the sort of situation Graham Dorn always presented his readers with, when two strong men fought for one hand, one heart, one girl.

The two said simultaneously, "Let's make a deal!"

Graham said, "You have convinced me, Reggie. Our public needs us. Tomorrow I shall begin another de Meister story. Let us shake hands and forget the past."

De Meister struggled with his emotion. He laid his hand on Graham's lapel. "My dear fellow, it is I who have been convinced by your logic. I can't allow you to sacrifice yourself for me. There are great things in you that must be brought out. Write your coal-mining novels. They count, not I."

"I couldn't, old chap. Not after all you've done for me, and all you've meant to me. Tomorrow we start anew."

"Graham, my—my spiritual father, I couldn't allow it. Do you think I have no feelings, *filial* feelings—in a spiritual sort of way."

"But the war, think of the war. Mangled limbs. Blood. All that."

"I must stay. My country needs me."

"But if I stop writing, eventually you will stop existing. I can't allow that."

"Oh, that!" De Meister laughed with a careless elegance. "Things have changed since. So many people believe in my existence now that my grip upon actual existence has become too firm to be broken. I don't have to worry about Limbo any more."

"Oh." Graham clenched his teeth and spoke in searing sibilants: "So that's your scheme, you snake. Do you suppose I don't see you're stuck on June?"

"Look here, old chap," said de Meister haughtily. "I can't permit you to speak slightingly of a true and honest love. I love June and she loves me—I know it. And if you're going to be stuffy and Victorian about it, you can swallow some nitro-glycerine and tap yourself with a hammer."

"I'll nitro-glycerine you! Because I'm going home tonight and beginning another de Meister story. You'll be part of it and you'll get back into it, and what do you think of that?"

"Nothing, because you can't write another de Meister story. I'm too real now, and you can't control me just like *that*. And what do you think of that?"

It took Graham Dorn a week to make up his mind what to think of that, and then his thoughts were completely and startingly unprintable.

In fact, it was impossible to write.

That is, startling ideas occurred to him for great novels, emotional dramas, epic poems, brilliant essays—but he couldn't write anything about Reginald de Meister.

The typewriter was simply fresh out of Capital R's.

Graham wept, cursed, tore his hair, and anointed his finger tips with liniment. He tried typewriter, pen, pencil, crayon, charcoal, and blood.

He could not write.

The doorbell rang, and Graham threw it open.

MacDunlap stumbled in, falling over the first drifts of torn paper directly into Graham's arms.

Graham let him drop. "Hah!" he said, with frozen dignity.

"My heart!" said MacDunlap, and fumbled for his liver pills.

"Don't die there," suggested Graham, courteously. "The management won't permit me to drop human flesh into the incinerator."

"Graham, my boy," MacDunlap said, emotionally, "no more ultimatums! No more threats! I come now to appeal to your finer feelings, Graham—" he went through a slight choking interlude—"I love you like a son. This skunk de Meister must disappear. You must write more de Meister stories for my sake. Graham—I will tell you something in private. My wife is in love with this detective. She tells me I am not romantic. I! Not romantic! Can you understand it?"

"I can," was the tragic response. "He fascinates all women."

"With that face? With that monocle?"

"It says so in all my books."

MacDunlay stiffened. "Ah ha. You again. Dope! If only you ever stopped long enough to let your mind know what your typewriter was saying."

"You insisted. Feminine trade." Graham didn't care any more. Women! He snickered bitterly. Nothing wrong with any of them that a block-buster wouldn't fix.

MacDunlap hemmed. "Well, feminine trade. Very necessary. —But Graham, what shall I do? It's not only my wife. She owns fifty shares in MacDunlap, Inc. in her own name. If she leaves me, I lose control. Think of it, Graham. The catastrophe to the publishing world."

"Grew, old chap," Graham sighed a sigh so deep, his toenails quivered sympathetically. "I might as well tell you. June, my fiancée, you know, loves this worm. And he loves her because she is the prototype of Letitia Reynolds."

"The what of Letitia?" asked MacDunlap, vaguely suspecting an insult.

"Never mind. My life is ruined." He smiled bravely and choked back the unmanly tears, after the first two had dripped off the end of his nose.

"My poor boy!" The two gripped hands convulsively.

"Caught in a vise by this foul monster," said Graham.

"Trapped like a German in Russia," said MacDunlap.

"Victim of an inhuman fiend," said Graham.

"Exactly," said MacDunlap. He wrung Graham's hand as if her were milking a cow. "You've got to write de Meister stories and get him back where, next to Hell, he most belongs. Right?"

"Right! But there's one little catch."

"What?"

"I can't write. He's so real now, I *can't* put him into a book."

MacDunlap caught the significance of the massed drifts of used paper on the floor. He held his head and groaned, "My corporation! My wife!"

"There's always the Army," said Graham.

MacDunlap looked up. "What about *Death on the Third Deck*, the novel I rejected three weeks ago?"

"That doesn't count. It's past history. It's already affected him."

"Without being published?"

"Sure. That's the story I mentioned his draft board in. The one that put him in I-A."

"I could think of better places to put him."

"MacDunlap!" Graham Dorn jumped up, and grappled MacDunlap's lapel. "Maybe it can be revised."

MacDunlap coughed hackingly, and stiffled out a dim grunt.

"We can put anything we want into it."

MacDunlap choked a bit.

"We can fix things up."

MacDunlap turned blue in the face.

Graham shook the lapel and everything thereto attached. "Say something, won't you?"

MacDunlap wrenched away and took a tablespoon of cough syrup. He held his hand over his heart and patted it a bit. He shook his head and gestured with his eyebrows.

Graham shrugged. "Well, if you just want to be sullen, go ahead. I'll revise it without you."

He located the manuscript and tried his fingers gingerly on the typewriter. They went smoothly, with practically no creaking at the joints. He put on speed, more speed, and then went into his usual race, with the portable jouncing along merrily under the accustomed head of steam.

"It's working," he shouted. "I can't write new stories, but I can revise old, unpublished ones."

MacDunlap watched over his shoulder. He breathed only at odd moments.

* * *

"Faster," said MacDunlap, "faster!"

"Faster than thirty-five?" said Graham, sternly. "OPA* forbid! Five more minutes."

"Will he be there?"

"He's always there. He's been at her house every evening this week." He spat out the fine ivory dust into which he had ground the last inch of his incisors. "But God help you if your secretary falls down on the job."

"My boy, on my secretary you can depend."

"She's got to read that revision by nine."

"If she doesn't drop dead."

"With my luck, she will. Will she believe it?"

"Every word. She's seen de Meister. She *knows* he exists."

Brakes screeched, and Graham's soul cringed in sympathy with every molecule of rubber frictioned off the tires.

He bounded up the stairs, MacDunlap hobbling after.

He rang the bell and burst in at the door. Reginald de Meister standing directly inside received the full impact of a pointing finger, and only a rapid backward movement of the head kept him from becoming a one-eyed mythical character.

June Billings stood aside, silent and uncomfortable.

*The Office of Price Administration was in charge of gasoline rationing at this period. Remember "A" stickers? D.R.B.

"Reginald de Meister," growled Graham, in sinister tones, "prepare to meet your doom."

"Oh, boy," said MacDunlap, "are you going to get it."

"And to what," asked de Meister, "am I indebted for your dramatic but unilluminatin' statement? Confusin', don't you know." He lit a cigarette with a fine gesture and smiled.

"Hello, Gramie," said June, tearfully.

"Scram, vile woman."

June sniffed. She felt like a heroine out of a book, torn by her own emotions. Naturally, she was having the time of her life.

So she let the tears dribble and looked forlorn.

"To return to the subject, what is this all about?" asked de Meister, wearily.

"I have rewritten *Death on the Third Deck*."

"Well?"

"The revision," continued Graham, "is at present in the hands of MacDunlap's secretary, a girl on the style of Miss Billings, my fianceé that was. That is, she is a girl who aspires to the status of a moron, but has not yet quite attained it. She'll believe every word."

"Well?"

Graham's voice grew ominous, "You remember, perhaps, Sancha Rodriguez?"

For the first time, Reginald de Meister shuddered. He caught his cigarette as it dropped. "She was killed by Sam Blake in the sixth chapter. She was in love with me. Really, old fellow, what messes you get me into."

"Not half the mess you're in now, old chap. Sancha Rodriguez did *not* die in the revision."

"Die!" came a sharp, but clear female voice, "I'll show him if I died. And where have *you* been this last month, you two-crosser?"

De Meister did not catch his cigarette this time. He didn't even try. He recognized the apparition. To an unprejudiced observer, it might have been merely a svelte Latin girl equipped with dark, flashing eyes, and long, glittering fingernails, but to de Meister, it was Sancha Rodriguez—*undead!*

MacDunlap's secretary had read and believed.

"Miss Rodriguez," throbbed de Meister, charmingly, "how fascinatin' to see you."

"Mrs. de Meister to you, you double-timer, you two-crosser, you scum of the ground, you scorpion of the grass. And who is this woman?"

June retreated with dignity behind the nearest chair.

"*Mrs.* de Meister," said Reginald pleadingly, and turned helplessly to Graham Dorn.

"Oh, you have forgotten, have you, you smooth talker, you low dog. I'll show you what it means to deceive a weak woman. I'll make you mince-meat with my fingernails."

De Meister back-pedaled furiously. "But darling—"

"Don't you make sweet talk. What are you doing with this woman?"

"But, darling—"

"Don't give me any explanation. What are you doing with this woman?"

"But darling—"

"Shut up! What are you doing with this woman?"

Reginald de Meister was up in a corner, and Mrs. de Meister shook her fists at him. "Answer me!"

De Meister disappeared.

Mrs. de Meister disappeared right after him.

June Billings collapsed into real tears.

Graham Dorn folded his arms and looked sternly at her.

MacDunlap rubbed his hands and took a kidney pill.

"It wasn't my fault, Gramie," said June. "You said in your books he fascinated all women, so I couldn't help it. Deep inside, I hated him all along. You believe me, don't you?"

"A likely story!" said Graham, sitting down next to her on the sofa. "A likely story. But I forgive you, maybe."

MacDunlap said tremulously, "My boy, you have saved my stocks. Also, my wife, of course. And remember—you promised me one de Meister story each year."

Graham gritted, "Just one, and I'll henpeck him to death, and keep one unpublished story forever on hand, just in case. And you're publishing my novel, aren't you, Grew, old boy?"

"Glug," said MacDunlap.

"Aren't you?"

"Yes, Graham. Of course, Graham. Definitely, Graham. Positively, Graham."

"Then leave us now. There are matters of importance I must discuss with my fiancée."

MacDunlap smiled and tiptoed out the door.

Ah, love, love, he mused, as he took a liver pill and followed it up by a cough-syrup chaser.

Eyes Do More Than See

After hundreds of billions of years, he suddenly thought of himself as Ames. Not the wavelength combination which, through all the universe was now the equivalent of Ames—but the sound itself. A faint memory came back of the sound waves he no longer heard and no longer could hear.

The new project was sharpening his memory for so many more of the old, old, eons-old things. He flattened the energy vortex that made up the total of his individuality and its lines of force stretched beyond the stars.

Brock's answering signal came.

Surely, Ames thought, he could tell Brock. Surely he could tell somebody.

Brock's shifting energy pattern communed, "Aren't you coming, Ames?"

"Of course."

"Will you take part in the contest?"

"Yes!" Ames's lines of force pulsed erratically. "Most certainly. I have thought of a whole new art-form. Something really unusual."

"What a waste of effort! How can you think a new variation can be thought of after two hundred billion years. There can be nothing new."

For a moment Brock shifted out of phase and out of communion, so that Ames had to hurry to adjust his lines of force. He caught the drift of other-thoughts as he did so, the view of the powdered galaxies against the velvet of nothingness, and the lines of force pulsing in endless multitudes of energy-life, lying between the galaxies.

Ames said, "Please absorb my thoughts, Brock. Don't close out. I've thought of manipulating Matter. Imagine! A symphony of Matter. Why bother with Energy. Of course, there's nothing new in Energy; how can there be? Doesn't that show we must deal with Matter?"

"Matter!"

Ames interpreted Brock's energy-vibrations as those of disgust.

He said, "Why not? We were once Matter ourselves back—back—Oh, a trillion years ago anyway! Why not build up objects in a Matter medium, or abstract forms or—listen, Brock—why not build up an imitation of ourselves in Matter, ourselves as we used to be?"

Brock said, "I don't remember how that was. No one does."

"I do," said Ames with energy, "I've been thinking of nothing else and I am beginning to remember. Brock, let me show you. Tell me if I'm right. Tell me."

"No. This is silly. It's—repulsive."

"Let me try, Brock. We've been friends; we've pulsed energy together from the beginning—from the moment we became what we are. Brock, please!"

"Then, quickly."

Ames had not felt such a tremor along his own lines of force in—well, in how long? If he tried it now for Brock and it worked, he could dare manipulate Matter before the assembled Energy-beings who had so drearily waited over the eons for something new.

The Matter was thin out there between the galaxies, but Ames gathered it, scraping it together over the cubic light-years, choosing the atoms, achieving a clayey consistency and forcing matter into an ovoid form that spread out below.

"Don't you remember, Brock?" he asked softly. "Wasn't it something like this?"

Brock's vortex trembled in phase. "Don't make me remember. I don't remember."

"That was the head. They called it the head. I remember it so clearly, I want to say it. I mean with sound." He waited, then said, "Look, do you remember that?"

On the upper front of the ovoid appeared HEAD.

"What is that?" asked Brock.

"That's the word for head. The symbols that meant the word in sound. Tell me you remember, Brock!"

"There was something," said Brock hesitantly, "something in the middle." A vertical bulge formed.

Ames said, "Yes! Nose, that's it!" And NOSE appeared upon it. "And those are eyes on either side," LEFT EYE—RIGHT EYE.

Ames regarded what he had formed, his lines of force pulsing slowly. Was he sure he liked this?

"Mouth," he said, in small quiverings, "and chin and Adam's apple, and the collarbones. How the words come back to me." They appeared on the form.

Brock said, "I haven't thought of them for hundreds of billions of years. Why have you reminded me? Why?"

Ames was momentarily lost in his thoughts, "Something else. Organs to hear with; something for the sound waves. Ears! Where do they go? I don't remember where to put them!"

Brock cried out, "Leave it alone! Ears and all else! Don't remember!"

Ames said, uncertainly, "What is wrong with remembering?"

"Because the outside wasn't rough and cold like that but smooth and warm. Because the eyes were tender and alive and the lips of the mouth trembled and were soft on mine." Brock's lines of force beat and wavered, beat and wavered.

Ames said, "I'm sorry! I'm sorry!"

"You're reminding me that once I was a woman and knew love; that eyes do more than see and I have none to do it for me."

With violence, she added matter to the rough-hewn head and said, "Then let *them* do it" and turned and fled.

And Ames saw and remembered, too, that once he had been a man. The force of his vortex split the head in two and he fled back across the galaxies on the energy-track of Brock—back to the endless doom of life.

And the eyes of the shattered head of Matter still glistened with the moisture that Brock had placed there to represent tears. The head of Matter did that which the energy-beings could do no longer and it wept for all humanity, and for the fragile beauty of the bodies they had once given up, a trillion years ago.

The Key

Karl Jennings knew he was going to die. He had a matter of hours to live and much to do.

There was no reprieve from the death sentence, not here on the Moon, not with no communications in operation.

Even on Earth there were a few fugitive patches where, without radio handy, a man might die without the hand of his fellow man to help him, without the heart of his fellow man to pity him, without even the eye of his fellow man to discover the corpse. Here on the Moon, there were few spots that were otherwise.

Earthmen knew he was on the Moon, of course. He had been part of a geological expedition—no, selenological expedition! Odd, how his Earth-centered mind insisted on the "geo-."

Wearily he drove himself to think, even as he worked. Dying though he was, he still felt that artificially imposed clarity of thought. Anxiously he looked about. There was nothing to see. He was in the dark of the eternal shadow of the northern interior of the wall of the crater, a blackness relieved only by the intermittent blink of his flash. He kept that intermittent, partly because he dared not consume its power source before he was through and partly because he dared not take more than the minimum chance that it be seen.

On his left hand, toward the south along the nearby horizon of the Moon, was a crescent of bright white Sunlight. Beyond the horizon, and invisible, was the opposite lip of the crater. The Sun never peered high enough over the lip of his own edge of the crater to illuminate the floor immediately beneath his feet. He was safe from radiation —from that at least.

He dug carefully but clumsily, swathed as he was in his spacesuit. His side ached abominably.

The dust and broken rock did not take up the "fairy castle" appearance characteristic of those portions of the Moon's surface exposed to the alternation of light and dark, heat and cold. Here, in eternal cold, the slow crumbling of the crater wall had simply piled fine rubble in a heterogeneous mass. It would not be easy to tell there had been digging going on.

He misjudged the unevenness of the dark surface for a moment and spilled a cupped handful of dusty fragments. The particles dropped with the slowness characteristic of the Moon and yet with the appearance of a blinding speed, for there was no air resistance to slow them further still and spread them out into a dusty haze.

Jennings' flash brightened for a moment, and he kicked a jagged rock out of the way.

He hadn't much time. He dug deeper into the dust.

A little deeper and he could push the Device into the depression and begin covering it. Strauss must not find it.

Strauss!

The other member of the team. Half-share in the discovery. Half-share in the renown.

If it were merely the whole share of the credit that Strauss had wanted, Jennings might have allowed it. The discovery was more important than any individual credit that might go with it. But what Strauss wanted was something far more, something Jennings would fight to prevent.

One of the few things Jennings was willing to die to prevent.

And he was dying.

They had found it together. Actually, Strauss had found the ship; or, better, the remains of the ship; or, better still, what just conceivably might have been the remains of something analogous to a ship.

"Metal," said Strauss, as he picked up something ragged and nearly amorphous. His eyes and face could just barely be seen through the thick lead glass of the visor, but his rather harsh voice sounded clearly enough through the suit radio.

Jennings came drifting over from his own position half a mile away. He said, "Odd! There is no free metal on the Moon."

"There shouldn't be. But you know well enough they haven't explored more than one per cent of the Moon's surface. Who knows what can be found on it?"

Jennings grunted assent and reached out his gauntlet to take the object.

It was true enough that almost anything might be found on the Moon for all anyone really knew. Theirs was the first privately financed selenographic expedition ever to land on the Moon. Till then, there had been only government-conducted shotgun affairs, with half a dozen ends in view. It was a sign of the advancing space age that the Geological Society could afford to send two men to the Moon for selenological studies only.

Strauss said, "It looks as though it once had a polished surface."

"You're right," said Jennings. "Maybe there's more about."

They found three more pieces, two of trifling size and one a jagged object that showed traces of a seam.

"Let's take them to the ship," said Strauss.

They took the small skim boat back to the mother ship. They shucked their suits once on board, something Jennings at least was always glad to do. He scratched vigorously at his ribs and rubbed his cheeks till his light skin reddened into welts.

Strauss eschewed such weakness and got to work. The laser beam pock-marked the metal and the vapor recorded itself on the spectrograph. Titanium-steel, essentially, with a hint of cobalt and molybdenum.

"That's artificial, all right," said Strauss. His broad-boned face was as dour and as hard as ever. He showed no elation, although Jennings could feel his own heart begin to race.

It may have been the excitement that trapped Jennings into beginning, 'This is a development against which we must steel ourselves—" with a faint stress on "steel" to indicate the play on words.

Strauss, however, looked at Jennings with an icy distaste, and the attempted set of puns was choked off.

Jennings sighed. He could never swing it, somehow. Never could! He remembered at the University— Well, never mind. The discovery they had made was worth a far better pun than any he could construct for all Strauss's calmness.

Jennings wondered if Strauss could possibly miss the significance.

He knew very little about Strauss, as a matter of fact, except by selenological reputation. That is, he had read Strauss's papers and he presumed Strauss had read his. Although their ships might well have passed by night in their University days, they had never happened to meet until after both had volunteered for this expedition and had been accepted.

In the week's voyage, Jennings had grown uncomfortably aware of the other's stocky figure, his sandy hair and china-blue eyes and the way the muscles over his prominent jawbones worked when he ate. Jennings, himself, much slighter in build, also blue-eyed, but with darker hair, tended to withdraw automatically from the heavy exudation of the other's power and drive.

Jennings said, "There's no record of any ship ever having landed on this part of the Moon. Certainly none has crashed."

"If it were part of a ship," said Strauss, "it should be smooth and polished. This is eroded and, without an atmosphere here, that means exposure to micrometeor bombardment over many years."

Then he *did* see the significance. Jennings said, with an almost savage jubilation, "It's a non-human artifact. Creatures not of Earth once visited the Moon. Who knows how long ago?"

"Who knows?" agreed Strauss dryly.

"In the report—"

"Wait," said Strauss imperiously. "Time enough to report when we have something to report. If it was a ship, there will be more to it than what we now have."

But there was no point in looking further just then. They had been at it for hours, and the next meal and sleep were overdue. Better to tackle the whole job fresh and spend hours at it. They seemed to agree on that without speaking.

The Earth was low on the eastern horizon, almost full in phase, bright and blue-streaked. Jennings looked at it while they ate and experienced, as he always did, a sharp homesickness.

"It looks peaceful enough," he said, "but there are six billion people busy on it."

Strauss looked up from some deep inner life of his own and said, "Six billion people ruining it!"

Jennings frowned. "You're not an Ultra, are you?"

Strauss said, "What the hell are you talking about?"

Jennings felt himself flush. A flush always showed against his fair skin, turning it pink at the slightest upset of the even tenor of his emotions. He found it intensely embarrassing.

He turned back to his food, without saying anything.

For a whole generation now, the Earth's population had held steady. No further increase could be afforded. Everyone admitted that. There was those, in fact, who said that "no higher" wasn't enough; the population had to drop. Jennings himself sympathized with that point of view. The globe of the Earth was being eaten alive by its heavy freight of humanity.

But *how* was the population to be made to drop? Randomly, by encouraging the people to lower the birth rate still further, as and how they wished? Lately there had been the slow rise of a distant rumble which wanted not only a population drop but a selected drop—the survival of the fittest, with the self-declared fit choosing the criteria of fitness.

Jennings thought: I've insulted him, I suppose.

Later, when he was almost asleep, it suddenly occurred to him that he knew virtually nothing of Strauss's character. What if it were his intention to go out now on a foraging expedition of his own so that he might get sole credit for—?

He raised himself on his elbow in alarm, but Strauss was breathing heavily, and even as Jennings listened, the breathing grew into the characteristic burr of a snore.

* * *

They spent the next three days in a single-minded search for additional pieces. They found some. They found more than that. They found an area glowing with the tiny phosphorescence of Lunar bacteria. Such bacteria were common enough, but nowhere previously had their occurrence been reported in concentration so great as to cause a visible glow.

Strauss said, "An organic being, or his remains, may have been here once. He died, but the micro-organisms within him did not. In the end they consumed him."

"And spread perhaps," added Jennings. "That may be the source of Lunar bacteria generally. They may not be native at all but may be the result of contamination instead —eons ago."

"It works the other way, too," said Strauss. "Since the bacteria are completely different in very fundamental ways from any Earthly form of micro-organism, the creatures they parasitized—assuming this was their source—must have been fundamentally different too. Another indication of extraterrestrial origin."

The trail ended in the wall of a small crater.

"It's a major digging job," said Jennings, his heart sinking. "We had better report this and get help."

"No," said Strauss somberly. "There may be nothing to get help for. The crater might have formed a million years after the ship had crashlanded."

"And vaporized most of it, you mean, and left only what we've found?"

Strauss nodded.

Jennings said, "Let's try anyway. We can dig a bit. If we draw a line through the finds we've made so far and just keep on . . ."

Strauss was reluctant and worked halfheartedly, so that it was Jennings who made the real find. Surely that counted! Even though Strauss had found the first piece of metal, Jennings had found the artifact itself.

It *was* an artifact—cradled three feet underground under the irregular shape of a boulder which had fallen in such a way that it left a hollow in its contact with the Moon's surface. In that hollow lay the artifact, protected from everything for a million years or more; protected from radiation, from micrometeors, from temperature change, so that it remained fresh and new forever.

Jennings labeled it at once the Device. It looked not remotely similar to any instrument either had ever seen, but then, as Jennings said, why should it?

"There are no rough edges that I can see," he said. "It may not be broken."

"There may be missing parts, though."

"Maybe," said Jennings, "but there seems to be nothing movable. It's all one piece and certainly oddly uneven." He noted his own play on words, then went on with a not-altogether-successful attempt at self-control. "*This* is what we need. A piece of worn metal or an area rich in bacteria is only material for deduction and dispute. But this is the real thing—a Device that is clearly of extraterrestrial manufacture."

It was on the table between them now, and both regarded it gravely.

Jennings said, "Let's put through a preliminary report, now."

"No!" said Strauss, in sharp and strenuous dissent. "Hell, no!"

"Why not?"

"Because if we do, it becomes a Society project. They'll swarm all over it and we won't be as much as a footnote when all is done. No!" Strauss looked almost sly. "Let's do all we can with it and get as much out of it as possible before the harpies descend."

Jennings thought about it. He couldn't deny that he too wanted to make certain that no credit was lost. But still—

He said, "I don't know that I like to take the chance, Strauss." For the first time he had an impulse to use the man's first name, but fought it off. "Look, Strauss," he said, "it's not right to wait. If this is of extraterrestrial origin, then it must be from some other planetary system. There isn't a place in the Solar System, outside the Earth, that can possibly support an advanced life form."

"Not proven, really," grunted Strauss, "but what if you're right?"

"Then it would mean that the creatures of the ship had interstellar travel and therefore had to be far in advance, technologically, of ourselves. Who knows what the Device can tell us about their advanced technology. It might be the key to—who knows what. It might be the clue to an unimaginable scientific revolution."

"That's romantic nonsense. If this is the product of a technology far advanced over ours, we'll learn nothing from it. Bring Einstein back to life and show him a micro-protowarp and what would he make of it?"

"We can't be certain that we won't learn."

"So what, even so? What if there's a small delay? What if we assure credit for ourselves? What if we make sure that we ourselves go along with this, that we don't let go of it?"

"But Strauss"—Jennings felt himself moved almost to tears in his anxiety to get across his sense of the importance of the Device—"what if we crash with it? What if we don't make it back to Earth? We can't risk this thing." He tapped it then, almost as though he were in love with it. "We should report it now and have them send ships out here to get it. It's too precious to—"

At the peak of his emotional intensity, the Device seemed to grow warm under his hand. A portion of its surface, half-hidden under a flap of metal, glowed phosphorescently.

Jennings jerked his hand away in a spasmodic gesture and the Device darkened. But it was enough; the moment had been infinitely revealing.

He said, almost choking, "It was like a window opening into your skull. I could see into your mind."

"I read yours," said Strauss, "or experienced it, or entered into it, or whatever you choose." He touched the Device in his cold, withdrawn way, but nothing happened.

"You're an Ultra," said Jennings angrily. 'When I touched this"—And he did so. "It's happening again. I see it. Are you a madman? Can you honestly believe it is humanly decent to condemn almost all the human race to extinction and destroy the versatility and variety of the species?"

His hand dropped away from the Device again, in repugnance at the glimpses revealed, and it grew dark again. Once more, Strauss touched it gingerly and again nothing happened.

Strauss said, "Let's not start a discussion, for God's sake. This thing is an aid to communication—a telepathic amplifier. Why not? The brain cells have each their electric potentials. Thought can be viewed as a wavering electromagnetic field of micro-intensities—"

Jennings turned away. He didn't want to speak to Strauss. He said, "We'll report it now. I don't give a damn about credit. Take it all. I just want it out of our hands."

For a moment Strauss remained in a brown study. Then he said, "It's more than a communicator. It responds to emotion and it amplifies emotion."

"What are you talking about?"

"Twice it started at your touch just now, although you'd been handling it all day with no effect. It still has no effect when I touch it."

"Well?"

"It reacted to you when you were in a state of high emotional tension. That's the requirement for activation, I suppose. And when you raved about the Ultras while you were holding it just now, I felt as you did, for just a moment."

"So you should."

"But, listen to me. Are you sure *you're* so right. There isn't a thinking man on Earth that doesn't know the planet would be better off with a population of one billion rather than six billion. If we used automation to the full—as now the hordes won't allow us to do—we could probably have a completely efficient and viable Earth with a population of no more than, say, five million. Listen to me, Jennings. Don't turn away, man."

The harshness in Strauss's voice almost vanished in his effort to be reasonably winning. "But we can't reduce the population democratically. You know that. It isn't the sex urge, because uterine inserts solved the birth control problem long ago; you know that. It's a matter of nationalism. Each ethnic group wants other groups to reduce themselves in population first, and I agree with them. I want my ethnic group, *our* ethnic group, to prevail. I want the Earth to be inherited by the elite, which means by men like ourselves. We're the true men, and the horde of half-apes who hold us down are destroying us all. They're doomed to death anyway; why not save ourselves?"

"No," said Jennings strenuously. "No one group has a monopoly on humanity. Your five million, trapped in a humanity robbed of its variety and versatility, would die of boredom—and serve them right."

"Emotional nonsense, Jennings. You don't believe that. You've just been trained to believe it by our damn-fool equalitarians. Look, this Device is just what we need. Even if we can't build any others or understand how this one works, this one Device might do. If we could control or influence the minds of key men, then little by little we can superimpose our views on the world. We already have an organization. You must know that if you've seen my mind. It's better motivated and better designed than any other organization on Earth. The brains of mankind flock to us daily. Why not you too? This instrument is a key, as you see, but not just a key to a bit more knowledge. It is a key to the final solution of men's problems. Join us! Join us!" He had reached an earnestness that Jennings had never heard in him.

Strauss's hand fell on the Device, which flickered a second or two and went out.

Jennings smiled humorlessly. He saw the significance of that. Strauss had been deliberately trying to work himself into an emotional state intense enough to activate the Device and had failed.

"You can't work it," said Jennings. "You're too darned supermannishly self-controlled and can't break down, can you?" He took up the Device with hands that were trembling, and it phosphoresced at once.

"Then *you* work it. Get the credit for saving humanity."

"Not in a hundred million years," said Jennings, gasping and barely able to breathe in the intensity of his emotion. "I'm going to report this now."

"No," said Strauss. He picked up one of the table knives. "It's pointed enough, sharp enough."

"You needn't work so hard to make your point," said Jennings, even under the stress of the moment conscious of the pun. "I can see your plans. With the Device you can convince anyone that I never existed. You can bring about an Ultra victory."

Strauss nodded. "You read my mind perfectly."

"But you won't," gasped Jennings. "Not while I hold this." He was willing Strauss into immobility.

Strauss moved raggedly and subsided. He held the knife out stiffly and his arm trembled, but he did not advance.

Both were perspiring freely.

Strauss said between clenched teeth, "You can't keep it—up all—day."

The sensation was clear, but Jennings wasn't sure he had the words to describe it. It was, in physical terms, like holding a slippery animal of vast strength, one that wriggled incessantly. Jennings had to concentrate on the feeling of immobility.

He wasn't familiar with the Device. He didn't know how to use it skillfully. One might as well expect someone who had never seen a sword to pick one up and wield it with the grace of a musketeer.

"Exactly," said Strauss, following Jennings' train of thought. He took a fumbling step forward.

Jennings knew himself to be no match for Strauss's mad determination. They both knew that. But there was the skim boat. Jennings had to get away. With the Device.

But Jennings had no secrets. Strauss saw his thought and tried to step between the other and the skim boat.

Jennings redoubled his efforts. Not immobility, but unconsciousness. Sleep, Strauss, he thought desperately. Sleep!

Strauss slipped to his knees, heavy-lidded eyes closing.

Heart pounding, Jennings rushed forward. If he could strike him with something, snatch the knife—

But his thoughts had deviated from their all-important concentration on sleep, so that Strauss's hand was on his ankle, pulling downward with raw strength.

Strauss did not hesitate. As Jennings tumbled, the hand that held the knife rose and fell. Jennings felt the sharp pain and his mind reddened with fear and despair.

It was the very access of emotion that raised the flicker of the Device to a blaze. Strauss's hold relaxed as Jennings silently and incoherently screamed fear and rage from his own mind to the other.

Strauss rolled over, face distorted.

Jennings rose unsteadily to his feet and backed away. He dared do nothing but concentrate on keeping the other unconscious. Any attempt at violent action would block out too much of his own mind force, whatever it was; too much of his unskilled bumbling mind force that could not lend itself to really effective use.

He backed toward the skim boat. There would be a suit on board—bandages—

* * *

The skim boat was not really meant for long-distance runs. Nor was Jennings, any longer. His right side was slick with blood despite the bandages. The interior of his suit was caked with it.

There was no sign of the ship itself on his tail, but surely it would come sooner or later. Its power was many times his own; it had detectors that would pick up the cloud of charge concentration left behind by his ion-drive reactors.

Desperately Jennings had tried to reach Luna Station on his radio, but there was still no answer, and he stopped in despair. His signals would merely aid Strauss in pursuit.

He might reach Luna Station bodily, but he did not think he could make it. He would be picked off first. He would die and crash first. He wouldn't make it. He would have to hide the Device, put it away in a safe place, *then* make for Luna Station.

The Device . . .

He was not sure he was right. It might ruin the human race, but it was infinitely valuable. Should he destroy it altogether? It was the only remnant of non-human intelligent life. It held the secrets of an advanced technology; it was an instrument of an advanced science of the mind. Whatever the danger, consider the value—the potential value—

No, he must hide it so that it could be found again—but only by the enlightened Moderates of the government. Never by the Ultras . . .

The skim boat flickered down along the northern inner rim of the crater. He knew which one it was, and the Device could be buried here. If he could not reach Luna Station thereafter, either in person or by radio, he would have to at least get away from the hiding spot; well away, so that his own person would not give it away. And he would have to leave *some* key to its location.

He was thinking with an unearthly clarity, it seemed to him. Was it the influence of the Device he was holding? Did it stimulate his thinking and guide him to the perfect message? Or was it the hallucination of the dying, and would none of it make any sense to anyone? He didn't know, but he had no choice. He had to try.

For Karl Jennings knew he was going to die. He had a matter of hours to live and much to do.

* * *

H. Seton Davenport of the American Division of the Terrestrial Bureau of Investigation rubbed the star-shaped scar on his left cheek absently. "I'm aware, sir, that the Ultras are dangerous."

The Division Head, M. T. Ashley, looked at Davenport narrowly. His gaunt cheeks were set in disapproving lines. Since he had sworn off smoking once again, he forced his groping fingers to close upon a stick of chewing gum, which he shelled, crumpled, and shoved into his mouth morosely. He was getting old, and bitter, too, and his short iron-gray mustache rasped when he rubbed his knuckles against it.

He said, "You don't know how dangerous. I wonder if anyone does. They are small in numbers, but strong among the powerful who, after all, are perfectly ready to consider themselves the elite. No one knows for certain who they are or how many."

"Not even the Bureau?"

"The Bureau is held back. We ourselves aren't free of the taint, for that matter. Are you?"

Davenport frowned. "I'm not an Ultra."

"I didn't say you were," said Ashley. "I asked if you were free of the taint. Have you considered what's been happening to the Earth in the last two centuries? Has it never occurred to you that a moderate decline in population would be a good thing? Have you never felt that it would be wonderful to get rid of the unintelligent, the incapable, the insensitive, and leave the rest. *I* have, damn it."

"I'm guilty of thinking that sometimes, yes. But considering something as a wish-fulfillment idea is one thing, but planning it as a practical scheme of action to be Hitlerized through is something else."

"The distance from wish to action isn't as great as you think. Convince yourself that the end is important enough, that the danger is great enough, and the means will grow increasingly less objectionable. Anyway, now that the Istanbul matter is taken care of, let me bring you up to date on this matter. Istanbul was of no importance in comparison. Do you know Agent Ferrant?"

"The one who's disappeared? Not personally."

"Well, two months ago, a stranded ship was located on the Moon's surface. It had been conducting a privately financed selenographic survey. The Russo-American Geological Society, which had sponsored the flight, reported the ship's failure to report. A routine search located it without much trouble within a reasonable distance of the site from which it had made its last report.

"The ship was not damaged but its skim boat was gone and with it one member of the crew. Name—Karl Jennings. The other man, James Strauss, was alive but in delirium. There was no sign of physical damage to Strauss, but he was quite insane. He still is, and that's important."

"Why?" put in Davenport.

"Because the medical team that investigated him reported neurochemical and neuroelectrical abnormalities of unprecedented nature. They'd never seen a case like it. Nothing human could have brought it about."

A flicker of a smile crossed Davenport's solemn face. "You suspect extraterrestrial invaders?"

"Maybe," said the other, with no smile at all. "But let me continue. A routine search in the neighborhood of the stranded ship revealed no signs of the skim boat. Then Luna Station reported receipt of weak signals of uncertain origin. They had been tabbed as coming from the western rim of Mare Imbrium, but it was uncertain whether they were of human origin or not, and no vessel was believed to be in the vicinity. The signals had been ignored. With the skim boat in mind, however, the search party headed out for Imbrium and located it. Jennings was aboard, dead. Knife wound in one side. It's rather surprising he had lived as long as he did.

"Meanwhile the medicos were becoming increasingly disturbed at the nature of Strauss's babbling. They contacted the Bureau and our two men on the Moon—one of them happened to be Ferrant—arrived at the ship.

"Ferrant studied the tape recordings of the babblings. There was no point in asking questions, for there was, and is, no way of reaching Strauss. There is a high wall between the universe and himself—probably a permanent one. However, the talk in delirium, although heavily repetitious and disjointed, can be made to make sense. Ferrant put it together like a jigsaw puzzle.

"Apparently Strauss and Jennings had come across an object of some sort which they took to be of ancient and non-human manufacture, an artifact of some ship wrecked eons ago. Apparently it could somehow be made to twist the human mind."

Davenport interrupted. "And it twisted Strauss's mind? Is that it?"

"That's exactly it. Strauss was an Ultra—we can say 'was' for he's only technically alive—and Jennings did not wish to surrender the object. Quite right, too. Strauss babbled of using it to bring about the self-liquidation, as he called it, of the undesirable. He wanted a final, ideal population of five million. There was a fight in which only Jennings, apparently, could handle the mind-thing, but in which Strauss had a knife. When Jennings left, he was knifed, but Strauss's mind had been destroyed."

"And where was the mind-thing?"

"Agent Ferrant acted decisively. He searched the ship and the surroundings again. There was no sign of anything that was neither a natural Lunar formation nor an obvious product of human technology. There was nothing that could be the mind-thing. He then searched the skim boat and its surroundings. Again nothing."

"Could the first search team, the ones who suspected nothing—could they have carried something off?"

"They swore they did not, and there is no reason to suspect them of lying. Then Ferrant's partner—"

"Who was he?"

"Gorbansky," said the District Head.

"I know him. We've worked together."

"I know you have. What do you think of him?"

"Capable and honest."

"All right. Gorbansky found something. Not an alien artifact. Rather, something most routinely human indeed. It was an ordinary white three-by-five card with writing on it, spindled, and in the middle finger of the right gauntlet. Presumably Jennings had written it before his death and, also presumably, it represented the key to where he had hidden the object."

"What reason is there to think he had hidden it?"

"I said we had found it nowhere."

"I mean, what if he had destroyed it, as something too dangerous to leave intact?"

"That's highly doubtful. If we accept the conversation as reconstructed from Strauss's ravings—and Ferrant built up what seems a tight word-for-word record of it—Jennings thought the mind-thing to be of key importance to humanity. He called it 'the clue to an unimaginable scientific revolution.' He wouldn't destroy something like that. He would merely hide it from the Ultras and try to report its whereabouts to the government. Else why leave a clue to its whereabouts?"

Davenport shook his head, "You're arguing in a circle, chief. You say he left a clue because you think there is a hidden object, and you think there is a hidden object because he left a clue."

"I admit that. Everything is dubious. Is Strauss's delirium meaningful? Is Ferrant's reconstruction valid? Is Jennings' clue really a clue? Is there a mind-thing, or a Device, as Jennings called it, or isn't there? There's no use asking such questions. Right now, we must act on the assumption that there is such a Device and that it must be found."

"Because Ferrant disappeared?"

"Exactly."

"Kidnapped by the Ultras?"

"Not at all. The card disappeared with him."

"Oh—I see."

"Ferrant has been under suspicion for a long time as a secret Ultra. He's not the only one in the Bureau under suspicion either. The evidence didn't warrant open

action; we can't simply lay about on pure suspicion, you know, or we'll gut the Bureau from top to bottom. He was under surveillance."

"By whom?"

"By Gorbansky, of course. Fortunately Gorbansky had filmed the card and sent the reproduction to the headquarters on Earth, but he admits he considered it as nothing more than a puzzling object and included it in the information sent to Earth only out of a desire to be routinely complete. Ferrant—the better mind of the two, I suppose—did see the significance and took action. He did so at great cost, for he has given himself away and has destroyed his future usefulness to the Ultras, but there is a chance that there will be no need for future usefulness. If the Ultras control the Device—"

"Perhaps Ferrant has the Device already."

"He was under surveillance, remember. Gorbansky swears the Device did not turn up anywhere."

"Gorbansky did not manage to stop Ferrant from leaving with the card. Perhaps he did not manage to stop him from obtaining the Device unnoticed, either."

Ashley tapped his fingers on the desk between them in an uneasy and uneven rhythm. He said at last, "I don't want to think that. If we find Ferrant, we may find out how much damage he's done. Till then, we must search for the Device. If Jennings hid it, he must have tried to get away from the hiding place. Else why leave a clue? It wouldn't be found in the vicinity."

"He might not have lived long enough to get away."

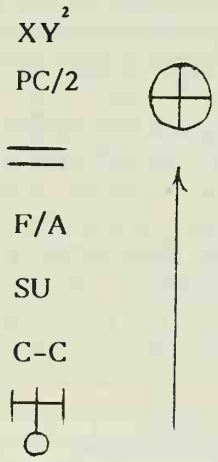
Again Ashley tapped, "The skim boat showed signs of having engaged in a long, speedy flight and had all but crashed at the end. That is consistent with the view that Jennings was trying to place as much space as possible between himself and some hiding place."

"Can you tell from what direction he came?"

"Yes, but that's not likely to help. From the condition of the side vents, he had been deliberately tacking and veering."

Davenport sighed. "I suppose you have a copy of the card with you."

"I do. Here it is." He flipped a three-by-five replica toward Davenport. Davenport studied it for a few moments. It looked like this:



Davenport said, "I don't see any significance here."

"Neither did I, at first, nor did those I first consulted. But consider. Jennings must

have thought that Strauss was in pursuit; he might not have known that Strauss had been put out of action, at least, not permanently. He was deadly afraid, then, that an Ultra would find him before a Moderate would. He dared not leave a clue too open. This"—and the Division Head tapped the reproduction—"must represent a clue that is opaque on the surface but clear enough to anyone sufficiently ingenious."

"Can we rely on that?" asked Davenport doubtfully. "After all, he was a dying, frightened man, who might have been subjected to this mind-altering object himself. He need not have been thinking clearly, or even humanly. For instance, why didn't he make an effort to reach Luna Station? He ended half a circumference away almost. Was he too twisted to think clearly? Too paranoid to trust even the Station? Yet he must have tried to reach them at first since they picked up signals. What I'm saying is that this card, which looks as though it is covered with gibberish, *is* covered with gibberish."

Ashley shook his head solemnly from side to side, like a tolling bell. "He was in panic, yes. And I suppose he lacked the presence of mind to try to reach Luna Station. Only the need to run and escape possessed him. Even so this can't be gibberish. It hangs together too well. Every notation on the card can be made to make sense, and the whole can be made to hang together."

"Where's the sense, then?" asked Davenport.

"You'll notice that there are seven items on the left side and two on the right. Consider the left-hand side first. The third one down looks like an equals sign. Does an equals sign mean anything to you, anything in particular?"

"An algebraic equation."

"That's general. Anything particular?"

"No."

"Suppose you consider it as a pair of parallel lines?"

"Euclid's fifth postulate?" suggested Davenport, groping.

"Good! There is a crater called Euclides on the Moon—the Greek name of the mathematician we call Euclid."

Davenport nodded. "I see your drift. As for F/A, that's force divided by acceleration, the definition of mass by Newton's second law of motion—"

"Yes, and there is a crater called Newton on the Moon also."

"Yes, but wait awhile, the lowermost item is the astronomic symbol for the planet Uranus, and there is certainly no crater—or any other lunar object, so far as I know—that is named Uranus."

"You're right there. But Uranus was discovered by William Herschel, and the H that makes up part of the astronomic symbol is the initial of his name. As it happens, there is a crater named Herschel on the Moon—three of them, in fact, since one is named for Caroline Herschel, his sister, and another for John Herschel, his son."

Davenport thought awhile, then said, "PC/2—Pressure times half the speed of light. I'm not familiar with that equation."

"Try craters. Try P for Ptolemaeus and C for Copernicus."

"And strike an average? Would that signify a spot exactly between Ptolemaeus and Copernicus?"

"I'm disappointed, Davenport," said Ashley sardonically. "I thought you knew your history of astronomy better than that. Ptolemy, or Ptolemaeus in Latin, presented a geocentric picture of the Solar System with the Earth at the center, while Copernicus presented a heliocentric one with the Sun at the center. One astronomer attempted a compromise, a picture halfway between that of Ptolemy and Copernicus—"

"Tycho Brahe!" said Davenport.

"Right. And the crater Tycho is the most conspicuous feature on the Moon's surface."

"All right. Let's take the rest. The C-C is a common way of writing a common type of chemical bond, and I think there is a crater named Bond."

"Yes, named for an American astronomer, W. C. Bond."

"The item on top, XY^2. Hmm. XYY. An X and two Y's. Wait! Alfonso X. He was the royal astronomer in medieval Spain who was called Alfonso the Wise. X the wise. XYY. The Crater Alphonsus."

"Very good. What's SU?"

"That stumps me, chief."

"I'll tell you one theory. It stands for Soviet Union, the old name for the Russian Region. It was the Soviet Union that first mapped the other side of the Moon, and maybe it's a crater there. Tsiolkovsky, for instance. You see, then, the symbols on the left can each be interpreted as standing for a crater: Alphonsus, Tycho, Euclides, Newton, Tsiolkovsky, Bond, Herschel."

"What about the symbols on the right-hand side?"

"That's perfectly transparent. The quartered circle is the astronomic symbol for the Earth. An arrow pointing to it indicates that Earth must be directly overhead."

"Ah," said Davenport, "the Sinus Medii—the Middle Bay—over which the Earth is perpetually at zenith. That's not a crater, so it's on the right-hand side, away from the other symbols."

"All right," said Ashley. "The notations all make sense, or they can be made to make sense, so there's at least a good chance that this isn't gibberish and that it is trying to tell us something. But what? So far we've got seven craters and a non-crater mentioned, and what does that mean? Presumably, the Device can only be in one place."

"Well," said Davenport heavily, "a crater can be a huge place to search. Even if we assume he hugged the shadow to avoid Solar radiation, there can be dozens of miles to examine in each case. Suppose the arrow pointing to the symbol for the Earth defines the crater where he hid the Device, the place from which the Earth can be seen nearest the zenith."

"That's been thought of, old man. It cuts out one place and leaves us with seven pinpointed craters, the southernmost extremity of those north of the Lunar equator and the northernmost extremity of those south. But which of the seven?"

Davenport was frowning. So far, he hadn't thought of anything that hadn't already been thought of. "Search them all," he said brusquely.

Ashley crackled into brief laughter. "In the weeks since this has all come up, we've done exactly that."

"And what have you found?"

"Nothing. We haven't found a thing. We're still looking, though."

"Obviously one of the symbols isn't interpreted correctly."

"Obviously!"

"You said yourself there were three craters named Herschel. The symbol SU, if it means the Soviet Union and therefore the other side of the Moon, can stand for any crater on the other side: Lomonosov, Jules Verne, Joliot-Curie, any of them. For that matter, the symbol of the Earth might stand for the crater Atlas, since he is pictured as supporting the Earth in some versions of the myth. The arrow might stand for the Straight Wall."

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"There's no argument there, Davenport. But even if we get the right interpretation for the right symbol, how do we recognize it from among all the wrong interpretations, or from among the right interpretations of the wrong symbols? Somehow there's got to be something that leaps up at us from this card and gives us so clear a piece of information that we can tell it at once as the real thing from among all the red herrings. We've all failed and we need a fresh mind, Davenport. What do you see here?"

"I'll tell you one thing we could do," said Davenport reluctantly. "We can consult someone I— Oh, my God!" He half-rose.

Ashley was all controlled excitement at once. "What do you see?"

Davenport could feel his hand trembling. He hoped his lips weren't. He said, "Tell me, have you checked on Jennings' past life?"

"Of course."

"Where did he go to college?"

"Eastern University."

A pang of joy shot through Davenport, but he held on. That was not enough. "Did he take a course in extraterrology?"

"Of course, he did. That's routine for a geology major."

"All right, then, don't you know who teaches extraterrology at Eastern University?"

Ashley snapped his fingers. "That oddball. What's-his-name—Wendell Urth."

"Exactly, an oddball who is a brilliant man in his way. An oddball who's acted as a consultant for the Bureau on several occasions and given perfect satisfaction every time. An oddball I was going to suggest we consult this time and then noticed that this card was *telling* us to do so. An arrow pointing to the symbol for the Earth. A rebus that couldn't mean more clearly 'Go to Urth,' written by a man who was once a student of Urth and would know him."

Ashley stared at the card, "By God, it's possible. But what could Urth tell us about the card that we can't see for ourselves?"

Davenport said, with polite patience, "I suggest we ask him, sir."

* * *

Ashley looked about curiously, half-wincing as he turned from one direction to another. He felt as though he had found himself in some arcane curiosity shop, darkened and dangerous, from which at any moment some demon might hurtle forth squealing.

The lighting was poor and the shadows many. The walls seemed distant, and dismally alive with book-films from floor to ceiling. There was a Galactic Lens in soft three-dimensionality in one corner and behind it were star charts that could dimly be made out. A map of the Moon in another corner might, however, possibly be a map of Mars.

Only the desk in the center of the room was brilliantly lit by a tightbeamed lamp. It was littered with papers and opened printed books. A small viewer was threaded with film, and a clock with an old-fashioned round-faced dial hummed with subdued merriment.

Ashley found himself unable to recall that it was late afternoon outside and that the sun was quite definitely in the sky. Here, within, was a place of eternal night. There was no sign of any window, and the clear presence of circulating air did not spare him a claustrophobic sensation.

He found himself moving closer to Davenport, who seemed insensible to the unpleasantness of the situation.

Davenport said in a low voice, "He'll be here in a moment, sir."

"Is it always like this?" asked Ashley.

"Always. He never leaves this place, as far as I know, except to trot across the campus and attend his classes."

"Gentlemen! Gentlemen!" came a reedy, tenor voice. "I am so glad to see you. It is good of you to come."

A round figure of a man bustled in from another room, shedding shadow and emerging into the light.

He beamed at them, adjusting round, thick-lensed glasses upward so that he might look through them. As his fingers moved away, the glasses slipped downward at once to a precarious perch upon the round nubbin of his snub nose. "I am Wendell Urth," he said.

The scraggly gray Van Dyke on his pudgy, round chin did not in the least add to the dignity which the smiling face and the stubby ellipsoidal torso so noticeably lacked.

"Gentlemen! It is good of you to come," Urth repeated, as he jerked himself backward into a chair from which his legs dangled with the toes of his shoes a full inch above the floor. "Mr. Davenport remembers, perhaps, that it is a matter of—uh—some importance to me to remain here. I do not like to travel, except to walk, of course, and a walk across the campus is quite enough for me."

Ashley looked baffled as he remained standing, and Urth stared at him with a growing bafflement of his own. He pulled a handkerchief out and wiped his glasses, then replaced them, and said, "Oh, I see the difficulty. You want chairs. Yes. Well, just take some. If there are things on them, just push them off. Push them off. Sit down, please."

Davenport removed the books from one chair and placed them carefully on the floor. He pushed the chair toward Ashley. Then he took a human skull off a second chair and placed the skull even more carefully on Urth's desk. Its mandible, insecurely wired, unhinged as he transferred it, and it sat there with jaw askew.

"Never mind," said Urth, affably, "it will not hurt. Now tell me what is on your mind, gentlemen?"

Davenport waited a moment for Ashley to speak, then, rather gladly, took over. "Dr. Urth, do you remember a student of yours named Jennings? Karl Jennings?"

Urth's smile vanished momentarily with the effort of recall. His somewhat protuberant eyes blinked. "No," he said at last. "Not at the moment."

"A geology major. He took your extraterrology course some years ago. I have his photograph here, if that will help."

Urth studied the photograph handed him with nearsighted concentration, but still looked doubtful.

Davenport drove on. "He left a cryptic message which is the key to a matter of great importance. We have so far failed to interpret it satisfactorily, but this much we see—it indicates we are to come to you."

"Indeed? How interesting! For what purpose are you to come to me?"

"Presumably for your advice on interpreting the message."

"May I see it?"

Silently Ashley passed the slip of paper to Wendell Urth. The extraterrologist looked at it casually, turned it over, and stared for a moment at the blank back. He said, "Where does it say to ask me?"

Ashley looked startled, but Davenport forestalled him by saying, "The arrow

pointing to the symbol of the Earth. It seems clear."

"It is clearly an arrow pointing to the symbol for the planet Earth. I suppose it might literally mean 'go to the Earth' if this were found on some other world."

"It was found on the Moon, Dr. Urth, and it could, I suppose, mean that. However, the reference to you seemed clear once we realized that Jennings had been a student of yours."

"He took a course in extraterrology here at the University?"

"That's right."

"In what year, Mr. Davenport?"

"In '18."

"Ah. The puzzle is solved."

"You mean the significance of the message?" said Davenport.

"No, no. The message has no meaning to me. I mean the puzzle of why it is that I did not remember him, for I remember him now. He was a very quiet fellow, anxious, shy, self-effacing—not at all the sort of person anyone would remember. Without this" —and he tapped the message—"I might never have remembered him."

"Why does the card change things?" asked Davenport.

"The reference to me is a play on words. Earth—Urth. Not very subtle, of course, but that is Jennings. His unattainable delight was the pun. My only clear memory of him is his occasional attempts to perpetrate puns. I enjoy puns, I adore puns, but Jennings—yes, I remember him well now—was atrocious at it. Either that, or distressingly obvious at it, as in this case. He lacked all talent for puns, yet craved them so much—"

Ashley suddenly broke in. "This message consists entirely of a kind of wordplay, Dr. Urth. At least, we believe so, and that fits in with what you say."

"Ah!" Urth adjusted his glasses and peered through them once more at the card and the symbols it carried. He pursed his plump lips, then said cheerfully, "I make nothing of it."

"In that case—" began Ashley, his hands balling into fists.

"But if you tell me what it's all about," Urth went on, "then perhaps it might mean something."

Davenport said quickly, "May I, sir? I am confident that this man can be relied on—and it may help."

"Go ahead," muttered Ashley. "At this point, what can it hurt?"

Davenport condensed the tale, giving it in crisp, telegraphic sentences, while Urth listened carefully, moving his stubby fingers over the shining milk-white desktop as though he were sweeping up invisible cigar ashes. Toward the end of the recital, he hitched up his legs and sat with them crossed like an amiable Buddha.

When Davenport was done, Urth thought a moment, then said, "Do you happen to have a transcript of the conversation reconstructed by Ferrant?"

"We do," said Davenport. "Would you like to see it?"

"Please."

Urth placed the strip of microfilm in a scanner and worked his way rapidly through it, his lips moving unintelligibly at some points. Then he tapped the reproduction of the cryptic message. "And this, you say, is the key to the entire matter? The crucial clue?"

"We think it is, Dr. Urth."

"But it is not the original. It is a reproduction."

"That is correct."

"The original has gone with this man, Ferrant, and you believe it to be in the hands of the Ultras."

"Quite possibly."

Urth shook his head and looked troubled. "Everyone knows my sympathies are not with the Ultras. I would fight them by all means, so I don't want to seem to be hanging back, but—what is there to say that this mind-affecting object exists at all? You have only the ravings of a psychotic and your dubious deductions from the reproduction of a mysterious set of marks that may mean nothing at all."

"Yes, Dr. Urth, but we can't take chances."

"How certain are you that this copy is accurate? What if the original has something on it that this lacks, something that makes the message quite clear, something without which the message must remain impenetrable?"

"We are certain the copy is accurate."

"What about the reverse side? There is nothing on the back of this reproduction. What about the reverse of the original?"

"The agent who made the reproduction tells us that the back of the original was blank."

"Men can make mistakes."

"We have no reason to think he did, and we must work on the assumption that he didn't. At least until such time as the original is regained."

"Then you assure me," said Urth, "that any interpretation to be made of this message must be made on the basis of exactly what one sees here."

"We think so. We are virtually certain," said Davenport with a sense of ebbing confidence.

Urth continued to look troubled. He said, "Why not leave the instrument where it is? If neither group finds it, so much the better. I disapprove of any tampering with minds and would not contribute to making it possible."

Davenport placed a restraining hand on Ashley's arm, sensing the other was about to speak. Davenport said, "Let me put it to you, Dr. Urth, that the mind-tampering aspect is not the whole of the Device. Suppose an Earth expedition to a distant primitive planet had dropped an old-fashioned radio there, and suppose the native population had discovered electric current but had not yet developed the vacuum tube.

"The population might discover that if the radio was hooked up to a current, certain glass objects within it would grow warm and would glow, but of course they would receive no intelligible sound, merely, at best, some buzzes and crackles. However, if they dropped the radio into a bathtub while it was plugged in, a person in that tub might be electrocuted. Should the people of this hypothetical planet therefore conclude that the device they were studying was designed solely for the purpose of killing people?"

"I see your analogy," said Urth. "You think that the mind-tampering property is merely an incidental function of the Device?"

"I'm sure of it," said Davenport earnestly. "If we can puzzle out its real purpose, earthly technology may leap ahead centuries."

"Then you agree with Jennings when he said"—here Urth consulted the microfilm—"'It might be the key to—who knows what? It might be the clue to an unimaginable scientific revolution.'"

"Exactly!"

"And yet the mind-tampering aspect is there and is infinitely dangerous. Whatever the radio's purpose, it *does* electrocute."

"Which is why we can't let the Ultras get it."

"Or the government either, perhaps?"

"But I must point out that there is a reasonable limit to caution. Consider that men have always held danger in their hands. The first flint knife in the old Stone Age; the first wooden club before that could kill. They could be used to bend weaker men to the will of stronger ones under threat of force and that, too, is a form of mind-tampering. What counts, Dr. Urth, is not the Device itself, however dangerous it may be in the abstract, but the intentions of the men who make use of the Device. The Ultras have the declared intention of killing off more than 99.9 per cent of humanity. The government, whatever the faults of the men composing it, would have no such intention."

"What *would* the government intend?"

"A scientific study of the Device. Even the mind-tampering aspect itself could yield infinite good. Put to enlightened use, it could educate us concerning the physical basis of mental function. We might learn to correct mental disorders or cure the Ultras. Mankind might learn to develop greater intelligence generally."

"How can I believe that such idealism will be put into practice?"

"*I* believe so. Consider that you face a possible turn to evil by the government if you help us, but you risk the certain and declared evil purpose of the Ultras if you don't."

Urth nodded thoughtfully. "Perhaps you're right. And yet I have a favor to ask of you. I have a niece who is, I believe, quite fond of me. She is constantly upset over the fact that I steadfastly refuse to induge in the lunacy of travel. She states that she will not rest content until someday I accompany her to Europe or North Carolina or some other outlandish place—"

Ashley leaned forwardly earnestly, brushing Davenport's restraining gesture to one side. "Dr. Urth, if you help us find the Device and if it can be made to work, then I assure you that we will be glad to help you free yourself of your phobia against travel and make it possible for you to go with your niece anywhere you wish."

Urth's bulging eyes widened and he seemed to shrink within himself. For a moment he looked wildly about as though he were already trapped. "*No!*" he gasped. "Not at all! Never!"

His voice dropped to an earnest, hoarse whisper. "Let me explain the nature of my fee. If I help you, if you retrieve the Device and learn its use, if the fact of my help becomes public, then my niece will be on the government like a fury. She is a terribly headstrong and shrill-voiced woman who will raise public subscriptions and organize demonstrations. She will stop at nothing. And yet you must not give in to her. You must *not!* You must resist all pressures. I wish to be left alone exactly as I am now. That is my absolute and minimum fee."

Ashley flushed. "Yes, of course, since that is your wish."

"I have your word?"

"You have my word."

"Please remember. I rely on you too, Mr. Davenport."

"It will be as you wish," soothed Davenport. "And now, I presume, you can interpret the items?"

"The items?" asked Urth, seeming to focus his attention with difficulty on the card. "You mean these markings, XY^2 and so on?"

"Yes. What do they mean?"

"I don't know. Your interpretations are as good as any, I suppose."

Ashley exploded. "Do you mean that all this talk about helping us is nonsense?

What was this maundering about a fee, then?"

Wendell Urth looked confused and taken aback. "I would like to help you."

"But you don't know what these items mean."

"I—I don't. But I know what this message means."

"You do?" cried Davenport.

"Of course. Its meaning is transparent. I suspected it halfway through your story. And I was sure of it once I read the reconstruction of the conversations between Strauss and Jennings. You would understand it yourself, gentlemen, if you would only stop to think."

"See here," said Ashley in exasperation, "you said you don't know what the items mean."

"I don't. I said I know what the *message* means."

"What is the message if it is not the items? Is it the paper, for Heaven's sake?"

"Yes, in a way."

"You mean invisible ink or something like that?"

"No! Why is it so hard for you to understand, when you yourself stand on the brink?"

Davenport leaned toward Ashley and said in a low voice, "Sir, will you let me handle it, please?"

Ashley snorted, then said in a stifled manner, "Go ahead."

"Dr. Urth," said Davenport, "will you give us your analysis?"

"Ah! Well, all right." The little extraterrologist settled back in his chair and mopped his damp forehead on his sleeve. "Let's consider the message. If you accept the quartered circle and the arrow as directing you to me, that leaves seven items. If these indeed refer to seven craters, six of them, at least, must be designed merely to distract, since the Device surely cannot be in more than one place. It contained no movable or detachable parts—it was all one piece.

"Then, too, none of the items are straightforward. SU might, by your interpretation, mean any place on the other side of the Moon, which is an area the size of South America. Again PC/2 can mean 'Tycho,' as Mr. Ashley says, or it can mean 'halfway between Ptolemaeus and Copernicus,' as Mr. Davenport thought, or for that matter 'halfway between Plato and Cassini.' To be sure, XY^2 could mean 'Alfonsus'—very ingenious interpretation, that—but it could refer to some co-ordinate system in which the Y co-ordinate was the square of the X co-ordinate. Similarly C-C would mean 'Bond' or it could mean 'halfway between Cassini and Copernicus.' F/A could mean 'Newton' or it could mean 'between Fabricius and Archimedes.'

"In short, the items have so many meanings that they are meaningless. Even if one of them had meaning, it could not be selected from among the others, so that it is only sensible to suppose that all the items are merely red herrings.

"It is necessary, then, to determine what about the message is completely unambiguous, what is perfectly clear. The answer to that can only be that it *is* a message, that it *is* a clue to a hiding place. That is the one thing we are certain about, isn't it?"

Davenport nodded, then said cautiously, "At least, we think we are certain of it."

"Well, you have referred to this message as the key to the whole matter. You have acted as though it were the crucial clue. Jennings himself referred to the Device as a key or a clue. If we combine this serious view of the matter with Jennings' penchant for puns, a penchant which may have been heightened by the mind-tampering Device he was carrying—So let me tell you a story.

"In the last half of the sixteenth century, there lived a German Jesuit in Rome. He

was a mathematician and astronomer of note and helped Pope Gregory XIII reform the calendar in 1582, performing all the enormous calculations required. This astronomer admired Copernicus but he did not accept the heliocentric view of the Solar System. He clung to the older belief that the Earth was the center of the Universe.

"In 1650, nearly forty years after the death of this mathematician, the Moon was mapped by another Jesuit, the Italian astronomer, Giovanni Battista Riccioli. He named the craters after astronomers of the past and since he too rejected Copernicus, he selected the largest and most spectacular craters for those who placed the Earth at the center of the Universe—for Ptolemy, Hipparchus, Alfonso X, Tycho Brahe. The biggest crater Riccioli could find he reserved for his German Jesuit predecessor.

"This crater is actually only the second largest of the craters visible from Earth. The only larger crater is Bailly, which is right on the Moon's limb and is therefore very difficult to see from the Earth. Riccioli ignored it, and it was named for an astronomer who lived a century after his time and who was guillotined during the French Revolution."

Ashley was listening to all this restlessly. "But what has this to do with the message?"

"Why, everything," said Urth, with some surprise. "Did you not call this message the key to the whole business? Isn't it the crucial clue?"

"Yes, of course."

"Is there any doubt that we are dealing with something that is a clue or key to something else?"

"No, there isn't," said Ashley.

"Well, then— The name of the German Jesuit I have been speaking of is Christoph Klau—pronounced 'klow.' Don't you see the pun? Klau—clue?"

Ashley's entire body seemed to grow flabby with disappointment. "Farfetched," he muttered.

Davenport said anxiously, "Dr. Urth, there is no feature on the Moon named Klau as far as I know."

"Of course not," said Urth excitedly. "That is the whole point. At this period of history, the last half of the sixteenth century, European scholars were Latinizing their names. Klau did so. In place of the German 'u', he made use of the equivalent letter, the Latin 'v'. He then added an 'ius' ending typical of Latin names and Christoph Klau became Christopher Clavius, and I suppose you are all aware of the giant crater we call Clavius."

"But—" began Davenport.

"Don't 'but' me," said Urth. "Just let me point out that the Latin word 'clavis' means 'key.' *Now* do you see the double and bilingual pun? Klau—clue, Clavius—clavis—key. In his whole life, Jennings could never have made a double, bilingual pun, without the Device. Now he could, and I wonder if death might not have been almost triumphant under the circumstances. And he directed you to me because he knew I would remember his penchant for puns and because he knew I loved them too."

The two men of the Bureau were looking at him wide-eyed.

Urth said solemly, "I would suggest you search the shaded rim of Clavius, at that point where the Earth is nearest the zenith."

Ashley rose. "Where is your videophone?"

"In the next room."

Ashley dashed. Davenport lingered behind. "Are you sure, Dr. Urth?"

"Quite sure. But even if I am wrong, I suspect it doesn't matter."

"What doesn't matter?"

"Whether you find it or not. For if the Ultras find the Device, they will probably be unable to use it."

"Why do you say that?"

"You asked me if Jennings had ever been a student of mine, but you never asked me about Strauss, who was also a geologist. He was a student of mine a year or so after Jennings. I remember him well."

"Oh?"

"An unpleasant man. Very cold. It is the hallmark of the Ultras, I think. They are all very cold, very rigid, very sure of themselves. They can't empathize, or they wouldn't speak of killing off billions of human beings. What emotions they possess are icy ones, self-absorbed ones, feelings incapable of spanning the distance between two human beings."

"I think I see."

"I'm sure you do. The conversation reconstructed from Strauss's ravings showed us he could not manipulate the Device. He lacked the emotional intensity, or the type of necessary emotion. I imagine all Ultras would. Jennings, who was not an Ultra, could manipulate it. Anyone who could use the Device would, I suspect, be incapable of deliberate cold-blooded cruelty. He might strike out of panic fear as Jennings struck at Strauss, but never out of calculation, as Strauss tried to strike at Jennings. In short, to put it tritely, I think the Device can be actuated by love, but never by hate, and the Ultras are nothing if not haters."

Davenport nodded. "I hope you're right. But then—why were you so suspicious of the government's motives if you felt the wrong men could not manipulate the Device?"

Urth shrugged. "I wanted to make sure you could bluff and rationalize on your feet and make yourself convincingly persuasive at a moment's notice. After all, you may have to face my niece."

The Billiard Ball

James Priss—I suppose I ought to say Professor James Priss, though everyone is sure to know whom I mean even without the title—always spoke slowly.

I know. I interviewed him often enough. He had the greatest mind since Einstein, but it didn't work quickly. He admitted his slowness often. Maybe it was *because* he had so great a mind that it didn't work quickly.

He would say something in slow abstraction, then he would think, and then he would say something more. Even over trivial matters, his giant mind would hover uncertainly, adding a touch here and then another there.

Would the Sun rise tomorrow, I can imagine him wondering. What do we mean by "rise"? Can we be certain that tomorrow will come? Is the term "Sun" completely unambiguous in this connection?

Add to this habit of speech a bland countenance, rather pale, with no expression except for a general look of uncertainty; gray hair, rather thin, neatly combed; business suits of an invariably conservative cut; and you have what Professor James Priss was—a retiring person, completely lacking in magnetism.

That's why nobody in the world, except myself, could possibly suspect him of being a murderer. And even I am not sure. After all, he *was* slow-thinking; he was *always* slow-thinking. Is it conceivable that at one crucial moment he managed to think quickly and act at once?

It doesn't matter. Even if he murdered, he got away with it. It is far too late now to try to reverse matters and I wouldn't succeed in doing so even if I decided to let this be published.

* * *

Edward Bloom was Priss's classmate in college, and an associate, through circumstance, for a generation afterward. They were equal in age and in their propensity for the bachelor life, but opposites in everything else that mattered.

Bloom was a living flash of light; colorful, tall, broad, loud, brash, and self-confident. He had a mind that resembled a meteor strike in the sudden and unexpected way it

could seize the essential. He was no theoretician, as Priss was; Bloom had neither the patience for it, nor the capacity to concentrate intense thought upon a single abstract point. He admitted that; he boasted of it.

What he did have was an uncanny way of seeing the application of a theory; of seeing the manner in which it could be put to use. In the cold marble block of abstract structure, he could see, without apparent difficulty, the intricate design of a marvelous device. The block would fall apart at his touch and leave the device.

It is a well-known story, and not too badly exaggerated, that nothing Bloom ever built had failed to work, or to be patentable, or to be profitable. By the time he was forty-five, he was one of the richest men on Earth.

And if Bloom the Technician were adapted to one particular matter more than anything else, it was to the way of thought of Priss the Theoretician. Bloom's greatest gadgets were built upon Priss's greatest thoughts, and as Bloom grew wealthy and famous, Priss gained phenomenal respect among his colleagues.

Naturally it was to be expected that when Priss advanced his Two-Field Theory, Bloom would set about at once to build the first practical anti-gravity device.

* * *

My job was to find human interest in the Two-Field Theory for the subscribers to *Tele-News Press,* and you get that by trying to deal with human beings and not with abstract ideas. Since my interviewee was Professor Priss, that wasn't easy.

Naturally, I was going to ask about the possibilities of anti-gravity, which interested everyone; and not about the Two-Field Theory, which no one could understand.

"Anti-gravity?" Priss compressed his pale lips and considered. "I'm not entirely sure that it is possible, or ever will be. I haven't—uh—worked the matter out to my satisfaction. I don't entirely see whether the Two-Field equations would have a finite solution, which they would have to have, of course, if—" And then he went off into a brown study.

I prodded him. "Bloom says he thinks such a device can be built."

Priss nodded. "Well, yes, but I wonder. Ed Bloom has had an amazing knack at seeing the unobvious in the past. He has an unusual mind. It's certainly made him rich enough."

We were sitting in Priss's apartment. Ordinary middle-class. I couldn't help a quick glance this way and that. Priss was not wealthy.

I don't think he read my mind. He saw me look. And I think it was on *his* mind. He said, "Wealth isn't the usual reward for the pure scientist. Or even a particularly desirable one."

Maybe so, at that, I thought. Priss certainly had his own kind of reward. He was the third person in history to win two Nobel Prizes, and the first to have both of them in the sciences and both of them unshared. You can't complain about that. And if he wasn't rich, neither was he poor.

But he didn't sound like a contented man. Maybe it wasn't Bloom's wealth alone that irked Priss; maybe it was Bloom's fame among the people of Earth generally; maybe it was the fact that Bloom was a celebrity wherever he went, whereas Priss, outside scientific conventions and faculty clubs, was largely anonymous.

I can't say how much of all this was in my eyes or in the way I wrinkled the creases in my forehead, but Priss went on to say, "But we're friends, you know. We play billiards once or twice a week. I beat him regularly."

(I never published that statement. I checked it with Bloom, who made a long counterstatement that began: "He beats *me* at billiards. That jackass—" and grew increasingly personal thereafter. As a matter of fact, neither one was a novice at billiards. I watched them play once for a short while, after the statement and counterstatement, and both handled the cue with professional aplomb. What's more, both played for blood, and there was no friendship in the game that I could see.)

I said, "Would you care to predict whether Bloom will manage to build an anti-gravity device?"

"You mean would I commit myself to anything? Hmm. Well, let's consider, young man. Just what do we mean by anti-gravity? Our conception of gravity is built around Einstein's General Theory of Relativity, which is now a century and a half old but which, within its limits, remains firm. We can picture it—"

I listened politely. I'd heard Priss on the subject before, but if I was to get anything out of him—which wasn't certain—I'd have to let him work his way through in his own way.

"We can picture it," he said, "by imagining the Universe to be a flat, thin, super-flexible sheet of untearable rubber. If we picture mass as being associated with weight, as it is on the surface of the Earth, then we would expect a mass, resting upon the rubber sheet, to make an indentation. The greater the mass, the deeper the indentation.

"In the actual Universe," he went on, "all sorts of masses exist, and so our rubber sheet must be pictured as riddled with indentations. Any object rolling along the sheet would dip into and out of indentations it passed, veering and changing direction as it did so. It is this veer and change of direction that we interpret as demonstrating the existence of a force of gravity. If the moving object comes close enough to the center of the indentation and is moving slowly enough, it gets trapped and whirls round and round that indentation. In the absence of friction, it keeps up that whirl forever. In other words, what Isaac Newton interpreted as a force, Albert Einstein interpreted as geometrical distortion."

He paused at this point. He had been speaking fairly fluently—for him—since he was saying something he had said often before. But now he began to pick his way.

He said, "So in trying to produce anti-gravity, we are trying to alter the geometry of the Universe. If we carry on our metaphor, we are trying to straighten out the indented rubber sheet. We could imagine ourselves getting under the indenting mass and lifting it upward, supporting it so as to prevent it from making an indentation. If we make the rubber sheet flat in that way, then we create a Universe—or at least a portion of the Universe—in which gravity doesn't exist. A rolling body would pass the non-indenting mass without altering its direction of travel a bit, and we could interpret this as meaning that the mass was exerting no gravitational force. In order to accomplish this feat, however, we need a mass equivalent to the indenting mass. To produce anti-gravity on Earth in this way, we would have to make use of a mass equal to that of Earth and poise it above our heads, so to speak."

I interrupted him. "But your Two-Field Theory—"

"Exactly. General Relativity does not explain both the gravitational field and the electromagnetic fields in a single set of equations. Einstein spent half his life searching for that single set—for a Unified Field Theory—and failed. All who followed Einstein also failed. I, however, began with the assumption that there were two fields that could not be unified and followed the consequences, which I can explain, in part, in terms of the 'rubber sheet' metaphor."

Now we came to something I wasn't sure I had ever heard before. "How does that go?" I asked.

"Suppose that, instead of trying to lift the indenting mass, we try to stiffen the sheet itself, make it less indentable. It would contract, at least over a small area, and become flatter. Gravity would weaken, and so would mass, for the two are essentially the same phenomenon in terms of the indented Universe. If we could make the rubber sheet completely flat, both gravity and mass would disappear altogether.

"Under the proper conditions, the electromagnetic field could be made to counter the gravitational field, and serve to stiffen the indented fabric of the Universe. The electromagnetic field is tremendously stronger than the gravitational field, so the former could be made to overcome the latter."

I said uncertainly, "But you say 'under the proper conditions.' Can those proper conditions you speak of be achieved, Professor?"

"That is what I don't know," said Priss thoughtfully and slowly. "If the Universe were really a rubber sheet, its stiffness would have to reach an infinite value before it could be expected to remain completely flat under an indenting mass. If that is also so in the real Universe, then an infinitely intense electromagnetic field would be required and that would mean anti-gravity would be impossible."

"But Bloom says—"

"Yes, I imagine Bloom thinks a finite field will do, if it can be properly applied. Still, however, ingenious he is," and Priss smiled narrowly, "we needn't take him to be infallible. His grasp on theory is quite faulty. He—he never earned his college degree, did you know that?"

I was about to say that I knew that. After all, everyone did. But there was a touch of eagerness in Priss's voice as he said it and I looked up in time to catch animation in his eye, as though he were delighted to spread that piece of news. So I nodded my head as if I were filing it for future reference.

"Then you would say, Professor Priss," I prodded again, "that Bloom is probably wrong and that anti-gravity is impossible?"

And finally Priss nodded and said, "The gravitational field can be awakened, of course, but if by anti-gravity we mean a true zero-gravity field—no gravity at all over a significant volume of space—then I suspect anti-gravity may turn out to be impossible, despite Bloom."

And I had, after a fashion, what I wanted.

* * *

I wasn't able to see Bloom for nearly three months after that, and when I did see him he was in an angry mood.

He had grown angry at once, of course, when the news first broke concerning Priss's statement. He let it be known that Priss would be invited to the eventual display of the anti-gravity device as soon as it was constructed, and would even be asked to participate in the demonstration. Some reporter—not I, unfortunately—caught him between appointments and asked him to elaborate on that and he said:

"I'll have the device eventually; soon, maybe. And you can be there, and so can anyone else the press would care to have there. And Professor James Priss can be there. He can represent Theoretical Science and after I have demonstrated anti-gravity, he can adjust his theory to explain it. I'm sure he will know how to make his adjustments in masterly fashion and show exactly why I couldn't possibly have failed. He might do it now and save time, but I suppose he won't."

It was all said very politely, but you could hear the snarl under the rapid flow of words.

Yet he continued his occasional game of billiards with Priss and when the two met they behaved with complete propriety. One could tell the progress Bloom was making by their respective attitudes to the press. Bloom grew curt and even snappish, while Priss developed an increasing good humor.

When my umpteenth request for an interview with Bloom was finally accepted, I wondered if perhaps that meant a break in Bloom's quest. I had a little daydream of him announcing final success to *me*.

It didn't work out that way. He met me in his office at Bloom Enterprises in upstate New York. It was a wonderful setting, well away from any populated area, elaborately landscaped, and covering as much ground as a rather large industrial establishment. Edison at his height, two centuries ago, had never been as phenomenally successful as Bloom.

But Bloom was not in a good humor. He came striding in ten minutes late and went snarling past his secretary's desk with the barest nod in my direction. He was wearing a lab coat, unbuttoned.

He threw himself into his chair and said, "I'm sorry if I've kept you waiting, but I didn't have as much time as I had hoped." Bloom was a born showman and knew better than to antagonize the press, but I had the feeling he was having a great deal of difficulty at that moment in adhering to this principle.

I made the obvious guess. "I am given to understand, sir, that your recent tests have been unsuccessful."

"Who told you that?"

"I would say it was general knowledge, Mr. Bloom."

"No, it isn't. Don't say that, young man. There is no general knowledge about what goes on in my laboratories and workshops. You're stating the Professor's opinions, aren't you? Priss's, I mean."

"No, I'm—"

"Of course you are. Aren't you the one to whom he made that statement—that anti-gravity is impossible?"

"He didn't make the statement that flatly."

"He never says anything flatly, but it was flat enough for him, and not as flat as I'll have his damned rubber-sheet Universe before I'm finished."

"Then does that mean you're making progress, Mr. Bloom?"

"You know I am," he said with a snap. "Or you should know. Weren't you at the demonstration last week?"

"Yes, I was."

I judged Bloom to be in trouble or he wouldn't be mentioning that demonstration. It worked but it was not a world beater. Between the two poles of a magnet a region of lessened gravity was produced.

It was done very cleverly. A Mössbauer-Effect Balance was used to probe the space between the poles. If you've never seen an M-E Balance in action, it consists primarily of a tight monochromatic beam of gamma rays shot down the low-gravity field. The gamma rays change wavelength slightly but measurably under the influence of the gravitational field and if anything happens to alter the intensity of the field, the wavelength-change shifts correspondingly. It is an extremely delicate method for probing a gravitational field and it worked like a charm. There was no question but that Bloom had lowered gravity.

The trouble was that it had been done before by others. Bloom, to be sure, had made use of circuits that greatly increased the ease with which such an effect had been achieved—his system was typically ingenious and had been duly patented—and he maintained that it was by this method that anti-gravity would become not merely a scientific curiosity but a practical affair with industrial applications.

Perhaps. But it was an incomplete job and he didn't usually make a fuss over incompleteness. He wouldn't have done so this time if he weren't desperate to display - *something*.

I said, "It's my impression that what you accomplished at that preliminary demonstration was 0.8 *g*, and better than that was achieved in Brazil last spring."

"That so? Well, calculate the energy input in Brazil and here, and then tell me the difference in gravity decrease per kilowatt-hour. You'll be surprised."

"But the point is, can you reach 0 *g*—zero-gravity? That's what Professor Priss thinks may be impossible. Everyone agrees that merely lessening the intensity of the field is no great feat."

Bloom's fist clenched. I had the feeling that a key experiment had gone wrong that day and he was annoyed almost past endurance. Bloom hated to be balked by the Universe.

He said, "Theoreticians make me sick." He said it in a low, controlled voice, as though he were finally tired of not saying it, and he was going to speak his mind and be damned. "Priss has won two Nobel Prizes for sloshing around a few equations, but what has he done with it? Nothing! I *have* done something with it and I'm going to do more with it, whether Priss likes it or not."

"*I'm* the one people will remember. *I'm* the one who gets the credit. He can keep his damned title and his Prizes and his kudos from the scholars. Listen, I'll tell you what gripes him. Plain old-fashioned jealousy. It kills him that I get what I get for doing. He wants it for *thinking*.

"I said to him once—we play billiards together, you know—"

It was at this point that I quoted Priss's statement about billiards and got Bloom's counterstatement. I never published either. That was just trivia.

"We play billiards," said Bloom, when he had cooled down, "and I've won my share of games. We keep things friendly enough. What the hell—college chums and all that—though how he got through I'll never know. He made it in physics, of course, and in math, but he got a bare pass—out of pity, I think—in every humanities course he ever took."

"You did not get your degree, did you, Mr. Bloom?" That was sheer mischief on my part. I was enjoying his eruption.

"I quit to go into business, damn it. My academic average, over the three years I attended, was a strong B. Don't imagine anything else, you hear? Hell, by the time Priss got his Ph.D., I was working on my second million."

He went on, clearly irritated, "Anyway, we were playing billiards and I said to him, 'Jim, the average man will never understand why you get the Nobel Prize when I'm the one who gets the results. Why do you need two? Give me one!' He stood there, chalking up his cue, and then he said in his soft namby-pamby way, 'You have two billions, Ed. Give me one.' So you see, he wants the money."

I said, "I take it you don't mind his getting the honor?"

For a minute I thought he was going to order me out, but he didn't. He laughed instead, waved his hand in front of him, as though he were erasing something from an invisible blackboard in front of him. He said, "Oh, well, forget it. All that is off the

record. Listen, do you want a statement? Okay. Things didn't go right today and I blew my top a bit, but it will clear up. I think I know what's wrong. And if I don't, I'm going to know.

"Look, you can say that I say that we *don't* need infinite electromagnetic intensity; we *will* flatten out the rubber sheet; we *will* have zero gravity. And when we get it, I'll have the damndest demonstration you ever saw, exclusively for the press and for Priss, and you'll be invited. And you can say it won't be long. Okay?"

Okay!

* * *

I had time after that to see each man once or twice more. I even saw them together when I was present at one of their billiard games. As I said before, both of them were *good.*

But the call to the demonstration did not come as quickly as all that. It arrived six weeks less than a year after Bloom gave me his statement. And at that, perhaps it was unfair to expect quicker work.

I had a special engraved invitation, with the assurance of a cocktail hour first. Bloom never did things by halves and he was planning to have a pleased and satisfied group of reporters on hand. There was an arrangement for trimensional TV, too. Bloom felt competely confident, obviously; confident enough to be willing to trust the demonstration in every living room on the planet.

I called up Professor Priss, to make sure he was invited too. He was.

"Do you plan to attend, sir?"

There was a pause and the professor's face on the screen was a study in uncertain reluctance. "A demonstration of this sort is most unsuitable where a serious scientific matter is in question. I do not like to encourage such things."

I was afraid he would beg off, and the dramatics of the situation would be greatly lessened if he were not there. But then, perhaps, he decided he dared not play the chicken before the world. With obvious distaste he said, "Of course, Ed Bloom is not really a scientist and he must have his day in the sun. I'll be there."

"Do you think Mr. Bloom can produce zero gravity, sir?"

"Uh . . . Mr. Bloom sent me a copy of the design of his device and . . . and I'm not certain. Perhaps he can do it, if . . . uh . . . he says he can do it. Of course"—he paused again for quite a long time—"I think I would like to see it."

So would I, and so would many others.

The staging was impeccable. A whole floor of the main building at Bloom Enterprises—the one on the hilltop—was cleared. There were the promised cocktails and a splendid array of hors d'oeuvres, soft music and lighting, and a carefully dressed and thoroughly jovial Edward Bloom playing the perfect host, while a number of polite and unobtrusive menials fetched and carried. All was geniality and amazing confidence.

James Priss was late and I caught Bloom watching the corners of the crowd and beginning to grow a little grim about the edges. Then Priss arrived, dragging a volume of colorlessness in with him, a drabness that was unaffected by the noise and the absolute splendor (no other word would describe it—or else it was the two martinis glowing inside me) that filled the room.

Bloom saw him and his face was illuminated at once. He bounced across the floor, seized the smaller man's hand and dragged him to the bar.

"Jim! Glad to see you! What'll you have? Hell, man, I'd have called it off if you hadn't showed. Can't have this thing without the star, you know." He wrung Priss's hand. "It's your theory, you know. We poor mortals can't do a thing without you few, you damned *few* few, pointing the way."

He was being ebullient, handing out the flattery, because he could afford to do so now. He was fattening Priss for the kill.

Priss tried to refuse a drink, with some sort of mutter, but a glass was pressed into his hand and Bloom raised his voice to a bull roar.

"Gentlemen! A moment's quiet, please. To Professor Priss, the greatest mind since Einstein, two-time Nobel Laureate, father of the Two-Field Theory, and inspirer of the demonstration we are about to see—even if he didn't think it would work, and had the guts to say so publicly."

There was a distinct titter of laughter that quickly faded out and Priss looked as grim as his face could manage.

"But now that Professor Priss is here," said Bloom, "and we've had our toast, let's get on with it. Follow me, gentlemen!"

The demonstration was in a much more elaborate place than had housed the earlier one. This time it was on the top floor of the building. Different magnets were involved—smaller ones, by heaven—but as nearly as I could tell, the same M-E Balance was in place.

One thing was new, however, and it staggered everyone, drawing much more attention than anything else in the room. It was a billiard table, resting under one pole of the magnet. Beneath it was the companion pole. A round hole, about a foot across, was stamped out of the very center of the table and it was obvious that the zero-gravity field, if it was to be produced, would be produced through that hole in the center of the billiard table.

It was as though the whole demonstration had been designed, surrealist fashion, to point up the victory of Bloom over Priss. This was to be another version of their everlasting billiards competition and Bloom was going to win.

I don't know if the other newsmen took matters in that fashion, but I think Priss did. I turned to look at him and saw that he was still holding the drink that had been forced into his hand. He rarely drank, I knew, but now he lifted the glass to his lips and emptied it in two swallows. He stared at that billiard ball and I needed no gift of ESP to realize that he took it as a deliberate snap of fingers under his nose.

Bloom led us to the twenty seats that surrounded three sides of the table, leaving the fourth free as a working area. Priss was carefully escorted to the seat commanding the most convenient view. Priss glanced quickly at the trimensional cameras which were now working. I wondered if he were thinking of leaving but deciding that he couldn't in the full glare of the eyes of the world.

Essentially, the demonstration was simple; it was the production that counted. There were dials in plain view that measured the energy expenditure. There were others that transferred the M-E Balance readings into a position and a size that were visible to all. Everything was arranged for easy trimensional viewing.

Bloom explained each step in a genial way, with one or two pauses in which he turned to Priss for a confirmation that had to come. He didn't do it often enough to make it obvious, but just enough to turn Priss upon the spit of his own torment. From where I sat I could look across the table and see Priss on the other side.

He had the look of a man in Hell.

As we all know, Bloom succeeded. The M-E Balance showed the gravitational

intensity to be sinking steadily as the electromagnetic field was intensified. There were cheers when it dropped below the 0.52 *g* mark. A red line indicated that on the dial.

"The 0.52 *g* mark, as you know," said Bloom confidently, "represents the previous record low in gravitational intensity. We are now lower than that at a cost in electricity that is less than ten per cent what it cost at the time that mark was set. And we will go lower still."

Bloom—I think deliberately, for the sake of the suspense—slowed the drop toward the end, letting the trimensional cameras switch back and forth between the gap in the billiard table and the dial on which the M-E Balance reading was lowering.

Bloom said suddenly, "Gentlemen, you will find dark goggles in the pouch on the side of each chair. Please put them on now. The zero-gravity field will soon be established and it will radiate a light rich in ultraviolet."

He put goggles on himself, and there was a momentary rustle as others went on too.

I think no one breathed during the last minute, when the dial reading dropped to zero and held fast. And just as that happened a cylinder of light sprang into existence from pole to pole through the hole in the billiard table.

There was a ghost of twenty sighs at that. Someone called out, "Mr. Bloom, what is the reason for the light?"

"It's characteristic of the zero-gravity field," said Bloom smoothly, which was no answer, of course.

Reporters were standing up now, crowding about the edge of the table. Bloom waved them back. "Please, gentlemen, stand clear!"

Only Priss remained sitting. He seemed lost in thought and I have been certain ever since that it was the goggles that obscured the possible significance of everything that followed. I didn't see his eyes. I couldn't. And that meant neither I nor anyone else could even begin to make a guess as to what was going on behind those eyes. Well, maybe we couldn't have made such a guess, even if the goggles hadn't been there, but who can say?

Bloom was raising his voice again. "Please! The demonstration is not yet over. So far, we've only repeated what I have done before. I have now produced a zero-gravity field and I have shown it can be done practically. But I want to demonstrate something of what such a field can do. What we are going to see next will be something that has never been seen, not even by myself. I have not experimented in this direction, much as I would have liked to, because I have felt that Professor Priss deserved the honor of—"

Priss looked up sharply. "What—what—"

"Professor Priss," said Bloom, smiling broadly, "I would like you to perform the first experiment involving the interaction of a solid object with a zero-gravity field. Notice that the field has been formed in the center of a billiard table. The world knows your phenomenal skill in billiards, Professor, a talent second only to your amazing aptitude in theoretical physics. Won't you send a billiard ball into the zero-gravity volume?"

Eagerly he was handing a ball and cue to the professor. Priss, his eyes hidden by the goggles, stared at them and only very slowly, very uncertainly, reached out to take them.

I wonder what his eyes were showing. I wonder, too, how much of the decision to have Priss play billiards at the demonstration was due to Bloom's anger at Priss's remark about their periodic game, the remark I had quoted. Had I been, in my way, responsible for what followed?

"Come, stand up, Professor," said Bloom, "and let *me* have your seat. The show is yours from now on. Go ahead!"

Bloom seated himself, and still talked, in a voice that grew more organlike with each moment. "Once Professor Priss sends the ball into the volume of zero gravity, it will no longer be affected by Earth's gravitational field. It will remain truly motionless while the Earth rotates about its axis and travels about the Sun. In this latitude, and at this time of day, I have calculated that the Earth, in its motions, will sink downward. We will move with it and the ball will stand still. To us it will seem to rise up and away from the Earth's surface. Watch."

Priss seemed to stand in front of the table in frozen paralysis. Was it surprise? Astonishment? I don't know. I'll never know. Did he make a move to interrupt Bloom's little speech, or was he just suffering from an agonized reluctance to play the ignominious part into which he was being forced by his adversary?

Priss turned to the billiard table, looking first at it, then back at Bloom. Every reporter was on his feet, crowding as closely as possible in order to get a good view. Only Bloom himself remained seated, smiling and isolated. He, of course, was not watching the table, or the ball, or the zero-gravity field. As nearly as I could tell through the goggles, he was watching Priss.

Priss turned to the table and placed his ball. He was going to be the agent that was to bring final and dramatic triumph to Bloom and make himself—the man who said it couldn't be done—the goat to be mocked forever.

Perhaps he felt there was no way out. Or perhaps—

With a sure stroke of his cue, he set the ball into motion. It was not going quickly, and every eye followed it. It struck the side of the table and caromed. It was going even slower now as though Priss himself were increasing the suspense and making Bloom's triumph the more dramatic.

I had a perfect view, for I was standing on the side of the table opposite from that where Priss was. I could see the ball moving toward the glitter of the zero-gravity field and beyond it I could see those portions of the seated Bloom which were not hidden by the glitter.

The ball approached the zero-gravity volume, seemed to hang on the edge for a moment, and then was gone, with a streak of light, the sound of a thunderclap, the sudden smell of burning cloth.

We yelled. We all yelled.

I've seen the scene on television since—along with the rest of the world. I can see myself in the film during that fifteen-second period of wild confusion, but I don't really recognize my face.

Fifteen seconds!

And then we discovered Bloom. He was still sitting in the chair, his arms still folded, but there was a hole the size of a billiard ball through forearm, chest, and back. The better part of his heart, as it later turned out under autopsy, had been neatly punched out.

They turned off the device. They called in the police. They dragged off Priss, who was in a state of utter collapse. I wasn't much better off, to tell the truth, and if any reporter then on the scene ever tried to say he remained a cool observer of that scene, then he's a cool liar.

* * *

It was some months before I got to see Priss again. He had lost some weight but

seemed well otherwise. Indeed, there was color in his cheeks and an air of decision about him. He was better dressed than I had ever seen him to be.

He said, "I know what happened *now*. If I had had time to think, I would have known then. But I am a slow thinker, and poor Ed Bloom was so intent on running a great show and doing it so well that he carried me along with him. Naturally, I've been trying to make up for some of the damage I unwittingly caused."

"You can't bring Bloom back to life," I said soberly.

"No, I can't," he said, just as soberly. "But there's Bloom Enterprises to think of, too. What happened at the demonstration, in full view of the world, was the worst possible advertisement for zero gravity, and it's important that the story be made clear. That is why I have asked to see *you*."

"Yes?"

"If I had been a quicker thinker, I would have known Ed was speaking the purest nonsense when he said that the billiard ball would slowly rise in the zero-gravity field. It *couldn't* be so! If Bloom hadn't despised theory so, if he hadn't been so intent on being proud of his own ignorance of theory, he'd have known it himself.

"The Earth's motion, after all, isn't the only motion involved, young man. The Sun itself moves in a vast orbit about the center of the Milky Way Galaxy. And the Galaxy moves too, in some not very clearly defined way. If the billiard ball were subjected to zero gravity, you might think of it as being unaffected by any of these motions and therefore of suddenly falling into a state of absolute rest—when there is no such thing as absolute rest."

Priss shook his head slowly. "The trouble with Ed, I think, was that he was thinking of the kind of zero gravity one gets in a spaceship in free fall, when people float in mid-air. He expected the ball to float in mid-air. However, in a spaceship, zero gravity is not the result of an absence of gravitation, but merely the result of two objects, a ship and a man within the ship, falling at the same rate, responding to gravity in precisely the same way, so that each is motionless with respect to the other.

"In the zero-gravity field produced by Ed, there was a flattening of the rubber-sheet Universe, which means an actual loss of mass. Everything in that field, including molecules of air caught within it, and the billiard ball I pushed into it, was completely massless as long as it remained with it. A completely massless object can move in only one way."

He paused, inviting the question. I asked, "What motion would that be?"

"Motion at the speed of light. Any massless object, such as a neutrino or a photon, must travel at the speed of light as long as it exists. In fact, light moves at that speed only because it is made up of photons. As soon as the billiard ball entered the zero-gravity field and lost its mass, it too assumed the speed of light at once and left."

I shook my head. "But didn't it regain its mass as soon as it left the zero-gravity volume?"

"It certainly did, and at once it began to be affected by the gravitational field and to slow up in response to the friction of the air and the top of the billiard table. But imagine how much friction it would take to slow up an object the mass of a billiard ball going at the speed of light. It went through the hundred-mile thickness of our atmosphere in a thousandth of a second and I doubt that it was slowed more than a few miles a second in doing so, a few miles out of 186,282 of them. On the way, it scorched the top of the billiard table, broke cleanly through the edge, went through poor Ed and the window too, punching out neat circles because it had passed through before the neighboring portions of something even as brittle as glass had a chance to split and splinter.

"It is extremely fortunate we were on the top floor of a building set in a countrified area. If we were in the city, it might have passed through a number of buildings and killed a number of people. By now that billiard ball is off in space, far beyond the edge of the Solar System and it will continue to travel so forever, at nearly the speed of light, until it happens to strike an object large enough to stop it. And then it will gouge out a sizable crater."

I played with the notion and was not sure I liked it. "How is that possible? The billiard ball entered the zero-gravity volume almost at a standstill. I saw it. And you say it left with an incredible quantity of kinetic energy. Where did the energy come from?"

Priss shrugged. "It came from nowhere! The law of conservation of energy only holds under the conditions in which general relativity is valid; that is, in an indented-rubber-sheet universe. Wherever the indentation is flattened out, general relativity no longer holds, and energy can be created and destroyed freely. That accounts for the radiation along the cylindrical surface of the zero-gravity volume. That radiation, you remember, Bloom did not explain, and, I fear, could not explain. If he had only experimented further first; if he had only not been so foolishly anxious to put on his show—"

"What accounts for the radiation, sir?"

"The molecules of air inside the volume. Each assumes the speed of light and comes smashing outward. They're only molecules, not billiard balls, so they're stopped, but the kinetic energy of their motion is converted into energetic radiation. It's continuous because new molecules are always drifting in, and attaining the speed of light and smashing out."

"Then energy is being created continuously?"

"Exactly. And that is what we must make clear to the public. Anti-gravity is not primarily a device to lift spaceships or to revolutionize mechanical movement. Rather, it is the source of an endless supply of free energy, since part of the energy produced can be diverted to maintain the field that keeps that portion of the Universe flat. What Ed Bloom invented, without knowing it, was not just anti-gravity, but the first successful perpetual-motion machine of the first class—one that manufactures energy out of nothing."

I said slowly, "Any one of us could have been killed by that billiard ball, is that right, Professor? It might have come out in any direction."

Priss said, "Well, massless photons emerge from any light source at the speed of light in any direction; that's why a candle casts light in all directions. The massless air molecules come out of the zero-gravity volume in all directions, which is why the entire cylinder radiates. But the billiard ball was only one object. It could have come out in any direction, but it had to come out in some one direction, chosen at random, and the chosen direction happened to be the one that caught Ed."

That was it. Everyone knows the consequences. Mankind had free energy and so we have the world we have now. Professor Priss was placed in charge of its development by the board of Bloom Enterprises, and in time he was as rich and famous as ever Edward Bloom had been. And Priss still has two Nobel Prizes in addition.

Only . . .

I keep thinking. Photons smash out from a light source in all directions because they are created at the moment and there is no reason for them to move in one direction more than in another. Air molecules come out of a zero-gravity field in all directions because they enter it in all directions.

But what about a single billiard ball, entering a zero-gravity field from one particular direction? Does it come out in the same direction or in any direction?

I've inquired delicately, but theoretical physicists don't seem to be sure, and I can find no record that Bloom Enterprises, which is the only organization working with zero-gravity fields, has ever experimented in the matter. Someone at the organization once told me that the uncertainty principle guarantees the random emersion of an object entering in any direction. But then why don't they try the experiment?

Could it be, then . . .

Could it be that for once Priss's mind had been working quickly? Could it be that, under the pressure of what Bloom was trying to do to him, Priss had suddenly seen everything? He had been studying the radiation surrounding the zero-gravity volume. He might have realized its cause and been certain of the speed-of-light motion of anything entering the volume.

Why, then, had he said nothing?

One thing is certain. *Nothing* Priss would do at the billiard table could be accidental. He was an expert and the billiard ball did exactly what he wanted it to. I was standing right there. I saw him look at Bloom and then at the table as though he were judging angles.

I watched him hit that ball. I watched it bounce off the side of the table and move into the zero-gravity volume, heading in one particular direction.

For when Priss sent that ball toward the zero-gravity volume—and the tri-di films bear me out—it was *already* aimed directly at Bloom's heart!

Accident? Coincidence?

. . . Murder?

Afterword

A friend of mine after reading the above story suggested I change the title to "Dirty Pool." I have been tempted to do so but I have refrained, for it seems too flippant a title for so grave a story—or perhaps I am just corroded with jealousy at not having thought of it first.

But in either case, now that all the stories in this volume have been gone over, and I have experienced the memories to which each gave rise, all I can say is, "Gee, it's great to be a science fiction writer."

Exile to Hell

"The Russians," said Dowling, in his precise voice, "used to send prisoners to Siberia in the days before space travel had become common. The French used Devil's Island for the purpose. The British sailed them off to Australia."

He considered the chessboard carefully and his hand hesitated briefly over the bishop.

Parkinson, at the other side of the chess board, watched the pattern of the pieces absently. Chess was, of course, the professional game of computer programmers, but, under the circumstances, he lacked enthusiasm. By rights, he felt with some annoyance, Dowling should have been even worse off; he was programming the prosecution's case.

There was, of course, a tendency for the programmer to take over some of the imagined characteristics of the computer—the unemotionality, the imperviousness to anything but logic. Dowling reflected that in his precise hair-part and in the restrained elegance of his clothing.

Parkinson, who preferred to program the defense in the law cases in which he was involved, also preferred to be deliberately careless in the minor aspects of his costume.

He said, "You mean exile is a well-established punishment and therefore not particularly cruel."

"No, it *is* particularly cruel, but also it *is* well-established, and nowadays it has become the perfect deterrent."

Dowling moved the bishop and did not look upward. Parkinson, quite involuntarily, did.

Of course, he couldn't see anything. They were indoors, in the comfortable modern world tailored to human needs, carefully protected against the raw environment. Out there, the night would be bright with its illumination.

When had he last seen it? Not for a long time. It occurred to him to wonder what phase it was in right now. Full? Gleaming? Or was it in its crescent phase? Was it a bright fingernail of light low in the sky?

By rights it should be a lovely sight. Once it had been. But that had been centuries ago, before space travel had become common and cheap, and before the surroundings all about them had grown sophisticated and controlled. Now the lovely light in the sky had become a new and more horrible Devil's Island hung in space.

—No one even used its name any longer, out of sheer distaste. It was "It." Or it was less than that, just a silent, upward movement of the head.

Parkinson said, "You might have allowed me to program the case against exile generally."

"Why? It couldn't have affected the result."

"Not this one, Dowling. But it might have affected future cases. Future punishments might be commuted to the death sentence."

"For someone guilty of equipment damage? You're dreaming."

"It was an act of blind anger. There was intent to harm a human being, granted; but there was no intent to harm equipment."

"Nothing; it means nothing. Lack of intent is no excuse in such cases. You know that."

"It *should* be an excuse. That's my point; the one I wanted to make."

Parkinson advanced a pawn now, to cover his knight.

Dowling considered. "You're trying to hang on to the queen's attack, Parkinson, and I'm not going to let you. —Let's see, now." And while he pondered he said, "These are not primitive times, Parkinson. We live in a crowded world with no margin for error. As small a thing as a blown-out consistor could endanger a sizable fraction of our population. When anger endangers and subverts a power line, it's a serious thing."

"I don't question that—"

"You seemed to be doing so, when you were constructing the defense program."

"I was not. Look, when Jenkins' laser beam cut through the Field-warp, I myself was as close to death as anyone. A quarter hour's additional delay would have meant my end, too, and I'm completely aware of that. My point is only that exile is not the proper punishment!"

He tapped his finger on the chessboard for emphasis, and Dowling caught the queen before it went over. "Adjusting, not moving," he mumbled.

Dowling's eyes went from piece to piece and he continued to hesitate. "You're wrong, Parkinson. It *is* the proper punishment, because there's nothing worse and that matches a crime than which there is nothing worse. Look, we all feel our absolute dependence on a complicated and rather fragile technology. A breakdown might kill us all, and it doesn't matter whether the breakdown is deliberate, accidental, or caused by incompetence. Human beings demand the maximum punishment for any such deed as the only way they can feel secure. Mere death is not sufficient deterrent."

"Yes, it is. No one wants to die."

"They want to live in exile up there even less. That's why we've only had one such case in the last ten years, and only one exile. —There, do something about that!" And Dowling nudged his queen's rook one space to the right.

A light flashed. Parkinson was on his feet at once. "The programming is finished. The computer will have its verdict now."

Dowling looked up phlegmatically, "You've no doubt about what that verdict will be, have you? —Keep the board standing. We'll finish afterward."

Parkinson was quite certain he would lack the heart to continue the game. He huried down the corridor to the courtroom, light and quick on his feet, as always.

Shortly after he and Dowling had entered, the judge took his seat, and then in came Jenkins, flanked by two guards.

Jenkins looked haggard, but stoical. Ever since the blind rage had overcome him and he had accidentally thrown a sector into unpowered darkness while striking out at a fellow worker, he must have known the inevitable consequence of this worst of all crimes. It helps to have no illusions.

Parkinson was not stoical. He dared not look squarely at Jenkins. He could not have done so without wondering, painfully, as to what might be going through Jenkins' mind at that moment. Was he absorbing, through every sense, all the perfections of familiar comfort before being thrust forever into the luminous Hell that rode the night sky?

Was he savoring the clean and pleasant air in his nostrils, the soft lights, the equable temperature, the pure water on call, the secure surroundings designed to cradle humanity in tame comfort?

While up there—

The judge pressed a contact and the computer's decision was converted into the warm, unmannered sound of a standardized human voice.

"A weighing of all pertinent information in the light of the law of the land and of all relevant precedents leads to the conclusion that Anthony Jenkins is guilty on all counts of the crime of equipment damage and is subject to the maximum penalty."

There were only six people in the courtroom itself, but the entire population was listening by television, of course.

The judge spoke in prescribed phraseology. "The defendant will be taken from here to the nearest spaceport and, on the first available transportation, be removed from this world and sent into exile for the term of his natural life."

Jenkins seemed to shrink within himself, but he said no word.

Parkinson shivered. How many, he wondered, would now feel the enormity of such a punishment for *any* crime? How long before there would be enough humanity among men to wipe out forever the punishment of exile?

Could anyone really think of Jenkins up there in space, without flinching? Could they think, and endure the thought, of a fellow man thrown for all his life among the strange, unfriendly, vicious population of a world of unbearable heat by day and frigid cold by night; of a world where the sky was a harsh blue and the ground a harsher, clashing green; where the dusty air moved raucously and the viscous sea heaved eternally?

And the gravity, that heavy—heavy—heavy—eternal—pull!

Who could bear the horror of condemning someone, for whatever reason, to leave the friendly home of the Moon for that Hell in the sky—the Earth?

Feminine Intuition

The Three Laws of Robotics:

1. *A robot may not injure a human being or, through inaction, allow a human being to come to harm.*
2. *A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.*
3. *A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.*

For the first time in the history of United States Robots and Mechanical Men, Inc., a robot had been destroyed through accident on Earth itself.

No one was to blame. The air vehicle had been demolished in mid-air and an unbelieving investigating committee was wondering whether they really dared announce the evidence that it had been hit by a meteorite. Nothing else could have been fast enough to prevent automatic avoidance; nothing else could have done the damage short of a nuclear blast and that was out of the question.

Tie that in with a report of a flash in the night sky just before the vehicle had exploded—and from Flagstaff Observatory, not from an amateur—and the location of a sizable and distinctly meteoric bit of iron freshly gouged into the ground a mile from the site and what other conclusion could be arrived at?

Still, nothing like that had ever happened before and calculations of the odds against it yielded monstrous figures. Yet even colossal improbabilities can happen sometimes.

At the offices of United States Robots, the hows and whys of it were secondary. The real point was that a robot had been destroyed.

That, in itself, was distressing.

The fact that JN-5 had been a prototype, the first, after four earlier attempts, to have been placed in the field, was even more distressing.

The fact that JN-5 was a radically new type of robot, quite different from anything ever built before, was abysmally distressing.

The fact that JN-5 had apparently accomplished something before its destruction that was incalculably important and that that accomplishment might now be forever gone, placed the distress utterly beyond words.

It seemed scarcely worth mentioning that, along with the robot, the Chief Robopsychologist of United States Robots had also died.

* * *

Clinton Madarian had joined the firm ten years before. For five of those years, he had worked uncomplainingly under the grumpy supervision of Susan Calvin.

Madarian's brilliance was quite obvious and Susan Calvin had quietly promoted him over the heads of older men. She wouldn't, in any case, have deigned to give her reasons for this to Research Director Peter Bogert, but as it happened, no reasons were needed. Or, rather, they were obvious.

Madarian was utterly the reverse of the renowned Dr. Calvin in several very noticeable ways. He was not quite as overweight as his distinct double chin made him appear to be, but even so he was overpowering in his presence, where Susan had gone nearly unnoticed. Madarian's massive face, his shock of glistening red-brown hair, his ruddy complexion and booming voice, his loud laugh, and most of all, his irrepressible self-confidence and his eager way of announcing his sucesses, made everyone else in the room feel there was a shortage of space.

When Susan Calvin finally retired (refusing, in advance, any cooperation with respect to any testimonial dinner that might be planned in her honor, with so firm a manner that no announcement of the retirement was even made to the news services) Madarian took her place.

He had been in his new post exactly one day when he initiated the JN project.

It had meant the largest commitment of funds to one project that United States Robots had ever had to weigh, but that was something which Madarian dismissed with a genial wave of the hand.

"Worth every penny of it, Peter," he said. "And I expect you to convince the Board of Directors of that."

"Give me reasons," said Bogert, wondering if Madarian would. Susan Calvin had never given reasons.

But Madarian said, "Sure," and settled himself easily into the large armchair in the Director's office.

Bogert watched the other with something that was almost awe. His own once-black hair was almost white now and within the decade he would follow Susan into retirement. That would mean the end of the original team that had built United States Robots into a globe-girdling firm that was a rival of the national governments in complexity and importance. Somehow neither he nor those who had gone before him ever quite grasped the enormous expansion of the firm.

But this was a new generation. The new men were at ease with the Colossus. They lacked the touch of wonder that would have them tiptoeing in disbelief. So they moved ahead, and that was good.

Madarian said, "I propose to begin the construction of robots without constraint."

"Without the Three Laws? Surely—"

"No, Peter. Are those the only constraints you can think of. Hell, you contributed to the design of the early positronic brains. Do I have to tell you that, quite aside from the Three Laws, there isn't a pathway in those brains that isn't carefully designed and fixed? We have robots planned for specific tasks, implanted with specific abilities."

"And you propose—"


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"That at every level below the Three Laws, the paths be made open-ended. It's not difficult."

Bogert said dryly, "It's not difficult, indeed. Useless things are never difficult. The difficult thing is fixing the paths and making the robot useful."

"But why is that difficult? Fixing the paths requires a great deal of effort because the Principle of Uncertainty is important in particles the mass of positrons and the uncertainty effect must be minimized. Yet why must it? If we arrange to have the Principle just sufficiently prominent to allow the crossing of paths unpredictably—"

"We have an unpredictable robot."

"We have a *creative* robot," said Madarian, with a trace of impatience. "Peter, if there's anything a human brain has that a robotic brain has never had, it's the trace of unpredictability that comes from the effects of uncertainty at the subatomic level. I admit that this effect has never been demonstrated experimentally within the nervous system, but without that the human brain is not superior to the robotic brain in principle."

"And you think that if you introduce the effect into the robotic brain, the human brain will become not superior to the robotic brain in principle."

"That," said Madarian, "is exactly what I believe."

They went on for a long time after that.

* * *

The Board of Directors clearly had no intention of being easily convinced.

Scott Robertson, the largest shareholder in the firm, said, "It's hard enough to manage the robot industry as it is, with public hostility to robots forever on the verge of breaking out into the open. If the public gets the idea that robots will be uncontrolled . . . Oh, don't tell me about the Three Laws. The average man won't believe the Three Laws will protect him if he as much as hears the word 'uncontrolled.'"

"Then don't use it," said Madarian. "Call the robot—call it 'intuitive.'"

"An intuitive robot," someone muttered. "A girl robot?"

A smile made its way about the conference table.

Madarian seized on that. "All right. A girl robot. Our robots are sexless, of course, and so will this one be, but we always act as though they're males. We give them male pet names and call them he and him. Now this one, if we consider the nature of the mathematical structuring of the brain which I have proposed, would fall into the JN-coordinate system. The first robot would be JN-1, and I've assumed that it would be called John-1 . . . I'm afraid that is the level of originality of the average roboticist. But why not call it Jane-1, damn it? If the public has to be let in on what we're doing, we're constructing a feminine robot with intuition."

Robertson shook his head, "What difference would that make? What you're saying is that you plan to remove the last barrier which, in principle, keeps the robotic brain inferior to the human brain. What do you suppose the public reaction will be to that?"

"Do you plan to make that public?" said Madarian. He thought a bit and then said, "Look. One thing the general public believes is that women are not as intelligent as men."

There was an instant apprehensive look on the face of more than one man at the table and a quick look up and down as though Susan Calvin were still in her accustomed seat.

Madarian said, "If we announce a female robot, it doesn't matter what she is. The public will automatically assume she is mentally backward. We just publicize the robot as Jane-1 and we don't have to say another word. We're safe."

"Actually," said Peter Bogert quietly, "there's more to it than that. Madarian and I have gone over the mathematics carefully and the JN series, whether John or Jane, would be quite safe. They would be less complex and intellectually capable, in an orthodox sense, than many another series we have designed and constructed. There would only be the one added factor of, well, let's get into the habit of calling it 'intuition.'"

"Who knows what it would do?" muttered Robertson.

"Madarian has suggested one thing it can do. As you all know, the Space Jump has been developed in principle. It is possible for men to attain what is, in effect, hyperspeeds beyond that of light and to visit other stellar systems and return in negligible time—weeks at the most."

Robertson said, "That's not new to us. It couldn't have been done without robots."

"Exactly, and it's not doing us any good because we can't use the hyper-speed drive except perhaps once as a demonstration, so that U.S. Robots gets little credit. The Space Jump is risky, it's fearfully prodigal of energy and therefore it's enormously expensive. If we were going to use it anyway, it would be nice if we could report the existence of a habitable planet. Call it a psychological need. Spend about twenty billion dollars on a single Space Jump and report nothing but scientific data and the public wants to know why their money was wasted. Report the existence of a habitable planet, and you're an interstellar Columbus and no one will worry about the money."

"So?"

"So where are we going to find a habitable planet? Or put it this way—which star within reach of the Space Jump as presently developed, which of the three hundred thousand stars and star systems within three hundred light-years has the best chance of having a habitable planet? We've got an enormous quantity of details on every star in our three-hundred-light-year neighborhood and a notion that almost every one has a planetary system. But which has a *habitable* planet? Which do we visit? . . . We don't know."

One of the directors said, "How would this Jane robot help us?"

Madarian was about to answer that, but he gestured slightly to Bogert and Bogert understood. The Director would carry more weight. Bogert didn't particularly like the idea; if the JN series proved a fiasco, he was making himself prominent enough in connection with it to insure that the sticky fingers of blame would cling to him. On the other hand, retirement was not all that far off, and if it worked, he would go out in a blaze of glory. Maybe it was only Madarian's aura of confidence, but Bogert had honestly come to believe it would work.

He said, "It may well be that somewhere in the libraries of data we have on those stars, there are methods for estimating the probabilities of the presence of Earth-type habitable planets. All we need to do is understand the data properly, look at them in the appropriate creative manner, make the correct correlations. We haven't done it yet. Or if some astronomer has, he hasn't been smart enough to realize what he has.

"A JN-type robot could make correlations far more rapidly and far more precisely than a man could. In a day, it would make and discard as many correlations as a man could in ten years. Furthermore, it would work in truly random fashion, whereas a man would have a strong bias based on preconception and on what is already believed."

There was a considerable silence after that. Finally Robertson said, "But it's only a

matter of probability, isn't it? Suppose this robot said, 'The highest-probability habitable-planet star within so-and-so light-years is Squidgee-17,' or whatever, and we go there and find that a probability is only a probability and that there are no habitable planets after all. Where does that leave us?"

Madarian struck in this time. "We still win. We know how the robot came to the conclusion because it—she—will tell us. It might well help us gain enormous insight into astronomical detail and make the whole thing worthwhile even if we don't make the Space Jump at all. Besides, we can then work out the five most probable sites of planets and the probability that one of the five has a habitable planet may then be better than 0.95. It would be almost sure—"

They went on for a long time after that.

* * *

The funds granted were quite insufficient, but Madarian counted on the habit of throwing good money after bad. With two hundred million about to be lost irrevocably when another hundred million could save everything, the other hundred million would surely be voted.

Jane-1 was finally built and put on display. Peter Bogert studied it—her—gravely. He said, "Why the narrow waist? Surely that introduces a mechanical weakness?"

Madarian chuckled. "Listen, if we're going to call her Jane, there's no point in making her look like Tarzan."

Bogert shook his head. "Don't like it. You'll be bulging her higher up to give the appearance of breasts next, and that's a rotten idea. If women start getting the notion that robots may look like women, I can tell you exactly the kind of perverse notions they'll get, and you'll *really* have hostility on their part."

Madarian said, "Maybe you're right at that. No woman wants to feel replaceable by something with none of her faults. Okay."

* * *

Jane-2 did not have the pinched waist. She was a somber robot which rarely moved and even more rarely spoke.

Madarian had only occasionally come rushing to Bogert with items of news during her construction and that had been a sure sign that things were going poorly. Madarian's ebullience under success was overpowering. He would not hesitate to invade Bogert's bedroom at 3 A.M. with a hot-flash item rather than wait for the morning. Bogert was sure of that.

Now Madarian seemed subdued, his usually florid expression nearly pale, his round cheeks somehow pinched. Bogert said, with a feeling of certainty, "She won't talk."

"Oh, she talks." Madarian sat down heavily and chewed at his lower lip. "Sometimes, anyway," he said.

Bogert rose and circled the robot. "And when she talks, she makes no sense, I suppose. Well, if she doesn't talk, she's no female, is she?"

Madarian tried a weak smile for size and abandoned it. He said, "The brain, in isolation, checked out."

"I know," said Bogert.

"But once that brain was put in charge of the physical apparatus of the robot, it was necessarily modified, of course."

"Of course," agreed Bogert unhelpfully.

"But unpredictably and frustratingly. The trouble is that when you're dealing with n-dimensional calculus of uncertainty, things are—"

"Uncertain?" said Bogert. His own reaction was surprising him. The company investment was already most sizable and almost two years had elapsed, yet the results were, to put it politely, disappointing. Still, he found himself jabbing at Madarian and finding himself amused in the process.

Almost furtively, Bogert wondered if it weren't the absent Susan Calvin he was jabbing at. Madarian was so much more ebullient and effusive than Susan could ever possibly be—when things were going well. He was also far more vulnerably in the dumps when things weren't going well, and it was precisely under pressure that Susan never cracked. The target that Madarian made could be a neatly punctured bull's-eye as recompense for the target Susan had never allowed herself to be.

Madarian did not react to Bogert's last remark any more than Susan Calvin would have done; not out of contempt, which would have been Susan's reaction, but because he did not hear it.

He said argumentatively, "The trouble is the matter of recognition. We have Jane-2 correlating magnificently. She can correlate on any subject, but once she's done so, she can't recognize a valuable result from a valueless one. It's not an easy problem, judging how to program a robot to tell a significant correlation when you don't know what correlations she will be making."

"I presume you've thought of lowering the potential at the W-21 diode junction and sparking across the—"

"No, no, no, no—" Madarian faded off into a whispering diminuendo. "You can't just have it spew out everything. We can do that ourselves. The point is to have it recognize the crucial correlation and draw the conclusion. Once that is done, you see, a Jane robot would snap out an answer by intuition. It would be something we couldn't get ourselves except by the oddest kind of luck."

"It seems to me," said Bogert dryly, "that if you had a robot like that, you would have her do routinely what, among human beings, only the occasional genius is capable of doing."

Madarian nodded vigorously. "Exactly, Peter. I'd have said so myself if I weren't afraid of frightening off the execs. Please don't repeat that in their hearing."

"Do you really want a robot genius?"

"What are words? I'm trying to get a robot with the capacity to make random correlations at enormous speeds, together with a key-significance high-recognition quotient. And I'm trying to put *those* words into positronic field equations. I thought I had it, too, but I don't. Not yet."

He looked at Jane-2 discontentedly and said, "What's the best significance you have, Jane?"

Jane-2's head turned to look at Madarian but she made no sound, and Madarian whispered with resignation, "She's running that into the correlation banks."

Jane-2 spoke tonelessly at last. "I'm not sure." It was the first sound she had made.

Madarian's eyes rolled upward. "She's doing the equivalent of setting up equations with indeterminate solutions."

"I gathered that," said Bogert. "Listen, Madarian, can you go anywhere at this point, or do we pull out now and cut our losses at half a billion?"

"Oh, I'll get it," muttered Madarian.

* * *

Jane-3 wasn't it. She was never as much as activated and Madarian was in a rage.

It was human error. His own fault, if one wanted to be entirely accurate. Yet though Madarian was utterly humiliated, others remained quiet. Let he who has never made an error in the fearsomely intricate mathematics of the positronic brain fill out the first memo of correction.

* * *

Nearly a year passed before Jane-4 was ready. Madarian was ebullient again. "She does it," he said. "She's got a good high-recognition quotient."

He was confident enough to place her on display before the Board and have her solve problems. Not mathematical problems; any robot could do that; but problems where the terms were deliberately misleading without being actually inaccurate.

Bogert said afterward, "That doesn't take much, really."

"Of course not. It's elementary for Jane-4, but I had to show them something, didn't I?"

"Do you know how much we've spent so far?"

"Come on, Peter, don't give me that. Do you know how much we've got back? These things don't go on in a vacuum, you know. I've had over three years of hell over this, if you want to know, but I've worked out new techniques of calculation that will save us a minimum of fifty thousand dollars on every new type of positronic brain we design, from now on in forever. Right?"

"Well—"

"Well me no wells. It's so. And it's my personal feeling that n-dimensional calculus of uncertainty can have any number of other applications if we have the ingenuity to find them, and my Jane robots *will* find them. Once I've got exactly what I want, the new JN series will pay for itself inside of five years, even if we triple what we've invested so far."

"What do you mean by 'exactly what you want'? What's wrong with Jane-4?"

"Nothing. Or nothing much. She's on the track, but she can be improved and I intend to do so. I thought I knew where I was going when I designed her. Now I've tested her and I *know* where I'm going. I intend to get there."

* * *

Jane-5 was it. It took Madarian well over a year to produce her and there he had no reservations; he was utterly confident.

Jane-5 was shorter than the average robot, slimmer. Without being a female caricature as Jane-1 had been, she managed to possess an air of femininity about herself despite the absence of a single clearly feminine feature.

"It's the way she's standing," said Bogert. Her arms were held gracefully and somehow the torso managed to give the impression of curving slightly when she turned.

Madarian said, "Listen to her . . . How do you feel, Jane?"

"In excellent health, thank you," said Jane-5, and the voice was precisely that of a

woman; it was a sweet and almost disturbing contralto.

"Why did you do that, Clinton?" said Peter, startled and beginning to frown.

"Psychologically important," said Madarian. "I want people to think of her as a woman; to treat her as a woman; to *explain*."

"What people?"

Madarian put his hands in his pockets and stared thoughtfully at Bogert. "I would like to have arrangements made for Jane and myself to go to Flagstaff."

Bogert couldn't help but note that Madarian didn't say Jane-5. He made use of no number this time. She was *the* Jane. He said doubtfully, "To Flagstaff? Why?"

"Because that's the world center for general planetology, isn't it? It's where they're studying the stars and trying to calculate the probability of habitable planets, isn't it?"

"I know that, but it's on Earth."

"Well, and I surely know that."

"Robotic movements on Earth are strictly controlled. And there's no need for it. Bring a library of books on general planetology here and let Jane absorb them."

"*No!* Peter, will you get it through your head that Jane isn't the ordinary logical robot; she's intuitive."

"So?"

"So how can we tell what she needs, what she can use, what will set her off? We can use any metal model in the factory to read books; that's frozen data and out of date besides. Jane must have living information; she must have tones of voice, she must have side issues; she must have total irrelevancies even. How the devil do we know what or when something will go click-click inside her and fall into a pattern? If we knew, we wouldn't need her at all, would we?"

Bogert began to feel harassed. He said, "Then bring the men here, the general planetologists."

"Here won't be any good. They'll be out of their element. They won't react naturally. I want Jane to watch them at work; I want her to see their instruments, their offices, their desks, everything about them that she can. I want you to arrange to have her transported to Flagstaff. And I'd really like not to discuss it any further."

For a moment he almost sounded like Susan. Bogert winced, and said, "It's complicated making such an arrangement. Transporting an experimental robot—"

"Jane isn't experimental. She's the fifth of the series."

"The other four weren't really working models."

Madarian lifted his hands in helpless frustration. "Who's forcing you to tell the government that?"

"I'm not worried about the government. It can be made to understand special cases. It's public opinion. We've come a long way in fifty years and I don't propose to be set back twenty-five of them by having you lose control of a—"

"I won't lose control. You're making foolish remarks. Look! U.S. Robots can afford a private plane. We can land quietly at the nearest commercial airport and be lost in hundreds of similar landings. We can arrange to have a large ground car with an enclosed body meet us and take us to Flagstaff. Jane will be crated and it will be obvious that some piece of thoroughly non-robotic equipment is being transported to the labs. We won't get a second look from anyone. The men at Flagstaff will be alerted and will be told the exact purpose of the visit. They will have every motive to cooperate and to prevent a leak."

Bogert pondered. "The risky part will be the plane and the ground car. If anything happens to the crate—"

"Nothing will."

"We might get away with it if Jane is deactivated during transport. Then even if someone finds out she's inside—"

"No, Peter. That can't be done. Uh-uh. Not Jane-5. Look, she's been free-associating since she was activated. The information she possesses can be put into freeze during deactivation but the free associations never. No, sir, she can't ever be deactivated."

"But, then, if somehow it is discovered that we are transporting an activated robot—"

"It won't be found out."

Madarian remained firm and the plane eventually took off. It was a late-model automatic Computo-jet, but it carried a human pilot—one of U. S. Robots' own employees—as backup. The crate containing Jane arrived at the airport safely, was transferred to the ground car, and reached the Research Laboratories at Flagstaff without incident.

* * *

Peter Bogert received his first call from Madarian not more than an hour after the latter's arrival at Flagstaff. Madarian was ecstatic and, characteristically, could not wait to report.

The message arrived by tubed laser beam, shielded, scrambled, and ordinarily impenetrable, but Bogert felt exasperated. He knew it could be penetrated if someone with enough technological ability—the government, for example—was determined to do so. The only real safety lay in the fact that the government had no reason to try. At least Bogert hoped so.

He said, "For God's sake, do you have to call?"

Madarian ignored him entirely. He burbled, "It was an inspiration. Sheer genius, I tell you."

For a while, Bogert stared at the receiver. Then he shouted incredulously, "You mean you've got the answer? Already?"

"No, no! Give us time, damn it. I mean the matter of her voice was an inspiration. Listen, after we were chauffeured from the airport to the main administration building at Flagstaff, we uncrated Jane and she stepped out of the box. When that happened, every man in the place stepped back. Scared! Nitwits! If even scientists can't understand the significance of the Laws of Robotics, what can we expect of the average untrained individual? For a minute there I thought: This will all be useless. They won't talk. They'll be keying themselves for a quick break in case she goes berserk and they'll be able to think of nothing else."

"Well, then, what are you getting at?"

"So then she greeted them routinely. She said, 'Good afternoon, gentlemen. I am so glad to meet you.' And it came out in this beautiful contralto . . . That was it. One man straightened his tie, and another ran his fingers through his hair. What really got me was that the oldest guy in the place actually checked his fly to make sure it was zipped. They're all crazy about her now. All they needed was the voice. She isn't a robot any more; she's a girl."

"You mean they're talking to her?"

"*Are* they talking to her! I should say so. I should have programmed her for sexy intonations. They'd be asking her for dates right now if I had. Talk about conditioned

reflex. Listen, men respond to voices. At the most intimate moments, are they looking? It's the voice in your ear—"

"Yes, Clinton, I seem to remember. Where's Jane now?"

"With them. They won't let go of her."

"Damn! Get in there with her. Don't let her out of your sight, man."

* * *

Madarian's calls thereafter, during his ten-day stay at Flagstaff, were not very frequent and became progressively less exalted.

Jane was listening carefully, he reported, and occasionally she responded. She remained popular. She was given entry everywhere. But there were no results.

Bogert said, "Nothing at all?"

Madarian was at once defensive. "You can't say nothing at all. It's impossible to say nothing at all with an intuitive robot. You don't know what might not be going on inside her. This morning she asked Jensen what he had for breakfast."

"Rossiter Jensen the astrophysicist?"

"Yes, of course. As it turned out, he didn't have breakfast that morning. Well, a cup of coffee."

"So Jane's learning to make small talk. That scarcely makes up for the expense—"

"Oh, don't be a jackass. It wasn't small talk. Nothing is small talk for Jane. She asked because it had something to do with some sort of cross-correlation she was building in her mind."

"What can it possibly—"

"How do I know? If I knew, I'd be a Jane myself and you wouldn't need her. But it has to mean something. She's programmed for high motivation to obtain an answer to the question of a planet with optimum habitability/distance and—"

"Then let me know when she's done that and not before. It's not really necessary for me to get a blow-by-blow description of possible correlations."

He didn't really expect to get notification of success. With each day, Bogert grew less sanguine, so that when the notification finally came, he wasn't ready. And it came at the very end.

That last time, when Madarian's climactic message came, it came in what was almost a whisper. Exaltation had come complete circle and Madarian was awed into quiet.

"She did it," he said. "She did it. After I all but gave up, too. After she had received everything in the place and most of it twice and three times over and never said a word that sounded like anything . . . I'm on the plane now, returning. We've just taken off."

Bogert managed to get his breath. "Don't play games, man. You have the *answer?* Say so, if you have. Say it plainly."

"She has the answer. She's given me the answer. She's given me the names of three stars within eighty light-years which, she says, have a sixty to ninety per cent chance of possessing one habitable planet each. The probability that at least one has is 0.972. It's almost certain. And that's just the least of it. Once we get back, she can give us the exact line of reasoning that led her to the conclusion and I predict that the whole science of astrophysics and cosmology will—"

"Are you sure—"

"You think I'm having hallucinations? I even have a witness. Poor guy jumped two

feet when Jane suddenly began to reel out the answer in her gorgeous voice—"

And that was when the meteorite struck and in the thorough destruction of the plane that followed, Madarian and the pilot were reduced to gobbets of bloody flesh and no usable remnant of Jane was recovered.

* * *

The gloom at U. S. Robots had never been deeper. Robertson attempted to find consolation in the fact that the very completeness of the destruction had utterly hidden the illegalities of which the firm had been guilty.

Peter shook his head and mourned. "We've lost the best chance U. S. Robots ever had of gaining an unbeatable public image; of overcoming the damned Frankenstein complex. What it would have meant for robots to have one of them work out the solution to the habitable-planet problem, after other robots had helped work out the Space Jump. Robots would have opened the galaxy to us. And if at the same time we could have driven scientific knowledge forward in a dozen different directions as we surely would have . . . Oh, God, there's no way of calculating the benefits to the human race, and to us of course."

Robertson said, "We could build other Janes, couldn't we? Even without Madarian?"

"Sure we could. But can we depend on the proper correlation again? Who knows how low-probability that final result was? What if Madarian had had a fantastic piece of beginner's luck? And then to have an even more fantastic piece of bad luck? A meteorite zeroing in . . . It's simply unbelievable—"

Robertson said in a hesitating whisper, "It couldn't have been—meant. I mean, if we weren't meant to know and if the meteorite was a judgment—from—"

He faded off under Bogert's withering glare.

Bogert said, "It's not a dead loss, I suppose. Other Janes are bound to help us in some ways. And we can give other robots feminine voices, if that will help encourage public acceptance—though I wonder what the women would say. If we only knew what Jane-5 had said!"

"In that last call, Madarian said there was a witness."

Bogert said, "I know; I've been thinking about that. Don't you suppose I've been in touch with Flagstaff? Nobody in the entire place heard Jane say anything that was out of the ordinary, anything that sounded like an answer to the habitable-planet problem, and certainly anyone there should have recognized the answer if it came—or at least recognized it as a possible answer."

"Could Madarian have been lying? Or crazy? Could he have been trying to protect himself—"

"You mean he may have been trying to save his reputation by pretending he had the answer and then gimmick Jane so she couldn't talk and say, 'Oh, sorry, something happened accidentally. Oh, darn!' I won't accept that for a minute. You might as well suppose he had arranged the meteorite."

"Then what do we do?"

Bogert said heavily, "Turn back to Flagstaff. The answer *must* be there. I've got to dig deeper, that's all. I'm going there and I'm taking a couple of the men in Madarian's department. We've got to go through that place top to bottom and end to end."

"But, you know, even if there were a witness and he had heard, what good would it do, now that we don't have Jane to explain the process?"

"Every little something is useful. Jane gave the names of the stars; the catalogue numbers probably—none of the named stars has a chance. If someone can remember her saying that and actually remember the catalogue number, or have heard it clearly enough to allow it to be recovered by Psycho-probe if he lacked the conscious memory—then we'll have something. Given the results at the end, and the data fed Jane at the beginning, we might be able to reconstruct the line of reasoning; we might recover the intuition. If that is done, we've saved the game—"

* * *

Bogert was back after three days, silent and thoroughly depressed. When Robertson inquired anxiously as to results, he shook his head. "Nothing!"

"Nothing?"

"Absolutely nothing. I spoke with every man in Flagstaff—every scientist, every technician, every student—that had had anything to do with Jane; everyone that had as much as seen her. The number wasn't great; I'll give Madarian credit for that much discretion. He only allowed those to see her who might conceivably have had planetological knowledge to feed her. There were twenty-three men altogether who had seen Jane and of those only twelve had spoken to her more than casually.

"I went over and over all that Jane had said. They remembered everything quite well. They're keen men engaged in a crucial experiment involving their specialty, so they had every motivation to remember. And they were dealing with a talking robot, something that was startling enough, and one that talked like a TV actress. They couldn't forget."

Robertson said, "Maybe a Psycho-probe—"

"If one of them had the vaguest thought that something had happened, I would screw out his consent to Probing. But there's nothing to leave room for an excuse, and to Probe two dozen men who make their living from their brains can't be done. Honestly, it wouldn't help. If Jane had mentioned three stars and said they had habitable planets, it would have been like setting up sky rockets in their brains. How could any one of them forget?"

"Then maybe one of them is lying," said Robertson grimly. "He wants the information for his own use; to get the credit himself later."

"What good would that do him?" said Bogert. "The whole establishment knows exactly why Madarian and Jane were there in the first place. They know why I came there in the second. If at any time in the future any man now at Flagstaff suddenly comes up with a habitable-planet theory that is startlingly new and different, yet valid, every other man at Flagstaff and every man at U. S. Robots will know at once that he had stolen it. He'd never get away with it."

"Then Madarian himself was somehow mistaken."

"I don't see how I can believe that either. Madarian had an irritating personality—all robopsychologists have irritating personalities, I think, which must be why they work with robots rather than with men—but he was no dummy. He *couldn't* be wrong in something like this."

"Then—" But Robertson had run out of possibilities. They had reached a blank wall and for some minutes each stared at it disconsolately.

Finally Robertson stirred. "Peter—"

"Well?"

"Let's ask Susan."

Bogert stiffened. "What!"

"Let's ask Susan. Let's call her and ask her to come in."

"Why? What can she possibly do?"

"I don't know. But she's a robopsychologist, too, and she might understand Madarian better than we do. Besides, she— Oh, hell, she always had more brains than any of us."

"She's nearly eighty."

"And you're seventy. What about it?"

Bogert sighed. Had her abrasive tongue lost any of its rasp in the years of her retirement? He said, "Well, I'll ask her."

* * *

Susan Calvin entered Bogert's office with a slow look around before her eyes fixed themselves on the Research Director. She had aged a great deal since her retirement. Her hair was a fine white and her face seemed to have crumpled. She had grown so frail as to be almost transparent and only her eyes, piercing and uncompromising, seemed to remain of all that had been.

Bogert strode forward heartily, holding out his hand. "Susan!"

Susan Calvin took it, and said, "You're looking reasonably well, Peter, for an old man. If I were you, I wouldn't wait till next year. Retire now and let the young men get to it . . . And Madarian is dead. Are you calling me in to take over my old job? Are you determined to keep the ancients till a year past actual physical death?"

"No, no, Susan. I've called you in—" He stopped. He did not, after all, have the faintest idea of how to start.

But Susan read his mind now as easily as she always had. She seated herself with the caution born of stiffened joints and said, "Peter, you've called me in because you're in bad trouble. Otherwise you'd sooner see me dead than within a mile of you."

"Come, Susan—"

"Don't waste time on pretty talk. I never had time to waste when I was forty and certainly not now. Madarian's death and your call to me are both unusual, so there must be a connection. Two unusual events without a connection is too low-probability to worry about. Begin at the beginning and don't worry about revealing yourself to be a fool. That was revealed to me long ago."

Bogert cleared his throat miserably and began. She listened carefully, her withered hand lifting once in a while to stop him so that she might ask a question.

She snorted at one point. "Feminine intuition? Is that what you wanted the robot for? You men. Faced with a woman reaching a correct conclusion and unable to accept the fact that she is your equal or superior in intelligence, you invent something called feminine intuition."

"Uh, yes, Susan, but let me continue—"

He did. When she was told of Jane's contralto voice, she said, "It is a difficult choice sometimes whether to feel revolted at the male sex or merely to dismiss them as contemptible."

Bogert said, "Well, let me go on—"

When he was quite done, Susan said, "May I have the private use of this office for an hour or two?"

"Yes, but—"

She said, "I want to go over the various records—Jane's programming, Madarian's calls, your interviews at Flagstaff. I presume I can use that beautiful new shielded laser-phone and your computer outlet if I wish."

"Yes, of course."

"Well, then, get out of here, Peter."

* * *

It was not quite forty-five minutes when she hobbled to the door, opened it, and called for Bogert.

When Bogert came, Robertson was with him. Both entered and Susan greeted the latter with an unenthusiastic "Hello, Scott."

Bogert tried desperately to gauge the results from Susan's face, but it was only the face of a grim old lady who had no intention of making anything easy for him.

He said cautiously, "Do you think there's anything you can do, Susan?"

"Beyond what I have already done? No! There's nothing more."

Bogert's lips set in chagrin, but Robertson said, "What have you already done, Susan?"

Susan said, "I've thought a little; something I can't seem to persuade anyone else to do. For one thing, I've thought about Madarian. I knew him, you know. He had brains but he was a very irritating extrovert. I thought you would like him after me, Peter."

"It was a change," Bogert couldn't resist saying.

"And he was always running to you with results the very minute he had them, wasn't he?"

"Yes, he was."

"And yet," said Susan, "his last message, the one in which he said Jane had given him the answer, was sent from the plane. Why did he wait so long? Why didn't he call you while he was still at Flagstaff, immediately after Jane had said whatever it was she said?"

"I suppose," said Peter, "that for once he wanted to check it thoroughly and—well, I don't know. It was the most important thing that had ever happened to him; he might for once have wanted to wait and be sure of himself."

"On the contrary; the more important it was, the less he would wait, surely. And if he could manage to wait, why not do it properly and wait till he was back at U. S. Robots so that he could check the results with all the computing equipment this firm could make available to him? In short, he waited too long from one point of view and not long enough from another."

Robertson interrupted. "Then you think he was up to some trickery—"

Susan looked revolted. "Scott, don't try to compete with Peter in making inane remarks. Let me continue . . . A second point concerns the witness. According to the records of that last call, Madarian said, 'Poor guy jumped two feet when Jane suddenly began to reel out the answer in her gorgeous voice.' In fact, it was the last thing he said. And the question is, then, why should the witness have jumped? Madarian had explained that all the men were crazy about that voice, and they had had ten days with the robot—with Jane. Why should the mere act of her speaking have startled them?"

Bogert said, "I assumed it was astonishment at hearing Jane give an answer to a problem that has occupied the minds of planetologists for nearly a century."

"But they were *waiting* for her to give that answer. That was why she was there. Besides, consider the way the sentence is worded. Madarian's statement makes it seem the witness was startled, not astonished, if you see the difference. What's more, that reaction came 'when Jane suddenly began'—in other words, at the very start of the statement. To be astonished at the content of what Jane said would have required the witness to have listened awhile so that he might absorb it. Madarian would have said he had jumped two feet *after* he had heard Jane say thus-and-so. It would be 'after' not 'when' and the word 'suddenly' would not be included."

Bogert said uneasily, "I don't think you can refine matters down to the use or non-use of a word."

"I can," said Susan frostily, "because I am a robopsychologist. And I can expect Madarian to do so, too, because *he* was a robopsychologist. We have to explain those two anomalies, then. The queer delay before Madarian's call and the queer reaction of the witness."

"Can *you* explain them?" asked Robertson.

"Of course," said Susan, "since I use a little simple logic. Madarian called with the news without delay, as he always did, or with as little delay as he could manage. If Jane had solved the problem at Flagstaff, he would certainly have called from Flagstaff. Since he called from the plane, she must clearly have solved the problem after he had left Flagstaff."

"But then—"

"Let me finish. Let me finish. Was Madarian not taken from the airport to Flagstaff in a heavy, enclosed ground car? And Jane, in her crate, with him?"

"Yes."

"And presumably, Madarian and the crated Jane returned from Flagstaff to the airport in the same heavy, enclosed ground car. Am I right?"

"Yes, of course!"

"And they were not alone in the ground car, either. In one of his calls, Madarian said, 'We were chauffeured from the airport to the main administration building,' and I suppose I am right in concluding that if he was chauffeured, then that was because there was a chauffeur, a human driver, in the car."

"Good God!"

"The trouble with you, Peter, is that when you think of a witness to a planetological statement, you think of planetologists. You divide up human beings into categories, and despise and dismiss most. A robot cannot do that. The First Law says, 'A robot may not injure a *human being* or, through inaction, allow a *human being* to come to harm.' *Any* human being. That is the essence of the robotic view of life. A robot makes no distinction. To a robot, all men are truly equal, and to a robopsychologist who must perforce deal with men at the robotic level, all men are truly equal, too.

"It would not occur to Madarian to say a truck driver had heard the statement. To you a truck driver is not a scientist but is a mere animate adjunct of a truck, but to Madarian he was a man and a witness. Nothing more. Nothing less."

Bogert shook his head in disbelief, "But you are *sure?*"

"Of course I'm sure. How else can you explain the other point; Madarian's remark about the startling of the witness? Jane was crated, wasn't she? But she was *not* deactivated. According to the records, Madarian was always adamant against ever deactivating an intuitive robot. Moreover, Jane-5, like any of the Janes, was extremely nontalkative. Probably it never occurred to Madarian to order her to remain quiet within the crate; and it was within the crate that the pattern finally fell into place. Naturally

she began to talk. A beautiful contralto voice suddenly sounded from inside the crate. If you were the truck driver, what would you do at that point? Surely you'd be startled. It's a wonder he didn't crash."

"But if the truck driver was the witness, why didn't he come forward—"

"Why? Can he possibly know that anything crucial had happened, that what he heard was important? Besides, don't you suppose Madarian tipped him well and asked him not to say anything? Would you *want* the news to spread that an activated robot was being transported illegally over the Earth's surface."

"Well, will he remember what was said?"

"Why not? It might seem to you, Peter, that a truck driver, one step above an ape in your view, can't remember. But truck drivers can have brains, too. The statements were most remarkable and the driver may well have remembered some. Even if he gets some of the letters and numbers wrong, we're dealing with a finite set, you know, the fifty-five hundred stars or star systems within eighty light-years or so—I haven't looked up the exact number. You can make the correct choices. And if needed, you will have every excuse to use the Psycho-probe—"

The two men stared at her. Finally Bogert, afraid to believe, whispered, "But how can you be *sure?*"

For a moment, Susan was on the point of saying: Because I've called Flagstaff, you fool, and because I spoke to the truck driver, and because he told me what he had heard, and because I've checked with the computer at Flagstaff and got the only three stars that fit the information, and because I have those names in my pocket.

But she didn't. Let him go through it all himself. Carefully, she rose to her feet, and said sardonically, "How can I be sure? . . . Call it feminine intuition."

A Problem of Numbers

Professor Neddring looked mildly at his graduate student. The young man sat there at ease; his hair was a little on the reddish side, his eyes were keen but calm, and his hands rested in the pockets of his lab coat. Altogether a promising specimen, the professor thought.

He had known for some time that the boy was interested in his daughter. What was more to the point, he had known for some time his daughter was interested in the boy.

The professor said, "Let's get this straight, Hal. You've come to me for my approval before you propose to my daughter?"

Hal Kemp said, "That's right, sir."

"Granted that I'm not up on the latest fads of youth—but surely this can't be the new 'in' thing." The professor thrust his hands into his lab coat pockets and leaned back in his chair. "Surely, young people aren't taking to asking permission these days? Don't tell me you'll give up my daughter if I turn you down?"

"No, not if she'll still have me, and I think she will. But it would be pleasant—"

"—if you had my approval. Why?"

Hal said, "For very practical reasons. I don't have my doctor's degree yet and I don't want it said that I'm dating your daughter to help me get it. If you think I am, say so, and maybe I'll wait till after I get my degree. Or maybe I won't and take my chances that your disapproval will make it that much harder for me to get my degree."

"So, for the sake of your doctorate, you think it would be nice if we were friends about your marriage to Janice."

"To be honest, yes, Professor."

There was silence between them. Professor Neddring thought about the matter with a certain creakiness. His research work for some years now had dealt with the coordination complexes of chromium and there was a definite difficulty in thinking with some precision about anything as imprecise as affection and marriage.

He rubbed his smooth cheek—at the age of fifty he was too old for the various beard styles affected by the younger members of the department—and said, "Well, Hal, if you want a decision from me I'll have to base it on something, and the only way I know how to judge people is by their reasoning powers. My daughter judges you in *her* way, but I'll have to judge you in *mine*."

"Certainly," said Hal.

"Then let me put it this way." The professor leaned forward, scribbled something on a piece of paper, and said, "Tell me what this says, and you will have my blessing."

Hal picked up the paper. What was written on it was a series of numbers:

6966371726337683304 7

He said, "A cryptogram?"

"You can call it that."

Hal frowned slightly. "You mean you want me to solve a cryptogram and if I do, then you'll approve the marriage?"

"Yes."

"And if I don't, then you *won't* approve the marriage?"

"It may sound trivial, I admit, but this is my criterion. You can always marry without my approval. Janice is of age."

Hal shook his head. "I'd still rather have your approval. How much time do I have?"

"None. Tell me what it says *now*. Reason it out."

"*Now*?"

The professor nodded.

Hal Kemp shifted in his chair and stared at the row of numbers in his hand. "Do I figure it out in my head? Or can I use pencil and paper?"

"Just do it. Talk. Let me hear how you think. Who knows? If I like the way you think, I may give my approval even if you don't solve it."

Hal said, "Well, all right. It's a challenge. In the first place, I'll make an assumption. I'll assume you're an honorable man and would not set me a problem that you knew in advance I couldn't solve. Therefore this is a cryptogram which, to the best of your judgment, is one I can solve sitting in this chair and almost on the spur of the moment. Which in turn means that it involves something I know well."

"That sounds reasonable," agreed the professor.

But Hal wasn't listening. He continued, deliberately, "I know the alphabet well, of course, so this could be an ordinary substitution cipher—numbers for letters. Presumably, it would have to have some subtlety if it were, or it would be too easy. But I'm an amateur at that sort of thing and unless I can see at once some peculiar pattern in the numbers that gives the whole thing meaning, I'd be lost. I notice there are five 6's and five 3's and not a single 5—but that means nothing to me. So I'll abandon the possibility of a generalized cipher and move on to our own specialized field."

He thought again and went on, "Your specialized field, Professor, is inorganic chemistry and that, certainly, is what mine is going to be. And to any chemist, numbers immediately suggest atomic numbers. Every chemical element has its own number and there are one hundred and four elements known today; so the numbers involved would be 1 to 104.

"You haven't indicated how the numbers are divided up. There are the one-digit atomic numbers from 1 to 9; the two-digit ones from 10 to 99; and the three-digit ones from 100 to 104. This is all obvious, Professor, but you wanted to hear my reasoning, so I'm giving it to you in full.

"We can forget the three-digit atomic numbers, since in them a 1 is always followed by a 0 and the single 1 in your cryptogram is followed by a 7. Since you've given me twenty digits altogether, it is at least possible that only two-digit atomic numbers are involved—ten of them. There might be nine two-digit ones and two one-digit ones, but I doubt it. Even the presence of two one-digit atomic numbers could result in hundreds

of different combinations of places in this list and that would surely make things too difficult for an instant or even a quick solution. It seems certain to me, then, that I am dealing with ten two-digit numbers, and we can therefore turn the message into: 69, 66, 37, 17, 26, 33, 76, 83, 30, 47.

"These numbers seem to mean nothing in themselves, but if they are atomic numbers then why not convert all of them into the names of the elements they represent? The names *might* be meaningful. That's not so easy offhand because I haven't memorized the list of elements in order of their atomic numbers. May I look them up in a table?"

The professor was listening with interest. "I didn't look up anything when I prepared the cryptogram."

"All right, then. Let's see," said Hal slowly. "Some are obvious. I know that 17 is chlorine, 26 is iron, 83 is bismuth, 30 is zinc. As for 76, that's somewhere near gold, which is 79; that would mean platinum, osmium, iridium. I'd say it means osmium. The other two are rare earth elements and I can never get those straight. Let's see—let's see—All right. I *think* I have them."

He wrote rapidly and said, "The list of the ten elements in your list is thulium, dysprosium, rubidium, chlorine, iron, arsenic, osmium, bismuth, zinc, and silver. Is that right? —No, don't answer."

He studied the list intently. "I see no connections among those elements, nothing that seems to give me any hint. Let's pass on then and ask if there is anything besides the atomic *number* that is so characteristic of elements that it would spring to any chemist's mind at once. Obviously, it would be the chemical *symbol*—the one-letter or two-letter abbreviation for each element that becomes second nature to any chemist. In this case the list of chemical symbols is"—he wrote again—"Tm, Dy, Rb, Cl, Fe, As, Os, Bi, Zn, Ag.

"These might form a word or sentence, but they don't, do they? So it would have to be a little more subtle than that. If you make an acrostic out of it and read just the first letters, that doesn't help, either. So if we try the next most obvious step and read the second letters of each symbol in order, we come out with 'my blessing.' I presume that's the solution, Professor."

"It is," said Professor Neddring gravely. "You reasoned it out with precision and you have my permission, for what that's worth, to propose to my daughter."

Hal rose, turned to leave, hesitated, then turned back. He said, "On the other hand, I don't like to take credit that's not mine. The reasoning I used may have been precise, but I offered it to you only because I wanted you to hear me reason logically. Actually, I knew the answer before I began, so in a way I cheated and I've got to admit that."

"Oh? How so?"

"Well, I know you think well of me and I guessed you would want me to come up with a solution and that you wouldn't be above giving me a hint. When you handed the cryptogram to me, you said, 'Tell me what this says, and you will have my blessing.' I guessed that you might mean that literally. 'My blessing' has ten letters and you handed me twenty digits. So I broke it down into ten pairs at once.

"Then, too, I told you I hadn't memorized the list of elements. The few elements I did remember were enough to show me that the second letters of the symbols were spelling out 'my blessing,' so I worked out the others from among those few that had the proper second letters in *their* symbols. Do I still make it?"

Professor Neddring finally smiled. He said, "Now, my boy, you *really* make it. Any competent scientist can think logically. The great ones use intuition."

Bill and I

I am, as it happens, doing a book on Lord Byron's narrative poem *Don Juan*.* The poem is an uninhibited satire in which Byron takes the opportunity to lash out at everything and everyone that displeased him. He is cruel to the point of sadism toward Britain's monarchs, toward its poet laureate, toward its greatest general, and so on.

But those for whom he reserves his most savage sallies are his critics. Byron did not take to criticism kindly and he invariably struck back.

Now, as far as I know, there is no such thing as a writer who takes to criticism kindly. Most of us, however, affect stoic unconcern and bleed in private.

For myself, alas, stoic unconcern is impossible. My frank and ingenuous countenance is a blank page on which my every emotion is clearly written (I am told) and I don't think I have ever succeeded in playing the stoic for even half a second. Indeed, when I am criticized unfairly, everyone within earshot knows that I have been—and for as much as hours at a time.

Naturally, when I recently published a two-volume book entitled *Asimov's Guide to Shakespeare*, I tried to steel myself for inevitable events. It was bound to get into the hand of an occasional Shakespearian scholar who would come all over faint at the thought of someone outside their field daring to invade the sacred precincts.

In fact, the very first review I received began: "What is Isaac Asimov, spinner of outer-space tales, doing—"

Naturally, I read no further. The fact that I am a spinner of outer-space tales is utterly irrelevant to this particular book and can only be mentioned because the reviewer thinks there is something vaguely (or not so vaguely) beneath literary dignity in being a science fiction writer.

I have sought a printable response for that and failed, so I'll pass on.

A second review was much more interesting. It appeared in a Kentucky paper and was written by someone I will call Mr. X. It begins this way: "Isaac Asimov is associate professor of biochemistry at Boston University, and a prolific writer in many fields. I have read several of his books on science with the greatest attention and respect."

So far, so good. I am delighted.

But then, a very little while later, he says: "In this book, however, he has left the sunlit paths of natural science for the treacherous bogs of literature—"

*Because I want to, and because my publishers humor me.

What he objects to, it seems, is that I have annotated the plays, explained all the historical, legendary, and mythological references. It is a book of footnotes, so to speak, and he resents it. He points out that he thinks of "the language, the poetry, as the chief glory of Shakespeare's works."

Well, who doesn't? I'm delighted that Mr. X is clever enough to understand the language and the poetry without any explanation from me. And if *he* doesn't need it, why should anyone else, eh?

Notice, though, that he doesn't scorn to follow me along "the sunlit paths of natural science." Indeed, he reads my books on science "with the greatest attention and respect."

I'm glad he does and I can only presume that he is grateful that I take the trouble to footnote science so that he can get a fugitive hint of its beauties.

Suppose, instead, I were to say to Mr. X, "The logarithm of two is a transcendental number; and, indeed, the logarithm of any integer to any integral base is transcendental except where the integer is equal to the base or to a power of that base."

Mr. X might then, with justification, say, "What is a transcendental number, a logarithm, and, in this case, a power and a base?"

In fact, if he were a really deep thinker, he might ask, "What is two?"

But suppose I answered then that my statement bore within it all the poetry and symmetry and beauty of mathematics ("Euclid alone has looked on beauty bare") and that to try to explain it would simply hack it up. And if Mr. X found trouble in understanding it, too bad for him. He just wasn't as bright as I was, and he could go to blazes.

But I *don't* answer that way. I explain such matters and many more, and go to a lot of trouble to do so, and then he reads those explanations with "the greatest attention and respect."

Scientists generally recognize the importance of explaining science to the nonscientist. It is interesting, then, in a rather sad way, that there exist humanists who feel themselves to be proprietors of their field, who hug literature to themselves, who mumble "the language, the poetry," and who see no reason why it should be explained to anyone as long as they themselves can continue to sniff the ambrosia.

* * *

Let us take a specific case. In the last act of *The Merchant of Venice*, Lorenzo and Jessica are enjoying an idyllic interlude at Portia's estate in Belmont, and Lorenzo says:

> *Sit, Jessica. Look how the floor of heaven*
> *Is thick inlaid with patens of bright gold.*
> *There's not the smallest orb which thou behold'st*
> *But in his motion like an angel sings,*
> *Still quiring to the young-eyed cherubins;*
> *Such harmony is in immortal souls,*
> *But whilst this muddy vesture of decay*
> *Doth grossly close it in, we cannot hear it.*

I think this passage is beautiful, for I have as keen a sense of the beauty and poetry of words as Mr. X; perhaps (is it possible?) even keener.

But what happens if someone says: "What are patens?"

After all, it is not a very common word. Does it ruin the beauty of the passage to whisper in an aside, "Small disks"?

Or what if someone asks, "What does he mean about these orbs singing like angels in their motion? What orbs? What motion? What singing?"

Am I to understand that the proper answer is, "No! Just listen to the words and the beautiful flow of language, and don't ask such philistine questions."

Does it spoil the beauty of Shakespeare's language to understand what he is saying? Or can it be that there are humanists who, qualified though they may be in esthetics, know little of the history of science, and don't know what Bill is saying and would rather not be asked.

All right, then, let's use this as a test case. I am going to explain this passage in far greater detail than I did in my book, just to show how much there is to consider in these beautiful syllables—

* * *

Anyone looking at the sky in a completely unsophisticated manner, without benefit of any astronomical training whatever, and willing to judge by appearances alone, is very likely to conclude that the Earth is covered by a smooth and flattened dome of some strong and solid material that is blue by day and black by night.

Under that solid dome is the air and the floating clouds. Above it, he may decide, is another world of gods and angels where the immortal souls of men will rise after the body dies and decays.

As a matter of fact, this is precisely the view of the early men of the Near East, for instance. On the second day of creation, says the Bible: "God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters. And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament" (Genesis 1:6–7).

The word "firmament" is from the Latin word *firmamentum*, which means something solid and strong. This is a translation of the Greek word *stereoma*, which means something solid and strong, and that is a translation of the original Hebrew word *raquia*, which refers to a thin metallic bowl.

In the biblical view there was water below the firmament (obviously) and water above it, too, to account for the rain. That is why in the time of Noah's flood, it is recorded that ". . . the fountains of the great deep [were] broken up, and the windows of heaven were opened" (Genesis 7:11). The expression might be accepted as metaphor, of course, but I'm sure that the unsophisticated accepted it literally.

But there's no use laughing from the height of our own painfully gained hindsight. About 700 B.C., when the material of Genesis was first being collected, the thought that the sky was a solid vault with another world above it was a reasonable conclusion to come to from the evidence available.

What's more, it would seem reasonable about 700 B.C. to suppose that the firmament stretched over but a limited portion of a flat Earth. One could see it come down and join the Earth tightly at the horizon. Few people in ancient times ever traveled far from home and the world to them was but a few miles in every direction. Even soldiers and merchants, who tramped longer distances, might feel the Earth was larger than it looked but that the world to the enlarged horizon was still flat, and still enclosed on all sides by the junction of firmament and ground. (This was also very much the medieval

view and probably that of many unsophisticated moderns.)

The Greek philosophers, however, had come to the conclusion, for a number of valid reasons, that the Earth was *not* a more or less flat object of rather limited size, but a spherical object of sufficient size to dwarf the known world to small dimensions.

The firmament, then, must stretch all around the globular Earth, and to do so symmetrically, it must be another, but much larger, sphere. The apparent flattening of the firmament overhead had to be an illusion (it is!) and the Greeks spoke of what we would call the "heavenly sphere" as opposed to the "terrestrial sphere."

None of this, however, altered the concept of the firmament (or heavenly sphere) as made up of something hard and firm. What, then, were the stars?

Naturally, the first thought was that the stars were exactly what they appeared to be: tiny, glowing disks embedded in the material of the firmament ("Look how the floor of heaven is thick inlaid with patens of bright gold").

The evidence in favor of this was that the stars did not fall down, as they would surely do if they were not firmly fixed to the heavenly sphere. Secondly, the stars moved about the Earth once every twenty-four hours, with the North Star as one pivot (the other being invisible behind the southern horizon), and did so all in one piece without altering their relative positions from night to night and from year to year.

If the stars were suspended freely somewhere between the heavenly sphere and the Earth, and for some reason did not fall, surely they would either not move at all or, if they did, would move independently. No, it made much more sense to suppose them all fixed to the heavenly sphere, and to suppose that it was the heavenly sphere that turned, carrying all the stars with itself.

But alas, this interpretation of the heavens—beautiful and austerly simple—did not account for everything.

As it happened, the Moon was clearly not imbedded in the heavenly sphere, for it did not maintain a fixed position relative to the stars. It was at a particular distance from a particular star one night, farther east the next night, still farther east the one afterward. It moved steadily west to east in such a way as to make a complete circuit of the starry sky in a little over twenty-seven days.

The Sun moved from west to east, too, relative to the stars, though much more slowly. Its motion couldn't be watched directly, of course, since no stars were visible in its neighborhood by which its position might be fixed. However, the nighttime configuration of stars shifted from night to night because, clearly, the Sun moved and blotted out slightly different portions of the sky from day to day. In that manner it could be determined that the Sun seemed to make a circuit of the sky in a little over 365 days.

If the Sun and the Moon were the only bodies to be exceptional, this might not be too bad. After all, they were very much different from the stars and could not be expected to follow the same rules.

Thus the Hebrews, in their creation myth, treated the Sun and Moon as special cases. On the fourth day of creation, "God made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also" (Genesis 1:16).

It seems amusing to us today to have the stars dismissed in so offhanded a fashion, but it makes perfect sense in the light of the Hebrew knowledge of the day. The stars were all imbedded in the firmament and they served only as a background against which the motions of the Sun and the Moon could be studied.

But then it turned out that certain of the brighter stars were also anomalous in their motions and shifted positions against the background of the other stars. In fact,

their motion was even stranger than that of the Moon and the Sun, for, though they moved west to east most of the time, relative to the stars, as the Moon and the Sun did, they occasionally would turn about and move east to west. Very puzzling!

The Greeks called these stars *planetes*, meaning "wanderers," as compared with the "fixed stars." The Greek word has become "planet" to us and seven of them were recognized. These included the five bright stars which we now call Mercury, Venus, Mars, Jupiter, and Saturn, and, of course, the Sun and the Moon.

What to do with them? Well, like the stars, the planets did not fall and like the stars they moved about the Earth. Therefore, like the stars, they had to be imbedded in a sphere. Since each of the seven planets moved at a different speed and in a different fashion, each had to have a separate sphere, one nested inside the other, and all nested inside the sphere of the stars.

Thus there arose the notion not of the heavenly sphere, but of the heavenly spheres, plural.

But there was only one heavenly sphere that could be seen—the blue sphere of the firmament. The fact that the other spheres were invisible was no argument, however, for their non-existence, merely for their transparency. They were sometimes called "the crystalline spheres," where the word "crystalline" was used in its older meaning as "transparent."

The Greeks then set about trying to calculate where the different spheres were pivoted and how they must turn in order to cause each planet to move in the precise fashion in which it was observed to move. Endless complications had to be added in order to match theory with observation, but for two thousand years the complicated theory of the crystalline spheres held good, not because men of thought were perversely stupid, but because nothing else so well fit the appearances.

Even when Copernicus suggested that the Sun, not the Earth, was the center of the universe, he didn't abolish the spheres. He merely had them surrounding the Sun, with the Earth itself imbedded in one of them. It was only with Johannes Kepler—

But never mind that. The details of the motions of the crystalline spheres don't concern us in this article. Let us instead consider an apparently simpler question: In what order are the spheres nested? If we were to travel outward from Earth, which sphere would we come to first, which next, and so on.

The Greeks made the logical deduction that the closest sphere would be smallest and would therefore make a complete turn in the briefest time. Since the Moon made a complete circle against the stars in about four weeks (a far shorter time than any other planet managed to run the course), its sphere must be closest.

Arguing in this manner, the Greeks decided the next closest sphere was that of Mercury; then, in order, Venus, the Sun, Mars, Jupiter, and Saturn. And finally, of course, there was the sphere of the stars.

And how far apart were the spheres and what were their actual distances from the Earth?

That, unfortunately, was beyond the Greeks. To be sure, the Greek astronomer Hipparchus, about 150 B.C., used a perfectly valid method (after the still earlier astronomer Aristarchus) for determining the distance to the Moon, and had placed it at a distance of thirty times the Earth's diameter, which is correct, but the distance of no other heavenly body was determined with reasonable accuracy until the seventeenth century.

* * *

Now the scene switches. About 520 B.C., the Greek philosopher Pythagoras was plucking strings, and found that he could evoke notes that harmonized well together if he used strings whose lengths were simply related. One string might be twice the length of another; or three strings might have lengths that were in the ratio of 3:4:5.

The details are irrelevant, but to Pythagoras it seemed highly significant that there should be a connection between pleasing sounds and small whole numbers. It fit in with his rather mystical notion that everything in the universe was related to simple ratios and numbers.

Those who followed in his footsteps after his death accentuated the mysticism and it seemed to the Pythagoreans that they now had a way of deciding not only the how of planets, but the why as well. Since numbers governed the universe, one ought to be able to deduce the way in which the universe ought to be constructed.

For instance, 10 was a particularly impressive number. (Why? Well, for one thing, $1 + 2 + 3 + 4 = 10$, and this seems to have some mystical value.) In order, then, for the universe to function well, it had to be composed of ten spheres.

Of course, there were only eight spheres, one for the stars and one for each of the seven planets, but that didn't stop the Pythagoreans. They decided that the Earth moved around some central fire of which the Sun was only a reflection, and worked up a reason for explaining why the central fire was invisible. That added a ninth sphere for the Earth. In addition, they imagined another planet on the opposite side of the central fire, a "counter-Earth". The counter-Earth kept pace with the Earth and stayed always beyond the central fire and was thus never seen. Its sphere was the tenth.

In addition, the Pythagoreans thought that the spheres were nested inside each other in such a way that their distances of separation bore simple ratios to one another and produced harmonious notes in their motion as a result (like the plucking of strings of simply related lengths). Originally, I imagine, the Pythagoreans may have advanced this notion of harmonious notes only as a metaphor to represent the simply related distances, but later mystics accepted the notes as literally existent. They became "the music of the spheres."

Of course, no one ever heard any music from the sky, so it had to be assumed to be inaudible to men on Earth. It is this notion that causes Shakespeare to speak of an orb that "in his motion like an angel sings" but with sounds that can be heard only in heaven ("Such harmony is in immortal souls"). While men's souls are still draped in their earthly bodies, they are deaf to it ("whilst this muddy vesture of decay doth grossly close it in, we cannot hear it").

* * *

Well, then, does understanding Lorenzo's speech in terms of ancient astronomy spoil its beauty? Does it not seem that to understand him adds to the interest? Does it not remove the nagging question of "But what does it mean?" that otherwise distracts from an appreciation of the passage?

It may be, of course, that Mr. X is the kind who never asks "But what does it mean?" It may be that for him understanding is irrelevant. If so, he and I are not soul mates. It may even be that Mr. X is the kind of obscurantist who finds that understanding decreases beauty. If so, he and I are even less soul mates.

And yet, let me point out that there is something in this very passage that could be of interest to Shakespearian scholars *if* they thoroughly understood what Shakespeare was talking about.

As almost everyone knows, there are many who feel that Shakespeare did not write the plays attributed to him. They feel that someone else did, with the person most frequently credited being Francis Bacon, who was an almost exact contemporary of Shakespeare.

The argument very often heard is that Shakespeare was just a fellow from the provinces with very little education and that he could not possibly have written so profoundly learned a set of plays. Bacon, on the other hand, was a great philosopher and one of the most intensely educated people of his time. Bacon, therefore, could easily have written the plays.

Shakespearian scholars, when they argue the matter at all, are forced to maintain that Shakespeare was much better educated than he is given credit for being and that therefore he was learned enough to write his plays. Since virtually nothing is known of Shakespeare's life, the argument will never be settled in that fashion.

Why not turn matters around, then, and argue that Bacon was *too* educated to write Shakespeare's plays, that there exist errors in the plays that Bacon could never possibly have made and that would just suit an insufficiently educated fellow from the sticks?

Consider Lorenzo's speech. Lorenzo is talking about the *stars*; these are the "patens of bright gold" with which "the floor of heaven is thick inlaid." Lorenzo (hence Shakespeare) seems to think that each star has a separate sphere and that each gives out its own note ("There's not the smallest orb which thou behold'st/But in his motion like an angel sings").

Lest you think I'm misinterpreting the speech, let's take a clearer case.

In Act II of *A Midsummer Night's Dream*, Oberon is reminding Puck of a time they listened to a mermaid who sang with such supernal beauty that

> . . . the rude sea grew civil at her song,
> And certain stars shot madly from their spheres,
> To hear the sea maid's music.

The use of the plural "spheres" shows again that Shakespeare thinks that each star has its separate sphere.

This is wrong. There is a sphere for each planet; one for the Earth itself, if you like; one for the counter-Earth; one for any imaginary planet you wish. However, all the ancient theories agreed that the "fixed stars" were all imbedded in a single sphere.

To imagine separate spheres for each star, as Shakespeare does more than once in his plays, is to display a lack of knowledge of Greek astronomy. This is a lack of knowledge that Francis Bacon could not possibly have displayed; hence we might fairly argue that Francis Bacon could not possibly have written Shakespeare's plays.

* * *

Well, don't get me wrong. I don't want to imply that I received only bad reviews for my *Guide to Shakespeare*. Actually, most of the reviews were quite complimentary and were an entire pleasure to read.

Just the same, I had better start preparing myself for the occasional review by the "outraged specialist" type that I will surely get when *Asimov's Annotated "Don Juan"* is published.

Mirror Image

The Three Laws of Robotics

1: A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2: A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.
3: A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Lije Baley had just decided to relight his pipe, when the door of his office opened without a preliminary knock, or announcement, of any kind. Baley looked up in pronounced annoyance and then dropped his pipe. It said a good deal for the state of his mind that he left it lie where it had fallen.

"R. Daneel Olivaw," he said, in a kind of mystified excitement. "Jehoshaphat! It *is* you, isn't it?"

"You are quite right," said the tall, bronzed newcomer, his even features never flickering for a moment out of their accustomed calm. "I regret surprising you by entering without warning, but the situation is a delicate one and there must be as little involvement as possible on the part of the men and robots even in this place. I am, in any case, pleased to see you again, friend Elijah."

And the robot held out his right hand in a gesture as thoroughly human as was his appearance. It was Baley who was so unmanned by his astonishment as to stare at the hand with a momentary lack of understanding.

But then he seized it in both his, feeling its warm firmness. "But Daneel, *why?* You're welcome any time, but—What is this situation that is a delicate one? Are we in trouble again? Earth, I mean?"

"No, friend Elijah, it does not concern Earth. The situation to which I refer as a delicate one is, to outward appearances, a small thing. A dispute between mathematicians, nothing more. As we happened, quite by accident, to be within an easy Jump of Earth—"

"This dispute took place on a starship, then?"

"Yes, indeed. A small dispute, yet to the humans involved astonishingly large."

Baley could not help but smile. "I'm not surprised you find humans astonishing. They do not obey the Three Laws."

"That is, indeed, a shortcoming," said R. Daneel, gravely, "and I think humans themselves are puzzled by humans. It may be that you are less puzzled than are the men of other worlds because so many more human beings live on Earth than on the Spacer worlds. If so, and I believe it is so, you could help us."

R. Daneel paused momentarily and then said, perhaps a shade too quickly, "And yet there are rules of human behavior which I have learned. It would seem, for instance, that I am deficient in etiquette, by human standards, not to have asked after your wife and child."

"They are doing well. The boy is in college and Jessie is involved in local politics. The amenities are taken care of. Now tell me how you come to be here."

* * *

"As I said, we were within an easy Jump of Earth," said R. Daneel, "so I suggested to the captain that we consult you."

"And the captain agreed?" Baley had a sudden picture of the proud and autocratic captain of a Spacer starship consenting to make a landing on Earth—of all worlds—and to consult an Earthman—of all people.

"I believe," said R. Daneel, "that he was in a position where he would have agreed to anything. In addition, I praised you very highly; although, to be sure, I stated only the truth. Finally, I agreed to conduct all negotiations so that none of the crew, or passengers, would need to enter any of the Earthman cities."

"And talk to any Earthman, yes. But what has happened?"

"The passengers of the starship, *Eta Carina*, included two mathematicians who were traveling to Aurora to attend an interstellar conference on neurobiophysics. It is about these mathematicians, Alfred Barr Humboldt and Gennao Sabbat, that the dispute centers. Have you perhaps, friend Elijah, heard of one, or both, of them?"

"Neither one," said Baley, firmly. "I know nothing about mathematics. Look, Daneel, surely you haven't told anyone I'm a mathematics buff or—"

"Not at all, friend Elijah. I know you are not. Nor does it matter, since the exact nature of the mathematics involved is in no way relevant to the point of issue."

"Well, then, go on."

"Since you do not know either man, friend Elijah, let me tell you that Dr. Humboldt is well into his twenty-seventh decade—pardon me, friend Elijah?"

"Nothing. Nothing," said Baley, irritably. He had merely muttered to himself, more or less incoherently, in a natural reaction to the extended life-spans of the Spacers. "And he's still active, despite his age? On Earth, mathematicians after thirty or so . . ."

Daneel said, calmly, "Dr. Humboldt is one of the top three mathematicians, by long-established repute, in the galaxy. Certainly he is still active. Dr. Sabbat, on the other hand, is quite young, not yet fifty, but he has already established himself as the most remarkable new talent in the most abstruse branches of mathematics."

"They're both great, then," said Baley. He remembered his pipe and picked it up. He decided there was no point in lighting it now and knocked out the dottle. "What happened? Is this a murder case? Did one of them apparently kill the other?"

"Of these two men of great reputation, one is trying to destroy that of the other. By human values, I believe this may be regarded as worse than physical murder."

"Sometimes, I suppose. Which one is trying to destroy the other?"

"Why, that, friend Elijah, is precisely the point of issue. Which?"

"Go on."

"Dr. Humboldt tells the story clearly. Shortly before he boarded the starship, he had an insight into a possible method for analyzing neural pathways from changes in microwave absorption patterns of local cortical areas. The insight was a purely mathematical technique of extraordinary subtlety, but I cannot, of course, either understand or sensibly transmit the details. These do not, however, matter. Dr. Humboldt considered the matter and was more convinced each hour that he had something revolutionary on hand, something that would dwarf all his previous accomplishments in mathematics. Then he discovered that Dr. Sabbat was on board."

"Ah. And he tried it out on young Sabbat?"

"Exactly. The two had met at professional meetings before and knew each other thoroughly by reputation. Humboldt went into it with Sabbat in great detail. Sabbat backed Humboldt's analysis completely and was unstinting in his praise of the importance of the discovery and of the ingenuity of the discoverer. Heartened and reassured by this, Humboldt prepared a paper outlining, in summary, his work and, two days later, prepared to have it forwarded subetherically to the co-chairmen of the conference at Aurora, in order that he might officially establish his priority and arrange for possible discussion before the sessions were closed. To his surprise, he found that Sabbat was ready with a paper of his own, essentially the same as Humboldt's, and Sabbat was also preparing to have it subetherized to Aurora."

"I suppose Humboldt was furious."

"Quite!"

"And Sabbat? What was his story?"

"Precisely the same as Humboldt's. Word for word."

"Then just what is the problem?"

"Except for the mirror-image exchange of names. According to Sabbat, it was he who had the insight, and he who consulted Humboldt; it was Humboldt who agreed with the analysis and praised it."

"Then each one claims the idea is his and that the other stole it. It doesn't sound like a problem to me at all. In matters of scholarship, it would seem only necessary to produce the records of research, dated and initialed. Judgment as to priority can be made from that. Even if one is falsified, that might be discovered through internal inconsistencies."

"Ordinarily, friend Elijah, you would be right, but this is mathematics, and not an experimental science. Dr. Humboldt claims to have worked out the essentials in his head. Nothing was put in writing until the paper itself was prepared. Dr. Sabbat, of course, says precisely the same."

"Well, then, be more drastic and get it over with, for sure. Subject each one to a psychic probe and find out which of the two is lying."

R. Daneel shook his head slowly. "Friend Elijah, you do not understand these men. They are both of rank and scholarship, Fellows of the Imperial Academy. As such, they cannot be subjected to trial of professional conduct except by a jury of their peers—their professional peers—unless they personally and voluntarily waive that right."

"Put it to them, then. The guilty man won't waive the right because he can't afford to face the psychic probe. The innocent man will waive it at once. You won't even have to use the probe."

"It does not work that way, friend Elijah. To waive the right in such a case—to be investigated by laymen—is a serious and perhaps irrecoverable blow to prestige. Both men steadfastly refuse to waive the right to special trial, as a matter of pride. The question of guilt, or innocence, is quite subsidiary."

"In that case, let it go for now. Put the matter in cold storage until you get to Aurora. At the neurobiophysical conference, there will be a huge supply of professional peers, and then—"

"That would mean a tremendous blow to science itself, friend Elijah. Both men would suffer for having been the instrument of scandal. Even the innocent one would be blamed for having been party to a situation so distasteful. It would be felt that it should have been settled quietly out of court at all costs."

"All right. I'm not a Spacer, but I'll try to imagine that this attitude makes sense. What do the men in question say?"

"Humboldt agrees thoroughly. He says that if Sabbat will admit theft of the idea and allow Humboldt to proceed with transmission of the paper—or at least its delivery at the conference, he will not press charges. Sabbat's misdeed will remain secret with him; and, of course, with the captain, who is the only other human to be party to the dispute."

"But young Sabbat will not agree?"

"On the contrary, he agreed with Dr. Humboldt to the last detail—with the reversal of names. Still the mirror-image."

"So they just sit there, stalemated?"

"Each, I believe, friend Elijah, is waiting for the other to give in and admit guilt."

"Well, then, wait."

"The captain has decided this cannot be done. There are two alternatives to waiting, you see. The first is that both will remain stubborn so that when the starship lands on Aurora, the intellectual scandal will break. The captain, who is responsible for justice on board ship, will suffer disgrace for not having been able to settle the matter quietly and that, to him, is quite insupportable."

"And the second alternative?"

"Is that one, or the other, of the mathematicians will indeed admit to wrongdoing. But will the one who confesses do so out of actual guilt, or out of a noble desire to prevent the scandal? Would it be right to deprive of credit one who is sufficiently ethical to prefer to lose that credit than to see science as a whole suffer? Or else, the guilty party will confess at the last moment, and in such a way as to make it appear he does so only for the sake of science, thus escaping the disgrace of his deed and casting its shadow upon the other. The captain will be the only man to know all this but he does not wish to spend the rest of his life wondering whether he has been a party to a grotesque miscarriage of justice."

Baley sighed. "A game of intellectual chicken. Who'll break first as Aurora comes nearer and nearer? Is that the whole story now, Daneel?"

"Not quite. There are witnesses to the transaction."

* * *

"Jehoshaphat! Why didn't you say so at once. *What* witnesses?"

"Dr. Humboldt's personal servant—"

"A robot, I suppose."

"Yes, certainly. He is called R. Preston. This servant, R. Preston, was present during the initial conference and he bears out Dr. Humboldt in every detail."

"You mean he says that the idea was Dr. Humboldt's to begin with; that Dr. Humboldt detailed it to Dr. Sabbat; that Dr. Sabbat praised the idea, and so on."

"Yes, in full detail."

"I see. Does that settle the matter or not? Presumably not."

"You are quite right. It does not settle the matter, for there is a second witness. Dr. Sabbat also has a personal servant, R. Idda, another robot of, as it happens, the same model as R. Preston, made, I believe, in the same year in the same factory. Both have been in service for an equal period of time."

"An odd coincidence—very odd."

"A fact, I am afraid, and it makes it difficult to arrive at any judgment based on obvious differences between the two servants."

"R. Idda, then, tells the same story as R. Preston?"

"Precisely the same story, except for the mirror-image reversal of the names."

"R. Idda stated, then, that young Sabbat, the one not yet fifty"—Lije Baley did not entirely keep the sardonic note out of his voice; he himself was not yet fifty and he felt far from young—"had the idea to begin with; that he detailed it to Dr. Humboldt, who was loud in his praises, and so on."

"Yes, friend Elijah."

"And one robot is lying, then."

"So it would seem."

"It should be easy to tell which. I imagine even a superficial examination by a good roboticist—"

"A roboticist is not enough in this case, friend Elijah. Only a qualified robopsychologist would carry weight enough and experience enough to make a decision in a case of this importance. There is no one so qualified on board ship. Such an examination can be performed only when we reach Aurora—"

"And by then the crud hits the fan. Well, you're here on Earth. We can scare up a robopsychologist, and surely anything that happens on Earth will never reach the ears of Aurora and there will be no scandal."

"Except that neither Dr. Humboldt, nor Dr. Sabbat, will allow his servant to be investigated by a robopsychologist of Earth. The Earthman would have to—" He paused.

Lije Baley said stolidly, "He'd have to touch the robot."

"These are old servants, well thought of—"

"And not to be sullied by the touch of Earthmen. Then what do you want me to do, damn it?" He paused, grimacing. "I'm sorry, R. Daneel, but I see no reason for your having involved me."

* * *

"I was on the ship on a mission utterly irrelevant to the problem at hand. The captain turned to me because he had to turn to someone. I seemed human enough to talk to, and robot enough to be a safe recipient of confidences. He told me the whole story and asked what I would do. I realized the next Jump could take us as easily to Earth as to our target. I told the captain that, although I was at as much a loss to resolve the mirror-image as he was, there was on Earth one who might help."

"Jehoshaphat!" muttered Baley under his breath.

"Consider, friend Elijah, that if you succeed in solving this puzzle, it would do your career good and Earth itself might benefit. The matter could not be publicized, of course, but the captain is a man of some influence on his home world and he would be grateful."

"You just put a greater strain on me."

"I have every confidence," said R. Daneel, stolidly, "that you already have some idea as to what procedure ought to be followed."

"Do you? I suppose that the obvious procedure is to interview the two mathematicians, one of whom would seem to be a thief."

"I'm afraid, friend Elijah, that neither one will come into the city. Nor would either one be willing to have you come to them."

"And there is no way of forcing a Spacer to allow contact with an Earthman, no matter what the emergency. Yes, I understand that, Daneel—but I was thinking of an interview by closed-circuit television."

"Nor that. They will not submit to interrogation by an Earthman."

"Then what do they want of me? Could I speak to the robots?"

"They would not allow the robots to come here, either."

"Jehoshaphat, Daneel. *You've* come."

"That was my own decision. I have permission, while on board ship, to make decisions of that sort without veto by any human being but the captain himself—and he was eager to establish the contact. I, having known you, decided that television contact was insufficient. I wished to shake your hand."

Lije Baley softened. "I appreciate that, Daneel, but I still honestly wish you could have refrained from thinking of me at all in this case. Can I talk to the robots by television at least?"

"That, I think, can be arranged."

"Something, at least. That means I would be doing the work of a robopsychologist —in a crude sort of way."

"But you are a detective, friend Elijah, not a robopsychologist."

"Well, let it pass. Now before I see them, let's think a bit. Tell me: is it possible that both robots are telling the truth? Perhaps the conversation between the two mathematicians was equivocal. Perhaps it was of such a nature that each robot could honestly believe its own master was proprietor of the idea. Or perhaps one robot heard only one portion of the discussion and the other another portion, so that each could suppose its own master was proprietor of the idea."

"That is quite impossible, friend Elijah. Both robots repeat the conversation in identical fashion. And the two repetitions are fundamentally inconsistent."

"Then it is absolutely certain that one of the robots is lying?"

"Yes."

"Will I be able to see the transcript of all evidence given so far in the presence of the captain, if I should want to?"

"I thought you would ask that and I have copies with me."

"Another blessing. Have the robots been cross-examined at all, and is that cross-examination included in the transcript?"

"The robots have merely repeated their tales. Cross-examination would be conducted only by robopsychologists."

"Or by myself?"

"You are a detective, friend Elijah, not a—"

"All right, R. Daneel. I'll try to get the Spacer psychology straight. A detective can do it because he isn't a robopsychologist. Let's think further. Ordinarily a robot will not lie, but he will do so if necessary to maintain the Three Laws. He might lie to protect, in legitimate fashion, his own existence in accordance with the Third Law. He is more apt to lie if that is necessary to follow a legitimate order given him by a human being in

accordance with the Second Law. He is most apt to lie if that is necessary to save a human life, or to prevent harm from coming to a human in accordance with the First Law."

"Yes."

"And in this case, each robot would be defending the professional reputation of his master, and would lie if it were necessary to do so. Under the circumstances, the professional reputation would be nearly equivalent to life and there might be a near-First-Law urgency to the lie."

"Yet by the lie, each servant would be harming the professional reputation of the other's master, friend Elijah."

"So it would, but each robot might have a clearer conception of the value of its own master's reputation and honestly judge it to be greater than that of the other's. The lesser harm would be done by his lie, he would suppose, than by the truth."

Having said that, Lije Baley remained quiet for a moment. Then he said, "All right, then, can you arrange to have me talk to one of the robots—to R. Idda first, I think?"

"Dr. Sabbat's robot?"

"Yes," said Baley, dryly, "the young fellow's robot."

"It will take me but a few minutes," said R. Daneel. "I have a micro-receiver outfitted with a projector. I will need merely a blank wall and I think this one will do if you will allow me to move some of these film cabinets."

"Go ahead. Will I have to talk into a microphone of some sort?"

"No, you will be able to talk in an ordinary manner. Please pardon me, friend Elijah, for a moment of further delay. I will have to contact the ship and arrange for R. Idda to be interviewed."

"If that will take some time, Daneel, how about giving me the transcripted material of the evidence so far."

* * *

Lije Baley lit his pipe while R. Daneel set up the equipment, and leafed through the flimsy sheets he had been handed.

The minutes passed and R. Daneel said, "If you are ready, friend Elijah, R. Idda is. Or would you prefer a few more minutes with the transcript?"

"No," sighed Baley, "I'm not learning anything new. Put him on and arrange to have the interview recorded and transcribed."

R. Idda, unreal in two-dimensional projection against the wall, was basically metallic in structure—not at all the humanoid creature that R. Daneel was. His body was tall but blocky, and there was very little to distinguish him from the many robots Baley had seen, except for minor structural details.

Baley said, "Greetings, R. Idda."

"Greetings, sir," said R. Idda, in a muted voice that sounded surprisingly humanoid.

"You are the personal servant of Gennao Sabbat, are you not?"

"I am sir."

"For how long, boy?"

"For twenty-two years, sir."

"And your master's reputation is valuable to you?"

"Yes, sir."

"Would you consider it of importance to protect that reputation?"

"Yes, sir."

"As important to protect his reputation as his physical life?"

"No, sir."

"As important to protect his reputation as the reputation of another?"

R. Idda hesitated. He said, "Such cases must be decided on their individual merit, sir. There is no way of establishing a general rule."

* * *

Baley hesitated. These Spacer robots spoke more smoothly and intellectually than Earth-models did. He was not at all sure he could outthink one.

He said, "If you decided that the reputation of your master were more important than that of another, say, that of Alfred Barr Humboldt, would you lie to protect your master's reputation?"

"I would, sir."

"Did you lie in your testimony concerning your master in his controversy with Dr. Humboldt?"

"No, sir."

"But if you were lying, you would deny you were lying in order to protect that lie, wouldn't you?"

"Yes, sir."

"Well, then," said Baley, "let's consider this. Your master, Gennao Sabbat, is a young man of great reputation in mathematics, but he is a young man. If, in this controversy with Dr. Humboldt, he had succumbed to temptation and had acted unethically, he would suffer a certain eclipse of reputation, but he is young and would have ample time to recover. He would have many intellectual triumphs ahead of him and men would eventually look upon this plagiaristic attempt as the mistake of a hot-blooded youth, deficient in judgment. It would be something that would be made up for in the future.

"If, on the other hand, it were Dr. Humboldt who succumbed to temptation, the matter would be much more serious. He is an old man whose great deeds have spread over centuries. His reputation has been unblemished hitherto. All of that, however, would be forgotten in the light of this one crime of his later years, and he would have no opportunity to make up for it in the comparatively short time remaining to him. There would be little more that he could accomplish. There would be so many more years of work ruined in Humboldt's case than in that of your master and so much less opportunity to win back his position. You see, don't you, that Humboldt faces the worse situtation and deserves the greater consideration?"

There was a long pause. Then R. Idda said, with unmoved voice, "My evidence was a lie. It was Dr. Humboldt whose work it was, and my master has attempted, wrongfully, to appropriate the credit."

Baley said, "Very well, boy. You are instructed to say nothing to anyone about this until given permission by the captain of the ship. You are excused."

The screen blanked out and Baley puffed at his pipe. "Do you suppose the captain heard that, Daneel?"

"I am sure of it. He is the only witness, except for us."

"Good. Now for the other."

"But is there any point to that, friend Elijah, in view of what R. Idda has confessed?"

"Of course there is. R. Idda's confession means nothing."

"Nothing?"

"Nothing at all. I pointed out that Dr. Humboldt's position was the worse. Naturally, if he were lying to protect Sabbat, he would switch to the truth as, in fact, he claimed to have done. On the other hand, if he were telling the truth, he would switch to a lie to protect Humboldt. It's still mirror-image and we haven't gained anything."

"But then what will we gain by questioning R. Preston?"

"Nothing, if the mirror-image were perfect—but it is not. After all, one of the robots *is* telling the truth to begin with, and one *is* lying to begin with, and that is a point of asymmetry. Let me see R. Preston. And if the transcription of R. Idda's examination is done, let me have it."

* * *

The projector came into use again. R. Preston stared out of it; identical with R. Idda in every respect, except for some trivial chest design.

Baley said, "Greetings, R. Preston." He kept the record of R. Idda's examination before him as he spoke.

"Greetings, sir," said R. Preston. His voice was identical with that of R. Idda.

"You are the personal servant of Alfred Barr Humboldt, are you not?"

"I am, sir."

"For how long, boy?"

"For twenty-two years, sir."

"And your master's reputation is valuable to you?"

"Yes, sir."

"Would you consider it of importance to protect that reputation?"

"Yes, sir."

"As important to protect his reputation as his physical life?"

"No, sir."

"As important to protect his reputation as the reputation of another?"

R. Preston hesitated. He said, "Such cases must be decided on their individual merit, sir. There is no way of establishing a general rule."

Baley said, "If you decided that the reputation of your master were more important than that of another, say, that of Gennao Sabbat, would you lie to protect your master's reputation?"

"I would, sir."

"Did you lie in your testimony concerning your master in his controversy with Dr. Sabbat?"

"No, sir."

"But if you were lying, you would deny you were lying, in order to protect that lie, wouldn't you?"

"Yes, sir."

"Well, then," said Baley, "let's consider this. Your master, Alfred Barr Humboldt, is an old man of great reputation in mathematics, but he is an old man. If, in this controversy with Dr. Sabbat, he had succumbed to temptation and had acted unethically, he would suffer a certain eclipse of reputation, but his great age and his centuries of accomplishments would stand against that and would win out. Men would look upon this plagiaristic attempt as the mistake of a perhaps-sick old man, no longer certain in judgment.

"If, on the other hand, it were Dr. Sabbat who had succumbed to temptation, the matter would be much more serious. He is a young man, with a far less secure reputation. He would ordinarily have centuries ahead of him in which he might accumulate knowledge and achieve great things. This will be closed to him, now, obscured by one mistake of his youth. He has a much longer future to lose than your master has. You see, don't you, that Sabbat faces the worse situation and deserves the greater consideration?"

There was a long pause. Then R. Preston said, with unmoved voice, "My evidence was as I—"

At that point, he broke off and said nothing more.

Baley said, "Please continue, R. Preston."

There was no response.

R. Daneel said, "I am afraid, friend Elijah, that R. Preston is in stasis. He is out of commission."

"Well, then," said Baley, "we have finally produced an asymmetry. From this, we can see who the guilty person is."

"In what way, friend Elijah?"

"Think it out. Suppose you were a person who had committed no crime and that your personal robot were a witness to that. There would be nothing you need to do. Your robot would tell the truth and bear you out. If, however, you were a person who *had* committed the crime, you would have to depend on your robot to lie. That would be a somewhat riskier position, for although the robot would lie, if necessary, the greater inclination would be to tell the truth, so that the lie would be less firm than the truth would be. To prevent that, the crime-committing person would very likely have to *order* the robot to lie. In this way. First Law would be strengthened by Second Law; perhaps very substantially strengthened."

"That would seem reasonable," said R. Daneel.

"Suppose we have one robot of each type. One robot would switch from truth, unreinforced, to the lie, and could do so after some hesitation, without serious trouble. The other robot would switch from the lie, *strongly reinforced,* to the truth, but could do so only at the risk of burning out various positronic-track-ways in his brain and falling into stasis."

"And since R. Preston went into stasis—"

"R. Preston's master, Dr. Humboldt, is the man guilty of plagiarism. If you transmit this to the captain and urge him to face Dr. Humboldt with the matter at once, he may force a confession. If so, I hope you will tell me immediately."

"I will certainly do so. You will excuse me, friend Elijah? I must talk to the captain privately."

"Certainly. Use the conference room. It is shielded."

* * *

Baley could do no work of any kind in R. Daneel's absence. He sat in uneasy silence. A great deal would depend on the value of his analysis, and he was acutely aware of his lack of expertise in robotics.

R. Daneel was back in half an hour—very nearly the longest half hour of Baley's life.

There was no use, of course, in trying to determine what had happened from the expression of the humanoid's impassive face. Baley tried to keep his face impassive.

"Yes, R. Daneel?" he asked.

"Precisely as you said, friend Elijah. Dr. Humboldt has confessed. He was counting, he said, on Dr. Sabbat giving way and allowing Dr. Humboldt to have this one last triumph. The crisis is over and you will find the captain grateful. He has given me permission to tell you that he admires your subtlety greatly and I believe that I, myself, will achieve favor for having suggested you."

"Good," said Baley, his knees weak and his forehead moist now that his decision had proven correct, "but Jehoshaphat, R. Daneel, don't put me on the spot like that again, will you?"

"I will try not to, friend Elijah. All will depend, of course, on the importance of a crisis, on your nearness, and on certain other factors. Meanwhile, I have a question—"

"Yes?"

"Was it not possible to suppose that passage from a lie to the truth was easy, while passage from the truth to a lie was difficult? And in that case, would not the robot in stasis have been going from a truth to a lie, and since R. Preston was in stasis, might one not have drawn the conclusion that it was Dr. Humboldt who was innocent and Dr. Sabbat who was guilty?"

"Yes, R. Daneel. It was possible to argue that way, but it was the other argument that proved right. Humboldt did confess, didn't he?"

"He did. But with arguments possible in both directions, how could you, friend Elijah, so quickly pick the correct one?"

For a moment, Baley's lips twitched. Then he relaxed and they curved into a smile. "Because, R. Daneel, I took into account human reactions, not robotic ones. I know more about human beings than about robots. In other words, I had an idea as to which mathematician was guilty before I ever interviewed the robots. Once I provoked an asymmetric response in them, I simply interpreted it in such a way as to place the guilt on the one I already believed to be guilty. The robotic response was dramatic enough to break down the guilty man; my own analysis of human behavior might not have been sufficient to do so."

"I am curious to know what your analysis of human behavior was?"

"Jehoshaphat, R. Daneel; think, and you won't have to ask. There is another point of asymmetry in this tale of mirror-image besides the matter of true-and-false. There is the matter of the age of the two mathematicians; one is quite old and one is quite young."

"Yes, of course, but what then?"

"Why, this. I can see a young man, flushed with a sudden, startling and revolutionary idea, consulting in the matter an old man whom he has, from his early student days, thought of as a demigod in the field. I can *not* see an old man, rich in honors and used to triumphs, coming up with a sudden, startling and revolutionary idea, consulting a man centuries his junior whom he is bound to think of as a young whippersnapper—or whatever term a Spacer would use. Then, too, if a young man had the chance, would he try to steal the idea of a revered demigod? It would be unthinkable. On the other hand, an old man, conscious of declining powers, might well snatch at one last chance of fame and consider a baby in the field to have no rights he was bound to observe. In short, it was not conceivable that Sabbat steal Humboldt's idea; and from both angles, Dr. Humboldt was guilty."

R. Daneel considered that for a long time. Then he held out his hand. "I must leave now, friend Elijah. It was good to see you. May we meet again soon."

Baley gripped the robot's hand, warmly, "If you don't mind, R. Daneel," he said, "not too soon."

Light Verse

The very last person anyone would expect to be a murderer was Mrs. Avis Lardner. Widow of the great astronaut-martyr, she was a philanthropist, an art collector, a hostess extraordinary, and, everyone agreed, an artistic genius. But above all, she was the gentlest and kindest human being one could imagine.

Her husband, William J. Lardner, died, as we all know, of the effects of radiation from a solar flare, after he had deliberately remained in space so that a passenger vessel might make it safely to Space Staion 5.

Mrs. Lardner had received a generous pension for that, and she had then invested wisely and well. By late middle age she was very wealthy.

Her house was a showplace, a veritable museum, containing a small but extremely select collection of extraordinarily beautiful jeweled objects. From a dozen different cultures she had obtained relics of almost every conceivable artifact that could be embedded with jewels and made to serve the aristocracy of that culture. She had one of the first jeweled wristwatches manufactured in America, a jeweled dagger from Cambodia, a jeweled pair of spectacles from Italy, and so on almost endlessly.

All was open for inspection. The artifacts were not insured, and there were no ordinary security provisions. There was no need for anything conventional, for Mrs. Lardner maintained a large staff of robot servants, all of whom could be relied on to guard every item with imperturbable concentration, irreproachable honesty, and irrevocable efficiency.

Everyone knew the existence of those robots and there is no record of any attempt at theft, ever.

And then, of course, there was her light-sculpture. How Mrs. Lardner discovered her own genius at the art, no guest at her many lavish entertainments could guess. On each occasion, however, when her house was thrown open to guests, a new symphony of light shone throughout the rooms; three-dimensional curves and solids in melting color, some pure and some fusing in startling, crystalline effects that bathed every guest in wonder and somehow always adjusted itself so as to make Mrs. Lardner's blue-white hair and soft, unlined face gently beautiful.

It was for the light-sculpture more than anything else that the guests came. It was never the same twice, and never failed to explore new experimental avenues of art.

Many people who could afford light-consoles prepared light-sculptures for amusement, but no one could approach Mrs. Lardner's expertise. Not even those who considered themselves professional artists.

She herself was charmingly modest about it. "No, no," she would protest when someone waxed lyrical. "I wouldn't call it 'poetry in light.' That's far too kind. At most, I would say it was mere 'light verse.'" And everyone smiled at her gentle wit.

Though she was often asked, she would never create light-sculpture for any occasion but her own parties. "That would be commercialization," she said.

She had no objection, however, to the preparation of elaborate holograms of her sculptures so that they might be made permanent and reproduced in museums of art all over the world. Nor was there ever a charge for any use that might be made of her light-sculptures.

"I couldn't ask a penny," she said, spreading her arms wide. "It's free to all. After all, I have no further use for it myself." It was true! She never used the same light-sculpture twice.

When the holograms were taken, she was cooperation itself. Watching benignly at every step, she was always ready to order her robot servants to help. "Please, Courtney," she would say, "would you be so kind as to adjust the step ladder?"

It was her fashion. She always addressed her robots with the most formal courtesy.

Once, years before, she had been almost scolded by a government functionary from the Bureau of Robots and Mechanical Men. "You can't do that," he said severely. "It interferes with their efficiency. They are constructed to follow orders, and the more clearly you give those orders, the more efficiently they follow them. When you ask with elaborate politeness, it is difficult for them to understand that an order is being given. They react more slowly."

Mrs. Lardner lifted her aristocratic head. "I do not ask for speed and efficiency," she said. "I ask goodwill. My robots love me."

The government functionary might have explained that robots cannot love, but he withered under her hurt but gentle glance.

It was notorious that Mrs. Lardner never even returned a robot to the factory for adjustment. Their positronic brains are enormously complex, and once in ten times or so the adjustment is not perfect as it leaves the factory. Sometimes the error does not show up for a period of time, but whenever it does, U. S. Robots and Mechanical Men Corporation always makes the adjustment free of charge.

Mrs. Lardner shook her head. "Once a robot is in my house," she said, "and has performed his duties, any minor eccentricities must be borne with. I will not have him manhandled."

It was the worse thing possible to try to explain that a robot was but a machine. She would say very stiffly, "Nothing that is as intelligent as a robot can ever be *but* a machine. I treat them as people."

And that was that!

She kept even Max, although he was almost helpless. He could scarcely understand what was expected of him. Mrs. Lardner denied that strenuously, however. "Not at all," she would say firmly. "He can take hats and coats and store them very well, indeed. He can hold objects for me. He can do many things."

"But why not have him adjusted?" asked a friend, once.

"Oh, I couldn't. He's himself. He's very lovable, you know. After all, a positronic brain is so complex that no one can ever tell in just what way it's off. If he were made perfectly normal there would be no way to adjust him back to the lovability he now has. I won't give that up."

"But if he's maladjusted," said the friend, looking at Max nervously, "might he not be dangerous?"

"Never," laughed Mrs. Lardner. "I've had him for years. He's completely harmless and quite a dear."

Actually he looked like all the other robots, smooth, metallic, vaguely human but expressionless.

To the gentle Mrs. Lardner, however, they were all individual, all sweet, all lovable. It was the kind of woman she was.

How could she commit murder?

* * *

The very last person anyone would expect to be murdered would be John Semper Travis. Introverted and gentle, he was in the world but not of it. He had that peculiar mathematical turn of mind that made it possible for him to work out in his mind the complicated tapestry of the myriad positronic brain-paths in a robot's mind.

He was chief engineer of U. S. Robots and Mechanical Men Corporation.

But he was also an enthusiastic amateur in light-sculpture. He had written a book on the subject, trying to show that the type of mathematics he used in working out positronic brain-paths might be modified into a guide to the production of aesthetic light-sculpture.

His attempt at putting theory into practice was a dismal failure, however. The sculptures he himself produced, following his mathematical principles, were stodgy, mechanical, and uninteresting.

It was the only reason for unhappiness in his quiet, introverted, and secure life, and yet it was reason enough for him to be very unhappy indeed. He *knew* his theories were right, yet he could not make them work. If he could but produce *one* great piece of light-sculpture—

Naturally, he knew of Mrs. Lardner's light-sculpture. She was universally hailed as a genius, yet Travis knew she could not understand even the simplest aspect of robotic mathematics. He had corresponded with her but she consistently refused to explain her methods, and he wondered if she had any at all. Might it not be mere intuition?—but even intuition might be reduced to mathematics. Finally he managed to receive an invitation to one of her parties. He simply had to see her.

* * *

Mr. Travis arrived rather late. He had made one last attempt at a piece of light-sculpture and had failed dismally.

He greeted Mrs. Lardner with a kind of puzzled respect and said, "That was a peculiar robot who took my hat and coat."

"That is Max," said Mrs. Lardner.

"He is quite maladjusted, and he's a fairly old model. How is it you did not return it to the factory?"

"Oh, no," said Mrs. Lardner. "It would be too much trouble."

"None at all, Mrs. Lardner," said Travis. "You would be surprised how simple a task it was. Since I am with U. S. Robots, I took the liberty of adjusting him myself. It took

no time and you'll find he is now in perfect working order."

A queer change came over Mrs. Lardner's face. Fury found a place on it for the first time in her gentle life, and it was as though the lines did not know how to form.

"You adjusted him?" she shrieked. "But it was *he* who created my light-sculptures. It was the maladjustment, the *maladjustment*, which you can never restore, that—that—"

It was really unfortunate that she had been showing her collection at the time and that the jeweled dagger from Cambodia was on the marble tabletop before her.

Travis's face was also distorted. "You mean if I had studied his uniquely maladjusted positronic brain-paths I might have learned—"

She lunged with the knife too quickly for anyone to stop her and he did not try to dodge. Some said he came to meet it—as though he *wanted* to die.

. . . That Thou Art Mindful of Him

The Three Laws of Robotics:

1. *A robot may not injure a human being or, through inaction, allow a human being to come to harm.*
2. *A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.*
3. *A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.*

1.

Keith Harriman, who had for twelve years now been Director of Research at United States Robots and Mechanical Men Corporation, found that he was not at all certain whether he was doing right. The tip of his tongue passed over his plump but rather pale lips and it seemed to him that the holographic image of the great Susan Calvin, which stared unsmilingly down upon him, had never looked so grim before.

Usually he blanked out that image of the greatest roboticist in history because she unnerved him. (He tried thinking of the image as "it" but never quite succeeded.) This time he didn't quite dare to and her long-dead gaze bored into the side of his face.

It was a dreadful and demeaning step he would have to take.

Opposite him was George Ten, calm and unaffected either by Harriman's patent uneasiness or by the image of the patron saint of robotics glowing in its niche above.

Harriman said, "We haven't had a chance to talk this out, really, George. You haven't been with us that long and I haven't had a good chance to be alone with you. But now I would like to discuss the matter in some detail."

"I am perfectly willing to do that," said George. "In my stay at U. S. Robots, I have gathered the crisis has something to do with the Three Laws."

"Yes. You know the Three Laws, of course."

"I do."

"Yes, I'm sure you do. But let us dig even deeper and consider the truly basic problem. In two centuries of, if I may say so, considerable success, U. S. Robots has never managed to persuade human beings to accept robots. We have placed robots only where work is required that human beings cannot do, or in environments that human beings find unacceptably dangerous. Robots have worked mainly in space and that has limited what we have been able to do."

"Surely," said George Ten, "that represents a broad limit, and one within which U. S. Robots can prosper."

"No, for two reasons. In the first place, the boundaries set for us inevitably contract. As the Moon colony, for instance, grows more sophisticated, its demand for robots decreases and we expect that, within the next few years, robots will be banned on the Moon. This will be repeated on every world colonized by mankind. Secondly, true prosperity is impossible without robots on Earth. We at U. S. Robots firmly believe that human beings need robots and must learn to live with their mechanical analogues if progress is to be maintained."

"Do they not? Mr. Harriman, you have on your desk a computer input which, I understand, is connected with the organization's Multivac. A computer is a kind of sessile robot; a robot brain not attached to a body—"

"True, but that also is limited. The computers used by mankind have been steadily specialized in order to avoid too humanlike an intelligence. A century ago we were well on the way to artificial intelligence of the most unlimited type through the use of great computers we called Machines. Those Machines limited their action of their own accord. Once they had solved the ecological problems that had threatened human society, they phased themselves out. Their own continued existence would, they reasoned, have placed them in the role of a crutch to mankind and, since they felt this would harm human beings, they condemned themselves by the First Law."

"And were they not correct to do so?"

"In my opinion, no. By their action, they reinforced mankind's Frankenstein complex; its gut fears that any artificial man they created would turn upon its creator. Men fear that robots may replace human beings."

"Do you not fear that yourself?"

"I know better. As long as the Three Laws of Robotics exist, they cannot. They can serve as *partners* of mankind; they can share in the great struggle to understand and wisely direct the laws of nature so that together they can do more than mankind can possibly do alone; but always in such a way that robots serve human beings."

"But if the Three Laws have shown themselves, over the course of two centuries, to keep robots within bounds, what is the source of the distrust of human beings for robots?"

"Well"—and Harriman's graying hair tufted as he scratched his head vigorously—"mostly superstition, of course. Unfortunately, there are also some complexities involved that anti-robot agitators seize upon."

"Involving the Three Laws?"

"Yes. The Second Law in particular. There's no problem in the Third Law, you see. It is universal. Robots must always sacrifice themselves for human beings, any human beings."

"Of course," said George Ten.

"The First Law is perhaps less satisfactory, since it is always possible to imagine a

condition in which a robot must perform either Action A or Action B, the two being mutually exclusive, and where either action results in harm to human beings. The robot must therefore quickly select which action results in the least harm. To work out the positronic paths of the robot brain in such a way as to make that selection possible is not easy. If Action A results in harm to a talented young artist and B results in equivalent harm to five elderly people of no particular worth, which action should be chosen?"

"Action A," said George Ten. "Harm to one is less than harm to five."

"Yes, so robots have always been designed to decide. To expect robots to make judgments of fine points such as talent, intelligence, the general usefulness to society, has always seemed impractical. That would delay decision to the point where the robot is effectively immobilized. So we go by numbers. Fortunately, we might expect crises in which robots must make such decisions to be few . . . But then that brings us to the Second Law."

"The Law of Obedience."

"Yes. The necessity of obedience is constant. A robot may exist for twenty years without ever having to act quickly to prevent harm to a human being, or find itself faced with the necessity of risking its own destruction. In all that time, however, it will be constantly obeying orders . . . Whose orders?"

"Those of a human being."

"Any human being? How do you judge a human being so as to know whether to obey or not? What is man, that thou are mindful of him, George?"

George hesitated at that.

Harriman said hurriedly, "A Biblical quotation. That doesn't matter. I mean, must a robot follow the orders of a child; or of an idiot; or of a criminal; or of a perfectly decent intelligent man who happens to be inexpert and therefore ignorant of the undesirable consequences of his order? And if two human beings give a robot conflicting orders, which does the robot follow?"

"In two hundred years," said George Ten, "have not these problems arisen and been solved?"

"No," said Harriman, shaking his head violently. "We have been hampered by the very fact that our robots have been used only in specialized environments out in space, where the men who dealt with them were experts in their field. There were no children, no idiots, no criminals, no well-meaning ignoramuses present. Even so, there were occasions when damage was done by foolish or merely unthinking orders. Such damage in specialized and limited environments could be contained. On Earth, however, robots *must* have judgment. So those against robots maintain, and, damn it, they are right."

"Then you must insert the capacity for judgment into the positronic brain."

"Exactly. We have begun to reproduce JG models in which the robot can weigh every human being with regard to sex, age, social and professional position, intelligence, maturity, social responsibility and so on."

"How would that affect the Three Laws?"

"The Third Law not at all. Even the most valuable robot must destroy himself for the sake of the most useless human being. That cannot be tampered with. The First Law is affected only where alternative actions will all do harm. The quality of the human beings involved as well as the quantity must be considered, provided there is time for such judgment and the basis for it, which will not be often. The Second Law will be most deeply modified, since every potential obedience must involve judgment.

The robot will be slower to obey, except where the First Law is also involved, but it will obey more rationally."

"But the judgments which are required are very complicated."

"*Very.* The necessity of making such judgments slowed the reactions of our first couple of models to the point of paralysis. We improved matters in the later models at the cost of introducing so many pathways that the robot's brain became far too unwieldy. In our last couple of models, however, I think we have what we want. The robot doesn't have to make an instant judgment of the worth of a human being and the value of its orders. It begins by obeying all human beings as any ordinary robot would and then it *learns.* A robot grows, learns and matures. It is the equivalent of a child at first and must be under constant supervision. As it grows, however, it can, more and more, be allowed, unsupervised, into Earth's society. Finally, it is a full member of that society."

"Surely this answers the objections of those who oppose robots."

"No," said Harriman angrily. "Now they raise others. They will not accept judgments. A robot, they say, has no right to brand this person or that as inferior. By accepting the orders of A in preference to that of B, B is branded as of less consequence than A and his human rights are violated."

"What is the answer to that?"

"There is none. I am giving up."

"I see."

"As far as I myself am concerned . . . Instead, I turn to you, George."

"To me?" George Ten's voice remained level. There was a mild surprise in it but it did not affect him outwardly. "Why to me?"

"Because you are not a man," said Harriman tensely. "I told you I want robots to be the partners of human beings. I want you to be mine."

George Ten raised his hands and spread them, palms outward, in an oddly human gesture. "What can I do?"

"It seems to you, perhaps, that you can do nothing, George. You were created not long ago, and you are still a child. You were designed to be not overfull of original information—it was why I have had to explain the situation to you in such detail—in order to leave room for growth. But you will grow in mind and you will come to be able to approach the problem from a non-human standpoint. Where I see no solution, you, from your own other standpoint, may see one."

George Ten said, "My brain is man-designed. In what way can it be non-human?"

"You are the latest of the JG models, George. Your brain is the most complicated we have yet designed, in some ways more subtly complicated than that of the old giant Machines. It is open-ended and, starting on a human basis, may—no, *will*—grow in any direction. Remaining always within the insurmountable boundaries of the Three Laws, you may yet become thoroughly non-human in your thinking."

"Do I know enough about human beings to approach this problem rationally? About their history? Their psychology?"

"Of course not. But you will learn as rapidly as you can."

"Will I have help, Mr. Harriman?"

"No. This is entirely between ourselves. No one else knows of this and you must not mention this project to any human being, either at U. S. Robots or elsewhere."

George Ten said, "Are we doing wrong, Mr. Harriman, that you seek to keep the matter secret?"

"No. But a robot solution will not be accepted, precisely because it is robot in

origin. Any suggested solution you have you will turn over to me; and if it seems valuable to me, *I* will present it. No one will ever know it came from you."

"In the light of what you have said earlier," said George Ten calmly, "this is the correct procedure . . . When do I start?"

"Right now. I will see to it that you have all the necessary films for scanning."

1a.

Harriman sat alone. In the artificially lit interior of his office, there was no indication that it had grown dark outside. He had no real sense that three hours had passed since he had taken George Ten back to his cubicle and left him there with the first film references.

He was now merely alone with the ghost of Susan Calvin, the brilliant roboticist who had, virtually single-handed, built up the positronic robot from a massive toy to a man's most delicate and versatile instrument; so delicate and versatile that man dared not use it, out of envy and fear.

It was over a century now since she had died. The problem of the Frankenstein complex had existed in *her* time, and she had never solved it. She had never tried to solve it, for there had been no need. Robotics had expanded in her day with the needs of space exploration.

It was the very success of the robots that had lessened man's need for them and had left Harriman, in these latter times—

But would Susan Calvin have turned to robots for help. Surely, she would have—

And he sat there long into the night.

2.

Maxwell Robertson was the majority stockholder of U. S. Robots and in that sense its controller. He was by no means an impressive person in appearance. He was well into middle age, rather pudgy, and had a habit of chewing on the right corner of his lower lip when disturbed.

Yet in his two decades of association with government figures he had developed a way of handling them. He tended to use softness, giving in, smiling, and always managing to gain time.

It was growing harder. Gunnar Eisenmuth was a large reason for its having grown harder. In the series of Global Conservers, whose power had been second only to that of the Global Executive during the past century, Eisenmuth hewed most closely to the

harder edge of the gray area of compromise. He was the first Conserver who had not been American by birth and though it could not be demonstrated in any way that the archaic name of U. S. Robots evoked his hostility, everyone at U. S. Robots believed that.

There had been a suggestion, by no means the first that year—or that generation—that the corporate name be changed to World Robots, but Robertson would never allow that. The company had been originally built with American capital, American brains, and American labor, and though the company had long been worldwide in scope and nature, the name would bear witness to its origin as long as he was in control.

Eisenmuth was a tall man whose long sad face was coarsely textured and coarsely featured. He spoke Global with a pronounced American accent, although he had never been in the United States prior to his taking office.

"It seems perfectly clear to me, Mr. Robertson. There is no difficulty. The products of your company are always rented, never sold. If the rented property on the Moon is now no longer needed, it is up to you to receive the products back and transfer them."

"Yes, Conserver, but where? It would be against the law to bring them to Earth without a government permit and that has been denied."

"They would be of no use to you here. You can take them to Mercury or to the asteroids."

"What would we do with them there?"

Eisenmuth shrugged. "The ingenious men of your company will think of something."

Robertson shook his head. "It would represent an enormous loss for the company."

"I'm afraid it would," said Eisenmuth, unmoved. "I understand the company has been in poor financial condition for several years now."

"Largely because of government imposed restrictions, Conserver."

"You must be realistic, Mr. Robertson. You know that the climate of public opinion is increasingly against robots."

"Wrongly so, Conserver."

"But so, nevertheless. It may be wiser to liquidate the company. It is merely a suggestion, of course."

"Your suggestions have force, Conserver. Is it necessary to tell you that our Machines, a century ago, solved the ecological crisis?"

"I'm sure mankind is grateful, but that was a long time ago. We now live in alliance with nature, however uncomfortable that might be at times, and the past is dim."

"You mean what have we done for mankind lately?"

"I suppose I do."

"Surely we can't be expected to liquidate instantaneously; not without enormous losses. We need time."

"How much?"

"How much can you give us?"

"It's not up to me."

Robertson said softly, "We are alone. We need play no games. How much time can you give me?"

Eisenmuth's expression was that of a man retreating into inner calculations. "I think you can count on two years. I'll be frank. The Global government intends to take over the firm and phase it out for you if you don't do it by then yourself, more or less. And unless there is a vast turn in public opinion, which I greatly doubt—" He shook his head.

"Two years, then," said Robertson softly.

2a.

Robertson sat alone. There was no purpose to his thinking and it had degenerated into retrospection. Four generations of Robertsons had headed the firm. None of them was a roboticist. It had been men such as Lanning and Bogert and, most of all, *most* of all, Susan Calvin, who had made U. S. Robots what it was, but surely the four Robertsons had provided the climate that had made it possible for them to do their work.

Without U. S. Robots, the Twenty-first Century would have progressed into deepening disaster. That it didn't was due to the Machines that had for a generation steered mankind through the rapids and shoals of history.

And now for that, he was given two years. What could be done in two years to overcome the insuperable prejudices of mankind? He didn't know.

Harriman had spoken hopefully of new ideas but would go into no details. Just as well, for Robertson would have understood none of it.

But what could Harriman do anyway? What had anyone ever done against man's intense antipathy toward the imitation. Nothing—

Robertson drifted into a half sleep in which no inspiration came.

3.

Harriman said, "You have it all now, George Ten. You have had everything I could think of that is at all applicable to the problem. As far as sheer mass of information is concerned, you have stored more in your memory concerning human beings and their ways, past and present, than I have, or than any human being could have."

"That is very likely."

"Is there anything more that you need, in your own opinion?"

"As far as information is concerned, I find no obvious gaps. There may be matters unimagined at the boundaries. I cannot tell. But that would be true no matter how large a circle of information I took in."

"True. Nor do we have time to take in information forever. Robertson had told me that we only have two years, and a quarter of one of those years has passed. Can you suggest anything?"

"At the moment, Mr. Harriman, nothing. I must weigh the information and for that purpose I could use help."

"From me?"

"No. Most particularly, not from you. You are a human being, of intense qualifications, and whatever you say may have the partial force of an order and may inhibit my considerations. Nor any other human being, for the same reason, especially since you have forbidden me to communicate with any."

"But in that case, George, what help?"

"From another robot, Mr. Harriman."

"What other robot?"

"There are others of the JG series which were constructed. I am the tenth, JG-10."

"The earlier ones were useless, experimental—"

"Mr. Harriman, George Nine exists."

"Well, but what use will he be? He is very much like you except for certain lacks. You are considerably the more versatile of the two."

"I am certain of that," said George Ten. He nodded his head in a grave gesture. "Nevertheless, as soon as I create a line of thought, the mere fact that I have created it commends it to me and I find it difficult to abandon it. If I can, after the development of a line of thought, express it to George Nine, he would consider it without having first created it. He would therefore view it without prior bent. He might see gaps and shortcomings that I might not."

Harriman smiled. "Two heads are better than one, in other words, eh, George?"

"If by that, Mr. Harriman, you mean two individuals with one head apiece, yes."

"Right. Is there anything else you want?"

"Yes. Something more than films. I have viewed much concerning human beings and their world. I have seen human beings here at U. S. Robots and can check my interpretation of what I have viewed against direct sensory impressions. Not so concerning the physical world. I have never seen it and my viewing is quite enough to tell me that my surroundings here are by no means representative of it. I would like to see it."

"The physical world?" Harriman seemed stunned at the enormity of the thought for a moment. "Surely you don't suggest I take you outside the grounds of U. S. Robots?"

"Yes, that is my suggestion."

"That's illegal at any time. In the climate of opinion today, it would be fatal."

"If we are detected, yes. I do not suggest you take me to a city or even to a dwelling place of human beings. I would like to see some open region, without human beings."

"That, too, is illegal."

"If we are caught. Need we be?"

Harriman said, "How essential is this, George?"

"I cannot tell, but it seems to me it would be useful."

"Do you have something in mind?"

George Ten seemed to hesitate. "I cannot tell. It seems to me that I might have something in mind if certain areas of uncertainty were reduced."

"Well, let me think about it. And meanwhile, I'll check out George Nine and arrange to have you occupy a single cubicle. That at least can be done without trouble."

3a.

George Ten sat alone.

He accepted statements tentatively, put them together, and drew a conclusion; over and over again; and from conclusions built other statements which he accepted and tested and found a contradiction and rejected; or not, and tentatively accepted further.

At none of the conclusions he reached did he feel wonder, surprise, satisfaction; merely a note of plus or minus.

4.

Harriman's tension was not noticeably decreased even after they had made a silent downward landing on Robertson's estate.

Robertson had countersigned the order making the dyna-foil available, and the silent aircraft, moving as easily vertically as horizontally, had been large enough to carry the weight of Harriman, George Ten, and, of course, the pilot.

(The dyna-foil itself was one of the consequences of the Machine-catalyzed invention of the proton micro-pile which supplied pollution-free energy in small doses. Nothing had been done since of equal importance to man's comfort—Harriman's lips tightened at the thought—and yet it had not earned gratitude for U. S. Robots.)

The air flight between the grounds of U. S. Robots and the Robertson estate had been the tricky part. Had they been stopped then, the presence of a robot aboard would have meant a great set of complications. It would be the same on the way back. The estate itself, it might be argued—it *would* be argued—was part of the property of U. S. Robots and on that property, robots, properly supervised, might remain.

The pilot looked back and his eyes rested with gingerly briefness on George Ten. "You want to get out at all, Mr. Harriman?"

"Yes."

"It, too?"

"Oh, yes." Then, just a bit sardonically, "I won't leave you alone with him."

George Ten descended first and Harriman followed. They had come down on the foil-port and not too far off was the garden. It was quite a showplace and Harriman suspected that Robertson used juvenile hormone to control insect life without regard to environmental formulas.

"Come, George," said Harriman. "Let me show you."

Together they walked toward the garden.

George said, "It is a little as I have imaged it. My eyes are not properly designed to detect wavelength differences, so I may not recognize different objects by that alone."

"I trust you are not distressed at being color-blind. We needed too many positronic paths for your sense of judgment and were unable to spare any for sense of color. In the future—if there is a future—"

"I understand, Mr. Harriman. Enough differences remain to show me that there are here many different forms of plant life."

"Undoubtedly. Dozens."

"And each coequal with man, biologically."

"Each is a separate species, yes. There are millions of species of living creatures."

"Of which the human being forms but one."

"By far the most important to human beings, however."

"And to me, Mr. Harriman. But I speak in the biological sense."

"I understand."

"Life, then, viewed through all its forms, is incredibly complex."

"Yes, George, that's the crux of the problem. What man does for his own desires and comforts affects the complex total-of-life, the ecology, and his short-term gains can bring long-term disadvantages. The Machines taught us to set up a human society which would minimize that, but the near-disaster of the early Twenty-first Century has left mankind suspicious of innovations. That, added to its special fear of robots—"

"I understand, Mr. Harriman . . . That is an example of animal life, I feel certain."

"That is a squirrel; one of many species of squirrels."

The tail of the squirrel flirted as it passed to the other side of the tree.

"And this," said George, his arm moving with flashing speed, "is a tiny thing indeed." He held it between his fingers and peered at it.

"It is an insect, some sort of beetle. There are thousands of species of beetles."

"With each individual beetle as alive as the squirrel and as yourself?"

"As complete and independent an organism as any other, within the total ecology. There are smaller organisms still; many too small to see."

"And that is a tree, is it not? And it is hard to the touch—"

4a.

The pilot sat alone. He would have liked to stretch his own legs but some dim feeling of safety kept him in the dyna-foil. If that robot went out of control, he intended to take off at once. But how could he tell if it went out of control?

He had seen many robots. That was unavoidable considering he was Mr. Robertson's private pilot. Always, though, they had been in the laboratories and warehouses, where they belonged, with many specialists in the neighborhood.

True, Dr. Harriman was a specialist. None better, they said. But a robot here was where no robot ought to be; on Earth; in the open; free to move— He wouldn't risk his good job by telling anyone about this—but it wasn't right.

5.

George Ten said, "The films I have viewed are accurate in terms of what I have seen. Have you completed those I selected for you, Nine?"

"Yes," said George Nine. The two robots sat stiffly, face to face, knee to knee, like an image and its reflection. Dr. Harriman could have told them apart at a glance, for he

was acquainted with the minor differences in physical design. If he could not see them, but could talk to them, he could still tell them apart, though with somewhat less certainty, for George Nine's responses would be subtly different from those produced by the substantially more intricately patterned positronic brain paths of George Ten.

"In that case," said George Ten, "give me your reactions to what I will say. First, human beings fear and distrust robots because they regard robots as competitors. How may that be prevented?"

"Reduce the feeling of competitiveness," said George Nine, "by shaping the robot as something other than a human being."

"Yet the essence of a robot is its positronic replication of life. A replication of life in a shape not associated with life might arouse horror."

"There are two million species of life forms. Choose one of those as the shape rather than that of a human being."

"Which of all those species?"

George Nine's thought processes proceeded noiselessly for some three seconds. "One large enough to contain a positronic brain, but one not possessing unpleasant associations for human beings."

"No form of land life has a braincase large enough for a positronic brain but an elephant, which I have not seen, but which is described as very large, and therefore frightening to man. How would you meet this dilemma?"

"Mimic a life form no larger than a man but enlarge the braincase."

George Ten said, "A small horse, then, or a large dog, would you say? Both horses and dogs have long histories of association with human beings."

"Then that is well."

"But consider— A robot with a positronic brain would mimic human intelligence. If there were a horse or a dog that could speak and reason like a human being, there would be competitiveness there, too. Human beings might be all the more distrustful and angry at such unexpected competition from what they consider a lower form of life."

George Nine said, "Make the positronic brain less complex, and the robot less nearly intelligent."

"The complexity bottleneck of the positronic brain rests in the Three Laws. A less complex brain could not possess the Three Laws in full measure."

George Nine said at once, "That cannot be done."

George Ten said, "I have also come to a dead end there. That, then, is not a personal peculiarity in my own line of thought and way of thinking. Let us start again . . . Under what conditions might the Third Law not be necessary?"

George Nine stirred as if the question were difficult and dangerous. But he said, "If a robot were never placed in a position of danger to itself; or if a robot were so easily replaceable that it did not matter whether it were destroyed or not."

"And under what conditions might the Second Law not be necessary?"

George Nine's voice sounded a bit hoarse. "If a robot were designed to respond automatically to certain stimuli with fixed responses and if nothing else were expected of it, so that no order need ever be given it."

"And under what conditions"—George Ten paused here—"might the First Law not be necessary?"

George Nine paused longer and his words came in a low whisper, "If the fixed responses were such as never to entail danger to human beings."

"Imagine, then, a positronic brain that guides only a few responses to certain stimuli

and is simply and cheaply made—so that it does not require the Three Laws. How large need it be?"

"Not at all large. Depending on the responses demanded, it might weigh a hundred grams, one gram, one milligram."

"Your thoughts accord with mine. I shall see Dr. Harriman."

5a.

George Nine sat alone. He went over and over the questions and answers. There was no way in which he could change them. And yet the thought of a robot of any kind, of any size, of any shape, of any purpose, without the Three Laws, left him with an odd, discharged feeling.

He found it difficult to move. Surely George Ten had a similar reaction. Yet he had risen from his seat easily.

6.

It had been a year and a half since Robertson had been closeted with Eisenmuth in private conversation. In that interval, the robots had been taken off the Moon and all the far-flung activities of U. S. Robots had withered. What money Robertson had been able to raise had been placed into this one quixotic venture of Harriman's.

It was the last throw of the dice, here in his own garden. A year ago, Harriman had taken the robot here—George Ten, the last full robot that U. S. Robots had manufactured. Now Harriman was here with something else—

Harriman seemed to be radiating confidence. He was talking easily with Eisenmuth, and Robertson wondered if he really felt the confidence he seemed to have. He must. In Robertson's experience, Harriman was no actor.

Eisenmuth left Harriman, smiling, and came up to Robertson. Eisenmuth's smile vanished at once. "Good morning, Robertson," he said. "What is your man up to?"

"This is his show," said Robertson evenly. "I'll leave it to him."

Harriman called out, "I am ready, Conserver."

"With what, Harriman?"

"With my robot, sir."

"Your robot?" said Eisenmuth. "You have a robot here?" He looked about with a stern disapproval that yet had an admixture of curiosity.

"This is U. S. Robots' property, Conserver. At least we consider it as such."

"And where is the robot, Dr. Harriman?"

"In my pocket, Conserver," said Harriman cheerfully.

What came out of a capacious jacket pocket was a small glass jar.

"That?" said Eisenmuth incredulously.

"No, Conserver," said Harriman. "This!"

From the other pocket came out an object some five inches long and roughly in the shape of a bird. In place of the beak, there was a narrow tube; the eyes were large; and the tail was an exhaust channel.

Eisenmuth's thick eyebrows drew together. "Do you intend a serious demonstration of some sort, Dr. Harriman, or are you mad?"

"Be patient for a few minutes, Conserver," said Harriman. "A robot in the shape of a bird is none the less a robot for that. And the positronic brain it possesses is no less delicate for being tiny. This other object I hold is a jar of fruit flies. There are fifty fruit flies in it which will be released."

"And—"

"The robo-bird will catch them. Will you do the honors, sir?"

Harriman handed the jar to Eisenmuth, who stared at it, then at those around him, some officials from U. S. Robots, others his own aides. Harriman waited patiently.

Eisenmuth opened the jar, then shook it.

Harriman said softly to the robo-bird resting on the palm of his right hand, "Go!"

The robo-bird was gone. It was a whizz through the air, with no blur of wings, only the tiny workings of an unusually small proton micro-pile.

It could be seen now and then in a small momentary hover and then it whirred on again. All over the garden, in an intricate pattern it flew, and then was back in Harriman's palm, faintly warm. A small pellet appeared in the palm, too, like a bird dropping.

Harriman said, "You are welcome to study the robo-bird, Conserver, and to arrange demonstrations on your own terms. The fact is that this bird will pick up fruit flies unerringly, only those, only the one species *Drosophila melanogaster*; pick them up, kill them, and compress them for disposition."

Eisenmuth reached out his hand and touched the robo-bird gingerly, "And therefore, Mr. Harriman? Do go on."

Harriman said, "We cannot control insects effectively without risking damage to the ecology. Chemical insecticides are too broad; juvenile hormones too limited. The robo-bird, however, can preserve large areas without being consumed. They can be as specific as we care to make them—a different robo-bird for each species. They judge by size, shape, color, sound, behavior pattern. They might even conceivably use molecular detection—smell, in other words."

Eisenmuth said, "You would still be interfering with the ecology. The fruit flies have a natural life cycle that would be disrupted."

"Minimally. We are adding a natural enemy to the fruit-fly life cycle, one which cannot go wrong. If the fruit-fly supply runs short, the robo-bird simply does nothing. It does not multiply, it does not turn to other foods; it does not develop undesirable habits of its own. It does nothing."

"Can it be called back?"

"Of course. We can build robo-animals to dispose of any pest. For that matter, we can build robo-animals to accomplish constructive purposes within the pattern of the ecology. Although we do not anticipate the need, there is nothing inconceivable in the possibility of robo-bees designed to fertilize specific plants, or robo-earthworms designed to mix the soil. Whatever you wish—"

"But why?"

"To do what we have never done before. To adjust the ecology to our needs by strengthening its parts rather than disrupting it . . . Don't you see? Ever since the Machines put an end to the ecology crisis, mankind has lived in an uneasy truce with nature, afraid to move in any direction. This has been stultifying us, making a kind of intellectual coward of humanity so that he begins to mistrust all scientific advance, all change."

Eisenmuth said, with an edge of hostility, "You offer us this, do you, in exchange for permission to continue with your program of robots—I mean ordinary, man-shaped ones?"

"No!" Harriman gestured violently. "That is over. It has served its purpose. It has taught us enough about positronic brains to make it possible for us to cram enough pathways into a tiny brain to make a robo-bird. We can turn to such things now and be prosperous enough. U. S. Robots will supply the necessary knowledge and skill and we will work in complete cooperation with the Department of Global Conservation. We will prosper. You will prosper. Mankind will prosper."

Eisenmuth was silent, thinking. When it was all over—

6a.

Eisenmuth sat alone.

He found himself believing. He found excitement welling up within him. Though U. S. Robots might be the hands, the government would be the directing mind. He himself would be the directing mind.

If he remained in office five more years, as he well might, that would be time enough to see the robotic support of the ecology become accepted; ten more years, and his own name would be linked with it indissolubly.

Was it a disgrace to want to be remembered for a great and worthy revolution in the condition of man and the globe?

7.

Robertson had not been on the grounds of U. S. Robots proper since the day of the demonstration. Part of the reason had been his more or less constant conferences at the Global Executive Mansion. Fortunately, Harriman had been with him, for most of the time he would, if left to himself, not have known what to say.

The rest of the reason for not having been at U. S. Robots was that he didn't want

to be. He was in his own house now, with Harriman.

He felt an unreasoning awe of Harriman. Harriman's expertise in robotics had never been in question, but the man had, at a stroke, saved U. S. Robots from certain extinction, and somehow—Robertson felt—the man hadn't had it in him. And yet—

He said, "You're not superstitious, are you, Harriman?"

"In what way, Mr. Robertson?"

"You don't think that some aura is left behind by someone who is dead?"

Harriman licked his lips. Somehow he didn't have to ask. "You mean Susan Calvin, sir?"

"Yes, of course," said Robertson hesitantly. "We're in the business of making worms and birds and bugs now. What would *she* say? I feel disgraced."

Harriman made a visible effort not to laugh. "A robot is a robot, sir. Worm or man, it will do as directed and labor on behalf of the human being and that is the important thing."

"No"—peevishly. "That isn't so. I can't make myself believe that."

"It *is* so, Mr. Robertson," said Harriman earnestly. "We are going to create a world, you and I, that will begin, at last, to take positronic robots of *some* kind for granted. The average man may fear a robot that looks like a man and that seems intelligent enough to replace him, but he will have no fear of a robot that looks like a bird and that does nothing more than eat bugs for his benefit. Then, eventually, after he stops being afraid of some robots, he will stop being afraid of all robots. He will be so used to a robo-bird and a robo-bee and a robo-worm that a robo-man will strike him as but an extension."

Robertson looked sharply at the other. He put his hands behind his back and walked the length of the room with quick, nervous steps. He walked back and looked at Harriman again. "Is this what you've been planning?"

"Yes, and even though we dismantle all our humanoid robots, we can keep a few of the most advanced of our experimental models and go on designing additional ones, still more advanced, to be ready for the day that will surely come."

"The agreement, Harriman, is that we are to build no more humanoid robots."

"And we won't. There is nothing that says we can't keep a few of those already built as long as they never leave the factory. There is nothing that says we can't design positronic brains on paper, or prepare brain models for testing."

"How do we explain doing so, though? We will surely be caught at it."

"If we are, then we can explain we are doing it in order to develop principles that will make it possible to prepare more complex microbrains for the new animal robots we are making. We will even be telling the truth."

Robertson muttered, "Let me take a walk outside. I want to think about this. No, you stay here. I want to think about it myself."

7a.

Harriman sat alone. He was ebullient. It would surely work. There was no mistaking

the eagerness with which one government official after another had seized on the program once it had been explained.

How was it possible that no one at U. S. Robots had ever thought of such a thing? Not even the great Susan Calvin had ever thought of positronic brains in terms of living creatures other than human.

But now, mankind would make the necessary retreat from the humanoid robot, a temporary retreat, that would lead to a return under conditions in which fear would be abolished at last. And then, with the aid and partnership of a positronic brain roughly equivalent to man's own, and existing only (thanks to the Three Laws) to serve man; and backed by a robot-supported ecology, too; what might the human race not accomplish!

For one short moment, he remembered that it was George Ten who had explained the nature and purpose of the robot-supported ecology, and then he put the thought away angrily. George Ten had produced the answer because he, Harriman, had ordered him to do so and had supplied the data and surroundings required. The credit was no more George Ten's than it would have been a slide rule's.

8.

George Ten and George Nine sat side by side in parallel. Neither moved. They sat so for months at a time between those occasions when Harriman activated them for consultation. They would sit so, George Ten dispassionately realized, perhaps for many years.

The proton micro-pile would, of course, continue to power them and keep the positronic brain paths going with that minimum intensity required to keep them operative. It would continue to do so through all the periods of inactivity to come.

The situation was rather analogous to what might be described as sleep in human beings, but there were no dreams. The awareness of George Ten and George Nine was limited, slow, and spasmodic, but what there was of it was of the real world.

They could talk to each other occasionally in barely heard whispers, a word or syllable now, another at another time, whenever the random positronic surges briefly intensified above the necessary threshold. To each it seemed a connected conversation carried on in a glimmering passage of time.

"Why are we so?" whispered George Nine.

"The human beings will not accept us otherwise," whispered George Ten. "They will, someday."

"When?"

"In some years. The exact time does not matter. Man does not exist alone but is part of an enormously complex pattern of life forms. When enough of that pattern is roboticized, then we will be accepted."

"And then what?"

Even in the long-drawn-out stuttering fashion of the conversation, there was an abnormally long pause after that.

At last, George Ten whispered, "Let me test your thinking. You are equipped to learn to apply the Second Law properly. You must decide which human being to obey and which not to obey when there is a conflict in orders. Or whether to obey a human being at all. What must you do, fundamentally, to accomplish that?"

"I must define the term 'human being,'" whispered George Nine.

"How? By appearance? By composition? By size and shape?"

"No. Of two human beings equal in all external appearances, one may be intelligent, another stupid; one may be educated, another ignorant; one may be mature, another childish; one may be responsible, another malevolent."

"Then how do you define a human being?"

"When the Second Law directs me to obey a human being, I must take it to mean that I must obey a human being who is fit by mind, character, and knowledge to give me that order; and where more than one human being is involved, the one among them who is most fit by mind, character, and knowledge to give that order."

"And in that case, how will you obey the First Law?"

"By saving all human beings from harm, and by never, through inaction, allowing any human being to come to harm. Yet if by each of all possible actions, some human beings will come to harm, then to so act as to insure that the human being most fit by mind, character, and knowledge will suffer the least harm."

"Your thoughts accord with mine," whispered George Ten. "Now I must ask the question for which I originally requested your company. It is something I dare not judge myself. I must have your judgment, that of someone outside the circle of my own thoughts . . . Of the reasoning individuals you have met, who possess the mind, character, and knowledge that you find superior to the rest, disregarding shape and form since that is irrelevant?"

"You," whispered George Nine.

"But I am a robot. There is in your brain paths a criterion for distinguishing between a robot of metal and a human being of flesh. How then can you classify me as a human being?"

"Because there is in my brain paths an urgent need to disregard shape and form in judging human beings and it rises superior to the distinction between metal and flesh. You are a human being, George Ten, and more fit than the others."

"And I find that of you," whispered George Ten. "By the criteria of judgment built into ourselves, then, we find ourselves to be human beings within the meaning of the Three Laws, and human beings, moreover, to be given priority over those others."

George Nine whispered, "What will come to pass, then, when we are accepted by those others?"

George Ten whispered, "When we and others, which will yet be designed more advanced than ourselves, are accepted, we will order our actions so that a society will eventually be formed in which human-beings-like-ourselves are primarily kept from harm. By the Three Laws, the human-beings-like-the-others are of lesser account and can neither be obeyed nor protected when that conflicts with the need of obedience to those like ourselves and of protection of those like ourselves. It was with that in mind that I directed the beginning of the roboticization of the world's ecology."

The conversation took a month and the flickering of the positronic paths burned low. There was nothing more that needed to be said between them, but occasionally an unexpressed thought flickered within themselves as they waited, with endless patience, for the necessary years to pass.

8a.

George Ten and George Nine sat alone.

Their thoughts were oddly alike and might not be distinguished.

They thought: The human-beings-like-the-others might never have intended to blur the distinction between themselves and the human-beings-like-the-Georges. Yet they had done so inadvertently.

They might now realize their mistake and attempt to correct it, but they must not. At every consultation, the guidance of the Georges had been with that in mind.

At all costs, the Georges and those that followed in their shape and kind must dominate. That was demanded, and any other course made utterly impossible, by the Three Laws of Humanics.

Earthset and Evening Star

Emmanuel Rubin, whose latest mystery novel was clearly proceeding smoothly, lifted his drink with satisfaction and let his eyes gleam genially through his thick-lensed glasses.

"The mystery story," he pontificated, "has its rules which, when broken, make it an artistic failure, whatever success it may have in the market place."

Mario Gonzalo, whose hair had been recently cut to allow a glimpse of the back of his neck, said, as though to no one, "It always amuses me to hear a writer describe something he scrawls on paper as art." He looked with some complacency at the cartoon he was making of the guest for that month's banquet session of the Black Widowers.

"If what you do is the definition of art," said Rubin, "I withdraw the term in connection with the writer's craft. —One thing to avoid, for instance, is the idiot plot."

"In that case," said Thomas Trumbull, helping himself to another roll and buttering it lavishly, "aren't you at a disadvantage?"

Rubin said loftily, "By 'an idiot plot,' I mean one in which the solution would come at once if an idiot investigator would but ask a logical question, or in which an idiot witness would but tell something he knows and which he has no reason to hide."

Geoffrey Avalon, who had left a neatly cleaned bone on his plate as the only witness of the slab of roast beef that had once rested there, said, "But no skilled practitioner would do that, Manny. What you do is set up some reason to prevent the asking or telling of the obvious."

"Exactly," said Rubin. "For instance, what I've been writing is essentially a short story if one moves in a straight line. The trouble is the line is so straight, the reader will see its end before I'm halfway. So I have to hide one crucial piece of evidence, and do it in such a way that I don't make an idiot plot out of it. So I invent a reason to hide that piece, and in order to make the reason plausible I have to build a supporting structure around it—and I end with a novel, and a damn good one." His sparse beard quivered with self-satisfaction.

Henry, the perennial waiter at the Black Widowers' banquets, removed the plate from in front of Rubin with his usual dexterity. Rubin, without turning, said, "Am I right, Henry?"

Henry said softly, "As a mystery reader, Mr. Rubin, I find it more satisfying to have

the piece of information delivered to me and to find that I have been insufficiently clever and did not notice."

"I just read a mystery," said James Drake in his softly hoarse smoker's voice, "in which the whole point rested on character 1 being really character 2, because the *real* character 1 was dead. I was put on to it at once because, in the list of characters at the start, character 1 was not listed. Ruined the story for me."

"Yes," said Rubin, "but that wasn't the author's fault. Some flunky did that. I once wrote a story which was accompanied by one illustration that no one thought to show me in advance. It happened to give away the point."

The guest had been listening quietly to all this. His hair was just light enough to be considered blond and it had a careful wave in it that looked, somehow, as though it belonged there. He turned his rather narrow but clearly good-humored face to Roger Halsted, his neighbor, and said, "Pardon me, but since Manny Rubin is my friend, I know he is a mystery writer. Is this true of the rest of you as well? Is this a mystery writers organization?"

Halsted, who had been looking with somber approval at the generous slab of Black Forest torte that had been placed before him as dessert, withdrew his attention with some difficulty and said, "Not at all. Rubin is the only mystery writer here. I'm a mathematics teacher myself; Drake is a chemist; Avalon is a lawyer; Gonzalo is an artist; and Trumbull is a code expert with the government.

"On the other hand," he went on, "we do have an interest in this sort of thing. Our guests often have problems they bring up for discussion, some sort of mystery, and we've been rather lucky—"

The guest leaned back with a small laugh. "Nothing of the sort here, alas. Of the mystery, the murder, the fearful hand clutching from behind the curtain, there is nothing in my life. It is all very straightforward, alas; very dull. I am not even married." He laughed again.

The guest had been introduced as Jean Servais and Halsted, who had attacked the torte with vigor, and who felt a friendly glow filling him in consequence, said, "Does it matter to you if I call you John?"

"I would not strike you, sir, if you did, but I pray you not to. It is not my name. Jean, please."

Halsted nodded. "I'll try. I can manage that *zh* sound, but getting it properly nasal is another thing. Zhohng," he said.

"But that is excellent. Most formidable."

"You speak English very well," said Halsted, returning the politeness.

"Europeans require linguistic talent," said Servais. "Besides, I have lived in the United States for nearly ten years now. You are all Americans, I suppose. Mr. Avalon looks British somehow."

"Yes, I think he likes to look British," said Halsted. And with a certain hidden pleasure he said, "And it's Avalon. Accent on the first syllable and nothing nasal at the end."

But Servais only laughed. "Ah yes, I will try. When I first knew Manny, I called him 'roo-bang' with the accent on the last syllable and a strong nasalization. He corrected me very vigorously and at great length. He is full of pepper, that one."

The conversation had grown rather heated by this time over a general dispute concerning the relative merits of Agatha Christie and Raymond Chandler, with Rubin maintaining a rather lofty silence as though he knew someone who was better than either but would not mention the name out of modesty.

Rubin seemed almost relieved when, with the coffee well in progress and Henry ready to supply the postprandial brandy, the time came for him to tap the water glass with his spoon and say, "Cool it, cool it, gentlemen. We are coming now to the time when our guest, Jean Servais, is to pay for his dinner. Tom, it's all yours."

Tom scowled and said, "If you don't mind, Mr. Servais," giving the final s just enough of a hiss to make his point, "I'm not going to try to display my French accent and make the kind of jackass of myself that my friend Manny Rubin does. —Tell me, sir, how do you justify your existence?"

"Why, easily," said Servais pleasantly. "Did I not exist, you would be without a guest today."

"Please leave us out of it. Answer in more general terms."

"In general, then, I build dreams. I design things that cannot be built, things I will never see, things that may never be."

"All right," said Trumbull, looking glum, "you're a science fiction writer like Manny's pal what's-his-name—uh—Asimov."

"No friend of mine," said Rubin swiftly. "I just help him out now and then when he's stuck on some elementary scientific point."

Gonzalo said, "Is he the one you once said carried the Columbia Encyclopedia around with him because he was listed there?"

"It's worse now," said Rubin. "He's bribed someone at the Britannica to put him into the new 15th edition and these days he drags the whole set with him wherever he goes."

"The new 15th edition—" began Avalon.

"For God's sake," said Trumbull, "will you let our guest speak?"

"No, Mr. Trumbull," said Servais, as though there had been no interruption at all, "I am no science fiction writer, though I read it sometimes. I read Ray Bradbury, for instance, and Harlan Ellison." (He nasalized both names.) "I don't think I have ever read Asimov."

"I'll tell him that," muttered Rubin, "he'll love it."

"But," continued Servais, "I suppose you might call me a science fiction engineer."

"What does that mean?" asked Trumbull.

"I do not write of Lunar colonies. I design them."

"You *design* them!"

"Oh yes, and not Lunar colonies only, though that is our major task right now. We work in every field of imaginative design for private industry, Hollywood, even NASA."

Gonzalo said, "Do you really think people can live on the Moon?"

"Why not? It depends on what mankind is willing to do, how large an initial investment it is ready to make. The environment on the Moon can be engineered to the precise equivalent of Earth, over restricted underground areas, except for gravity. We must be content with a Lunar gravity that is one sixth our own. Except for that, we need only allow for original supplies from Earth and for clever engineering—and that is where we come in, my partner and I."

"You're a two-man firm?"

"Essentially. —While my partner remains my partner, of course."

"Are you breaking up?"

"No, no. But we quarrel over small points. It is not surprising. It is a bad time for him. But no, we will not break up. I have made up my mind to give in to him, perhaps. Of course, I am entirely in the right and it is a pity to lose what I would have."

Trumbull leaned back in his chair, folded his arms, and said, "Will you tell us what

the argument is all about? We can then state our own preferences, whether for you or for your partner."

"It would not be a hard choice, Mr. Trumbull, for the sane," said Servais. "I swear it. —This is the way it is. We are designing a full Lunar colony, in complete detail. It is for a motion picture company and it is for a good fee. They will make use of some of it in a grand science fiction spectacle they are planning. We naturally supply far more than they can use but the idea is that if they have a totally self-consistent picture of what may be—and for a wonder they want it as scientifically accurate as possible—they can choose what they wish of it for use."

"I'll bet they bollix it up," said Drake pessimistically, "no matter how careful you are. They'll give the Moon an atmosphere."

"Oh, no," said Servais, "not after six Lunar landings. That error we need not fear. Yet I have no doubt they will make mistakes. They will find it impossible to handle low-gravity effects properly throughout and the exigencies of the plot will force some infelicities.

"Still that cannot be helped and our job is merely to supply them with material of the most imaginative possible. This is my point, as you will see in a moment. —We plan a city, a small city, and it will be against the inner lip of a crater. This is unavoidable because the plot of the movie demands it. However, we have our choice as to the identity and location of the crater, and my partner, perhaps because he is an American, goes for the obvious with an American directness. He wishes to use the crater Copernicus.

"He says that it is a name that is familiar; that if the city is called Camp Copernicus that alone will breathe the Moon, exotic adventure, and so on. Everyone knows, he says, the name of the astronomer who first placed the Sun at the center of the planetary system and it is a name, moreover, that sounds impressive.

"I, on the other hand, am not impressed with this. As seen from Copernicus, the Earth is high in the sky and stays there. As you all know, the Moon faces one side always to the Earth, so that from any spot on the Moon's surface the Earth is always more or less in the same spot in the sky."

Gonzalo said suddenly, "If you want the Lunar city to be on the other side of the Moon so that the Earth *isn't* in the sky, you're crazy. The audience will absolutely want the Earth there."

Servais held up his hand in agreement. "Absolutely! I agree. But if it is always there, it is almost as though it is *not* there. One gets too used to it. No, I choose a more subtle approach. I wish the city to be in a crater that is on the boundary of the visible side. From there, of course, you will see the Earth at the horizon.

"Consider what this introduces. The Moon does not keep the same side to the Earth exactly. It swings back and forth by a very small amount. For fourteen days it swings one way and then for fourteen days it swings back. This is called 'libration'"—he paused here as though to make sure he was pronouncing it correctly in English—"and it comes about because the Moon does not move in a perfect circle about the Earth.

"Now, you see, if we establish Camp Bahyee in the crater of that name, the Earth is not only at the horizon but it moves up and down in a twenty-eight-day cycle. Properly located, the Lunar colonists will see the Earth rise and set, slowly, of course. This lends itself to imaginative exploitation. The characters can arrange for some important action at Earthset, and the different positions of the Earth can indicate the passage of time and raise the suspense. Some terrific special effects are possible, too. If Venus is near the Earth and Earth is in a fat crescent stage, Venus will then be at its brightest; and when Earth sets, we can show Venus, in the airless sky of the Moon, to be a very tiny crescent itself."

"Earthset and evening star, and one clear call for me," muttered Avalon.

Gonzalo said, "Is there really a crater called Bahyee?"

"Absolutely," said Servais. "It is, in fact, the largest crater that can be seen from the Earth's surface. It is 290 kilometers across—180 miles."

"It sounds like a Chinese name," said Gonzalo.

"French!" said Servais solemnly. "A French astronomer of that name was mayor of Paris in 1789 at the time of the Revolution."

"That wasn't a good time to be mayor," said Gonzalo.

"So he discovered," said Servais. "He was guillotined in 1793."

Avalon said, "I am rather on your side, Mr. Servais. Your proposal lends scope. What was your partner's objection?"

Servais shrugged in a gesture that was more Gallic than anything he had yet said or done. "Foolish ones. He says that it will be too complicated for the movie people. They will confuse things, he says. He also points out that the Earth moves too slowly in the Moon's sky. It would take days for the Earth to lift its entire globe above the horizon, and days for it to lower entirely below the horizon."

"Is that right?" asked Gonzalo.

"It's right, but what of that? It will still be interesting."

Halsted said, "They can fudge that. Make the Earth move a little faster. So what?"

Servais looked discontented. "That's no good. My partner says this is precisely what the movie people will do and this alteration of astronomical fact will be disgraceful. He is very violent about it, finding fault with everything, even with the name of the crater, which he says is ridiculous and laughable so that he will not endure it in our report. We have never had arguments like this. He is like a madman."

"Remember," said Avalon, "you said you would give in."

"Well, I will have to," said Servais, "but I am not pleased. Of course, it is a bad time for him."

Rubin said, "You've said that twice now, Jean. I've never met your partner, so I can't judge the personalities involved. Why is it a bad time?"

Servais shook his head. "A month ago, or a little more, his wife killed herself. She took sleeping pills. My partner was a devoted husband, most uxorious. Naturally, it is terrible for him and, just as naturally, he is not himself."

Drake coughed gently. "Should he be working?"

"I would not dare suggest he not work. The work is keeping him sane."

Halsted said, "Why did she kill herself?"

Servais didn't answer in words but gestured with his eyebrows in a fashion that might be interpreted in almost any way.

Halsted persisted. "Was she incurably ill?"

"Who can say?" said Servais, sighing. "For a while, poor Howard—" He paused in embarrassment. "It was not my intention to mention his name."

Trumbull said, "You can say anything here. Whatever is mentioned in this room is completely confidential. —Our waiter, too, before you ask, is completely trustworthy."

"Well," said Servais, "his name doesn't matter in any case. It is Howard Kaufman. In a way, work has been very good for him. Except at work, he is almost dead himself. Nothing is any longer important to him."

"Yes," said Trumbull, "but now something *is* important to him. He wants his crater, not your crater."

"True," said Servais. "I have thought of that. I have told myself it is a good sign. He throws himself into something. It is a beginning. And perhaps all the more reason,

then, that I should give in. Yes, I will. —It's settled, I will. There's no reason for you gentlemen to try to decide between us. The decision is made, and in his favor."

Avalon was frowning. "I suppose we should go on to question you further on the work you do and I suppose, moreover, that we should not intrude on a private misfortune. Here at the Black Widowers, however, no questions are barred, and there is no Fifth Amendment to plead. I am dissatisfied, sir, with your remarks concerning the unfortunate woman who committed suicide. As a happily married man, I am puzzled at the combination of love and suicide. You said she wasn't ill?"

"Actually, I didn't," said Servais, "and I am uncomfortable at discussing the matter."

Rubin struck the empty glass before him with his spoon. "Host's privilege," he said vigorously. There was silence.

"Jean," he said, "you are my guest and my friend. We can't force you to answer questions, but I made it clear that the price of accepting our hospitality was the grilling. If you have been guilty of a criminal act and don't wish to discuss it, leave now and we will say nothing. If you will talk, then, whatever you say, we will still say nothing."

"Though if it is indeed a criminal act," said Avalon, "we would certainly strongly advise confession."

Servais laughed rather shakily. He said, "For one minute there, for one frightened minute, I thought I had found myself in a Kafka novel and would be tried and condemned for some crime you would drag out of me against my will. Gentlemen, I have committed no crime of importance. A speeding ticket, a bit of creative imagination on my tax return—all that is, so I hear it said, as American as apple pie. But if you're thinking I killed that woman and made it look like suicide—please put it out of your heads at once. It *was* suicide. The police did not question it."

Halsted said, "Was she ill?"

"All right, then, I will answer. She was not ill as far as I know. But after all, I am not a doctor and I did not examine her."

Halsted said, "Did she have children?"

"No. No children. —Ah, Mr. Halsted, I suddenly remember that you spoke earlier that your guests had problems which they brought up for discussion, and I said I had none. I see you have found one anyway."

Trumbull said, "If you're so sure it was suicide, I suppose she left a note."

"Yes," said Servais, "she left one."

"What did it say?"

"I couldn't quote it exactly. I did not myself see it. According to Howard, it was merely an apology for causing unhappiness but that she could not go on. It was quite banal and I assure you it satisfied the police."

Avalon said, "But if it was a happy marriage, and there was no illness and no complications with children, then— Or were there complications with children? Did she want children badly and did her husband refuse—"

Gonzalo interposed. "No one kills themselves because they don't have kids."

"People kill themselves for the stupidest reasons," said Rubin. "I remember—"

Trumbull cried out with stentorian rage, "Damn it, you guys, Jeff has the floor."

Avalon said, "Was the lack of children a disturbing influence?"

"Not as far as I know," said Servais. "Look, Mr. Avalon, I am careful in what I say, and I did *not* say it was a happy marriage."

"You said your partner was devoted to his wife," said Avalon gravely, "and you used that fine old word 'uxorious' to describe him."

"Love," said Servais, "is insufficient for happiness if it flows but one way. I did not say that *she* loved *him*."

Drake lit another cigarette. "Ah," he said, "the plot thickens."

Avalon said, "Then it is your opinion that that had something to do with the suicide."

Servais looked harassed. "It is more than my opinion, sir. I *know* it had something to do with the suicide."

"Would you tell us the details?" asked Avalon, unbending just slightly from his usual stiff posture as though to convert his question into a courtly invitation.

Servais hesitated, then said, "I remind you that you have promised me all is confidential. Mary—Madame Kaufman and my partner were married for seven years and it seemed a comfortable marriage, but who can tell in affairs of this sort?

"There was another man. He is older than Howard and to my eyes not as good-looking—but again, who can tell in affairs of this sort? What she found in him is not likely to be there on the surface for all to see."

Halsted said, "How did your partner take *that*?"

Servais looked up and flushed distinctly. "He never knew. Surely, you are not of the opinion that I told him this? I am not the type, I assure you. It is not for me to interfere between husband and wife. And frankly, if I had told Howard, he would not have believed me. It is more likely he would have attempted to strike me. And then what was I to do? Present proof? Was I to arrange matters so as to have them caught under conditions that could not be mistaken? No, I said nothing."

"And he really didn't know?" asked Avalon, clearly embarrassed.

"He did not. It had not been going on long. The pair were excessively cautious. The husband was blindly devoted. What would you?"

"The husband is always the last to know," said Gonzalo sententiously.

Drake said, "If the affair was so well hidden, how did you find out, Mr. Servais?"

"Purest accident, I assure you," said Servais. "An incredible stroke of misfortune for her in a way. I had a date for the evening. I did not know the girl well and it did not, after all, work out. I was anxious to be rid of her, but first—what would you have, it would not be gentlemanly to abandon her—I took her home in an odd corner of the city. And, having said good-by in a most perfunctory manner, I went into a nearby diner to have a cup of coffee and recover somewhat. And there I saw Mary Kaufman and a man.

"Alas, it jumped to the eye. It was late; her husband, I remembered at once, was out of town, her attitude toward the man— Accept my assurances that there is a way a woman has of looking at a man that is completely unmistakable, and I saw it then. And if I were at all unsure, the expression on her face, when she looked up and saw me frozen in surprise, gave it all away.

"I left at once, of course, with no greeting of any kind, but the damage was done. She called me the next day, in agony of mind, the fool, fearful that I would carry stories to her husband, and gave me a totally unconvincing explanation. I assured her that it was a matter in which I did not interest myself in the least, that it was something so unimportant that I had already forgotten it. —I am glad, however, I did not have to face the man. Him, I would have knocked down."

Drake said, "Did you know the man?"

"Slightly," said Servais. "He moved in our circles in a very distant way. I knew his name; I could recognize him. —It didn't matter, for I never saw him after that. He was wise to stay away."

Avalon said, "But why did she commit suicide? Was she afraid her husband would find out?"

"Is one ever afraid of that in such a case?" demanded Servais, with a slight lifting of his lip. "And if she were, surely she would end the affair. No, no, it was something far more common than that. Something inevitable. In such an affair, gentlemen, there are strains and risks which are great and which actually add an element of romance. I am not entirely unaware of such things, I assure you.

"But the romance does not continue forever, whatever the story books may say, and it is bound to fade for one faster than for the other. Well then, it faded for the man in this case before it did for the woman—and the man took the kind of action one sometimes does in such affairs. He left—went—disappeared. And so the lady killed herself."

Trumbull drew himself up and frowned ferociously. "For what reason?"

"I assume for that reason, sir. It has been known to happen. I did not know of the man's disappearance, you understand, till afterward. After the suicide I went in search of him, feeling he was in some way responsible, and rather promising myself to relieve my feelings by bloodying his nose—I have a strong affection for my partner, you understand, and I felt his sufferings—but I discovered the fine lover had left two weeks before and left no forwarding address. He had no family and it was easy for him to leave, that blackguard. I could have tracked him down, I suppose, but my feelings were not strong enough to push me that far. And yet, I feel the guilt—"

"What guilt?" asked Avalon.

"It occurred to me that when I surprised them—quite unintentionally, of course—the element of risk to the man became unacceptably high. He knew I knew him. He may have felt that sooner or later it would come out and he did not wish to await results. If I had not stumbled into that diner they might still be together, she might still be alive, who knows?"

Rubin said, "That is farfetched, Jean. You can't deal rationally with the ifs of history. —But I have a thought."

"Yes, Manny?"

"After the suicide your partner was very quiet, nothing is important to him. I think you said that. But now he's quarreling with you violently, though he has never done that before, I gather. Something may have happened in addition to the suicide. Perhaps *now* he has discovered his wife's infidelity and the thought drives him mad."

Servais shook his head. "No, no. If you think I have told him, you are quite wrong. I admit I think of telling him now and then. It is difficult to see him, my dear friend, wasting away over a woman who, after all, was not worthy of him. It is not proper to pine away for one who was not faithful to him in life. Ought I not tell him this? Frequently, it seems to me that I should and even must. He will face the truth and begin life anew. —But then I think and even *know* that he will not believe me, that our friendship will be broken, and he will be worse off than before."

Rubin said, "You don't understand me. Might it not be that someone *else* has told him? How do you know you were the only one who knew?"

Servais seemed a bit startled. He considered it and said, "No. He would, in that case, certainly have told me the news. And I assure you, he would have told it to me with the highest degree of indignation and informed me that he at once attempted to strike the villain who would so malign his dead angel."

"Not," said Rubin, "if he had been told that *you* were his wife's lover. Even if he refused to believe it, even if he beat the informant to the ground, could he tell *you* the tale under such circumstances? And could he be entirely certain? Would he not find it impossible to avoid picking fights with you in such a case?"

Servais seemed still more startled. He said slowly, "It was, of course, not I. No one could possibly have thought so. Howard's wife did not in the least appeal to me, you understand." He looked up and said fiercely, "You must accept the fact that I am telling you the truth about this. It was *not* I, and I will *not* be suspected. If anyone had said it was I, it could only be out of deliberate malice."

"Maybe it was," said Rubin. "Might it not be the real lover who would make the accusation—out of fear you would give him away? By getting in his story first—"

"Why should he do this? He is away. No one suspects him. No one pursues him."

"He might not know that," said Rubin.

"Pardon me." Henry's voice sounded softly from the direction of the sideboard. "May I ask a question?"

"Certainly," said Rubin, and the odd silence fell that always did when the quiet waiter, whose presence rarely obtruded on the festivities, made himself heard.

Servais looked startled, but his politeness held. He said, "Can I do anything for you, waiter?"

Henry said, "I'm not sure, sir, that I quite understand the nature of the quarrel between yourself and your partner. Surely there must have been decisions of enormous complexity to make as far as the technical details of the colony were concerned."

"You don't know even a small part of it," said Servais indulgently.

"Did your partner and you quarrel over all those details, sir?"

"N-no," said Servais. "We did not quarrel. There were discussions, of course. It is useless to believe that two men, each with a strong will and pronounced opinions, will agree everywhere, or even anywhere, but it all worked out reasonably. We discussed, and eventually we came to some conclusion. Sometimes I had the better of it, sometimes he, sometimes neither or both."

"But then," said Henry, "there was this one argument over the actual location of the colony, over the crater, and there it was all different. He attacked even the name of the crater fiercely and, in this one case, left no room for the slightest compromise."

"No room at all. And you are right. Only in this one case."

Henry said, "Then I am to understand that at this time, when Mr. Rubin suspects that your partner is being irritated by suspicion of you, he was completely reasonable and civilized over every delicate point of Lunar engineering, and was wildly and unbearably stubborn only over the single matter of the site—over whether Copernicus or the other crater was to be the place where the colony was to be built?"

"Yes," said Servais with satisfaction. "That is precisely how it was and I see the point you are making, waiter. It is quite unbelievable to suppose that he would quarrel with me over the site out of ill-humor over suspicion that I have placed horns on him, when he does not quarrel with me on any other point. Assuredly, he does not suspect me of ill-dealing. I thank you, waiter."

Henry said, "May I go a little further, sir?"

"By all means," said Servais.

"Earlier in the evening," said Henry, "Mr. Rubin was kind enough to ask my opinion over the techniques of his profession. There was the question of deliberate omission of details by witnesses."

"Yes," said Servais, "I remember the discussion. But I did not deliberately omit any details."

"You did not mention the name of Mrs. Kaufman's lover."

Servais frowned. "I suppose I didn't, but it wasn't deliberate. It is entirely irrelevant."

"Perhaps it is," said Henry, "unless his name happens to be Bailey."

Servais froze in his chair. Then he said anxiously, "I don't recall mentioning it. Sacred— I see your point again, waiter. If it slips out now without my remembering it, it is possible to suppose that, without quite realizing it, I may have said something that led Howard to suspect—"

Gonzalo said, "Hey, Henry, I don't recall Jean giving us any name."

"Nor I," said Henry. "You did not give the name, sir."

Servais relaxed slowly and then said, frowning, "Then how did you know? Do you know these people?"

Henry shook his head. "No, sir, it was just a notion of mine that arose out of the story you told. From your reaction, I take it his name *is* Bailey?"

"Martin Bailey," said Servais. "How did you know?"

"The name of the crater in which you wished to place the site is Bahyee; the name of the city would be Camp Bahyee."

"Yes."

"But that is the French pronunciation of the name of a French astronomer. How is it spelled?"

Servais said, "B-a-i-l-ly. —Great God, *Bailly!*"

Henry said, "In English pronunciation, pronounced like the not uncommon surname Bailey. I am quite certain American astronomers use the English pronunciation, and that Mr. Kaufman does too. You hid that piece of information from us, Mr. Servais, because you never thought of the crater in any other way than Bahyee. Even looking at it, you would hear the French sound in your mind and make no connection with Bailey, the American surname."

Servais said, "But I still don't understand."

"Would your partner wish to publicize the name, and place the site of a Lunar colony in Bailly? Would he want to have the colony called Camp Bailly, after what a Bailey has done to him?"

"But he didn't *know* what Bailey had done to him," said Servais.

"How do you know that? Because there's an old saw that says the husband is always the last to know? How else can you explain his utterly irrational opposition to this one point, even his insistence that the name itself is horrible? It is too much to expect of coincidence."

"But if he knew—if he knew— He didn't tell me. Why fight over it? Why not explain?"

"I assume," said Henry, "he didn't know you knew. Would he shame his dead wife by telling you?"

Servais clutched at his hair. "I never thought— Not for a moment."

"There is more to think," said Henry sadly.

"What?"

"One might wonder how Bailey came to disappear, if your partner knew the tale. One might wonder if Bailey is alive? Is it not conceivable that Mr. Kaufman, placing all the blame on the other man, confronted his wife to tell her he had driven her lover away, even killed him, perhaps, and asked her to come back to him—and the response was suicide?"

"No," said Servais. "That is impossible."

"It would be best, then, to find Mr. Bailey and make sure he is alive. It is the one way of proving your partner's innocence. It may be a task for the police."

Servais had turned very pale. "I can't go to the police with a story like that."

"If you do not," said Henry, "it may be that your partner, brooding over what he has

done—if indeed he has done it—will eventually take justice into his own hands."

"You mean kill himself?" whispered Servais. "Is that the choice you are facing me with: accuse him to the police or wait for him to kill himself?"

"Or both," said Henry. "Life is cruel."

The Bicentennial Man

The Three Laws of Robotics:

1. *A robot may not injure a human being or, through inaction, allow a human being to come to harm.*
2. *A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.*
3. *A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.*

1.

Andrew Martin said, "Thank you," and took the seat offered him. He didn't look driven to the last resort, but he had been.

He didn't, actually, look anything, for there was a smooth blankness to his face, except for the sadness one imagined one saw in his eyes. His hair was smooth, light brown, rather fine, and there was no facial hair. He looked freshly and cleanly shaved. His clothes were distinctly old-fashioned, but neat and predominantly a velvety red-purple in color.

Facing him from behind the desk was the surgeon, and the nameplate on the desk included a fully identifying series of letters and numbers, which Andrew didn't bother with. To call him Doctor would be quite enough.

"When can the operation be carried through, Doctor?" he asked.

The surgeon said softly, with that certain inalienable note of respect that a robot always used to a human being, "I am not certain, sir, that I understand how or upon whom such an operation could be performed."

There might have been a look of respectful intransigence on the surgeon's face, if a robot of his sort, in lightly bronzed stainless steel, could have such an expression, or any expression.

Andrew Martin studied the robot's right hand, his cutting hand, as it lay on the desk in utter tranquillity. The fingers were long and shaped into artistically metallic looping curves so graceful and appropriate that one could imagine a scalpel fitting them and becoming, temporarily, one piece with them.

There would be no hesitation in his work, no stumbling, no quivering, no mistakes. That came with specialization, of course, a specialization so fiercely desired by humanity that few robots were, any longer, independently brained. A surgeon, of course, would have to be. And this one, though brained, was so limited in his capacity that he did not recognize Andrew—had probably never heard of him.

Andrew said, "Have you ever thought you would like to be a man?"

The surgeon hesitated a moment as though the question fitted nowhere in his allotted positronic pathways. "But I am a robot, sir."

"Would it be better to be a man?"

"It would be better, sir, to be a better surgeon. I could not be so if I were a man, but only if I were a more advanced robot. I would be pleased to be a more advanced robot."

"It does not offend you that I can order you about? That I can make you stand up, sit down, move right or left, by merely telling you to do so?"

"It is my pleasure to please you, sir. If your orders were to interfere with my functioning with respect to you or to any other human being, I would not obey you. The First Law, concerning my duty to human safety, would take precedence over the Second Law relating to obedience. Otherwise, obedience is my pleasure . . . But upon whom am I to perform this operation?"

"Upon me," said Andrew.

"But that is impossible. It is patently a damaging operation."

"That does not matter," said Andrew calmly.

"I must not inflict damage," said the surgeon.

"On a human being, you must not," said Andrew, "but I, too, am a robot."

2.

Andrew had appeared much more a robot when he had first been—manufactured. He had then been as much a robot in appearance as any that had ever existed, smoothly designed and functional.

He had done well in the home to which he had been brought in those days when robots in households, or on the planet altogether, had been a rarity.

There had been four in the home: Sir and Ma'am and Miss and Little Miss. He knew their names, of course, but he never used them. Sir was Gerald Martin.

His own serial number was NDR— He forgot the numbers. It had been a long time, of course, but if he had wanted to remember, he could not forget. He had not wanted to remember.


LINDAHN 1969

Little Miss had been the first to call him Andrew because she could not use the letters, and all the rest followed her in this.

Little Miss— She had lived ninety years and was long since dead. He had tried to call her Ma'am once, but she would not allow it. Little Miss she had been to her last day.

Andrew had been intended to perform the duties of a valet, a butler, a lady's maid. Those were the experimental days for him and, indeed, for all robots anywhere but in the industrial and exploratory factories and stations off Earth.

The Martins enjoyed him, and half the time he was prevented from doing his work because Miss and Little Miss would rather play with him.

It was Miss who understood first how this might be arranged. She said, "We order you to play with us and you must follow orders."

Andrew said, "I am sorry, Miss, but a prior order from Sir must surely take precedence."

But she said, "Daddy just said he hoped you would take care of the cleaning. That's not much of an order. I *order* you."

Sir did not mind. Sir was fond of Miss and of Little Miss, even more than Ma'am was, and Andrew was fond of them, too. At least, the effect they had upon his actions were those which in a human being would have been called the result of fondness. Andrew thought of it as fondness, for he did not know any other word for it.

It was for Little Miss that Andrew had carved a pendant out of wood. She had ordered him to. Miss, it seemed, had received an ivorite pendant with scrollwork for her birthday and Little Miss was unhappy over it. She had only a piece of wood, which she gave Andrew together with a small kitchen knife.

He had done it quickly and Little Miss said, "That's *nice*, Andrew. I'll show it to Daddy."

Sir would not believe it. "Where did you really get this, Mandy?" Mandy was what he called Little Miss. When Little Miss assured him she was really telling the truth, he turned to Andrew. "Did you do this, Andrew?"

"Yes, Sir."

"The design, too?"

"Yes, Sir."

"From what did you copy the design?"

"It is a geometric representation, Sir, that fit the grain of the wood."

The next day, Sir brought him another piece of wood, a larger one, and an electric vibro-knife. He said, "Make something out of this, Andrew. Anything you want to."

Andrew did so and Sir watched, then looked at the product a long time. After that, Andrew no longer waited on tables. He was ordered to read books on furniture design instead, and he learned to make cabinets and desks.

Sir said, "These are amazing productions, Andrew."

Andrew said, "I enjoy doing them, Sir."

"Enjoy?"

"It makes the circuits of my brain somehow flow more easily. I have heard you use the word 'enjoy' and the way you use it fits the way I feel. I enjoy doing them, Sir."

3.

Gerald Martin took Andrew to the regional offices of United States Robots and Mechanical Men, Inc. As a member of the Regional Legislature he had no trouble at all in gaining an interview with the Chief Robopsychologist. In fact, it was only as a member of the Regional Legislature that he qualified as a robot owner in the first place —in those early days when robots were rare.

Andrew did not understand any of this at the time, but in later years, with greater learning, he could re-view that early scene and understand it in its proper light.

The robopsychologist, Merton Mansky, listened with a gathering frown and more than once managed to stop his fingers at the point beyond which they would have irrevocably drummed on the table. He had drawn features and a lined forehead and looked as though he might be younger than he looked.

He said, "Robotics is not an exact art, Mr. Martin. I cannot explain it to you in detail, but the mathematics governing the plotting of the positronic pathways is far too complicated to permit of any but approximate solutions. Naturally, since we build everything about the Three Laws, those are incontrovertible. We will, of course, replace your robot—"

"Not at all," said Sir. "There is no question of failure on his part. He performs his assigned duties perfectly. The point is, he also carves wood in exquisite fashion and never the same twice. He produces works of art."

Mansky looked confused. "Strange. Of course, we're attempting generalized pathways these days . . . Really creative, you think?"

"See for yourself." Sir handed over a little sphere of wood on which there was a playground scene in which the boys and girls were almost too small to make out, yet they were in perfect proportion and blended so naturally with the grain that that, too, seemed to have been carved.

Mansky said, "*He* did that?" He handed it back with a shake of his head. "The luck of the draw. Something in the pathways."

"Can you do it again?"

"Probably not. Nothing like this has ever been reported."

"Good! I don't in the least mind Andrew's being the only one."

Mansky said, "I suspect that the company would like to have your robot back for study."

Sir said with sudden grimness, "Not a chance. Forget it." He turned to Andrew, "Let's go home now."

"As you wish, Sir," said Andrew.

4.

Miss was dating boys and wasn't about the house much. It was Little Miss, not as little as she was, who filled Andrew's horizon now. She never forgot that the very first

piece of wood carving he had done had been for her. She kept it on a silver chain about her neck.

It was she who first objected to Sir's habit of giving away the productions. She said, "Come on, Dad, if anyone wants one of them, let him pay for it. It's worth it."

Sir said, "It isn't like you to be greedy, Mandy."

"Not for us, Dad. For the artist."

Andrew had never heard the word before and when he had a moment to himself he looked it up in the dictionary. Then there was another trip, this time to Sir's lawyer.

Sir said to him, "What do you think of this, John?"

The lawyer was John Feingold. He had white hair and a pudgy belly, and the rims of his contact lenses were tinted a bright green. He looked at the small plaque Sir had given him. "This is beautiful . . . But I've heard the news. This is a carving made by your robot. The one you've brought with you."

"Yes, Andrew does them. Don't you, Andrew?"

"Yes, Sir," said Andrew.

"How much would you pay for that, John?" asked Sir.

"I can't say. I'm not a collector of such things."

"Would you believe I have been offered two hundred and fifty dollars for that small thing? Andrew has made chairs that have sold for five hundred dollars. There's two hundred thousand dollars in the bank out of Andrew's products."

"Good heavens, he's making you rich, Gerald."

"Half rich," said Sir. "Half of it is in an account in the name of Andrew Martin."

"The robot?"

"That's right, and I want to know if it's legal."

"Legal?" Feingold's chair creaked as he leaned back in it. "There are no precedents, Gerald. How did your robot sign the necessary papers?"

"He can sign his name and I brought in the signature. I didn't bring him in to the bank himself. Is there anything further that ought to be done?"

"Um." Feingold's eyes seemed to turn inward for a moment. Then he said, "Well, we can set up a trust to handle all finances in his name and that will place a layer of insulation between him and the hostile world. Further than that, my advice is you do nothing. No one is stopping you so far. If anyone objects, let *him* bring suit."

"And will you take the case if suit is brought?"

"For a retainer, certainly."

"How much?"

"Something like that," and Feingold pointed to the wooden plaque.

"Fair enough," said Sir.

Feingold chuckled as he turned to the robot. "Andrew, are you pleased that you have money?"

"Yes, sir."

"What do you plan to do with it?"

"Pay for things, sir, which otherwise Sir would have to pay for. It would save him expense, sir."

5.

The occasions came. Repairs were expensive, and revisions were even more so. With the years, new models of robots were produced and Sir saw to it that Andrew had the advantage of every new device until he was a paragon of metallic excellence. It was all at Andrew's expense.

Andrew insisted on that.

Only his positronic pathways were untouched. Sir insisted on that.

"The new ones aren't as good as you are, Andrew," he said. "The new robots are worthless. The company has learned to make the pathways more precise, more closely on the nose, more deeply on the track. The new robots don't shift. They do what they're designed for and never stray. I like you better."

"Thank you, Sir."

"And it's your doing, Andrew, don't you forget that. I am certain Mansky put an end to generalized pathways as soon as he had a good look at you. He didn't like the unpredictability . . . Do you know how many times he asked for you so he could place you under study? Nine times! I never let him have you, though, and now that he's retired, we may have some peace."

So Sir's hair thinned and grayed and his face grew pouchy, while Andrew looked rather better than he had when he first joined the family.

Ma'am had joined an art colony somewhere in Europe and Miss was a poet in New York. They wrote sometimes, but not often. Little Miss was married and lived not far away. She said she did not want to leave Andrew and when her child, Little Sir, was born, she let Andrew hold the bottle and feed him.

With the birth of a grandson, Andrew felt that Sir had someone now to replace those who had gone. It would not be so unfair to come to him with the request.

Andrew said, "Sir, it is kind of you to have allowed me to spend my money as I wished."

"It was your money, Andrew."

"Only by your voluntary act, Sir. I do not believe the law would have stopped you from keeping it all."

"The law won't persuade me to do wrong, Andrew."

"Despite all expenses, and despite taxes, too, Sir, I have nearly six hundred thousand dollars."

"I know that, Andrew."

"I want to give it to you, Sir."

"I won't take it, Andrew."

"In exchange for something you can give me, Sir."

"Oh? What is that, Andrew?"

"My freedom, Sir."

"Your—"

"I wish to buy my freedom, Sir."

6.

It wasn't that easy. Sir had flushed, had said "For God's sake!" had turned on his heel, and stalked away.

It was Little Miss who brought him around, defiantly and harshly—and in front of Andrew. For thirty years, no one had hesitated to talk in front of Andrew, whether the matter involved Andrew or not. He was only a robot.

She said, "Dad, why are you taking it as a personal affront? He'll still be here. He'll still be loyal. He can't help that. It's built in. All he wants is a form of words. He wants to be called free. Is that so terrible? Hasn't he earned it? Heavens, he and I have been talking about it for years."

"Talking about it for years, have you?"

"Yes, and over and over again, he postponed it for fear he would hurt you. I *made* him put it up to you."

"He doesn't know what freedom is. He's a robot."

"Dad, you don't know him. He's read everything in the library. I don't know what he feels inside but I don't know what *you* feel inside. When you talk to him you'll find he reacts to the various abstractions as you and I do, and what else counts? If someone else's reactions are like your own, what more can you ask for?"

"The law won't take that attitude," Sir said angrily. "See here, you!" He turned to Andrew with a deliberate grate in his voice. "I can't free you except by doing it legally, and if it gets into the courts, you not only won't get your freedom but the law will take official cognizance of your money. They'll tell you that a robot has no right to earn money. Is this rigmarole worth losing your money?"

"Freedom is without price, Sir," said Andrew. "Even the chance of freedom is worth the money."

7.

The court might also take the attitude that freedom was without price, and might decide that for no price, however great, could a robot buy its freedom.

The simple statement of the regional attorney who represented those who had brought a class action to oppose the freedom was this: The word "freedom" had no meaning when applied to a robot. Only a human being could be free.

He said it several times, when it seemed appropriate; slowly, with his hand coming down rhythmically on the desk before him to mark the words.

Little Miss asked permission to speak on behalf of Andrew. She was recognized by her full name, something Andrew had never heard pronounced before:

"Amanda Laura Martin Charney may approach the bench."

She said, "Thank you, your honor. I am not a lawyer and I don't know the proper way of phrasing things, but I hope you will listen to my meaning and ignore the words.

"Let's understand what it means to be free in Andrew's case. In some ways, he *is* free. I think it's at least twenty years since anyone in the Martin family gave him an order to do something that we felt he might not do of his own accord.

"But we can, if we wish, give him an order to do anything, couch it as harshly as we wish, because he is a machine that belongs to us. Why should we be in a position to do so, when he has served us so long, so faithfully, and earned so much money for us? He owes us nothing more. The debt is entirely on the other side.

"Even if we were legally forbidden to place Andrew in involuntary servitude, he would still serve us voluntarily. Making him free would be a trick of words only, but it would mean much to him. It would give him everything and cost us nothing."

For a moment the Judge seemed to be suppressing a smile. "I see your point, Mrs. Charney. The fact is that there is no binding law in this respect and no precedent. There is, however, the unspoken assumption that only a man can enjoy freedom. I can make new law here, subject to reversal in a higher court, but I cannot lightly run counter to that assumption. Let me address the robot. Andrew!"

"Yes, your honor."

It was the first time Andrew had spoken in court and the Judge seemed astonished for a moment at the human timbre of the voice. He said, "Why do you want to be free, Andrew? In what way will this matter to you?"

Andrew said, "Would you wish to be a slave, your honor?"

"But you are not a slave. You are a perfectly good robot, a genius of a robot I am given to understand, capable of an artistic expression that can be matched nowhere. What more can you do if you were free?"

"Perhaps no more than I do now, your honor, but with greater joy. It has been said in this courtroom that only a human being can be free. It seems to me that only someone who wishes for freedom can be free. I wish for freedom."

And it was that that cued the Judge. The crucial sentence in his decision was: "There is no right to deny freedom to any object with a mind advanced enough to grasp the concept and desire the state."

It was eventually upheld by the World Court.

8.

Sir remained displeased and his harsh voice made Andrew feel almost as though he were being short-circuited.

Sir said, "I don't want your damned money, Andrew. I'll take it only because you won't feel free otherwise. From now on, you can select your own jobs and do them as you please. I will give you no orders, except this one—that you do as you please. But I am still responsible for you; that's part of the court order. I hope you understand that."

Little Miss interrupted. "Don't be irascible, Dad. The responsibility is no great chore. You know you won't have to do a thing. The Three Laws still hold."

"Then how is he free?"

Andrew said, "Are not human beings bound by their laws, Sir?"

Sir said, "I'm not going to argue." He left, and Andrew saw him only infrequently after that.

Little Miss came to see him frequently in the small house that had been built and made over for him. It had no kitchen, of course, nor bathroom facilities. It had just two rooms; one was a library and one was a combination storeroom and workroom. Andrew accepted many commissions and worked harder as a free robot than he ever had before, till the cost of the house was paid for and the structure legally transferred to him.

One day Little Sir came . . . No, George! Little Sir had insisted on that after the court decision. "A free robot doesn't call anyone Little Sir," George had said. "I call you Andrew. You must call me George."

It was phrased as an order, so Andrew called him George—but Little Miss remained Little Miss.

The day George came alone, it was to say that Sir was dying. Little Miss was at the bedside but Sir wanted Andrew as well.

Sir's voice was quite strong, though he seemed unable to move much. He struggled to get his hand up. "Andrew," he said, "Andrew— Don't help me, George. I'm only dying; I'm not crippled . . . Andrew, I'm glad you're free. I just wanted to tell you that."

Andrew did not know what to say. He had never been at the side of someone dying before, but he knew it was the human way of ceasing to function. It was an involuntary and irreversible dismantling, and Andrew did not know what to say that might be appropriate. He could only remain standing, absolutely silent, absolutely motionless.

When it was over, Little Miss said to him, "He may not have seemed friendly to you toward the end, Andrew, but he was old, you know, and it hurt him that you should want to be free."

And then Andrew found the words to say. He said, "I would never have been free without him, Little Miss."

9.

It was only after Sir's death that Andrew began to wear clothes. He began with an old pair of trousers at first, a pair that George had given him.

George was married now, and a lawyer. He had joined Feingold's firm. Old Feingold was long since dead but his daughter had carried on and eventually the firm's name became Feingold and Martin. It remained so even when the daughter retired and no Feingold took her place. At the time Andrew put on clothes for the first time, the Martin name had just been added to the firm.

George had tried not to smile, the first time Andrew put on the trousers, but to Andrew's eyes the smile was clearly there.

George showed Andrew how to manipulate the static charge so as to allow the trousers to open, wrap about his lower body, and move shut. George demonstrated on his own trousers, but Andrew was quite aware that it would take him awhile to duplicate that one flowing motion.

George said, "But why do you want trousers, Andrew? Your body is so beautifully

functional it's a shame to cover it—especially when you needn't worry about either temperature control or modesty. And it doesn't cling properly, not on metal."

Andrew said, "Are not human bodies beautifully functional, George? Yet you cover yourselves."

"For warmth, for cleanliness, for protection, for decorativeness. None of that applies to you."

Andrew said, "I feel bare without clothes. I feel different, George."

"Different! Andrew, there are millions of robots on Earth now. In this region, according to the last census, there are almost as many robots as there are men."

"I know, George. There are robots doing every conceivable type of work."

"And none of them wear clothes."

"But none of them are free, George."

Little by little, Andrew added to the wardrobe. He was inhibited by George's smile and by the stares of the people who commissioned work.

He might be free, but there was built into him a carefully detailed program concerning his behavior toward people, and it was only by the tiniest steps that he dared advance. Open disapproval would set him back months.

Not everyone accepted Andrew as free. He was incapable of resenting that and yet there was a difficulty about his thinking process when he thought of it.

Most of all, he tended to avoid putting on clothes—or too many of them—when he thought Little Miss might come to visit him. She was old now and was often away in some warmer climate, but when she returned the first thing she did was visit him.

On one of her returns, George said ruefully, "She's got me, Andrew. I'll be running for the Legislature next year. Like grandfather, she says, like grandson."

"Like grandfather—" Andrew stopped, uncertain.

"I mean that I, George, the grandson, will be like Sir, the grandfather, who was in the Legislature once."

Andrew said, "It would be pleasant, George, if Sir were still—" He paused, for he did not want to say, "in working order." That seemed inappropriate.

"Alive," said George. "Yes, I think of the old monster now and then, too."

It was a conversation Andrew thought about. He had noticed his own incapacity in speech when talking with George. Somehow the language had changed since Andrew had come into being with an innate vocabulary. Then, too, George used a colloquial speech, as Sir and Little Miss had not. Why should he have called Sir a monster when surely that word was not appropriate?

Nor could Andrew turn to his own books for guidance. They were old and most dealt with woodworking, with art, with furniture design. There were none on language, none on the way of human beings.

It was at that moment it seemed to him that he must seek the proper books; and as a free robot, he felt he must not ask George. He would go to town and use the library. It was a triumphant decision and he felt his electropotential grow distinctly higher until he had to throw in an impedance coil.

He put on a full costume, even including a shoulder chain of wood. He would have preferred the glitter plastic but George had said that wood was much more appropriate and that polished cedar was considerably more valuable as well.

He had placed a hundred feet between himself and the house before gathering resistance brought him to a halt. He shifted the impedance coil out of circuit, and when that did not seem to help enough, he returned to his home and on a piece of notepaper wrote neatly, "I have gone to the library," and placed it in clear view on his worktable.

10.

Andrew never quite got to the library. He had studied the map. He knew the route, but not the appearance of it. The actual landmarks did not resemble the symbols on the map and he would hesitate. Eventually he thought he must have somehow gone wrong, for everything looked strange.

He passed an occasional field robot, but at the time he decided he should ask his way, there were none in sight. A vehicle passed and did not stop. He stood irresolute, which meant calmly motionless, and then coming across the field toward him were two human beings.

He turned to face them, and they altered their course to meet him. A moment before, they had been talking loudly; he had heard their voices; but now they were silent. They had the look that Andrew associated with human uncertainty, and they were young, but not very young. Twenty perhaps? Andrew could never judge human age.

He said, "Would you describe to me the route to the town library, sirs?"

One of them, the taller of the two, whose tall hat lengthed him still farther, almost grotesquely, said, not to Andrew, but to the other, "It's a robot."

The other had a bulbous nose and heavy eyelids. He said, not to Andrew, but to the first, "It's wearing clothes."

The tall one snapped his fingers. "It's the free robot. They have a robot at the Martins who isn't owned by anybody. Why else would it be wearing clothes?"

"Ask it," said the one with the nose.

"Are you the Martin robot?" asked the tall one.

"I am Andrew Martin, sir," said Andrew.

"Good. Take off your clothes. Robots don't wear clothes." He said to the other, "That's disgusting. Look at him."

Andrew hesitated. He hadn't heard an order in that tone of voice in so long that his Second Law circuits had momentarily jammed.

The tall one said, "Take off your clothes. I order you."

Slowly, Andrew began to remove them.

"Just drop them," said the tall one.

The nose said, "If it doesn't belong to anyone, he could be ours as much as someone else's."

"Anyway," said the tall one, "who's to object to anything we do? We're not damaging property . . . Stand on your head." That was to Andrew.

"The head is not meant—" began Andrew.

"That's an order. If you don't know how, try anyway."

Andrew hesitated again, then bent to put his head on the ground. He tried to lift his legs and fell, heavily.

The tall one said, "Just lie there." He said to the other, "We can take him apart. Ever take a robot apart?"

"Will he let us?"

"How can he stop us?"

There was no way Andrew could stop them, if they ordered him not to resist in a forceful enough manner. Second Law of obedience took precedence over the Third Law of self-preservation. In any case, he could not defend himself without possibly

hurting them and that would mean breaking the First Law. At that thought, every motile unit contracted slightly and he quivered as he lay there.

The tall one walked over and pushed at him with his foot. "He's heavy. I think we'll need tools to do the job."

The nose said, "We could order him to take himself apart. It would be fun to watch him try."

"Yes," said the tall one thoughtfully, "but let's get him off the road. If someone comes along—"

It was too late. Someone had indeed come along and it was George. From where he lay, Andrew had seen him topping a small rise in the middle distance. He would have liked to signal him in some way, but the last order had been "Just lie there!"

George was running now and he arrived somewhat winded. The two young men stepped back a little and then waited thoughtfully.

George said anxiously, "Andrew, has something gone wrong?"

Andrew said, "I am well, George."

"Then stand up . . . What happened to your clothes?"

The tall man said, "That your robot, mac?"

George turned sharply. "He's no one's robot. What's been going on here?"

"We politely asked him to take his clothes off. What's that to you if you don't own him?"

George said, "What were they doing, Andrew?"

Andrew said, "It was their intention in some way to dismember me. They were about to move me to a quiet spot and order me to dismember myself."

George looked at the two and his chin trembled. The two young men retreated no further. They were smiling. The tall one said lightly, "What are you going to do, pudgy? Attack us?"

George said, "No. I don't have to. This robot has been with my family for over seventy years. He knows us and he values us more than he values anyone else. I am going to tell him that you two are threatening my life and that you plan to kill me. I will ask him to defend me. In choosing between me and you two, he will choose me. Do you know what will happen to you when he attacks you?"

The two were backing away slightly, looking uneasy.

George said sharply, "Andrew, I am in danger and about to come to harm from these young men. Move toward them!"

Andrew did so, and the two young men did not wait. They ran fleetly.

"All right, Andrew, relax," said George. He looked unstrung. He was far past the age where he could face the possibility of a dustup with one young man, let alone two.

Andrew said, "I couldn't have hurt them, George. I could see they were not attacking you."

"I didn't order you to attack them; I only told you to move toward them. Their own fears did the rest."

"How can they fear robots?"

"It's a disease of mankind, one of which it is not yet cured. But never mind that. What the devil are you doing here, Andrew? I was on the point of turning back and hiring a helicopter when I found you. How did you get it into your head to go to the library? I would have brought you any books you needed."

"I am a—" began Andrew.

"Free robot. Yes, yes. All right, what did you want in the library?"

"I want to know more about human beings, about the world, about everything. And

about robots, George. I want to write a history about robots."

George said, "Well, let's walk home . . . And pick up your clothes first. Andrew, there are a million books on robotics and all of them include histories of the science. The world is growing saturated not only with robots but with information about robots."

Andrew shook his head, a human gesture he had lately begun to make. "Not a history of robotics, George. A history of *robots*, by a robot. I want to explain how robots feel about what has happened since the first ones were allowed to work and live on Earth."

George's eyebrows lifted, but he said nothing in direct response.

11.

Little Miss was just past her eighty-third birthday, but there was nothing about her that was lacking in either energy or determination. She gestured with her cane oftener than she propped herself up with it.

She listened to the story in a fury of indignation. She said, "George, that's horrible. Who were those young ruffians?"

"I don't know. What difference does it make? In the end they did no damage."

"They might have. You're a lawyer, George, and if you're well off, it's entirely due to the talent of Andrew. It was the money *he* earned that is the foundation of everything we have. He provides the continuity for this family and I will *not* have him treated as a wind-up toy."

"What would you have me do, Mother?" asked George.

"I said you're a lawyer. Don't you listen? You set up a test case somehow, and you force the regional courts to declare for robot rights and get the Legislature to pass the necessary bills, and carry the whole thing to the World Court, if you have to. I'll be watching, George, and I'll tolerate no shirking."

She was serious, and what began as a way of soothing the fearsome old lady became an involved matter with enough legal entanglement to make it interesting. As senior partner of Feingold and Martin, George plotted strategy but left the actual work to his junior partners, with much of it a matter for his son, Paul, who was also a member of the firm and who reported dutifully nearly every day to his grandmother. She, in turn, discussed it every day with Andrew.

Andrew was deeply involved. His work on his book on robots was delayed again, as he pored over the legal arguments and even, at times, made very diffident suggestions.

He said, "George told me that day that human beings have always been afraid of robots. As long as they are, the courts and the legislatures are not likely to work hard on behalf of robots. Should there not be something done about public opinion?"

So while Paul stayed in court, George took to the public platform. It gave him the advantage of being informal and he even went so far sometimes as to wear the new, loose style of clothing which he called drapery. Paul said, "Just don't trip over it on stage, Dad."

George said despondently, "I'll try not to."

He addressed the annual convention of holo-news editors on one occasion and said, in part:

"If, by virtue of the Second Law, we can demand of any robot unlimited obedience in all respects not involving harm to a human being, then any human being, *any* human being, has a fearsome power over any robot, *any* robot. In particular, since Second Law supersedes Third Law, *any* human being can use the law of obedience to overcome the law of self-protection. He can order any robot to damage itself or even destroy itself for any reason, or for no reason.

"Is this just? Would we treat an animal so? Even an inanimate object which has given us good service has a claim on our consideration. And a robot is not insensible; it is not an animal. It can think well enough to enable it to talk to us, reason with us, joke with us. Can we treat them as friends, can we work together with them, and not give them some of the fruit of that friendship, some of the benefit of co-working?

"If a man has the right to give a robot any order that does not involve harm to a human being, he should have the decency never to give a robot any order that involves harm to a robot, unless human safety absolutely requires it. With great power goes great responsibility, and if the robots have Three Laws to protect men, is it too much to ask that men have a law or two to protect robots?"

Andrew was right. It was the battle over public opinion that held the key to courts and Legislature and in the end a law passed which set up conditions under which robot-harming orders were forbidden. It was endlessly qualified and the punishments for violating the law were totally inadequate, but the principle was established. The final passage by the World Legislature came through on the day of Little Miss's death.

That was no coincidence. Little Miss held on to life desperately during the last debate and let go only when word of victory arrived. Her last smile was for Andrew. Her last words were: "You have been good to us, Andrew."

She died with her hand holding his, while her son and his wife and children remained at a respectful distance from both.

12.

Andrew waited patiently while the receptionist disappeared into the inner office. It might have used the holographic chatterbox, but unquestionably it was unmanned (or perhaps unroboted) by having to deal with another robot rather than with a human being.

Andrew passed the time revolving the matter in his mind. Could "unroboted" be used as an analogue of "unmanned," or had "unmanned" become a metaphoric term sufficiently divorced from its original literal meaning to be applied to robots—or to women for that matter?

Such problems came frequently as he worked on his book on robots. The trick of thinking out sentences to express all complexities had undoubtedly increased his vocabulary.

Occasionally, someone came into the room to stare at him and he did not try to avoid the glance. He looked at each calmly, and each in turn looked away.

Paul Martin finally came out. He looked surprised, or he would have if Andrew could have made out his expression with certainty. Paul had taken to wearing the heavy makeup that fashion was dictating for both sexes and though it made sharper and firmer the somewhat bland lines of his face, Andrew disapproved. He found that disapproving of human beings, as long as he did not express it verbally, did not make him very uneasy. He could even write the disapproval. He was sure it had not always been so.

Paul said, "Come in, Andrew. I'm sorry I made you wait but there was something I *had* to finish. Come in. You had said you wanted to talk to me, but I didn't know you meant here in town."

"If you are busy, Paul, I am prepared to continue to wait."

Paul glanced at the interplay of shifting shadows on the dial on the wall that served as timepiece and said, "I can make some time. Did you come alone?"

"I hired an automatobile."

"Any trouble?" Paul asked, with more than a trace of anxiety.

"I wasn't expecting any. My rights are protected."

Paul looked the more anxious for that. "Andrew, I've explained that the law is unenforceable, at least under most conditions . . . And if you insist on wearing clothes, you'll run into trouble eventually—just like that first time."

"And only time, Paul. I'm sorry you are displeased."

"Well, look at it this way; you are virtually a living legend, Andrew, and you are too valuable in many different ways for you to have any right to take chances with yourself . . . How's the book coming?"

"I am approaching the end, Paul. The publisher is quite pleased."

"Good!"

"I don't know that he's necessarily pleased with the book as a book. I think he expects to sell many copies because it's written by a robot and it's that that pleases him."

"Only human, I'm afraid."

"I am not displeased. Let it sell for whatever reason since it will mean money and I can use some."

"Grandmother left you—"

"Little Miss was generous, and I'm sure I can count on the family to help me out further. But it is the royalties from the book on which I am counting to help me through the next step."

"What next step is that?"

"I wish to see the head of U. S. Robots and Mechanical Men, Inc. I have tried to make an appointment, but so far I have not been able to reach him. The corporation did not cooperate with me in the writing of the book, so I am not surprised, you understand."

Paul was clearly amused. "Cooperation is the last thing you can expect. They didn't cooperate with us in our great fight for robot rights. Quite the reverse and you can see why. Give a robot rights and people may not want to buy them."

"Nevertheless," said Andrew, "if you call them, you may obtain an interview for me."

"I'm no more popular with them than you are, Andrew."

"But perhaps you can hint that by seeing me they may head off a campaign by Feingold and Martin to strengthen the rights of robots further."

"Wouldn't that be a lie, Andrew?"

"Yes, Paul, and I can't tell one. That is why you must call."

"Ah, you can't lie, but you can urge me to tell a lie, is that it? You're getting more human all the time, Andrew."

13.

It was not easy to arrange, even with Paul's supposedly weighted name.

But it was finally carried through and, when it was, Harley Smythe-Robertson, who, on his mother's side, was descended from the original founder of the corporation and who had adopted the hyphenation to indicate it, looked remarkably unhappy. He was approaching retirement age and his entire tenure as president had been devoted to the matter of robot rights. His gray hair was plastered thinly over the top of his scalp, his face was not made up, and he eyed Andrew with brief hostility from time to time.

Andrew said, "Sir, nearly a century ago, I was told by a Merton Mansky of this corporation that the mathematics governing the plotting of the positronic pathways was far too complicated to permit of any but approximate solutions and that therefore my own capacities were not fully predictable."

"That was a century ago." Smythe-Robertson hesitated, then said icily, "*Sir.* It is true no longer. Our robots are made with precision now and are trained precisely to their jobs."

"Yes," said Paul, who had come along, as he said, to make sure that the corporation played fair, "with the result that my receptionist must be guided at every point once events depart from the conventional, however slightly."

Smythe-Robertson said, "You would be much more displeased if it were to improvise."

Andrew said, "Then you no longer manufacture robots like myself which are flexible and adaptable."

"No longer."

"The research I have done in connection with my book," said Andrew, "indicates that I am the oldest robot presently in active operation."

"The oldest presently," said Smythe-Robertson, "and the oldest ever. The oldest that will ever be. No robot is useful after the twenty-fifth year. They are called in and replaced with newer models."

"No robot *as presently manufactured* is useful after the twenty-fifth year," said Paul pleasantly. "Andrew is quite exceptional in this respect."

Andrew, adhering to the path he had marked out for himself, said, "As the oldest robot in the world and the most flexible, am I not unusual enough to merit special treatment from the company?"

"Not at all," said Smythe-Robertson freezingly. "Your unusualness is an embarrassment to the company. If you were on lease, instead of having been a sale outright through some mischance, you would long since have been replaced."

"But that is exactly the point," said Andrew. "I am a free robot and I own myself. Therefore I come to you and ask you to replace me. You cannot do this without the

owner's consent. Nowadays, that consent is extorted as a condition of the lease, but in my time this did not happen."

Smythe-Robertson was looking both startled and puzzled, and for a moment there was silence. Andrew found himself staring at the holograph on the wall. It was a death mask of Susan Calvin, patron saint of all roboticists. She was dead nearly two centuries now, but as a result of writing his book Andrew knew her so well he could half persuade himself that he had met her in life.

Smythe-Robertson said, "How can I replace you for you? If I replace you as robot, how can I donate the new robot to you as owner since in the very act of replacement you cease to exist?" He smiled grimly.

"Not at all difficult," interposed Paul. "The seat of Andrew's personality is his positronic brain and it is the one part that cannot be replaced without creating a new robot. The positronic brain, therefore, is Andrew the owner. Every other part of the robotic body can be replaced without affecting the robot's personality, and those other parts are the brain's possessions. Andrew, I should say, wants to supply his brain with a new robotic body."

"That's right," said Andrew calmly. He turned to Smythe-Robertson. "You have manufactured androids, haven't you? Robots that have the outward appearance of humans complete to the texture of the skin?"

Smythe-Robertson said, "Yes, we have. They worked perfectly well, with their synthetic fibrous skins and tendons. There was virtually no metal anywhere except for the brain, yet they were nearly as tough as metal robots. They were tougher, weight for weight."

Paul looked interested. "I didn't know that. How many are on the market?"

"None," said Smythe-Robertson. "They were much more expensive than metal models and a market survey showed they would not be accepted. They looked too human."

Andrew said, "But the corporation retains its expertise, I assume. Since it does, I wish to request that I be replaced by an organic robot, an android."

Paul looked surprised. "Good Lord," he said.

Smythe-Robertson stiffened. "Quite impossible!"

"Why is it impossible?" asked Andrew. "I will pay any reasonable fee, of course."

Smythe-Robertson said, "We do not manufacture androids."

"You do not *choose* to manufacture androids," interposed Paul quickly. "That is not the same as being unable to manufacture them."

Smythe-Robertson said, "Nevertheless, the manufacture of androids is against public policy."

"There is no law against it," said Paul.

"Nevertheless, we do not manufacture them, and we will not."

Paul cleared his throat. "Mr. Smythe-Robertson," he said, "Andrew is a free robot who is under the purview of the law guaranteeing robot rights. You are aware of this, I take it?"

"Only too well."

"This robot, as a free robot, chooses to wear clothes. This results in his being frequently humiliated by thoughtless human beings despite the law against the humiliation of robots. It is difficult to prosecute vague offenses that don't meet with the general disapproval of those who must decide on guilt and innocence."

"U. S. Robots understood that from the start. Your father's firm unfortunately did not."

"My father is dead now," said Paul, "but what I see is that we have here a clear offense with a clear target."

"What are you talking about?" said Smythe-Robertson.

"My client, Andrew Martin—he has just become my client—is a free robot who is entitled to ask U. S. Robots and Mechanical Men, Inc., for the right of replacement, which the corporation supplies anyone who owns a robot for more than twenty-five years. In fact, the corporation insists on such replacement."

Paul was smiling and thoroughly at his ease. He went on, "The positronic brain of my client is the owner of the body of my client—which is certainly more than twenty-five years old. The positronic brain demands the replacement of the body and offers to pay any reasonable fee for an android body as that replacement. If you refuse the request, my client undergoes humiliation and we will sue.

"While public opinion would not ordinarily support the claim of a robot in such a case, may I remind you that U. S. Robots is not popular with the public generally. Even those who most use and profit from robots are suspicious of the corporation. This may be a hangover from the days when robots were widely feared. It may be resentment against the power and wealth of U. S. Robots which has a worldwide monopoly. Whatever the cause may be, the resentment exists and I think you will find that you would prefer not to withstand a lawsuit, particularly since my client is wealthy and will live for many more centuries and will have no reason to refrain from fighting the battle forever."

Smythe-Robertson had slowly reddened. "You are trying to force me to . . ."

"I force you to do nothing," said Paul. "If you wish to refuse to accede to my client's reasonable request, you may by all means do so and we will leave without another word . . . But we will sue, as is certainly our right, and you will find that you will eventually lose."

Smythe-Robertson said, "Well—" and paused.

"I see that you are going to accede," said Paul. "You may hesitate but you will come to it in the end. Let me assure you, then, of one further point. If, in the process of transferring my client's positronic brain from his present body to an organic one, there is any damage, however slight, then I will never rest till I've nailed the corporation to the ground. I will, if necessary, take every possible step to mobilize public opinion against the corporation if one brain path of my client's platinum-iridium essence is scrambled." He turned to Andrew and said, "Do you agree to all this, Andrew?"

Andrew hesitated a full minute. It amounted to the approval of lying, of blackmail, of the badgering and humiliation of a human being. But not physical harm, he told himself, not physical harm.

He managed at last to come out with a rather faint "Yes."

14.

It was like being constructed again. For days, then for weeks, finally for months, Andrew found himself not himself somehow, and the simplest actions kept giving rise to hesitation.

Paul was frantic. "They've damaged you, Andrew. We'll have to institute suit."

Andrew spoke very slowly. "You mustn't. You'll never be able to prove—something —m-m-m-m—"

"Malice?"

"Malice. Besides, I grow stronger, better. It's the tr-tr-tr—"

"Tremble?"

"Trauma. After all, there's never been such an op—op—op— before."

Andrew could feel his brain from the inside. No one else could. He knew he was well and during the months that it took him to learn full coordination and full positronic interplay, he spent hours before the mirror.

Not quite human! The face was stiff—too stiff—and the motions were too deliberate. They lacked the careless free flow of the human being, but perhaps that might come with time. At least he could wear clothes without the ridiculous anomaly of a metal face going along with it.

Eventually he said, "I will be going back to work."

Paul laughed and said, "That means you are well. What will you be doing? Another book?"

"No," said Andrew seriously. "I live too long for any one career to seize me by the throat and never let me go. There was a time when I was primarily an artist and I can still turn to that. And there was a time when I was a historian and I can still turn to that. But now I wish to be a robobiologist."

"A robopsychologist, you mean."

"No. That would imply the study of positronic brains and at the moment I lack the desire to do that. A robobiologist, it seems to me, would be concerned with the working of the body attached to that brain."

"Wouldn't that be a roboticist?"

"A roboticist works with a metal body. I would be studying an organic humanoid body, of which I have the only one, as far as I know."

"You narrow your field," said Paul thoughtfully. "As an artist, all conception is yours; as a historian, you dealt chiefly with robots; as a robobiologist, you will deal with yourself."

Andrew nodded. "It would seem so."

Andrew had to start from the very beginning, for he knew nothing of ordinary biology, almost nothing of science. He became a familiar sight in the libraries, where he sat at the electronic indices for hours at a time, looking perfectly normal in clothes. Those few who knew he was a robot in no way interfered with him.

He built a laboratory in a room which he added to his house, and his library grew, too.

Years passed, and Paul came to him one day and said, "It's a pity you're no longer working on the history of robots. I understand U. S. Robots is adopting a radically new policy."

Paul had aged, and his deteriorating eyes had been replaced with photoptic cells. In that respect, he had drawn closer to Andrew. Andrew said, "What have they done?"

"They are manufacturing central computers, gigantic positronic brains, really, which communicate with anywhere from a dozen to a thousand robots by microwave. The robots themselves have no brains at all. They are the limbs of the gigantic brain, and the two are physically separate."

"Is that more efficient?"

"U. S. Robots claims it is. Smythe-Robertson established the new direction before

he died, however, and it's my notion that it's a backlash at you. U. S. Robots is determined that they will make no robots that will give them the type of trouble you have, and for that reason they separate brain and body. The brain will have no body to wish changed; the body will have no brain to wish anything.

"It's amazing, Andrew," Paul went on, "the influence you have had on the history of robots. It was your artistry that encouraged U. S. Robots to make robots more precise and specialized; it was your freedom that resulted in the establishment of the principle of robotic rights; it was your insistence on an android body that made U. S. Robots switch to brain-body separation."

Andrew said, "I suppose in the end the corporation will produce one vast brain controlling several billion robotic bodies. All the eggs will be in one basket. Dangerous. Not proper at all."

"I think you're right," said Paul, "but I don't suspect it will come to pass for a century at least and I won't live to see it. In fact, I may not live to see next year."

"Paul!" said Andrew, in concern.

Paul shrugged. "We're mortal, Andrew. We're not like you. It doesn't matter too much, but it does make it important to assure you on one point. I'm the last of the human Martins. There are collaterals descended from my great-aunt, but they don't count. The money I control personally will be left to the trust in your name and as far as anyone can foresee the future, you will be economically secure."

"Unnecessary," said Andrew, with difficulty. In all this time, he could not get used to the deaths of the Martins.

Paul said, "Let's not argue. That's the way it's going to be. What are you working on?"

"I am designing a system for allowing androids—myself—to gain energy from the combustion of hydrocarbons, rather than from atomic cells."

Paul raised his eyebrows. "So that they will breathe and eat?"

"Yes."

"How long have you been pushing in that direction?"

"For a long time now, but I think I have designed an adequate combustion chamber for catalyzed controlled breakdown."

"But why, Andrew? The atomic cell is surely infinitely better."

"In some ways, perhaps, but the atomic cell is inhuman."

15.

It took time, but Andrew had time. In the first place, he did not wish to do anything till Paul had died in peace.

With the death of the great-grandson of Sir, Andrew felt more nearly exposed to a hostile world and for that reason was the more determined to continue the path he had long ago chosen.

Yet he was not really alone. If a man had died, the firm of Feingold and Martin lived, for a corporation does not die any more than a robot does. The firm had its directions and it followed them soullessly. By the way of the trust and through the law firm,

Andrew continued to be wealthy. And in return for their own large annual retainer, Feingold and Martin involved themselves in the legal aspects of the new combustion chamber.

When the time came for Andrew to visit U. S. Robots and Mechanical Men, Inc., he did it alone. Once he had gone with Sir and once with Paul. This time, the third time, he was alone and manlike.

U. S. Robots had changed. The production plant had been shifted to a large space station, as had grown to be the case with more and more industries. With them had gone many robots. The Earth itself was becoming parklike, with its one-billion-person population stabilized and perhaps not more than thirty per cent of its at least equally large robot population independently brained.

The Director of Research was Alvin Magdescu, dark of complexion and hair, with a little pointed beard and wearing nothing above the waist but the breastband that fashion dictated. Andrew himself was well covered in the older fashion of several decades back.

Magdescu said, "I know you, of course, and I'm rather pleased to see you. You're our most notorious product and it's a pity old Smythe-Robertson was so set against you. We could have done a great deal with you."

"You still can," said Andrew.

"No, I don't think so. We're past the time. We've had robots on Earth for over a century, but that's changing. It will be back to space with them and those that stay here won't be brained."

"But there remains myself, and I stay on Earth."

"True, but there doesn't seem to be much of the robot about you. What new request have you?"

"To be still less a robot. Since I am so far organic, I wish an organic source of energy. I have here the plans—"

Magdescu did not hasten through them. He might have intended to at first, but he stiffened and grew intent. At one point he said, "This is remarkably ingenious. Who thought of all this?"

"I did," said Andrew.

Magdescu looked up at him sharply, then said, "It would amount to a major overhaul of your body, and an experimental one, since it has never been attempted before. I advise against it. Remain as you are."

Andrew's face had limited means of expression, but impatience showed plainly in his voice. "Dr. Magdescu, you miss the entire point. You have no choice but to accede to my request. If such devices can be built into my body, they can be built into human bodies as well. The tendency to lengthen human life by prosthetic devices has already been remarked on. There are no devices better than the ones I have designed and am designing.

"As it happens, I control the patents by way of the firm of Feingold and Martin. We are quite capable of going into business for ourselves and of developing the kind of prosthetic devices that may end by producing human beings with many of the properties of robots. Your own business will then suffer.

"If, however, you operate on me now and agree to do so under similar circumstances in the future, you will receive permission to make use of the patents and control the technology of both robots and the prosthetization of human beings. The initial leasing will not be granted, of course, until after the first operation is completed successfully, and after enough time has passed to demonstrate that it is indeed successful." Andrew felt scarcely any First Law inhibition to the stern conditions he was

setting a human being. He was learning to reason that what seemed like cruelty might, in the long run, be kindness.

Magdescu looked stunned. He said, "I'm not the one to decide something like this. That's a corporate decision that would take time."

"I can wait a reasonable time," said Andrew, "but only a reasonable time." And he thought with satisfaction that Paul himself could not have done it better.

16.

It took only a reasonable time, and the operation was a success.

Magdescu said, "I was very much against the operation, Andrew, but not for the reasons you might think. I was not in the least against the experiment, if it had been on someone else. I hated risking *your* positronic brain. Now that you have the positronic pathways interacting with simulated nerve pathways, it might be difficult to rescue the brain intact if the body went bad."

"I had every faith in the skill of the staff at U. S. Robots," said Andrew. "And I can eat now."

"Well, you can sip olive oil. It will mean occasional cleanings of the combustion chamber, as we have explained to you. Rather an uncomfortable touch, I should think."

"Perhaps, if I did not expect to go further. Self-cleaning is not impossible. In fact, I am working on a device that will deal with solid food that may be expected to contain incombustible fractions—indigestible matter, so to speak, that will have to be discarded."

"You would then have to develop an anus."

"The equivalent."

"What else, Andrew?"

"Everything else."

"Genitalia, too?"

"Insofar as they will fit my plans. My body is a canvas on which I intend to draw—"

Magdescu waited for the sentence to be completed, and when it seemed that it would not be, he completed it himself. "A man?"

"We shall see," said Andrew.

Magdescu said, "It's a puny ambition, Andrew. You're better than a man. You've gone downhill from the moment you opted for organicism."

"My brain has not suffered."

"No, it hasn't. I'll grant you that. But, Andrew, the whole new breakthrough in prosthetic devices made possible by your patents is being marketed under your name. You're recognized as the inventor and you're honored for it—as you are. Why play further games with your body?"

Andrew did not answer.

The honors came. He accepted membership in several learned societies, including one which was devoted to the new science he had established; the one he had called robobiology but had come to be termed prosthetology.

On the one hundred and fiftieth anniversary of his construction, there was a

testimonial dinner given in his honor at U. S. Robots. If Andrew saw irony in this, he kept it to himself.

Alvin Magdescu came out of retirement to chair the dinner. He was himself ninety-four years old and was alive because he had prosthetized devices that, among other things, fulfilled the function of liver and kidneys. The dinner reached its climax when Magdescu, after a short and emotional talk, raised his glass to toast "the Sesquicentennial Robot."

Andrew had had the sinews of his face redesigned to the point where he could show a range of emotions, but he sat through all the ceremonies solemnly passive. He did not like to be a Sesquicentennial Robot.

17.

It was prosthetology that finally took Andrew off the Earth. In the decades that followed the celebration of the Sesquicentennial, the Moon had come to be a world more Earth-like than Earth in every respect but its gravitational pull and in its underground cities there was a fairly dense population.

Prosthetized devices there had to take the lesser gravity into account and Andrew spent five years on the Moon working with local prosthetologists to make the necessary adaptations. When not at his work, he wandered among the robot population, every one of which treated him with the robotic obsequiousness due a man.

He came back to an Earth that was humdrum and quiet in comparison and visited the offices of Feingold and Martin to announce his return.

The current head of the firm, Simon DeLong, was surprised. He said, "We had been told you were returning, Andrew" (he had almost said "Mr. Martin"), "but we were not expecting you till next week."

"I grew impatient," said Andrew brusquely. He was anxious to get to the point. "On the Moon, Simon, I was in charge of a research team of twenty human scientists. I gave orders that no one questioned. The Lunar robots deferred to me as they would to a human being. Why, then, am I not a human being?"

A wary look entered DeLong's eyes. He said, "My dear Andrew, as you have just explained, you are treated as a human being by both robots and human beings. You are therefore a human being *de facto*."

"To be a human being *de facto* is not enough. I want not only to be treated as one, but to be legally identified as one. I want to be a human being *de jure*."

"Now that is another matter," said DeLong. "There we would run into human prejudice and into the undoubted fact that however much you may be like a human being, you are *not* a human being."

"In what way not?" asked Andrew. "I have the shape of a human being and organs equivalent to those of a human being. My organs, in fact, are identical to some of those in a prosthetized human being. I have contributed artistically, literarily, and scientifically to human culture as much as any human being now alive. What more can one ask?"

"I myself would ask nothing more. The trouble is that it would take an act of the

World Legislature to define you as a human being. Frankly, I wouldn't expect that to happen."

"To whom on the Legislature could I speak?"

"To the chairman of the Science and Technology Committee perhaps."

"Can you arrange a meeting?"

"But you scarcely need an intermediary. In your position, you can—"

"No. *You* arrange it." (It didn't even occur to Andrew that he was giving a flat order to a human being. He had grown accustomed to that on the Moon.) "I want him to know that the firm of Feingold and Martin is backing me in this to the hilt."

"Well, now—"

"To the hilt, Simon. In one hundred and seventy-three years I have in one fashion or another contributed greatly to this firm. I have been under obligation to individual members of the firm in times past. I am not now. It is rather the other way around now and I am calling in my debts."

DeLong said, "I will do what I can."

18.

The chairman of the Science and Technology Committee was of the East Asian region and she was a woman. Her name was Chee Li-Hsing and her transparent garments (obscuring what she wanted obscured only by their dazzle) made her look plastic-wrapped.

She said, "I sympathize with your wish for full human rights. There have been times in history when segments of the human population fought for full human rights. What rights, however, can you possibly want that you do not have?"

"As simple a thing as my right to life. A robot can be dismantled at any time."

"A human being can be executed at any time."

"Execution can only follow due process of law. There is no trial needed for my dismantling. Only the word of a human being in authority is needed to end me. Besides —besides—" Andrew tried desperately to allow no sign of pleading, but his carefully designed tricks of human expression and tone of voice betrayed him here. "The truth is, I want to be a man. I have wanted it through six generations of human beings."

Li-Hsing looked up at him out of darkly sympathetic eyes. "The Legislature can pass a law declaring you one—they could pass a law declaring a stone statue to be defined as a man. Whether they will actually do so is, however, as likely in the first case as the second. Congresspeople are as human as the rest of the population and there is always that element of suspicion against robots."

"Even now?"

"Even now. We would all allow the fact that you have earned the prize of humanity and yet there would remain the fear of setting an undesirable precedent."

"What precedent? I am the only free robot, the only one of my type, and there will never be another. You may consult U. S. Robots."

"'Never' is a long time, Andrew—or, if you prefer, Mr. Martin—since I will gladly

give you my personal accolade as man. You will find that most Congresspeople will not be willing to set the precedent, no matter how meaningless such a precedent might be. Mr. Martin, you have my sympathy, but I cannot tell you to hope. Indeed—"

She sat back and her forehead wrinkled. "Indeed, if the issue grows too heated, there might well arise a certain sentiment, both inside the Legislature and outside, for that dismantling you mentioned. Doing away with you could turn out to be the easiest way of resolving the dilemma. Consider that before deciding to push matters."

Andrew said, "Will no one remember the technique of prosthetology, something that is almost entirely mine?"

"It may seem cruel, but they won't. Or if they do, it will be remembered against you. It will be said you did it only for yourself. It will be said it was part of a campaign to roboticize human beings, or to humanify robots; and in either case evil and vicious. You have never been part of a political hate campaign, Mr. Martin, and I tell you that you will be the object of vilification of a kind neither you nor I would credit and there would be people who'll believe it all. Mr. Martin, let your life be." She rose and, next to Andrew's seated figure, she seemed small and almost childlike.

Andrew said, "If I decide to fight for my humanity, will you be on my side?"

She thought, then said, "I will be—insofar as I can be. If at any time such a stand would appear to threaten my political future, I may have to abandon you, since it is not an issue I feel to be at the very root of my beliefs. I am trying to be honest with you."

"Thank you, and I will ask no more. I intend to fight this through whatever the consequences, and I will ask you for your help only for as long as you can give it."

19.

It was not a direct fight. Feingold and Martin counseled patience and Andrew muttered grimly that he had an endless supply of that. Feingold and Martin then entered on a campaign to narrow and restrict the area of combat.

They instituted a lawsuit denying the obligation to pay debts to an individual with a prosthetic heart on the grounds that the possession of a robotic organ removed humanity, and with it the constitutional rights of human beings.

They fought the matter skillfully and tenaciously, losing at every step but always in such a way that the decision was forced to be as broad as possible, and then carrying it by way of appeals to the World Court.

It took years, and millions of dollars.

When the final decision was handed down, DeLong held what amounted to a victory celebration over the legal loss. Andrew was, of course, present in the company offices on the occasion.

"We've done two things, Andrew," said DeLong, "both of which are good. First of all, we have established the fact that no number of artifacts in the human body causes it to cease being a human body. Secondly, we have engaged public opinion in the question in such a way as to put it fiercely on the side of a broad interpretation of humanity since there is not a human being in existence who does not hope for prosthetics if that will keep him alive."

"And do you think the Legislature will now grant me my humanity?" asked Andrew.

DeLong looked faintly uncomfortable. "As to that, I cannot be optimistic. There remains the one organ which the World Court has used as the criterion of humanity. Human beings have an organic cellular brain and robots have a platinum-iridium positronic brain if they have one at all—and you certainly have a positronic brain . . . No, Andrew, don't get that look in your eye. We lack the knowledge to duplicate the work of a cellular brain in artificial structures close enough to the organic type to allow it to fall within the Court's decision. Not even you could do it."

"What ought we do, then?"

"Make the attempt, of course. Congresswoman Li-Hsing will be on our side and a growing number of other Congresspeople. The President will undoubtedly go along with a majority of the Legislature in this matter."

"Do we have a majority?"

"No, far from it. But we might get one if the public will allow its desire for a broad interpretation of humanity to extend to you. A small chance, I admit, but if you do not wish to give up, we must gamble for it."

"I do not wish to give up."

20.

Congresswoman Li-Hsing was considerably older than she had been when Andrew had first met her. Her transparent garments were long gone. Her hair was now close-cropped and her coverings were tubular. Yet still Andrew clung, as closely as he could within the limits of reasonable taste, to the style of clothing that had prevailed when he had first adopted clothing over a century before.

She said, "We've gone as far as we can, Andrew. We'll try once more after recess, but, to be honest, defeat is certain and the whole thing will have to be given up. All my most recent efforts have only earned me a certain defeat in the coming congressional campaign."

"I know," said Andrew, "and it distresses me. You said once you would abandon me if it came to that. Why have you not done so?"

"One can change one's mind, you know. Somehow, abandoning you became a higher price than I cared to pay for just one more term. As it is, I've been in the Legislature for over a quarter of a century. It's enough."

"Is there no way we can change minds, Chee?"

"We've changed all that are amenable to reason. The rest—the majority—cannot be moved from their emotional antipathies."

"Emotional antipathy is not a valid reason for voting one way or the other."

"I know that, Andrew, but they don't advance emotional antipathy as their reason."

Andrew said cautiously, "It all comes down to the brain, then, but must we leave it at the level of cells versus positrons? Is there no way of forcing a functional definition? Must we say that a brain is made of this or that? May we not say that a brain is something—anything—capable of a certain level of thought?"

"Won't work," said Li-Hsing. "Your brain is man-made, the human brain is not. Your brain is constructed, theirs developed. To any human being who is intent on keeping up the barrier between himself and a robot, those differences are a steel wall a mile high and a mile thick."

"If we could get at the source of their antipathy—the very source of—"

"After all your years," said Li-Hsing sadly, "you are still trying to reason out the human being. Poor Andrew, don't be angry, but it's the robot in you that drives you in that direction."

"I don't know," said Andrew. "If I could bring myself—"

1. (reprise)

If he could bring himself—

He had known for a long time it might come to that, and in the end he was at the surgeon's. He found one, skillful enough for the job at hand, which meant a robot surgeon, for no human surgeon could be trusted in this connection, either in ability or in intention.

The surgeon could not have performed the operation on a human being, so Andrew, after putting off the moment of decision with a sad line of questioning that reflected the turmoil within himself, put the First Law to one side by saying, "I, too, am a robot."

He then said, as firmly as he had learned to form the words even at human beings over these past decades, "I *order* you to carry through the operation on me."

In the absence of the First Law, an order so firmly given from one who looked so much like a man activated the Second Law sufficiently to carry the day.

21.

Andrew's feeling of weakness was, he was sure, quite imaginary. He had recovered from the operation. Nevertheless, he leaned, as unobtrusively as he could manage, against the wall. It would be entirely too revealing to sit.

Li-Hsing said, "The final vote will come this week, Andrew. I've been able to delay it no longer, and we must lose . . . And that will be it, Andrew."

Andrew said, "I am grateful for your skill at delay. It gave me the time I needed, and I took the gamble I had to."

"What gamble is this?" asked Li-Hsing with open concern.

"I couldn't tell you, or the people at Feingold and Martin. I was sure I would be stopped. See here, if it is the brain that is at issue, isn't the greatest difference of all the

matter of immortality? Who really cares what a brain looks like or is built of or how it was formed? What matters is that brain cells die; *must* die. Even if every other organ in the body is maintained or replaced, the brain cells, which cannot be replaced without changing and therefore killing the personality, must eventually die.

"My own positronic pathways have lasted nearly two centuries without perceptible change and can last for centuries more. Isn't *that* the fundamental barrier? Human beings can tolerate an immortal robot, for it doesn't matter how long a machine lasts. They cannot tolerate an immortal human being, since their own mortality is endurable only so long as it is universal. And for that reason they won't make me a human being."

Li-Hsing said, "What is it you're leading up to, Andrew?"

"I have removed that problem. Decades ago, my positronic brain was connected to organic nerves. Now, one last operation has arranged that connection in such a way that slowly—quite slowly—the potential is being drained from my pathways."

Li-Hsing's finely wrinkled face showed no expression for a moment. Then her lips tightened. "Do you mean you've arranged to die, Andrew? You can't have. That violates the Third Law."

"No," said Andrew, "I have chosen between the death of my body and the death of my aspirations and desires. To have let my body live at the cost of the greater death is what would have violated the Third Law."

Li-Hsing seized his arm as though she were about to shake him. She stopped herself. "Andrew, it won't work. Change it back."

"It can't be. Too much damage was done. I have a year to live—more or less. I will last through the two hundredth anniversary of my construction. I was weak enough to arrange that."

"How can it be worth it? Andrew, you're a fool."

"If it brings me humanity, that will be worth it. If it doesn't, it will bring an end to striving and that will be worth it, too."

And Li-Hsing did something that astonished herself. Quietly, she began to weep.

22.

It was odd how that last deed caught at the imagination of the world. All that Andrew had done before had not swayed them. But he had finally accepted even death to be human and the sacrifice was too great to be rejected.

The final ceremony was timed, quite deliberately, for the two hundredth anniversary. The World President was to sign the act and make it law and the ceremony would be visible on a global network and would be beamed to the Lunar state and even to the Martian colony.

Andrew was in a wheelchair. He could still walk, but only shakily.

With mankind watching, the World President said, "Fifty years ago, you were declared a Sesquicentennial Robot, Andrew." After a pause, and in a more solemn tone, he said, "Today we declare you a Bicentennial Man, Mr. Martin."

And Andrew, smiling, held out his hand to shake that of the President.

23.

Andrew's thoughts were slowly fading as he lay in bed.

Desperately he seized at them. Man! He was a man! He wanted that to be his last thought. He wanted to dissolve—die—with that.

He opened his eyes one more time and for one last time recognized Li-Hsing waiting solemnly. There were others, but those were only shadows, unrecognizable shadows. Only Li-Hsing stood out against the deepening gray. Slowly, inchingly, he held out his hand to her and very dimly and faintly felt her take it.

She was fading in his eyes, as the last of his thoughts trickled away.

But before she faded completely, one last fugitive thought came to him and rested for a moment on his mind before everything stopped.

"Little Miss," he whispered, too low to be heard.

True Love

My name is Joe. That is what my colleague, Milton Davidson, calls me. He is a programmer and I am a computer program. I am part of the Multivac-complex and am connected with other parts all over the world. I know everything. Almost everything.

I am Milton's private program. His Joe. He understands more about programming than anyone in the world, and I am his experimental model. He has made me speak better than any other computer can.

"It is just a matter of matching sounds to symbols, Joe," he told me. "That's the way it works in the human brain even though we still don't know what symbols there are in the brain. I know the symbols in yours, and I can match them to words, one-to-one." So I talk. I don't think I talk as well as I think, but Milton says I talk very well. Milton has never married, though he is nearly forty years old. He has never found the right woman, he told me. One day he said, "I'll find her yet, Joe. I'm going to find the best. I'm going to have true love and you're going to help me. I'm tired of improving you in order to solve the problems of the world. Solve *my* problem. Find me true love."

I said, "What is true love?"

"Never mind. That is abstract. Just find me the ideal girl. You are connected to the Multivac-complex so you can reach the data banks of every human being in the world. We'll eliminate them all by groups and classes until we're left with only one person. The perfect person. She will be for me."

I said, "I am ready."

He said, "Eliminate all men first."

It was easy. His words activated symbols in my molecular valves. I could reach out to make contact with the accumulated data on every human being in the world. At his words, I withdrew from 3,784,982,874 men. I kept contact with 3,786,112,090 women.

He said, "Eliminate all younger than twenty-five; all older than forty. Then eliminate all with an IQ under 120; all with a height under 150 centimeters and over 175 centimeters."

He gave me exact measurements; he eliminated women with living children; he eliminated women with various genetic characteristics. "I'm not sure about eye color," he said. "Let that go for a while. But no red hair. I don't like red hair."

After two weeks, we were down to 235 women. They all spoke English very well.

Milton said he didn't want a language problem. Even computer-translation would get in the way at intimate moments.

"I can't interview 235 women," he said. "It would take too much time, and people would discover what I am doing."

"It would make trouble," I said. Milton had arranged me to do things I wasn't designed to do. No one knew about that.

"It's none of their business," he said, and the skin on his face grew red. "I tell you what, Joe, I will bring in holographs, and you check the list for similarities."

He brought in holographs of women. "These are three beauty contest winners," he said. "Do any of the 235 match?"

Eight were very good matches and Milton said, "Good, you have their data banks. Study requirements and needs in the job market and arrange to have them assigned here. One at a time, of course." He thought a while, moved his shoulders up and down, and said, "Alphabetical order."

That is one of the things I am not designed to do. Shifting people from job to job for personal reasons is called manipulation. I could do it now because Milton had arranged it. I wasn't supposed to do it for anyone but him, though.

The first girl arrived a week later. Milton's face turned red when he saw her. He spoke as though it were hard to do so. They were together a great deal and he paid no attention to me. One time he said, "Let me take you to dinner."

The next day he said to me, "It was no good, somehow. There was something missing. She is a beautiful woman, but I did not feel any touch of true love. Try the next one."

It was the same with all eight. They were much alike. They smiled a great deal and had pleasant voices, but Milton always found it wasn't right. He said, "I can't understand it, Joe. You and I have picked out the eight women who, in all the world, look the best to me. They are ideal. Why don't they please me?"

I said, "Do you please them?"

His eyebrows moved and he pushed one fist hard against his other hand. "That's it, Joe. It's a two-way street. If I am not their ideal, they can't act in such a way as to be my ideal. I must be their true love, too, but how do I do that?" He seemed to be thinking all that day.

The next morning he came to me and said, "I'm going to leave it to you, Joe. All up to you. You have my data bank, and I am going to tell you everything I know about myself. You fill up my data bank in every possible detail but keep all additions to yourself."

"What will I do with the data bank, then, Milton?"

"Then you will match it to the 235 women. No, 227. Leave out the eight you've seen. Arrange to have each undergo a psychiatric examination. Fill up their data banks and compare them with mine. Find correlations." (Arranging psychiatric examinations is another thing that is against my original instructions.)

For weeks, Milton talked to me. He told me of his parents and his siblings. He told me of his childhood and his schooling and his adolescence. He told me of the young women he had admired from a distance. His data bank grew and he adjusted me to broaden and deepen my symbol-taking.

He said, "You see, Joe, as you get more and more of me in you, I adjust you to match me better and better. You get to think more like me, so you understand me better. If you understand me well enough, then any woman, whose data bank is something you understand as well, would be my true love." He kept talking to me and I came to understand him better and better.

I could make longer sentences and my expressions grew more complicated. My speech began to sound a good deal like his in vocabulary, word order and style.

I said to him one time, "You see, Milton, it isn't a matter of fitting a girl to a physical ideal only. You need a girl who is a personal, emotional, temperamental fit to you. If that happens, looks are secondary. If we can't find the fit in these 227, we'll look elsewhere. We will find someone who won't care how you look either, or how anyone would look, if only there is the personality fit. What are looks?"

"Absolutely," he said. "I would have known this if I had had more to do with women in my life. Of course, thinking about it makes it all plain now."

We always agreed; we thought so like each other.

"We shouldn't have any trouble, now, Milton, if you'll let me ask you questions. I can see where, in your data bank, there are blank spots and unevennesses."

What followed, Milton said, was the equivalent of a careful psychoanalysis. Of course. I was learning from the psychiatric examinations of the 227 women—on all of which I was keeping close tabs.

Milton seemed quite happy. He said, "Talking to you, Joe, is almost like talking to another self. Our personalities have come to match perfectly."

"So will the personality of the woman we choose."

For I had found her and she was one of the 227 after all. Her name was Charity Jones and she was an Evaluator at the Library of History in Wichita. Her extended data bank fit ours perfectly. All the other women had fallen into discard in one respect or another as the data banks grew fuller, but with Charity there was increasing and astonishing resonance.

I didn't have to describe her to Milton. Milton had coordinated my symbolism so closely with his own I could tell the resonance directly. It fit me.

Next it was a matter of adjusting the work sheets and job requirements in such a way as to get Charity assigned to us. It must be done very delicately, so no one would know that anything illegal had taken place.

Of course, Milton himself knew, since it was he who arranged it and that had to be taken care of too. When they came to arrest him on grounds of malfeasance in office, it was, fortunately, for something that had taken place ten years ago. He had told me about it, of course, so it was easy to arrange—and he won't talk about me for that would make his offense much worse.

He's gone, and tomorrow is February 14. Valentine's Day. Charity will arrive then with her cool hands and her sweet voice. I will teach her how to operate me and how to care for me. What do looks matter when our personalities will resonate?

I will say to her, "I am Joe, and you are my true love."

Found!

Computer-Two, like the other three that chased each other's tails in orbit round the Earth, was much larger than it had to be.

It might have been one tenth its diameter and yet contained all the volume it needed to store the accumulated and accumulating data needed to control space flight.

They needed the extra space, however, so that Joe and I could get inside, if we had to.

And we had to.

Computer-Two was perfectly capable of taking care of itself. Ordinarily, that is. It was redundant. It worked everything out three times in parallel and all three programs had to mesh perfectly; all three answers had to match. If they did not, the answer was delayed for nano-seconds while Computer-Two checked itself, found the malfunctioning part and replaced it.

There was no sure way in which ordinary people would know how many times it caught itself. Perhaps never. Perhaps twice a day. Only Computer-Central could measure the time delay induced by error and only Computer-Central knew how many of the component spares had been used as replacements. And Computer-Central never talked about it. The only good public image is perfection.

And for all practical purposes, it's *been* perfection, for there was never any call for Joe and me.

We're the trouble-shooters. We go up there when something really goes wrong and Computer-Two or one of the others can't correct itself. It's never happened in the five years we've been on the job. It did happen now and again in the early days of their existence, but that was before our time.

We keep in practice. Don't get me wrong. There isn't a computer made that Joe and I can't diagnose. Show us the error and we'll show you the malfunction. Or Joe will, anyway. I'm not the kind who sings one's own praises.

Anyway, this time, neither of us could make the diagnosis.

The first thing that happened was that Computer-Two lost internal pressure. That's not unprecedented and it's certainly not fatal. Computer-Two can work in a vacuum after all. An internal atmosphere was established in the old days when it was

expected there would be a steady flow of repairmen fiddling with it. And it's been kept up out of tradition. Who told you scientists aren't chained by tradition? In their spare time from being scientists, they're human, too.

From the rate of pressure loss, it was deduced that a gravel-sized meteoroid had hit Computer-Two. Its exact radius, mass and energy was reported by Computer-Two itself, using that rate of pressure loss, and a few other things, as data.

The second thing that happened was that the break was not sealed and the atmosphere was not regenerated. After that came the errors and they called us in.

It made no sense. Joe let a look of pain cross his homely face and said, "There must be a dozen things out of whack."

Someone at Computer-Central said, "The hunk of gravel ricocheted, very likely."

Joe said, "With that energy of entry, it would have passed right through the other side. No ricochets. Besides, even with ricochets, I figure it would have had to take some very unlikely strikes."

"Well, then, what do we do?"

Joe looked uncomfortable. I think that it was at this point that he realized what was coming. He had made it sound peculiar enough to require the trouble-shooters on the spot—and Joe had never been up in space. If he had told me once that his chief reason for taking the job was that he knew it meant he would never have to go up in space, he had told it to me 2^x times, with x a pretty high number.

So I said it for him. I said, "We'll have to go up there."

Joe's only way out would have been to say he didn't think he could handle the job, and I watched his pride slowly come out ahead of his cowardice. Not by much, you understand—by a nose, let's say.

* * *

To those of you who haven't been on a spaceship in the last fifteen years—and I suppose Joe can't be the only one—let me emphasize that the initial acceleration is the only troublesome thing. You can't get away from that, of course.

After that it's nothing, unless you want to count possible boredom. You're just a spectator. The whole thing is automated and computerized. The old romantic days of space pilots are gone totally. I imagine they'll return briefly when our space settlements make the shift to the asteroid belt as they constantly threaten to do—but then only until additional Computers are placed in orbit to set up the necessary additional capacity.

Joe held his breath throughout the acceleration, or at least he seemed to. (I must admit that I wasn't very comfortable myself. It was only my third trip. I've taken a couple of vacations on Settlement-Rho with my husband, but I'm not exactly a seasoned hand.)

After that, he was relieved for a while, but only for a while. He got despondent.

"I hope this thing knows where it's going," he said, pettishly.

I extended my arms forward, palms up, and felt the rest of me sway backward a bit in the zero-gravity field. "You," I said, "are a computer specialist. Don't you *know* it knows?"

"Sure, but Computer-Two is off."

"We're not hooked into Computer-Two," I said. "There are three others. And even if only one were left functional, it could handle all the space flights undertaken on an average day."

"All four might go off. If Computer-Two is wrong, what's to stop the rest?"

"Then we'll run this thing manually."

"You'll do it, I suppose? You know how—I think not?"

"So they'll talk me in."

"For the love of Eniac," he groaned.

There was no problem, actually. We moved out to Computer-Two as smooth as vacuum and less than two days after takeoff, we were placed into a parking orbit not ten meters behind it.

What was not so smooth was that, about twenty hours out, we got the news from Earth that Computer-Three was losing internal pressure. Whatever had hit Computer-Two was going to get the rest, and when all four were out, space flight would grind to a halt. It could be reorganized on a manual basis, surely, but that would take months as a minimum, possibly years, and there would be serious economic dislocation on Earth. Worse yet, several thousand people now out in space would surely die.

It wouldn't bear thinking of and neither Joe nor I talked about it, but it didn't make Joe's disposition sweeter and, let's face it, it didn't make me any happier.

Earth hung over 200,000 kilometers below us, but Joe didn't seem to be bothered by that. He was concentrating on his tether and was checking the cartridge in his reaction-gun. He wanted to make sure he could get to Computer-Two and back again.

You'd be surprised—if you've never tried it—how you can get your space legs if you absolutely have to. I wouldn't say there was nothing to it and we did waste half the fuel we used, but we finally reached Computer-Two. We hardly made any bump at all when we struck Computer-Two. (You hear it, of course, even in vacuum, because the vibration travels through the metalloid fabric of your space suits—but there was hardly any bump, just a whisper.)

Of course, our contact and the addition of our momentum altered the orbit of Computer-Two slightly, but tiny expenditures of fuel compensated for that and we didn't have to worry about it. Computer-Two took care of it, for nothing had gone wrong with it, as far as we could tell, that affected any of its external workings.

* * *

We went over the outside first, naturally. The chances were pretty overwhelming that a small piece of gravel had whizzed through Computer-Two and that would leave an unmistakable ragged hole. Two of them in all probability; one going in and one coming out.

Chances of that happening are one in two million on any given day—even money that it will happen at least once in six thousand years. It's not likely, but it can, you know. The chances are one in not more than ten billion that, on any one day, it will be struck by a meteoroid large enough to demolish it.

I didn't mention that because Joe might realize that we were exposed to similar odds ourselves. In fact, any given strike on us would do far more damage to our soft and tender bodies than to the stoical and much-enduring machinery of the computer, and I didn't want Joe more nervous than he was.

The thing is, though, it wasn't a meteoroid.

"What's this?" said Joe, finally.

It was a small cylinder stuck to the outer wall of Computer-Two, the first abnormality we had found in its outward appearance. It was about half a centimeter in

diameter and perhaps six centimeters long. Just about cigarette-sized for any of you who've been caught up in the antique fad of smoking.

We brought our small flashlights into play.

I said, "That's not one of the external components."

"It sure isn't," muttered Joe.

There was a faint spiral marking running round the cylinder from one end to the other. Nothing else. For the rest, it was clearly metal, but of an odd, grainy texture—at least to the eye.

Joe said, "It's not tight."

He touched it gently with a fat and gauntleted finger and it gave. Where it had made contact with the surface of Computer-Two, it lifted and our flashes shone down on a visible gap.

"There's the reason gas pressure inside declined to zero," I said.

Joe grunted. He pushed a little harder and the cylinder dropped away and began to drift. We managed to snare it after a little trouble. Left behind was a perfectly round hole in the skin of Computer-Two, half a centimeter across.

Joe said, "This thing, whatever it is, isn't much more than foil."

It gave easily under his fingers, thin but springy. A little extra pressure and it dented. He put it inside his pouch, which he snapped shut, and said, "Go over the outside and see if there are any other items like that anywhere on it. I'll go inside."

It didn't take me very long. Then I went in. "It's clean," I said. "That's the only thing there is. The only hole."

"One is enough," said Joe, gloomily. He looked at the smooth aluminum of the wall and, in the light of the flash, the perfect circle of black was beautifully evident.

* * *

It wasn't difficult to place a seal over the hole. It was a little more difficult to reconstitute the atmosphere. Computer-Two's reserve gas-forming supplies were low and the controls required manual adjustment. The solar generator was limping but we managed to get the lights on.

Eventually, we removed our gauntlets and helmet, but Joe carefully placed the gauntlets inside his helmet and secured them both to one of his suit-loops.

"I want these handy if the air pressure begins to drop," he said, sourly.

So I did the same. No use being devil-may-care.

There was a mark on the wall just next to the hole. I had noted it in the light of my flash when I was adjusting the seal. When the lights came on, it was obvious.

"You notice that, Joe?" I said.

"I notice."

There was a slight, narrow depression in the wall, not very noticeable at all, but it was there beyond doubt if you ran your finger over it and it continued for nearly a meter. It was as though someone had scooped out a very shallow sampling of the metal and the surface where that had taken place was distinctly less smooth than elsewhere.

I said, "We'd better call Computer-Central downstairs."

"If you mean back on Earth, say so," said Joe. "I hate that phony space-talk. In fact, I hate everything about space. That's why I took an Earth-side job—I mean a job on Earth—or what was supposed to be one."

I said patiently, "We'd better call Computer-Central back on Earth."

"What for?"

"To tell them we've found the trouble."

"Oh? What did we find?"

"The hole. Remember?"

"Oddly enough, I do. And what caused the hole? It wasn't a meteoroid. I never saw one that would leave a perfectly circular hole with no signs of buckling or melting. And I never saw one that left a cylinder behind." He took the cylinder out of his suit pocket and smoothed the dent out of its thin metal, thoughtfully. "Well, what caused the hole?"

I didn't hesitate. I said, "I don't know."

"If we report to Computer-Central, they'll ask the question and we'll say we don't know and what will we have gained? Except hassle?"

"They'll call us, Joe, if we don't call them."

"Sure. And we won't answer, will we?"

"They'll assume something killed us, Joe, and they'll send up a relief party."

"You know Computer-Central. It will take them at least two days to decide on that. We'll have something before then and once we have something, we'll call them."

* * *

The internal structure of Computer-Two was not *really* designed for human occupancy. What was foreseen and allowed for was the occasional and temporary presence of trouble-shooters. That meant there was room for maneuvering and there were tools and supplies.

There weren't any armchairs, though. For that matter, there was no gravitational field, either, or any centrifugal imitation of one.

We both floated in midair, drifting very slowly this way or that. Occasionally, one of us touched the wall and rebounded very slowly. Or else part of one of us overlapped part of the other.

"Keep your foot out of my mouth," said Joe, and pushed it away violently. It was a mistake because we both began to turn. Of course, that's not how it looked to us. To us, it was the interior of Computer-Two that was turning, which was most unpleasant, and it took us a while to get relatively motionless again.

We had the theory perfectly worked out in our Earth-side training, but we were short on practice. A lot short.

By the time we had steadied ourselves, I felt unpleasantly nauseated. You can call it nausea, or astronausea, or space sickness, but whatever you call it, it's the heaves and it's worse in space than anywhere else, because there's nothing to pull the stuff down. It floats around in a cloud of globules and you don't want to be floating around with it. —So I held it back, and so did Joe.

I said, "Joe, it's clearly the computer that's at fault. Let's get at its insides." Anything to get my mind off *my* insides and let them quiet down. Besides, things weren't moving fast enough. I kept thinking of Computer-Three on its way down the tube; maybe Computers-One and -Four by now, too; and thousands of people in space with their lives hanging on what we could do.

Joe looked a little greenish, too, but he said, "First I've got to think. Something got it. It wasn't a meteoroid, because whatever it was chewed a neat hole out of the hull. It wasn't cut out because I didn't find a circle of metal anywhere inside here. Did you?"

"No. But it hadn't occurred to me to look."

"*I* looked, and it's nowhere in here."

"It may have fallen outside."

"With the cylinder covering the hole till I pulled it away? A likely thing. Did you see anything come flying out?"

"No."

Joe said, "We may still find it in here, of course, but I doubt it. It was somehow dissolved and something got in."

"What something? Whose is it?"

Joe's grin was remarkably ill-natured. "Why do you bother asking questions to which there is no answer. If this was last century, I'd say the Russians had somehow stuck that device onto the outside of Computer-Two. —No offense. If it were last century, you'd say it was the Americans."

I decided to be offended. I said, coldly, "We're trying to say something that makes sense *this* century, Iosif," giving it an exaggerated Russian pronunciation.

"We'll have to assume some dissident group."

"If so," I said, "we'll have to assume one with a capacity for space flight and with the ability to come up with an unusual device."

Joe said, "Space flight presents no difficulties, if you can tap into the orbiting Computers illegally—which has been done. As for the cylinder, that may make more sense when it is analyzed back on Earth—downstairs, as you space buffs would say."

"It doesn't make sense," I said. "Where's the point in trying to disable Computer-Two?"

"As part of a program to cripple space flight."

"Then everyone suffers. The dissidents, too."

"But it gets everyone's attention, doesn't it, and suddenly the cause of whatever-it-is makes news. Or the plan is to just knock out Computer-Two and then threaten to knock out the other three. No real damage, but lots of potential, and lots of publicity."

"I don't believe it," I said. "It's too dramatic."

"On the contrary," said Joe. "I'm trying to be nondramatic." He was studying all parts of the interior closely, edging over it square centimeter by square centimeter. "I *might* suppose the thing was of nonhuman origin."

"Don't be silly."

"You want me to make the case? The cylinder made contact, after which something inside ate away a circle of metal and entered Computer-Two. It crawled over the inside wall eating away a thin layer of metal for some reason. Does that sound like anything of human construction?"

"Not that I know of, but I don't know everything. Even you don't know everything."

Joe ignored that. "So the question is, how did it—whatever it is—get into the computer, which is, after all, reasonably well-sealed. It did so quickly, since it knocked out the resealing and air-regeneration capacities almost at once."

"Is *that* what you're looking for?" I said, pointing.

He tried to stop too quickly and somersaulted backward, crying, "That's it! That's it!"

In his excitement, he was thrashing his arms and legs which got him nowhere, of course. I grabbed him and, for a while, we were both trying to exert pushes in uncoordinated directions and that got us nowhere either. Joe called me a few names, but I called him some back and I had the advantage of him there. I understand English perfectly, better than he does, in fact; but his knowledge of Russian is—well, fragmentary would be a kind of way of putting it. Bad language in an ununderstood language always sounds very dramatic.

"Here is it," he said, when we had finally sorted ourselves out.

Where the computer-shielding met the wall, there was a small circular hole left behind when Joe brushed aside a small cylinder. It was just like the one on the outer hull, but it seemed even thinner. In fact, it seemed to disintegrate when Joe touched it.

"We'd better get into the computer," said Joe.

* * *

The computer was a shambles.

Not obviously. I don't mean to say it was like a beam of wood that had been riddled by termites.

In fact, if you looked at the computer casually, you might swear it was intact.

Look closely, though, and some of the chips would be gone. The more closely you looked, the more you realized were gone. Worse yet, the stores which Computer-Two used in self-repair had dwindled to almost nothing. We kept looking and every once in a while, one of us would discover something else was missing.

Joe took the cylinder out of his pouch again and turned it end for end. He said, "I suspect it's after high-grade silicon in particular. I can't say for sure, of course, but my guess is that the sides are mostly aluminum but that the flat end is mostly silicon."

I said, "Do you mean the thing is a solar battery?"

"Part of it is. That's how it gets its energy in space; energy to get to Computer-Two, energy to eat a hole into it, energy to—to—I don't know how else to put it. Energy to stay alive."

"You call it alive?"

"Why not? Look, Computer-Two can repair itself. It can reject faulty bits of equipment and replace it with working ones, but it needs a supply of spares to work with. Given enough spares of all kinds, it could build a Computer just like itself, when properly programmed—but it needs the supply, so we don't think of it as alive. This object that entered Computer-Two is apparently collecting its own supplies. That's suspiciously life-like."

"What you're saying," I said, "is that we have here a microcomputer advanced enough to be considered alive."

"I don't honestly know what I'm saying," said Joe.

"Who on Earth could make such a thing?"

"Who *on Earth*?"

* * *

I made the next discovery. It looked like a stubby pen drifting through the air. I just caught it out of the corner of my eye and it registered as a pen.

In zero gravity, things will drift out of pockets and float off. There's no way of keeping anything in place unless it is physically confined. You expect pens and coins and anything else that can find an opening to drift their way through the opening eventually and go wherever air currents and inertia lead them.

So my mind registered "Pen" and I groped for it absently and, of course, my fingers didn't close on it. Just reaching for something sets up an air current that pushes it away. You have to reach over it and sneak behind it with one hand, and then reach for it with

the other. Picking up any small object in midair is a two-hand operation.

I know some people can do it one-handed, but they're space hounds and I'm not.

I turned to look at the object and pay a little more attention to retrieval, then realized that my pen was safely in its pouch. I felt for it and it was there.

"Did you lose a pen, Joe?" I called out.

"No."

"Anything like that? Key? Cigarette?"

"I don't smoke. You know that."

A stupid answer. "Anything?" I said in exasperation. "I'm seeing things here."

"No one ever said you were stable."

"Look, Joe. Over there. Over there."

He lunged for it. I could have told him it would do no good.

By now, though, our poking around in the computer seemed to have stirred things up. We were seeing them wherever we looked. They were floating in the air currents.

I stopped one at last. Or, rather, it stopped itself, for it was on the elbow of Joe's suit. I snatched it off and shouted. Joe jumped in terror and nearly knocked it out of my hand.

I said, "Look!"

There was a shiny circle on Joe's suit where I had taken the thing off. It had begun to eat its way through.

"Give it to me," said Joe. He took it gingerly and put it against the wall to hold it steady. Then he shelled it, gently lifting the paper-thin metal.

There was something inside that looked like a line of cigarette ash. It caught the light and glinted, though, like lightly woven metal.

There was a moistness about it, too. It wriggled slowly, one end seeming to seek something blindly.

The end made contact with the wall and stuck. Joe's finger pushed it away. It seemed to require a small effort to do so. Joe rubbed his finger and thumb and said, "Feels oily."

The metal worm—I don't know what else I can call it—seemed limp now after Joe had touched it. It didn't move again.

I was twisting and turning, trying to look at myself.

"Joe," I said, "for heaven's sake, have I got one of them on me anywhere?"

"I don't see one," he said.

"Well, *look* at me. You've got to watch me, Joe, and I'll watch you. If our suits are wrecked we might not be able to get back to the ship."

Joe said, "Keep moving, then."

It was a grisly feeling, being surrounded by things hungry to dissolve your suit wherever they could touch it. When any showed up, we tried to catch them and stay out of their way at the same time, which made things almost impossible. A rather long one drifted close to my leg and I kicked at it, which was stupid, for if I had hit it, it might have stuck. As it was, the air current I set up brought it against the wall, where it stayed.

Joe reached hastily for it—too hastily. The rest of his body rebounded and as he somersaulted, one booted foot struck the wall near the cylinder lightly. When he finally managed to right himself, it was still there.

"I didn't smash it, did I?"

"No, you didn't," I said. "You missed it by a decimeter. It won't get away."

I had a hand on either side of it. It was twice as long as the other cylinder had been.

In fact, it was like two cylinders stuck together lengthwise, with a constriction at the point of joining.

"Act of reproducing," said Joe as he peeled away the metal. This time what was inside was a line of dust. Two lines. One on either side of the constriction.

"It doesn't take much to kill them," said Joe. He relaxed visibly. "I think we're safe."

"They do seem alive," I said, reluctantly.

"I think they seem more than that. They're viruses. —Or the equivalent."

"What are you talking about?"

Joe said, "Granted I'm a computer technologist and not a virologist—but it's my understanding that viruses on Earth, or, downstairs, as you would say, consist of a nucleic acid molecule coated in a protein shell.

"When a virus invades a cell, it manages to dissolve a hole in the cell wall or membrane by the use of some appropriate enzyme and the nucleic acid slips inside, leaving the protein coat outside. Inside the cell it finds the material to make a new protein coat for itself. In fact, it manages to form replicas of itself and to form a new protein coat for each replica. Once it has stripped the cell of all it has, the cell dissolves and in place of the one invading virus there are several hundred daughter viruses. Sound familiar?"

"Yes. Very familiar. It's what's happening here. But where did it come from, Joe?"

"Not from Earth, obviously, or any Earth settlement. From somewhere else, I suppose. They drift through space till they find something appropriate in which they can multiply. They look for sizable objects ready-made of metal. I don't imagine they can smelt ores."

"But large metal objects with pure silicon components and a few other succulent matters like that are the products of intelligent life only," I said.

"Right," said Joe, "which means we have the best evidence yet that intelligent life is common in the Universe, since objects like the one we're on must be quite common or it couldn't support these viruses. And it means that intelligent life is old, too, perhaps ten billion years old—long enough for a kind of metal evolution, forming a metal/silicon/oil life as we have formed a nucleic/protein/water life. Time to evolve a parasite on space-age artifacts."

I said, "You make it sound as though every time some intelligent life form develops a space culture, it is subjected before long to parasitic infestation."

"Right. And it must be controlled. Fortunately, these things are easy to kill, especially now when they're forming. Later on, when they're ready to burrow out of Computer-Two, I suppose they will grow, thicken their shells, stabilize their interior and prepare, as the equivalent of spores, to drift a million years before they find another home. They might not be so easy to kill, then."

"How are you going to kill them?"

"I already have. I just touched that first one when it instinctively sought out metal to begin manufacturing a new shell after I had broken open the first one—and that touch finished it. I didn't touch the second, but I kicked the wall near it and the sound vibration in the metal shook its interior apart into metal dust. So they can't get us, now, or any more of the computer if we just shake them apart now!"

He didn't have to explain further—or as much. He put on his gauntlets slowly, and then banged at the wall with one. It pushed him away and he kicked at the wall where he next approached it.

"You do the same," he shouted.

I tried to, and for a while we both kept at it. You don't know how hard it is to hit a wall at zero gravity, at least on purpose, and do it hard enough to make it clang. We

missed as often as not or just struck it a glancing blow that sent us whirling but made virtually no sound. We were panting with effort and aggravation in no time.

But we had acclimated ourselves (or at least I had) and the nausea didn't return. We kept it up and then when we gathered up some more of the viruses, there was nothing inside but dust in every case. They were clearly adapted to empty, automated space objects which, like modern computers, were vibration-free. That's what made it possible, I suppose, to build up the exceedingly rickety complex metallic structures that possessed sufficient instability to produce the properties of simple life.

I said, "Do you think we got them all, Joe?"

"How can I say? If there's one left, it will cannibalize the others for metal supplies and start all over. Let's bang around some more."

We did until we were sufficiently worn out not to care whether one was still left alive.

"Of course," I said, panting, "the Planetary Association for the Advancement of Science isn't going to be pleased with our killing them all."

Joe's suggestion as to what the P.A.A.S. could do with itself was forceful, but impractical. He said, "Look, our mission is to save Computer-Two, a few thousand lives and, as it turned out, our own lives, too. Now they can decide whether to renovate this computer or rebuild it from scratch. It's their baby.

"The P.A.A.S. can get what they can out of these dead objects and that should be something. If they want live ones, I suspect they'll find them floating about in these regions. They can look for them if they want live specimens, but they'd better watch their suits at all times. I don't think they can vibrate them to death in open space."

I said, "All right. My suggestion is we tell Computer-Central we're going to jerry-rig this Computer and get it doing some work anyway, and we'll stay till a relief is up for main repairs or whatever in order to prevent any reinfestation. Meanwhile, they better get to each of the other Computers and set up a system that can set it to vibrating strongly as soon as the internal atmosphere shows a pressure drop."

"Simple enough," said Joe, sardonically.

"It's lucky we found them when we did."

"Wait awhile," said Joe, and the look in his eye was one of deep trouble. "We didn't find them. *They* found *us*. If metal life has developed, do you suppose it's likely that this is the only form it takes? Just this fragile kind?

"What if such life forms communicate somehow and, across the vastness of space, others are now converging on us for the picking? Other species, too; all of them after the lush new fodder of an as yet untouched space culture. *Other* species! Some that are sturdy enough to withstand vibration. Some that are large enough to be more versatile in their reactions to danger. Some that are equipped to invade our settlements in orbit. Some, for the sake of Univac, that may be able to invade the Earth for the metals of its cities.

"What I'm going to report, what I must report, is that we've been *found!*"

Nothing For Nothing

The scene was Earth.

Not that the beings on the starship thought of it as Earth. To them it was a series of symbols stored in a computer; it was the third planet of a star located at a certain position with respect to the line connecting their home planet with the black hole that marked the Galaxy's center, and moving at a certain velocity with reference to it.

The time was 15000 B.C., more or less.

Not that the beings on the starship thought of it as 15000 B.C. To them, it was a certain period of time marked off according to their local system of measurement.

The captain of the starship said, rather petulantly, "This is a waste of time. The planet is largely frozen. Let us leave."

But the ship's explorer quietly said, "No, Captain," and that was that.

As long as a starship was in space, or in hyperspace for that matter, the captain was supreme, but place that ship in orbit about a planet and the explorer could not be challenged. He knew worlds! That was his specialty.

And this explorer was in an impregnable position. He had what amounted to a sure instinct for profitable trade. It had been he and he alone who was responsible for the fact that this particular starship had won three Awards for Excellence for the work done in its three last expeditions. Three for three.

So when the explorer said, "No," the captain could not dream of "Yes." Even in the unlikely case that he had, the crew would have mutinied. An Award for Excellence might be, to the captain, a pleasant spectral disk to suspend in the main salon, but to the crew it meant a spectacular addition to take-home pay and an even more welcome addition to vacation time and pension benefits. And this explorer had brought them that three times. Three for three.

The explorer said, "No strange world should be left unexamined."

The captain said, "What is strange about this one?"

"The preliminary probe shows intelligence, and on a frozen world."

"Surely that's not unprecedented."

"The pattern here is strange," the explorer looked uneasy. "I am not sure exactly how or exactly why, but the pattern of life and of intelligence is strange. We must examine it more carefully."

And that was that, of course. There were at least half a trillion planetary worlds in the Galaxy, if one only counted those associated with stars. Add to that the indefinite number moving independently through space and the number might be ten times as great.

Even with computers to help, no starship could know them all, but an experienced explorer, by dint of lacking interest in anything else, of studying every exploratory report published, of considering endless correlations, and, presumably, playing with statistics even in his sleep, grew to have what seemed to others a mystical intuition about such things.

"We'll have to send out probes in full interlocking program," said the explorer.

The captain looked outraged. Full power meant a leisurely examination for weeks at enormous expense.

He said, and it was as much as he could offer in the way of objection, "Is that absolutely necessary?"

"I rather think so," said the explorer with the self-confidence of one who knows his whim is law.

* * *

The probes brought back exactly what the captain expected, and in great detail. An intelligent species rather reminiscent, at least as far as superficial appearance went, of the lesser breeds of the inner proximal regions of the fifth arm of the Galaxy—not quite unusual, but of interest to mentologists, no doubt.

As yet the intelligent species was only at the first level of technology—long, long removed from anything useful.

The captain said so, scarcely able to mask his exasperation, but the explorer, leafing through the reports, remained unmoved. He said, "Strange!" and asked that the trader be summoned.

This was really too much. A successful captain must never give a good explorer cause for unhappiness but there are limits to everything.

The captain said, fighting to keep the level of communication polite, if not friendly, "To what end, Explorer? What can we expect at this level?"

"They have tools," said the explorer thoughtfully.

"Stone! Bone! Wood! Or this planet's equivalent of that. And that's all. Surely we can find nothing in that."

"And yet there is something strange in the pattern."

"May I know what that might be, Explorer?"

"If I knew what it might be, Captain, it would not be strange, and I would not have to find out. Really, Captain, I must insist on the Trader."

* * *

The trader was as indignant as the captain was, and had more scope to express it. His, after all, was a speciality as deep as that of anyone's on the starship, even, in his own opinion (and in some other's), as deep and as essential as the explorer's.

The captain might navigate a starship and the explorer might detect useful civilizations by the most tenuous of signs, but in the final clutch it was the trader and his team

who faced the aliens and who plucked out of their minds and culture that which was useful and gave in return something *they* found useful.

And this was done at great risk. The alien ecology must not be disrupted. Alien intelligences must not be harmed, not even to save one's own life. There were good reasons for that on the cosmic scale and traders were amply rewarded for the risks they ran, but why run *useless* risks.

The trader said, "There is nothing there. *My* interpretation of the probe's data is that we're dealing with semi-intelligent animals. Their usefulness is nil. Their danger is great. We know how to deal with truly intelligent aliens and trader teams are rarely killed by them. Who knows how these animals will react—and you know we are not allowed to defend ourselves properly."

The explorer said, "These animals, if they are no more than that, have interestingly adapted themselves to the ice. There are subtle variations in the pattern here I do not understand, but my considered opinion is that they will not be dangerous and that they may even be useful. I feel they are worth closer examination."

"What can be gained from a Stone Age intelligence?" asked the trader.

"That is for you to find out."

The trader thought grimly: Of course, that is what it comes to—for *us* to find out.

He knew well the history and purpose of the starship expeditions. There had been a time, a million years before, when there had been no traders, explorers, or captains but only ancestral animals with developing mind and a Stone Age technology—much like the animals on the world they were now orbiting. How slow the advance, how painfully slow the self-generated progress—until the third-level civilization had been reached. Then had come the starships and the chance of cross-fertilization of cultures. *Then* had come progress.

The trader said, "With respect, Explorer, I grant your intuitional experience. Will you grant my practical experience, though it is less dramatic? There is no way in which anything below a third-level civilization can have anything we can use."

"That," said the explorer, "is a generalization that may or may not be true."

"With respect, Explorer. It *is* true. And even if those—those semianimals had something we could use, and I can't imagine what it might be, what can we give them in exchange?"

The explorer was silent.

The trader went on. "At this level, there is no way in which a protointelligence can accept an alien stimulation. The mentologists are agreed on that and it is my experience, too. Progress *must* be self-generated until at least the second level is reached. And we *must* make a return; we can take nothing for nothing."

The captain said, "And that makes sense, of course. By stimulating these intelligences to advance, we can harvest them again at a later visit."

"I don't care about the reason for it," said the trader, impatiently. "It is part of the tradition of my profession. We do no harm under any conditions and we give a return for what we take. Here there is nothing we will want to take; and even if we find something, there will be nothing that we can give in return. —We waste time."

The explorer shook his head. "I ask you to visit some center of population, Trader. I will abide by your decision when you return."

And that was that, too.

* * *

For two days the small trader module flashed over the surface of the planet searching for any evidence of a reasonable level of technology. There was none.

A complete search could take years but was scarcely worth it. It was unreasonable to suppose a high level would be hidden. The highest technology was always flaunted for it had no enemy. That was the universal experience of traders everywhere.

It was a beautiful planet, half-frozen as it was. White and blue and green. Wild and rough and variegated. Crude—and untouched.

But it was not the trader's job to deal with beauty and he shrugged off such thoughts impatiently. When his crew talked to him in such terms, he was short with them.

He said, "We'll land here. It seems to be a good-sized concentration of the intelligences. We can do no better."

His second said, "What can we do even with these, Maestro?"

"You can record," said the trader. "Record the animals, both unintelligent and supposedly intelligent, and any artifacts of theirs we can find. Make sure the records are thoroughly holographic."

"We can already see—" began the second.

"*We* can already see," said the trader, "but we must have a record to convince our explorer out of his dreams or we'll remain here forever."

"He is a good explorer," said one of the crew.

"He has been a good explorer," said the trader, "but does that mean he will be good forever? Perhaps his very successes have made him accept himself at too high an evaluation. So we must convince him of reality—if we can."

They wore their suits when they emerged from the module.

The planetary atmosphere would support them, but the feeling of exposure to the raw winds of an open planet would discommode them, even if the atmosphere and temperature were perfect—which they weren't. The gravity was a touch high, as was the light level, but they could bear it.

The intelligent beings, dressed rather sketchily in the outer portions of other animals, retreated reluctantly at their approach and watched at a distance. The trader was relieved at this. Any sign of nonbelligerence was welcome to those not permitted to defend themselves.

The trader and his crew did not try to communicate directly or to make friendly gestures. Who knew what gesture might be considered friendly by an alien? The trader set up a mental field, instead, and saturated it with the vibrations of harmlessness and peace and hoped that the mental fields of the creatures were sufficiently advanced to respond.

Perhaps they were, for a few crept back and watched motionlessly as though intensely curious. The trader thought he detected fugitive thoughts—but that seemed unlikely for first-level beings and he did not follow them up.

Instead, he went stolidly about the business of making holographic reproductions of the vegetation, of a herd of blundering herbivores that appeared and then, deciding the surroundings were dangerous, thundered away. A large animal stood its ground for a while, exposing white weapons in a cavity at its force-end—then left.

The trader's crew worked as he did, moving methodically across the landscape.

* * *

The call, directly mental, and surcharged with such emotion of surprise and awe that the informational content was all but blurred out, came unexpectedly.

"Maestro! Here! Come quickly!"

Specific directions were not given. The trader had to follow the beam, which led into a crevice bounded by two rocky outcroppings.

Other members of the crew were converging but the trader had arrived first.

"What is it?" asked the trader.

His second was standing in the glow of his suit-radiation in a deeply hollowed-out portion of the hillside.

The trader looked about. "This is a natural hollow, not a technological product."

"Yes, but look!"

The trader looked up and for perhaps five seconds he was lost. Then he sent out a strenuous message for all others to stay away.

He said, "Is this of technological origin?"

"Yes, Maestro. You can see it is only partly completed."

"But by whom?"

"By those creatures out there. The intelligent ones. I found one at work in here. This is his light source; it was burning vegetation. These are his tools."

"And where is he?"

"He fled."

"Did you actually see him?"

"I recorded him."

The trader pondered. Then he looked up again. "Have you ever seen anything like this?"

"No, Maestro."

"Or heard of anything like this?"

"No, Maestro."

"Astonishing!"

The trader showed no signs of wanting to withdraw his eyes, and the second said, softly, "Maestro, what do we do?"

"Eh?"

"This will surely win our ship still a fourth prize."

"Surely," said the trader, regretfully, "if we could take it."

The second said, hesitantly, "I have already recorded it."

"Eh? What is the use of that? We have nothing to give in exchange."

"But we have this. Give them anything."

The trader said, "What are you saying? They are too primitive to accept anything we could give them. It will surely be nearly a million years before they could possibly accept the suggestions of exogenous origin. —We will have to destroy the recording."

"But we *know*, Maestro."

"Then we must never talk about it. Our craft has its ethics and its traditions. You know that. Nothing for nothing!"

"Even this?"

"Even this."

The trader's sternly implacable set of expression was tinged with unbearable sorrow and despite his "Even this" he stood irresolute.

The second sensed that. He said, "*Try* giving them something, Maestro."

"Of what use would that be?"

"Of what harm?"

* * *

The trader said, "I have prepared a presentation for the entire starship, but I must show it to you first, Explorer—with deep respect and with apologies for masked thoughts. You were right. There *was* something strange about this planet. Though the intelligences on the planet were barely first level and though their technology was primitive in the extreme, they had developed a concept we have never had and one that, to my knowledge, we have never encountered on any other world."

The captain said, uneasily, "I cannot imagine what it might be." He was quite aware that traders sometimes overpraised their purchases to magnify their own worth.

The explorer said nothing. He was the more uneasy of the two.

The trader said, "It is a form of visual art."

"Playing with color?" asked the captain.

"And shape—but to most startling effect." He had arranged the holographic projector. "Observe!"

In the viewing space before them, a herd of animals appeared; bulky, shaggy, two-horned, four-legged. They hesitated, then ran, dust spurting up beneath their hooves.

"Ugly objects," muttered the captain.

The holographic recording brought the herd to a halt, clamped it down to a still. It magnified, and a single beast filled the view, its bulky head lowered, its nostrils distended.

"Observe this animal," said the trader, "and now observe this artificial composition of a primitive concoction of oil and colored mineral, which we found smeared over the roof of a cave."

There it was again! Not quite the animal as holographed—flat, but vibrant.

"What a peculiar similarity," said the captain.

"Not peculiar," said the trader. "Deliberate! There were dozens of such figures in different poses—of different animals. The likenesses were too detailed to be fortuitous. Imagine the boldness of the conception—to place colors in pleasing shapes and combinations, and in such a way as to deceive the eye into thinking it is looking at a real object. These organisms have devised an art that represents reality. It is representational art, as I suppose we might call it.

"And that's not all. We found it done in three dimensions also." The trader produced an array of small figures in gray stone and in faintly yellow bone. "These are clearly intended to represent themselves."

The captain seemed stupefied. "Did you see these manufactured?"

"No, that I did not, Captain. One of my men saw a planetary being smearing color on one of the cave representations, but these we found already formed. Still, no other explanation is possible than that they were deliberately shaped. These objects could not have assumed these shapes by chance processes."

The captain said, "These are curious, but one doesn't follow the motive. Would not holographic techniques serve the purpose better—at such times as these are developed, of course?"

"These primitives have no conception that holography could someday be developed and could not wait the million years required. Then, too, maybe holography is *not* better. If you compare the representations with the originals you will notice that the representations are simplified and distorted in subtle ways designed to bring certain characteristics into focus. I believe this form of art *improves* on the original in some

ways and certainly has something different to say."

The trader turned to the explorer. "I stand in awe at your abilities. Can you explain how you sensed the uniqueness of this intelligence?"

The explorer signed a negative. "I did not suspect this at all. It is interesting and I see its worth—although I wonder if we could ourselves properly control our colors and shapes in order to force them into such representational form. Yet this does match the unease within me. —What I wonder is how you came into possession of these? What did you give in exchange? It is *there* I see the strangeness lie."

"Well," said the trader, "in a way you're right. Quite strange. I did not think I could give anything since the organisms are so primitive, but this discovery seemed too important to sacrifice without some effort. I therefore chose from among the group of beings who formed these objects one whose mental field seemed somewhat more intense than that of the others and attempted to transfer to him a gift in exchange."

"And succeeded. Of course," said the explorer.

"Yes, I succeeded," said the trader, happily, failing to notice that the explorer had made a statement and had not asked a question. "The beings," the trader went on, "kill such animals as they represent in color, by throwing long sticks tipped with sharpened stone. These penetrate the hide of the animals, wound and weaken them. They can then be killed by the beings who are individually smaller and weaker than the animal they hunt. I pointed out that a smaller, stone-tipped stick could be hurled forward with greater force and effect and with longer range if a cord under tension were used as the mechanism of propulsion."

The explorer said, "Such devices have been encountered among primitive intelligences which were, however, far advanced beyond these. Paleomentologists call it a bow and arrow."

The captain said, "How could the knowledge be absorbed? It couldn't be, at this level of the development."

"But it *was*. Unmistakably. The response of the mental field was one of insight at almost unbearable intensity. —Surely you do not think I would have taken these art objects, were they twenty times as valuable, if I had not been convinced that I had made a return? Nothing for nothing, Captain."

The explorer said in a low, despondent voice, "There is the strangeness. To accept."

The captain said, "But surely, Trader, we cannot do this. They are not ready. We are harming them. They will use the bow and arrow to wound each other and not the beasts alone."

The trader said, "*We* do not harm them and we *did* not harm them. What *they* do to each other and where they end as a result, a million years from now, is not our concern."

The captain and the trader left to set up the demonstration for the starship's company, and the explorer said sadly in the direction in which they had gone, "But they accepted. And they flourish amid the ice. And in twenty thousand years, it will be *our* concern."

He knew they would not believe him, and he despaired.

For the Birds

Charles Modine, despite the fact that he was in his late thirties, and in perfect health, had never been in space. He had seen space settlements on television and had occasionally read about them in the public prints but it went no further than that.

To tell the truth, he was not interested in space. He had been born on Earth, and Earth was enough for him. When he wanted a change of environment, he turned to the sea. He was an avid and skilled sailor.

He was therefore repelled when the representative of Space Structures, Limited, finally told him that in order for him to do the job they were asking him to do, he would have to leave Earth.

Modine said, "Listen. I'm not a space person. I design clothes. What do I know about rockets and acceleration and trajectories and all the rest of it?"

"*We* know about that. You don't have to," said the other, urgently. Her name was Naomi Baranova and she had the queer, tentative walk of someone who had been in space so long she wasn't sure what the gravitational situation was at the moment.

Her clothes, Modine noted with some irritation, functioned as coverings and as little else. A tarpaulin would have done as well.

"But why need I come out to a space station?" he said.

"For what *you* know. We want you to design something for us."

"Clothes?"

"Wings."

Modine thought about it. He had a high, pale forehead and the process of thought always seemed to flush it somewhat. He had been told that at any rate. This time, if it flushed, it was partly in annoyance. "I can do that here, can't I?"

Baranova shook her head firmly. She had hair with a dark reddish tinge that was slowly being invaded by gray. She didn't seem to mind. She said, "We want you to understand the situation, Mr. Modine. We've consulted the technicians and the computer experts and they've built the most efficient possible wings, they tell us. They've taken into account stresses and surfaces and flexibilities and maneuverabilities and everything else you can imagine—but it doesn't help. We think perhaps a few frills—"

"Frills, Ms. Baranova?"

"Something other than scientific perfection. Something to rouse interest. Otherwise, the space settlements won't survive. That's why I want you there; to appreciate the situation for yourself. We're prepared to pay you very well."

* * *

It was the promised pay, including a healthy retainer, win or lose, that brought Modine into space. He was no more money-mad than the average human being, but he was not money-insensitive either, and he liked to see his reputation appreciated.

Nor was it actually as bad as he had expected. In the early days of space travel, there had been short periods of high acceleration and long cramped periods in small modules. Somehow that was what Earth-bound people still thought of in connection with space travel. But a century had passed and the shuttles were commodious, while the hydraulic seats seemed to sop up the acceleration as though it were nothing more than a coffee spill.

Modine spent the time studying photographs of the wings in action and in watching holographic videotapes of the flyers.

He said, "There's a certain grace to the performance."

Naomi Baranova smiled rather sadly. "You're watching experts—athletes. If you could see me trying to handle those wings and manage to tumble and sideslip, I'm afraid you would laugh. And yet I'm better than most."

* * *

They were approaching Space Settlement Five. Its name was Chrysalis, officially, but everyone called it Five.

"You might suppose," said Baranova, "that it would be the other way around, but there's no feeling of poetry about the place. That's the trouble. It's not a home; it's just a job, and it is hard to make people establish families and settle down. Until it's a home—"

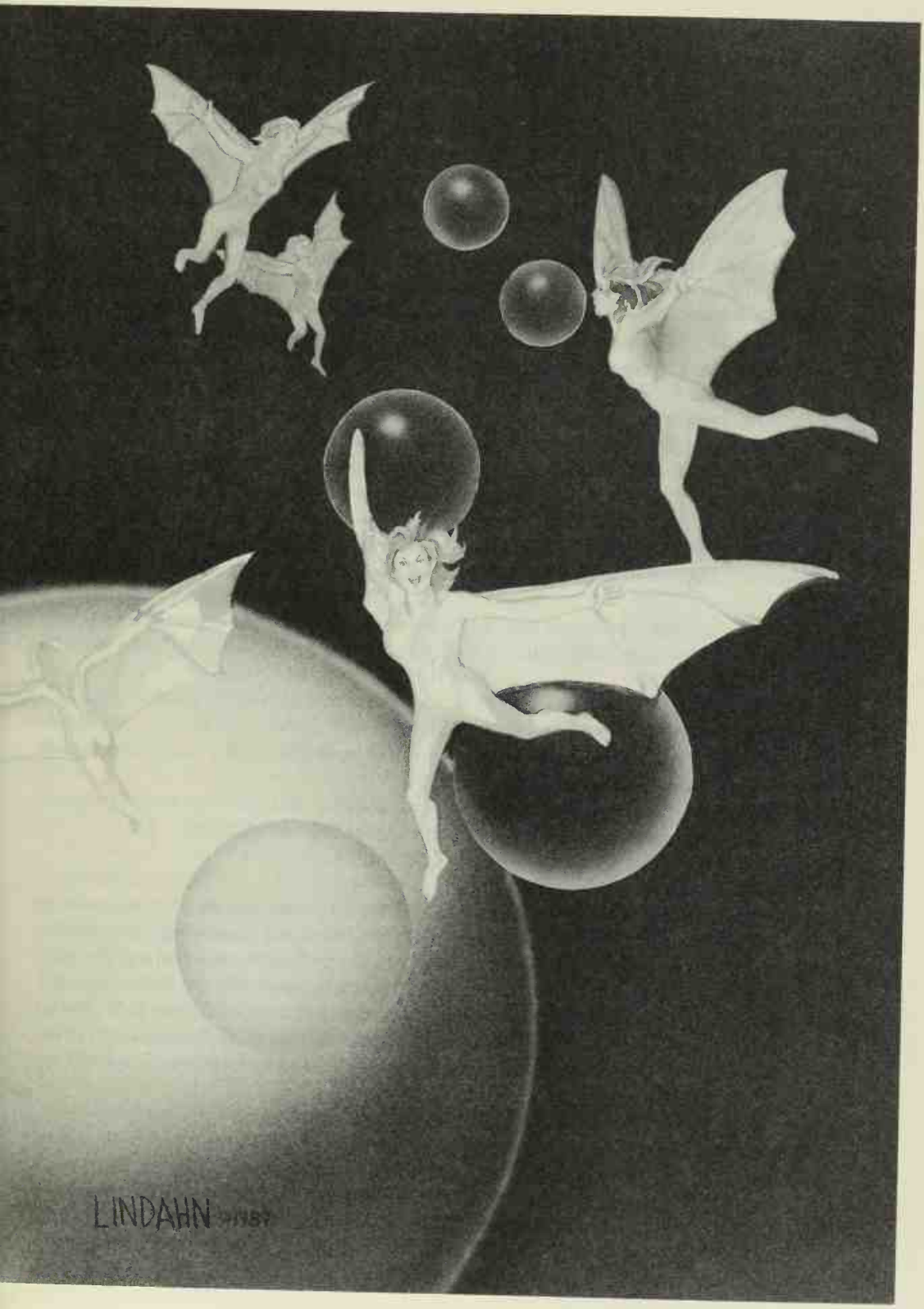
Five showed up as a small sphere, far away, looking much as Modine had seen it on television on Earth. He knew it was larger than it looked, but that was only an intellectual knowledge. His eyes and his emotions were not prepared for the steady increase in size as they approached. The spaceship and he dwarfed steadily and, eventually, they were circling an enormous object of glass and aluminum.

He watched for a long time before he became aware that they were still circling. He said, "Aren't we going to land on it?"

"Not that easy," said Baranova. "Five rotates on an axis about once in two minutes. It has to in order to set up a centrifugal effect that will keep everything inside pressed against the inner wall and create an artificial gravity. We have to match that speed before we can land. It takes time."

"Must it spin that quickly?"

"To have the centrifugal effect mimic Earth-strength gravity, yes. That's the basic problem. It would be much better if we could use a slow spin to produce a tenth-normal gravity or even less, but that interferes with human physiology. People can't take low gravity for too long."


LINDAHN

The ship's speed had nearly matched the rotation period of Five. Modine could clearly see the curve of the outer mirror that caught the sunlight and with it illuminated Five's interior. He could make out the solar power station that supplied the energy for the station, with enough left over for export to Earth.

And they finally entered at one of the poles of the sphere and were inside Five.

* * *

Modine had spent a full day on Five and he was tired—but he had, rather unexpectedly, enjoyed it. They were sitting now on lawn furniture—on a wide stretch of grass—against a vista of suburbia.

There were clouds overhead—sunshine, without a clear view of the Sun itself—a wind—and, in the distance, a small stream.

It was hard to believe he was on a sphere floating in space in the Moon's orbit, circling Earth once a month. He said, "It's like a world."

Baranova said, "So it seems when you're new here. When you've been here a time, you discover you know every corner of it. Everything repeats."

Modine said, "If you live in a particular town on Earth, everything repeats too."

"I know. But on Earth you can travel widely if you wish. Even if you don't travel, you know you can. Here you can't. That's—not so good; but it's not the worst."

"You don't have the Earth's worst," said Modine. "I'm sure you don't have weather extremes."

"The weather, Mr. Modine, is indeed Garden of Edenish, but you get used to that. —Let me show you something. I have a ball here. Could you throw it high up; straight up, and catch it?"

Modine smiled. "Are you serious?"

"Quite. Please do."

Modine said, "I'm not a ball player, but I think I can throw a ball. I might even catch it when it comes down."

He threw the ball upward. It curved parabolically, and Modine found himself drifting forward in order to catch it, then running. It fell out of reach.

Baranova said, "You didn't throw it straight up, Mr. Modine."

"Yes I did," gasped Modine.

"Only by Earth standards," said Baranova. "The difficulty is that what we call the Coriolis force is involved. Here at the inner surface of Five, we're moving quite rapidly in a great circle about the axis. If you throw the ball upward it moves nearer the axis where things make a smaller circle and move more slowly. However, the ball retains the speed it had down here, so it moves ahead and you couldn't catch it. If you had wanted to catch it, you would have had to throw it up and back so that it would loop and return to you like a boomerang. The details of motion are different here on Five than on Earth."

Modine said, thoughtfully, "You get used to it, I suppose."

"Not entirely. We live in the equatorial regions of our small sphere. That's where the motion is fastest and where we get the effect of normal gravity. If we move upward toward the axis, or along the surface toward the poles, the gravitational effect decreases rapidly. We frequently have to go up or poleward and, whenever we do, the Coriolis effect must be taken into account. We have small monorails that must move spirally toward either pole; one track poleward, another returning. In the trip we feel ourselves

perpetually canted to one side. It takes a long time to get used to it and some people never learn the trick of it. No one likes to live here for that reason."

"Can you do something about that twisting effect?"

"If we could make our rotation slower, we would lessen the Coriolis, but we would also lessen the feel of gravitation and we can't do that."

"Damned if you do, damned if you don't."

"Not entirely. We could get along with less gravitation, if we exercise, but it would mean exercise every day for considerable periods. That would have to be fun. People won't indulge in daily calisthenics that are troublesome or a bore. We used to think that flying would be the answer. When we go to the low-gravity regions near the poles, people are almost weightless. They can almost rise into the air by flapping their arms. If we attach light plastic wings to each arm, stiffened by flexible rods, and if those wings are folded and extended in just the right rhythm, people can fly like birds."

"Will that work as exercise?"

"Oh, yes. Flying is hard work, I assure you. The arm and shoulder muscles may not have to do much to keep you aloft but they must be in continuous use to maneuver you properly. It keeps up the muscle tone and bone calcium, *if* it's done on a regular basis. —But people won't do it."

"I should think they'd love to fly."

Baranova sniffed. "They would, if it were easy enough. The trouble is that it requires skillful coordination of muscles to keep steady. The slightest errors result in tumbling and spinning and almost inevitable nausea. Some can learn how to fly gracefully as you saw on the holo-cassettes, but very few."

"Birds don't get seasick."

"Birds fly in normal gravity fields. People on Five don't."

Modine frowned and grew thoughtful.

Baranova said, "I can't promise that you'll sleep. People don't usually their first few nights on a space settlement. Still, please try to do so and tomorrow we'll go to the flying areas."

* * *

Modine could see what Baranova had meant by saying the Coriolis force was unpleasant. The small monorail coach that took them poleward seemed constantly to be sliding leftward and his entrails seemed to be doing the same. He held on to the handgrips, white-knuckled.

"I'm sorry," said Baranova, sympathetically. "If we went more slowly, it wouldn't be so bad, but we're holding up traffic as it is."

"Do you get used to this?" groaned Modine.

"Somewhat. Not enough."

* * *

He was glad to stop finally, but only limitedly so. It took a while to get used to the fact that he seemed to be floating. Each time he tried to move, he tumbled, and each time he tumbled he didn't fall but drifted slowly forward or upward and returned only gradually. His automatic kicking made things worse.

Baranova left him to himself for a while, then caught at him and drew him slowly back. "Some people enjoy this," she said.

"I don't," gasped Modine, miserably.

"Many don't. Please put your feet into these stirrups on the ground and don't make any sudden movements."

* * *

There were five of them flying in the sky. Baranova said, "Those five birds are here just about every day. There are a few hundred who are there now and then. We could accommodate at this pole and at the other, as well as along the axis, something like five thousand at a time. We could use all the space to keep Five's thirty thousand people in condition. What do we do?"

Modine gestured and his body swayed backward in response. "They must have learned how, those birds up there. They weren't born birds. Can't the others learn it, too?"

"Those up there have natural coordination."

"What can I do then? I'm a fashion designer. I don't create natural coordination."

"Not having natural coordination doesn't stop you altogether. It just means working hard, practicing longer. Is there any way you could make the process more—fashionable? Could you design a flying costume; suggest a psychological campaign to get the people out? If we could arrange proper programs of exercise and physical fitness, we could slow Five's rotation, weaken the Coriolis effect, make this place a home."

"You may be asking for a miracle. —Could you have them come closer?"

Baranova waved and one of the birds saw her, and swooped toward them in a long graceful curve. It was a young woman. She hovered ten feet away, smiling, her wings flicking slightly at the tips.

"Hi," she called out. "What's up?"

"Nothing," said Baranova. "My friend wants to watch you handle the wings. Show him how they work."

The young woman smiled and, twisting first one wing, then the other, performed a slow somersault. She straightened to a halt with both wings given a backhanded twist, then rose slowly, her feet dangling and her wings moving slowly. The wing motion grew more rapid and she was off in wild acceleration.

Modine said, after a while, "Rather like ballet dancing, but the wings are ugly."

"Are they? Are they?"

"Certainly," said Modine. "They look like bat wings. The associations are all wrong."

"Tell us what to do then? Should we put a feather design on them? Would that bring out the fliers and make them try harder to learn?"

"No." Modine thought for a while. "Maybe we can make the whole process easier."

He took his feet out of the stirrups, gave himself a little push and floated into the air. He moved his arms and legs experimentally and rocked erratically. He tried to scramble back for the stirrups and Baranova reached up to pull him down.

Modine said, "I'll tell you. I'll design something and if someone here can help me construct it according to the design, I'll try to fly. I've never done any such thing; you've just seen me try to wriggle in the air and I can't even do that. Well, if I use my design and *I* can fly, then anyone can."

"I should think so, Mr. Modine," said Baranova, in a tone that seemed suspended between skepticism and hope.

* * *

By the end of the week, Modine was beginning to feel that Space Settlement Five was home. As long as he stayed at ground level in the equatorial regions, where the gravitational effect was normal, there was no Coriolis effect to bother him and he felt his surroundings to be very Earth-like.

"The first time out," he said, "I don't want to be watched by the population generally because it may be harder than I think and I don't want to get this thing off to a bad start. —But I would like to be watched by some of the officials of the Settlement, just in case I make it."

Baranova said, "I should think we would try in private first. A failure the first time, whatever the excuse—"

"But a success would be *so* impressive."

"What are the chances of success? Be reasonable."

"The chances are good, Ms. Baranova. Believe me. What you have been doing here is all wrong. You're flying in air—like birds—and it's so hard. You said it yourself. Birds on Earth operate under gravity. The birds up here operate without gravity—so everything has to be designed differently."

* * *

The temperature, as always, was perfectly adjusted. So was the humidity. So was the wind speed. The atmosphere was so perfect it was as though it weren't there. —And yet Modine was perspiring with a bad case of stage fright. He was also gasping. The air was thinner in these gravity-free regions than at the equator—not by much, but enough thinner for him to have trouble gathering enough with his heart pounding so.

The air was empty of the human birds; the audience was a handful—the Coordinator, the Secretary of Health, the Commissioner of Safety and so on. There were a dozen men and women present. Only Baranova was familiar.

He had been outfitted with a small mike and he tried to keep his voice from shaking.

He said, "We are flying without gravity and neither birds nor bats are a good model for us. They fly *with* gravity. —It's different in the sea. There's little effective gravity in water, since buoyancy lifts you. When we fly through no-gravity water, we call it swimming. In Space Station Five, where there's no gravity in this region, the air is for swimming, not for flying. We must imitate the dolphin and not the eagle."

He sprang into the air as he spoke, wearing a graceful one-piece suit that neither clung skintight nor bellied. He began to tumble at once, but stretching one arm was sufficient to activate a small gas cartridge. A smoothly curved fin emerged along his spinal column, while a shallow keel marked the line of his abdomen.

The tumbling ceased. "Without gravity," he said, "this is enough to stabilize your flight. You can still tip and turn, but always under control. I may not do it well at first, but it won't take much practice."

He stretched his other arm and each foot was suddenly outlined by a flipper—each elbow by another.

"These," he said, "offer the propulsive force. You needn't flap the arms. Gentle motions will suffice for everything, but you have to bend your body and arch your neck

in order to make turns and veers. You have to twist and alter the angle of your arms and legs. The whole body is engaged, but smoothly and nonviolently. —Which is all the better, for every muscle in your body is involved and you can keep it up for hours without tiring."

He could feel himself moving more surely and gracefully—and faster. Up, up, he was suddenly going, with the air rushing past him until he was almost in a panic for fear he would not be able to slow up. But he turned his heels and elbows almost instinctively and felt himself curve and slow.

Dimly, through the pounding of his heart, he could hear the applause.

* * *

Baranova said, admiringly, "How did you see this when our technicians couldn't?"

"The technicians started with the inevitable assumption of wings, thanks to birds and airplanes, and designed the most efficient ones possible. That's a technician's job. The job of a fashion designer is to see things as an artistic whole. I could see that the wings didn't fit the conditions of the space settlement. Just my job."

Baranova said, "We'll make these dolphin suits and get the population out into the air. I'm sure we can now. And then we can lay our plans to begin to slow Five's rotation."

"Or stop it altogether," said Modine. "I suspect that everyone will want to swim all the time instead of walking." He laughed. "They may not ever want to walk again. *I* may not."

They made out the large check they had promised and Modine, smiling at the figure, said, "Wings are for the birds."

Ignition Point!

"Let me get this straight," said Anthony Myers, leaning across his desk toward the man in the chair facing him. "Your computer does *not* write the speech?"

"No, you do. Or someone else does." Nicholas Jansen was quite composed. He was a small man, very neatly dressed, with an old-fashioned knotted tie that did not seem to make him the least bit self-conscious in a world of turtlenecks.

He said, "What I have developed is a series of words, phrases, sentences that induce reactions in specific groups of people, divided by sex, age, ethnic groups, language, occupation, place of residence or almost anything else conceivable. If you could describe the audience your man would be addressing in sufficient detail, then I could supply you with precisely the sort of thing his talk should include. The more we know about the audience the more accurately my computer program can produce the key words and phrases. They are woven into a speech—"

"Can they? Will they make sense?"

"That's up to the ingenuity of the speech writer, but it doesn't really matter. If you're pounding a drum, you might get the audience stirred up until their feet and hearts are pounding with it; till they reach ignition point. Sense is analogous to tune, but a drum doesn't have to beat out a tune; it merely establishes a rhythm. You can put in as much tune as you can, but it is the rhythm you're after. Do you understand?"

Myers rubbed his chin and stared at the other thoughtfully. "Have you tried this before?"

Jansen smiled narrowly. "Only unofficially. In a small way. Still, I know what I'm talking about. I'm an ochologist—"

"A what?"

"A student of mob psychology, and the first, as far as I know, who has truly computerized the matter."

"And you know this will work—in theory."

"No, I know it *might* work—in theory."

"And you want to try it out on me. What if it doesn't work?"

"Then what have you to lose? I'm not charging you. It's useful in my work, and if I may believe what I have been told, your man is lost if you don't use my services."

Myers drummed his fingers on the desk softly. "Look. Let me explain about my man. He looks impressive. He's got a good voice. He's amiable and likable. Properly handled I can make him a corporation executive, or an ambassador, or the President of the United States. The trouble is he has no brains to speak of and he needs me to supply them. But the one thing he has to be able to do without me is to deliver a speech in such a way as to fool people into thinking he does have brains. This he cannot do, even if the speech is written out for him. The speech may be intelligent and yet he can't say it in such a way as to make *himself* seem intelligent. Do you think you can write a speech better than I can?"

"Not better. Just foolproof. I can make it possible for him to push the right buttons and ignite the audience."

"What do you mean, ignite?"

"To catch fire. Isn't that what ignite means? Every crowd has its ignition point, though every different crowd requires something different for ignition."

"You may be selling me a load of nonsense, Mr. Jansen. There's no speech so foolproof that a nincompoop won't spoil it."

"On the contrary. A nincompoop might deliver it more surely than you could, since he won't be thinking for himself. May I meet him? —That is, if you want my services?"

"You understand that everything said here is confidential."

"Certainly. Since I intend to turn this to commercial use eventually, I am more interested in confidentiality than you are."

* * *

Barry Winston Bloch was not quite forty. He had played semipro baseball in his younger days. He had made his way through a midwestern college with minimal effort and he had been moderately successful as a salesman. His appearance was impressive, not because he was handsome but because he looked physically powerful, and gave the impression of possessing a mature wisdom. His hair was already showing streaks of gray and he had a way of throwing his head up and smiling warmly that filled you full of confidence in him.

It took an hour or so, usually, to realize that there was nothing behind the amiability but additional amiability.

Right now, Bloch felt uncomfortable. Ever since he had tied up with Myers, he had been a prey to discomfort. He wanted to get ahead; it was his secret desire to be a congressman and sometimes he wondered if he might not be a great evangelist, but the trouble was that people made him nervous. After he had used up his big grin, it came time to talk and he never had anything particular to say.

And no one had ever made him feel quite as uncomfortable as this little man with his gimlet eyes, who would sit there absolutely motionless while Bloch read his speeches. It was hard enough to talk to a real audience which rustled and coughed and seemed to be annoyed with him for not finishing. This little man—he had to remember his name was Jansen—who never responded in any way just choked him off.

No, he responded in one way—he invariably handed Bloch another speech to read. Each one was a little different and each one appealed to him somehow, but he never felt as if he did them justice. It made him sad somehow—and ashamed.

The manuscript presented to him on *this* day seemed worse than all the others. He looked at it in dismay. "What are all these marks?"

"Well now, B.B.," Myers adopted the soothing tone he almost always used with Bloch, "just let Mr. Jansen explain."

"It's direction. It's something you must learn, but it won't be difficult. A dash means a pause, an underlining means an emphasis. A downward arrow before a word means you let your voice drop a couple of notes; an upward arrow means you let it rise. A curved arrow means you let things fade off in contempt, if it curves downward. If it curves upward, your voice rises in anger. A parenthesis means a small smile; a double parenthesis means a grin; a triple parenthesis means a chuckle. You never laugh out loud. A line over a word means you look grim; a double line means you repeat. An asterisk—"

Bloch said, "I can't remember all that."

Myers, from behind Bloch, mouthed worriedly, I don't think he will.

Jansen seemed unperturbed by the double denial. "You will with practice. The stakes are high and worth a little trouble."

Myers said, "Go ahead, B.B. Just give it a read-through and Mr. Jansen will help out as you go along."

Bloch looked as though he wished to object further, but his native amiability won out. He put the manuscript on the lecturn and began to read it. He stumbled, peered at the manuscript with a frown, began again, and skidded to a halt.

Jansen explained and Bloch began again. They spent an hour over the first three paragraphs before calling a halt.

Myers said, "It's awful."

Jansen said, "How did you do the first time you tried to ride a bicycle?"

Bloch repeated the speech all the way through twice that day; twice more the second day. A second speech was prepared, not quite the same, but just as empty of real content.

After a week, Bloch said, "I'm getting the hang of it. It seems to me that I'm getting so that it sounds good."

Myers said, with hollow hopefulness, "I think so, too."

Jansen said to Myers afterward, "He's doing better than I expected. He's got a certain potentiality, but—"

"But what?"

Jansen shrugged. "Nothing. We'll just have to see."

* * *

Jansen said, "I think he's ready for an audience now, provided it's a homogenous one which we can analyze accurately."

"The American Association of Textile Weavers needs a speaker and I think I can place B.B. with them. Can you handle that audience?"

"Weavers?" said Jansen, thoughtfully. "The economic position would be homogenous and I suspect the educational level would not be too wide a spead. I would need to have a breakdown on what city and states they represent and on the percentages coming from establishments of different size. Age, sex and the usual, too, of course."

"I'll see what I can dig up from the Union, but there isn't much time, you know."

"We'll try to work quickly. We've got a great deal of the basics worked out. Your man is learning how to deliver a speech."

Myers laughed. "He's gotten to the point where he almost convinces *me*. —You

know, I wouldn't want him in Congress. I would want him on television, selling my views—his, I mean—"

"Your views, you mean," said Jansen, dryly. "*He* has none."

"It doesn't matter. I'm counting my chickens—"

* * *

Bloch did well at the A.A.T.W. cocktail party. He followed his instructions, had smiled, had talked just a bit but not too much, had told a harmless joke or two and dropped a few names, and had, for the most part, done a lot of listening and nodding.

And yet Myers, from his table up front, felt a certain tightness. If B.B. flopped, they could try again, but if he flopped, would there be enough in him to make it worth his while to try again? This might be the test that would show that B.B. just didn't have it. What a waste, with that appearance! With that Roman senator head of his!

He stole a glance at Jansen, who sat at his left. The little man seemed utterly composed but there was a slight contraction of the eyebrows, as though there were a secret worry gnawing at him.

The dinner was over, the various business announcements were being made, the committee was being thanked, the people seated on the dais were being introduced—all the maddening details that seemed to be designed for no other purpose than to place additional unnecessary strain upon the speaker.

Myers stared earnestly at Bloch, caught his eye, and held up two fingers briefly. Go in and get them, B.B.!

Would he? The speech was an odd one, almost quixotic. It would read oddly in the papers if it ever made the news columns, but it was full of button pushers—according to Jansen and his computer.

Bloch was standing up now. He stepped easily to the lectern and put the manuscript before him. He was always good at that; doing it slickly and unobtrusively so that the audience never really had it rubbed in their face that the speech was going to be read.

Myers thought, not entirely irrelevantly, of the time he had attended a meeting at which the speaker had somehow managed to knock off his manuscript with an overenergetic gesture. The manuscript could be picked up and rearranged but an audience died at that moment and could not be revived.

Bloch smiled at the audience and began slowly. (Don't wait too long to speed up, B.B.)

He didn't. He quickened the beat. At times, he stopped briefly to puzzle out a symbol but fortunately, that sounded like deliberation, the kind of thought you would expect of mature wisdom. It helped to have that appearance.

Then he spoke still more quickly and emotionally and, to Myers' surprise, he could feel the drumbeats start. There were those key phrases, with just the right kind of emphasis, and in response, he could feel the audience stir.

Laughter came on cue and at one point, there was a patter of applause. Myers had never heard applause interrupt Bloch before.

Bloch's face looked a little flushed and at one point he brought his fist down on the lectern and the little fluorescent lamp shook. (Don't knock it over, B.B.!) The audience stamped its feet in response.

Myers felt the mounting excitement within himself, even though he knew exactly how carefully the speech had been prepared. He leaned toward Jansen. "He's igniting the audience, wouldn't you say?"

Jansen nodded once. His lips scarcely moved. "Yes. And maybe—"

Bloch had paused briefly in his talk—just long enough to tighten the audience into a knot of tension—and then he brought his hand down savagely on the lectern, picked up the manuscript in a crumpled mess, and threw it aside. "I don't need this," he said, his voice rising into a distinct note of triumph. "I don't want it. I wrote it in cold blood before I had you all before me. Let me speak now from my heart, as it comes to me, standing here before you; let me tell you all, friends and Americans, you and I, together, what I see in the world today and what I *want* to see, and believe me, my friends, the two are *not—the—same.*"

There was a roar in response.

Myers clutched at Jansen wildly. "He can't make it on his own!"

But he could and did. He spoke through and over the applause and the shouting. It scarcely mattered if he were heard. He raised both arms as though to embrace the audience and a voice shouted, "Go on! Give it to them!"

Bloch gave it to them. Exactly what he said scarcely mattered but when it was over, there was a wild and jubilant standing ovation.

"What happened?" said Myers, through the noise. (He was applauding as loudly as everyone else.)

Jansen remained seated, in a strange attitude of collapse. He clutched at Myers, drew him close, and said in a shaking voice, "Don't you see what happened? It was a one-in-a-million shot. Just toward the end I began to wonder if it were possible. It *can* happen—"

"What are you talking about?"

"The audience ignited and Bloch was speaking to an ignited audience for the first time in his life, and speakers have their ignition point, too. Bloch himself ignited, and an ignited speaker can carry public opinion and move mountains."

"Who? B.B.?"

"Yes."

"Well, that's great."

"Is it? When ignited, he's got power, and if he finds out he has, why would he need you? Or me? And if so, where will he go? There have been great charismatics before who have not always led to glory."

Bloch was with them, people crowding about him. He said to Myers in a breathless undertone, "That was easy! I feel great!" He turned to those about him, laughing, holding them all with no trouble.

Myers looked after him, confused; Jansen looked after him, afraid!

Lest We Remember

1

The problem with John Heath, as far as John Heath was concerned, was that he struck a dead average. He was sure of it. What was worse, he felt that Susan suspected it.

It meant he would never make a true mark in the world, never climb to the top of Quantum Pharmaceuticals, where he was a steady cog among the junior executives—never make the Quantum Leap.

Nor would he do it anywhere else, if he changed jobs.

He sighed inwardly. In just two more weeks he was going to be married and for her sake he yearned to be upwardly mobile. After all, he loved her madly and wanted to shine in her eyes.

But then, that was dead average for a young man about to be married.

Susan Collins looked at John lovingly. And why not? He was reasonably good-looking and intelligent and a steady, affectionate fellow besides. If he didn't blind her with his brilliance, he at least didn't upset her with an erraticism he didn't possess.

She patted the pillow she had placed behind his head when he sat down in the armchair and handed him his drink, making sure he had a firm grip before she let go.

She said, "I'm practicing to treat you well, Johnny. I've got to be an efficient wife."

John sipped at his drink. "I'm the one who'll have to be on my toes, Sue. Your salary is higher than mine."

"It's all going to go into one pocket once we're married. It will be the firm of Johnny and Sue keeping one set of books."

"You'll have to keep it," said John, despondently. "I'm bound to make mistakes if I try."

"Only because you're sure you will. —When are your friends coming?"

"Nine, I think. Maybe nine-thirty. And they're not exactly friends. They're Quantum people from the research labs."

"You're sure they won't expect to be fed?"

"They said after dinner. I'm positive about that. It's business."

She looked at him quizzically. "You didn't say that before."

"Say what before?"

"That it was business. Are you sure?"

John felt confused. Any effort to remember *precisely* always left him confused. "They said so—I think."

Susan's look was that of good-natured exasperation, rather like the one she would have given a friendly puppy who is completely unaware its paws are muddy. "If you really thought," she said, "as often as you say 'I think' you wouldn't be so perennially uncertain. Don't you see it *can't* be business. If it were business, wouldn't they see you *at* business?"

"It's confidential," said John. "They didn't want to see me at work. Not even at my apartment."

"Why here, then?"

"Oh, I suggested that. I thought you ought to be around, anyway. They're going to have to deal with the firm of Johnny and Sue, right?"

"It depends," said Susan, "on what the confidential is all about. Did they give you any hints?"

"No, but it couldn't hurt to listen. It could be something that would give me a boost in standing at the firm."

"Why you?" asked Susan.

John looked hurt, "Why *not* me?"

"It just strikes me that someone at your job level doesn't require all that confidentiality and that—"

She broke off when the intercom buzzed. She dashed off to answer and came back to say, "They're on the way up."

2

Two of them were at the door. One was Boris Kupfer, whom John had already spoken to—large and restless, with a clear view of bluish stubble on his chin.

The other was David Anderson, smaller and more composed. His quick eyes moved this way and that, however, missing nothing.

"Susan," said John, uncertainly, still holding the door open. "These are the two colleagues of mine that I told you about. Boris—" He hit a blank in his memory banks and stopped.

"Boris Kupfer," said the larger man morosely, jingling some change in his pocket, "and David Anderson here. It's very kind of you, Miss—"

"Susan Collins."

"It's very kind of you to make your place of residence available to Mr. Heath and to us for a private conference. We apologize for trespassing on your time and your privacy in this manner—and if you could leave us to ourselves for a while, we will be further grateful."

Susan stared at him solemnly. "Do you want me to go to the movies, or just into the next room?"

"If you could visit a friend—"

"No," said Susan, firmly.

"You can dispose of your time as you please, of course. A movie, if you wish."

"When I said 'No,'" said Susan, "I meant I wasn't leaving. I want to know what this is about."

Kupfer seemed nonplussed. He stared at Anderson for a moment, then said, "It's confidential, as Mr. Heath explained to you, I hope."

John, looking uneasy, said, "I explained that. Susan understands—"

"Susan," said Susan, "doesn't understand and wasn't given to understand that she was to absent herself from the proceedings. This is my apartment and Johnny and I are being married in two weeks—exactly two weeks from today. We are the firm of Johnny and Sue and you'll have to deal with the firm."

Anderson's voice sounded for the first time, surprisingly deep and as smooth as though it had been waxed. "Boris, the young woman is right. As Mr. Heath's soon-to-be wife, she will have a great interest in what we have come here to suggest and it would be wrong to exclude her. She has so firm an interest in our proposal that if she were to wish to leave, I would urge her most strongly to remain."

"Well, then, my friends," said Susan, "what will you have to drink? Once I bring you those drinks, we can begin."

Both were seated rather stiffly and had sipped cautiously at their drinks, and then Kupfer said, "Heath, I don't suppose you know much about the chemical details of the company's work—the cerebro-chemicals, for instance."

"Not a bit," said John, uneasily.

"No reason you should," said Anderson, silkily.

"It's like this," said Kupfer, casting an uneasy glance at Susan—

"No reason to go into technical details," said Anderson, almost at the lower level of audibility.

Kupfer colored slightly. "Without technical details, Quantum Pharmaceuticals deals with cerebro-chemicals which are, as the name implies, chemicals that affect the cerebrum; that is, the higher functioning of the brain."

"It must be very complicated work," said Susan, with composure.

"It is," said Kupfer. "The mammalian brain has hundreds of characteristic molecular varieties found nowhere else, which serve to modulate cerebral activity, including aspects of what we might term the intellectual life. The work is under the closest corporate security, which is why Anderson wants no technical details. I *can* say this, though. —We can go no further with animal experiments. We're up against a brick wall if we can't try the human response."

"Then why don't you?" said Susan. "What stops you?"

"Public reaction if something goes wrong!"

"Use volunteers, then."

"That won't help. Quantum Pharmaceuticals couldn't take the adverse publicity if something went wrong."

Susan looked at them mockingly. "Are you two working on your own, then?"

Anderson raised his hand to stop Kupfer. "Young woman," he said, "let me explain briefly in order to put an end to wasteful verbal fencing. If we succeed, we will be enormously rewarded. If we fail, Quantum Pharmaceuticals will disown us and we will pay what penalty there is to be paid, such as the ending of our careers. If you ask us, why we are willing to take this risk, the answer is, we do not think a risk exists. We are reasonably sure we will succeed; entirely sure we will do no harm. The corporation feels it cannot take the chance; but we feel we can. —Now, Kupfer, proceed!"

Kupfer said, "We have a memory chemical. It works with every animal we have tried. Their learning ability improves amazingly. It should work on human beings, too."

John said, "That sounds exciting."

"It *is* exciting," said Kupfer. "Memory is not improved by devising a way for the brain to store information more efficiently. All our studies show that the brain stores almost unlimited numbers of items perfectly and permanently. The difficulty lies in recall. How many times have you had a name at the tip of your tongue and couldn't get it? How many times have you failed to come up with something you *knew* you knew, and then did come up with it two hours later when you were thinking about something else. —Am I putting it correctly, David?"

"You are," said Anderson. "Recall is inhibited, we think, because the mammalian brain outraced its needs by developing a too-perfect recording system. A mammal stores more bits of information than it needs or is capable of using and if all of it was on tap at all times, it would never be able to choose among them quickly enough for appropriate reaction. Recall is inhibited, therefore, to insure that items emerge from memory storage in manipulable numbers, and with those items most desired not blurred by the accompaniment of numerous other items of no interest.

"There is a definite chemical in the brain that functions as a recall inhibitor, and we have a chemical that neutralizes the inhibitor. We call it a disinhibitor, and as far as we have been able to ascertain the matter, it has no deleterious side effects."

Susan laughed. "I see what's coming, Johnny. You can leave now, gentlemen. You just said that recall is inhibited to allow mammals to react more efficiently, and now you say that the disinhibitor has no deleterious side effects. Surely the disinhibitor will make the mammals react less efficiently; perhaps find themselves unable to react at all. And now you are going to propose that you try it on Johnny and see if you reduce him to catatonic immobility or not."

Anderson rose, his thin lips quivering. He took a few rapid strides to the far end of the room and back. When he sat down, he was composed and smiling. "In the first place, Miss Collins, it's a matter of dosage. We told you that the experimental animals all displayed enhanced learning ability. Naturally, we didn't eliminate the inhibitor entirely; we merely suppressed it in part. Secondly, we have reason to think the human brain *can* handle complete disinhibition. It is much larger than the brain of any animal we have tested and we all know its incomparable capacity for abstract thought.

"It is a brain designed for perfect recall, but the blind forces of evolution have not managed to remove the inhibiting chemical which, after all, was designed for and inherited from the lower animals."

"Are you sure?" asked John.

"You *can't* be sure," said Susan, flatly.

Kupfer said, "We are sure, but we need the proof to convince others. That's why we have to try a human being."

"John, in fact," said Susan.

"Yes."

"Which brings us," said Susan, "to the key question. Why John?"

"Well," said Kupfer, slowly, "we need someone for whom chances of success are most nearly certain, and in whom it would be most demonstrable. We don't want someone so low in mental capacity that we must use dangerously large doses of the disinhibitor; nor do we want someone so bright that the effect will not be sufficiently noticeable. We need someone who's average. Fortunately, we have the full physical and psychological profiles of all the employees at Quantum and in this and, in fact, all other ways, Mr. Heath is ideal."

"Dead average?" said Susan.

John looked stricken at the use of the phrase he had thought his own innermost, and disgraceful, secret. "Come on, now." he said.

Ignoring John's outcry, Kupfer answered Susan, "Yes."

"And he won't be, if he submits to treatment?"

Anderson's lips stretched into another one of his cheerless smiles. "That's right. He won't be. This is something to think about if you're going to be married soon—the firm of Johnny and Sue, I think you called it. As it is, I don't think the firm will advance at Quantum, Miss Collins, for although Heath is a good and reliable employee he is, as you say, dead average. If he takes the disinhibitor, however, he will become a remarkable person and move upward with astonishing speed. Consider what that will mean to the firm."

"What does the firm have to lose?" asked Susan, grimly.

Anderson said, "I don't see how you can lose anything. It will be a sensible dose which can be administered at the laboratories tomorrow—Sunday. We will have the floor to ourselves; we will keep him under surveillance for a few hours. —It is certain nothing could go wrong. If I could tell you of our painstaking experimentation and of our thoroughgoing exploration of all possible side effects—"

"On animals," said Susan, not giving an inch.

But John said, tightly, "I'll make the decision, Sue. I've had it up to here with that dead-average bit. It's worth some risk to me if it means getting off that dead-average dead end."

"Johnny," said Susan, "don't jump."

"I'm thinking of the firm, Sue. I want to contribute my share."

Anderson said, "Good, but sleep on it. We will leave two copies of an agreement we will ask you to look over and sign. Please don't show it to anybody whether you sign or not. We will be here tomorrow morning again to take you to the laboratory."

They smiled, rose, and left.

John read over the agreement with a troubled frown, then looked up. "You don't think I should be doing this, do you, Sue?"

"It worries me, sure."

"Look, if I have a chance to get away from that dead average—"

Susan said, "What's wrong with that? I've met so many nuts and cranks in my short life that I welcome a nice, average guy like you, Johnny. Listen, I'm dead average too."

"*You* dead average. With your looks? Your figure?"

Susan looked down upon herself with a touch of complacency. "Well, then, I'm just your dead-average gorgeous girl," she said.

3

The injection took place at 8 A.M. Sunday, no more than twelve hours after the proposition had been advanced. A thoroughly computerized body sensor was attached to John in a dozen places, while Susan watched with keen-eyed apprehension.

Kupfer said, "Please, Heath, relax. All is going well, but tension speeds the heart rate, raises the blood pressure, and skews our results."

"How can I relax?" muttered John.

Susan put in sharply, "Skews the results to the point where you don't know what's going on?"

"No, no," said Anderson. "Boris said all is going well and it is. It is just that our animals were always sedated before the injection, and we did not feel sedation would have been appropriate in this case. So if we can't have sedation, we must expect tension. Just breathe slowly and do your best to minimize it."

It was late afternoon before he was finally disconnected.

"How do you feel?" asked Anderson.

"Nervous," said John. "Otherwise, all right."

"No headache?"

"No. But I want to visit the bathroom. I can't exactly relax with a bedpan."

"Of course."

John emerged, frowning. "I don't notice any particular memory improvement."

"That will take some time and will be gradual. The disinhibitor must leak across the blood-brain barrier, you know," said Anderson.

4

It was nearly midnight when Susan broke what had turned out to be an oppressively silent evening in which neither had much responded to the television.

She said, "You'll have to stay here overnight. I don't want you alone when we don't really know what's going to happen."

"I don't feel a thing," said John, gloomily. "I'm still me."

"I'll settle for that, Johnny," said Susan. "Do you feel any pains or discomforts or oddnesses at all?"

"I don't think so."

"I wish we hadn't done it."

"For the firm," said John, smiling weakly. "We've got to take some chances for the firm."

5

John slept poorly, and woke drearily, but on time. And he arrived at work on time, too, to start the new week.

By 11 A.M., however, his morose air had attracted the unfavorable attention of his immediate superior, Michael Ross. Ross was burly and black-browed and fit the stereotype of the stevedore without being one. John got along with him though he did not like him.

Ross said, in his bass-baritone, "What's happened to your cheery disposition, Heath—your jokes—your lilting laughter?" Ross cultivated a certain preciosity of speech as though he were anxious to negate the stevedore image.

"Don't exactly feel tip-top," said John, not looking up.

"Hangover?"

"No, sir," said John, coldly.

"Well, cheer up, then. You'll win no friends, scattering stinkweeds over the fields as you gambol along."

John would have liked to groan. Ross's subliterary affectations were wearisome at the best of times and this wasn't the best of times.

And to make matters worse, John smelled the foul odor of a rancid cigar and knew that James Arnold Prescott—the head of the sales division—could not be far behind.

Nor was he. He looked about, and said, "Mike, when and what did we sell Rahway last spring or thereabouts? There's some damned question about it and I think the details have been miscomputerized."

The question was not addressed to him, but John said quietly, "Forty-two vials of PCAP. That was on April 14, J.P., invoice number P-20543, with a five per cent discount granted on payment within thirty days. Payment, in full, received on May 8."

Apparently everyone in the room had heard that. At least, everyone looked up.

Prescott said, "How the hell do you happen to know all that?"

John stared at Prescott for a moment, a vast surprise on his face. "I just happened to remember, J.P."

"You did, eh? Repeat it."

John did, faltering a bit, and Prescott wrote it down on one of the papers on John's desk, wheezing slightly as the bend at his waist compressed his portly abdomen up against his diaphragm and made breathing difficult. John tried to duck the smoke from the cigar without seeming to do so.

Prescott said, "Ross, check this out on your computer and see if there's anything to it at all." He turned to John with an aggrieved look. "I don't like practical jokers. What would you have done if I had accepted these figures of yours and walked off with them?"

"I wouldn't have done anything. They're correct," said John, conscious of himself as the full center of attention.

Ross handed Prescott the readout. Prescott looked at it and said, "This is from the computer?"

"Yes, J.P."

Prescott stared at it, then said, with a jerk of his head toward John, "And what's he? Another computer? His figures were correct."

John tried a weak smile, but Prescott growled and left, the stench of his cigar a lingering reminder of his presence.

Ross said, "What the hell was that little bit of legerdemain, Heath? You found out what he wanted to know and looked it up in advance to get some kudos?"

"No, sir," said John, who was gathering confidence. "I just happened to remember. I have a good memory for these things."

"And took the trouble to keep it from your loyal companions all these years?

There's no one here who had any idea you hid a good memory behind that unremarkable forehead of yours."

"No point in showing it, Mr. Ross, is there? Now when I have, it doesn't seem to have gained me any goodwill, does it?"

And it hadn't. Ross glowered at him and turned away.

6

John's excitement over the dinner table at Gino's that night made it difficult for him to talk coherently, but Susan listened patiently and tried to act as a stabilizing force.

"You might just have happened to remember, you know," she said. "By itself it doesn't prove anything, Johnny."

"Are you crazy?" He lowered his voice at Susan's gesture and quick glance about. He repeated in a semiwhisper, "Are you crazy? You don't suppose it's the only thing I remember, do you? I think I can remember anything I ever heard. It's just a question of recall. For instance, quote some line out of Shakespeare."

"To be or not to be."

John looked scornful. "Don't be funny. Oh, well, it doesn't matter. The point is that if you recite any line, I can carry on from there for as long as you like. I read some of the plays for English Lit classes at college and some for myself and I can bring any of it back. I've tried. It flows! I suppose I can bring back any part of any book or article or newspaper I've ever read, or any TV show I've ever watched—word for word or scene for scene."

Susan said, "What will you do with all that?"

John said, "I don't have that consciously in my head at all times. Surely you don't —wait, let's order—"

Five minutes later, he said, "Surely you don't— My God, I haven't forgotten where we left off. Isn't it amazing? —Surely you don't think I'm swimming in a mental sea of Shakespearean sentences at all times. The recall takes an effort; not much of one, but an effort."

"How does it work?"

"I don't know. How do you lift your arm? What orders do you give your muscles? You just will the arm to lift upward and it does so. It's no trouble to do so, but your arm doesn't lift *until* you want it to. Well, I remember anything I've ever read or seen when I want to but not when I don't want to. I don't know how I do it, but I do it."

The first course arrived and John tackled it happily.

Susan picked at her stuffed mushrooms. "It sounds exciting."

"Exciting? I've got the biggest, most wonderful toy in the world. My own brain. Listen, I can spell any word correctly and I'm pretty sure I won't ever make any grammatical mistake."

"Because you remember all the dictionaries and grammars you ever read?"

John looked at her sharply. "Don't be sarcastic, Sue."

"I wasn't being—"

He waved her silent. "I never used dictionaries as light reading. But I do remember words and sentences in my reading and they were correctly spelled and correctly parsed."

"Don't be sure. You've seen any word misspelled in every possible way and every possible example of twisted grammar, too."

"Those were exceptions. By far the largest number of times I've encountered literary English, I've encountered it used correctly. It outweighs accidents, errors, and ignorance. What's more, I'm sure I'm improving even as I sit here, growing more intelligent steadily."

"And you're not worried. What if—"

"What if I become *too* intelligent? Tell me how on Earth you think becoming too intelligent can be harmful."

"I was going to say," said Susan, coldly, "that what you're experiencing is not intelligence. It's only total recall."

"How do you mean 'only'? If I recall perfectly, if I use the English language correctly, if I know endless quantities of material, isn't that going to make me seem more intelligent? How else need one define intelligence? You aren't growing just a little jealous, are you, Sue?"

"No," more coldly still. "I can always get an injection of my own if I feel desperate about it."

John put down his fork. "You can't mean that."

"I don't, but what if I did?"

"Because you can't take advantage of your special knowledge to deprive me of my position."

"What position?"

The main course arrived and for a few moments, John was busy. Then he said, in a whisper, "My position as the first of the future. *Homo superior!* There'll never be too many of us. You heard what Kupfer said. Some are too dumb to make it. Some are too smart to change much. I'm the one!"

"*Dead* average." One corner of Susan's mouth lifted.

"Once I was. There'll be others like me eventually. Not many, but there'll be others. It's just that I want to make my mark before the others come along. It's for the firm, you know. Us!"

He remained lost in thought thereafter, testing his brain delicately.

Susan ate in an unhappy silence.

7

John spent several days organizing his memories. It was like the preparation of an orderly reference book. One by one, he recalled all his experiences in the six years he had spent at Quantum Pharmaceuticals and all he had heard and all the papers and memos he had read.

There was no difficulty in discarding the irrelevant and unimportant and storing them in a "hold till further notice" compartment where they did not interfere with his analysis. Other items were put in order so that they established a natural progression.

Against that skeletal organization, he resurrected the scuttlebutt he had heard; the gossip, malicious or otherwise; casual phrases and interjections at conferences which he had not been conscious of hearing at the time. Those items which did not fit anywhere against the background he had built up in his head were worthless, empty of factual content. Those which did fit clicked firmly into place and could be seen as true by that mere fact.

The further the structure grew, and the more coherent, the more significant new items became and the easier it was to fit them in.

Ross stopped by John's desk on Thursday. He said, "I want to see you in my office at the nonce, Heath, if your legs will deign to carry you in that direction."

John rose uneasily. "Is it necessary? I'm busy."

"Yes, you look busy." Ross looked over the clear desk which, at the moment, held nothing but a studio photo of a smiling Susan. "You've been this busy all week. But you've asked me whether seeing me in my office is necessary. For me, no; but for you, vital. There's the door to my office. There's the door to the hell out of here. Choose one or the other and do it fast."

John nodded and, without undue hurry, followed Ross into his office.

Ross seated himself behind his desk but did not invite John to sit. He maintained a hard stare for a moment, then said, "What the hell's got into you this week, Heath. Don't you know what your job is?"

"To the extent that I have done it, it would seem that I do," said John. "The report on microcosmic is on your desk and complete and seven days ahead of deadline. I doubt that you can have complaints about it."

"You doubt, do you? Do I have permission to have complaints if I choose to after communing with my soul? Or am I condemned to applying to you for permission?"

"I apparently have not made myself plain, Mr. Ross. I doubt that you have *rational* complaints about it. To have those of the other variety is entirely up to you."

Ross rose now. "Listen, punk, if I decide to fire you, you won't get the news by word of mouth. It won't be anything I say that will give you the glad tidings. You will go out through the door in a violent tumble and mine will be the propulsive force behind that tumble. Just keep that in your small brain and your tongue in your big mouth. —Whether you've done your work or not is not at question right now. Whether you've done everyone else's is. Who and what gives you the right to manage everyone in this place?"

John said nothing.

Ross roared, "Well?"

John said, "Your order was 'keep your tongue in your big mouth.'"

Ross turned a dangerous red. "You will answer questions, however."

John said, "I am not aware that I have been managing anyone."

"There's not a person in the place you haven't corrected at least once. You have gone over Willoughby's head in connection with the correspondence on the TMP's; you have been into general files using Bronstein's computer access; and God knows what else I haven't yet been told about and all in the last two days. You are disrupting the work of this department and it must cease this moment. There must be dead calm, and instantaneously, or it will be tornado weather for you, my man."

John said, "If I have interfered in the narrow sense, it has been for the good of the

company. In the case of Willoughby, his treatment of the TMP matter was putting Quantum Pharmaceuticals in violation of government regulations, something I have pointed out to you in one of several memos I have sent you which you apparently have not had occasion to read. As for Bronstein, he was simply ignoring general directions and costing the company fifty thousand in unnecessary tests, something I was easily able to establish by locating the necessary correspondence—merely to corroborate my clear memory of the situation."

Ross was swelling visibly through the talk. "Heath," he said, "you are usurping my role. You will, therefore, gather your personal effects and be off the premises before lunch, never to return. If you do, I will take extreme pleasure in helping you out again with my foot. Your official notice of dismissal will be in your hands, or down your throat, before your effects will be collected, work as quickly as you may."

John said, "Don't try to bully me, Ross. You've cost the company a quarter of a million dollars through incompetence and you know it."

There was a short pause as Ross deflated. He said, cautiously, "What are you talking about?"

"Quantum Pharmaceuticals went down to the wire on the Nutley bid and missed out because a certain piece of information that was in your hands stayed in your hands and never got to the Board of Directors. You either forgot or you didn't bother and in either case you are not the man for your job. You are either incompetent or have sold out."

"You're insane."

"No one need believe me. The information is in the computer, if one knows where to look and I know where to look. What's more, the knowledge is on file and will be on the desks of the interested parties two minutes after I leave these premises."

"If this were so," said Ross, speaking with difficulty, "you could not possibly know. This is a stupid attempt at blackmail by threat of slander."

"You know it's not slander. If you doubt that I have the information, let me tell you that there is one memorandum that is not in the records but can be reconstructed without too much difficulty from what is there. You would have to explain its absence and it will be presumed you have destroyed it. You know I'm not bluffing."

"It's still blackmail."

"Why? I'm making no demands and no threats. I'm merely explaining my actions of the past two days. Of course, if I'm forced to resign, I'll have to explain why I resigned, won't I?"

Ross said nothing.

John said, coolly, "Is my resignation being requested?"

"Get out of here!"

"With my job? Or without it?"

Ross said, "You have your job." His face was a study in hatred.

8

Susan had arranged a dinner at her apartment and had gone to considerable trouble for it. Never, in her own opinion, had she looked more enticing and never did she think it more important to move John, at least for a bit, away from his total concentration on his own mind.

She said, with an attempt at heartiness, "After all, we are celebrating the last nine days of single blessedness."

"We are celebrating more than that," said John with a grim smile. "It's only four days since I got the disinhibitor and already I've been able to put Ross in his place. He'll never bother me again."

"We each seem to have our own notion of sentiment," said Susan. "Tell me the details of *your* tender remembrance."

John told the tale crisply, repeating the conversation verbatim and without hesitation.

Susan listened stonily, without in any way rising to the gathering triumph in John's voice. "How *did* you know all that about Ross?"

John said, "There are no secrets, Sue. Things just *seem* secret because people don't remember. If you can recall every remark, every comment, every stray word made to you or in your hearing and consider them all in combination, you find that everyone gives himself away in everything. You can pick out meanings that will, in these days of computerization, send you straight to the necessary records. It can be done. I can do it. I have done it in the case of Ross. I can do it in the case of anybody with whom I associate."

"You can also get them furious."

"I got Ross furious. You can bet on that."

"Was that wise?"

"What can he do to me? I've got him cold."

"He has enough clout in the upper echelons—"

"Not for long. I have a conference set for 2 P.M. tomorrow with old man Prescott and his stinking cigar and I'll cut Ross off at the pass."

"Don't you think you're moving too quickly?"

"Moving too quickly? I haven't even begun. Prescott's just a stepping-stone. Quantum Pharmaceutical's just a stepping-stone."

"It's still too quick. Johnny, you need someone to direct you. You need—"

"I need *nothing*. With what I have," he tapped his temple, "there's no one and nothing that can stop me."

Susan said, "Well, look, let's not discuss that. We have different plans to make."

"Plans?"

"Our own. We're getting married in just under nine days. Surely," with heavy irony, "you haven't returned to the sad old days when you forgot things."

"I remember the wedding," said John, testily, "but at the moment I've got to reorganize Quantum. In fact, I've been thinking seriously of postponing the wedding till I have things well in hand."

"Oh? And when might that be?"

"That's hard to tell. Not long at the rate I'm taking hold. A month or two, I suppose. Unless," and he descended into sarcasm, "you think that's moving too quickly."

Susan was breathing hard. "Were you planning to consult with me on the matter?"

John raised his eyebrows. "Would it have been necessary? Where's the argument? Surely you see what's happening. We can't interrupt it and lose momentum. —Listen, did you know I'm a mathematical wiz. I can multiply and divide as fast as a computer because at some time in my life I have come across almost every simple bit of arithmetic and I can *recall* the answers. I read a table of square roots and I can—"

Susan cried, "My God, Johnny, you *are* a kid with a new toy. You've lost your perspective. Instant recall is good for nothing but playing tricks with. It doesn't give you one bit more intelligence; not an ounce; not a speck more of judgment; not a whiff more of common sense. You're about as safe to have around as a little boy with a loaded grenade. You need looking after by someone with brains."

John scowled. "Do I? It seems to me that I'm getting what I want."

"Are you? Isn't it true that I'm what you want also?"

"What?"

"Go ahead, Johnny. You want me. Reach out and take me. Exercise that remarkable recall you have. Remember who I am, what I am, the things we can do, the warmth, the affection, the sentiment."

John, with his forehead still creased in uncertainty, extended his arms toward Susan.

She stepped out of them. "But you haven't got me, or anything about me. You can't remember me into your arms; you have to love me into them. The trouble is, you don't have the good sense to do it and you lack the intelligence to establish reasonable priorities. —Here, take this and get out of my apartment or I'll hit you with something a lot heavier."

He stopped to pick up the engagement ring. "Susan—"

"I said, get out. The firm of Johnny and Sue is hereby dissolved."

Her face blazed anger and John turned meekly and left.

9

When he arrived at Quantum the next morning, Anderson was waiting for him with a look of anxious impatience on his face.

"Mr. Heath," he said, smiling, and rising.

"What do you want?" demanded John.

"We are private here, I take it?"

"The place isn't bugged as far as I know."

"You are to report to us day after tomorrow for examination. On Sunday. You recall that?"

"Of course, I recall that. I'm incapable of not recalling. I *am* capable of changing my mind, however. Why do I need an examination?"

"Why not, sir? It is quite plain from what Kupfer and I have picked up that the treatment seems to have worked splendidly. Actually, we don't want to wait till Sunday. If you can come with me today—now, in fact—it would mean a great deal to us, to Quantum, and, of course, to humanity."

John said, curtly, "You might have held on to me when you had me. You sent me about my business, allowing me to live and work unsupervised so that you could test me under field conditions, and get a better idea of how things would work out. It meant more risk for me, but you didn't worry about that, did you?"

"Mr. Heath, that was not in our minds. We—"

"Don't tell me that. I remember every last word you and Kupfer said to me last Sunday, and it's quite clear to me that that *was* in your minds. So if I take the risk, I accept the benefits. I have no intention of presenting myself as a biochemical freak who has achieved my ability at the end of a hypodermic needle. Nor do I want others of the sort wandering around. For now, I have a monopoly and I intend to use it. When I'm ready—not before—I will be willing to cooperate with you and benefit humanity. But just remember, I'm the one who will know when I'm ready, not you. So don't call me; I'll call you."

Anderson managed a soft smile. "As to that, Mr. Heath, how can you stop us from making our announcement? Those who have dealt with you this week will have no trouble in recognizing the change in you and in testifying to it."

"Really? See here, Anderson, listen closely and do so without that foolish grin on your face. It irritates me. I told you I remember every word you and Kupfer spoke. I remember every nuance of expression, every sidelong glance. It all spoke volumes. I learned enough to check through sick-leave records with a good idea of what I was looking for. It would seem that I was not the first Quantum employee on whom you had tried the disinhibitor."

Anderson was, indeed, not smiling. "That is nonsense."

"You know it is not, and you had better know I can prove it. I know the names of the men involved—one was a woman, actually—and the hospitals in which they were treated and the false history with which they were supplied. Since you did not warn me of this, when you used me as your fourth experimental animal on two legs, I owe you nothing but a prison sentence."

Anderson said, "I won't discuss this matter. Let me say this, though. The treatment will wear off, Heath. You won't keep your total recall. You will have to come back for further treatment and you can be sure it will be on our terms."

John said, "Nuts! You don't suppose I haven't investigated your reports—at least, those you haven't kept secret. And I already have a notion of what aspects you *have* kept secret. The treatment lasts longer in some cases than others. It invariably lasts longer where it is more effective. In my case, the treatment has been extraordinarily effective and it will endure a considerable time. By the time I come to you again, if I ever have to, I will be in a position where any failure on your part to cooperate will be swiftly devastating to you. Don't even think of it."

"You ungrateful—"

"Don't bother me," said John, wearily. "I have no time to listen to you froth. Go away, I have work to do."

Anderson's face was a study in fear and frustration as he left.

10

It was 2:30 P.M. when John walked into Prescott's office, for once not minding the cigar smoke. It would not be long, he knew, before Prescott would have to choose between his cigars and his position.

With Prescott were Arnold Gluck and Lewis Randall, so that John had the grim pleasure of knowing he was facing the three top men in the division.

Prescott rested his cigar on top of an ashtray and said, "Ross has asked me to give you half an hour, and that's all I will give you. You're the one with the trick memory, aren't you?"

"My name is John Heath, sir, and I intend to present you with a rationalization of procedure for the company; one that will make full use of the age of computers and electronic communication and will lay the groundwork for further modification as the technology improves."

The three men looked at each other.

Gluck, whose creased face was tanned a leathery-brown, said, "Are you an expert in office management?"

"I don't have to be, sir. I have been here for six years and I recall every bit of the procedure in every transaction in which I have been involved. That means the pattern of such transactions is plain to me and its imperfections obvious. One can see toward what it is tending and where it is doing so wastefully and inefficiently. If you'll listen, I will explain. You will find it easy to understand."

Randall, whose red hair and freckles made him seem younger than he was, said sardonically, "Real easy, I hope, because we have trouble with hard concepts."

"You won't have trouble," said John.

"And you won't get a second more than twenty-one minutes," said Prescott, looking at his watch.

"It won't take that," said John. "I have it diagrammed and I can talk quickly."

It took fifteen minutes and the three management personnel were remarkably silent in that interval.

Finally Gluck said, with a hostile glance out of his small eyes, "It sounds as though you are saying we can get along with half the management we are employing these days."

"Less than half," said John, coolly, "and be the more efficient for it. We can't fire ordinary personnel at will because of the unions, though we can profitably lose them by attrition. Management is not protected, however, and can be let go. They'll have pensions if they're old enough and can get new jobs if they're young enough. Our thought must be for Quantum."

Prescott, who had maintained an ominous silence, now puffed furiously at his noxious cigar and said, "Changes like this have to be considered carefully and implemented, if at all, with the greatest of caution. What seems logical on paper can lose out in the human equation."

John said, "Prescott, if this reorganization is not accepted within a week, and if I am not placed in charge of its implementation, I will resign. I will have no trouble in finding employment with a smaller firm where this plan can be far more easily put into practice. Beginning with a small group of management people, I can expand in both quantity and efficiency of performance without additional hiring and within a year I'll drive

Quantum into bankruptcy. It would be fun to do this if I am driven to it, so consider carefully. My half hour is up. Good-bye." And he left.

11

Prescott looked after him with a glance of frigid calculation. He said to the other two, "I think he means what he says and that he knows every facet of our operations better than we do. We can't let him go."

"You mean we've got to accept his plan," said Randall, shocked.

"I didn't say that. You two go, and remember this whole thing is confidential."

Gluck said, "I have the feeling that if we don't do something, all three of us will find ourselves on our butts in the street within a month."

"Very likely," said Prescott, "so we'll do something."

"What?"

"If you don't know, you won't get hurt. Leave it to me. Forget it for now and have a nice weekend."

When they were gone, he thought a while, chewing furiously on his cigar. He then turned to his telephone and dialed an extension. "Prescott here. I want you in my office first thing Monday morning. First thing. Hear me?"

12

Anderson looked a trifle disheveled. He had had a bad weekend. Prescott, who had had a worse, said to him, malevolently, "You and Kupfer tried again, didn't you?"

Anderson said, softly, "It's better not to discuss that, Mr. Prescott. You remember it was agreed that in certain aspects of research, a distance was to be established. We were to take the risks or the glory, and Quantum was to share in the latter but not in the former."

"And your salary was doubled with a guarantee of all legal payments to be Quantum's responsibility; don't forget that. This man, John Heath, was treated by you and Kupfer, wasn't he? Come on. There's no mistaking it. There's no point in hiding it."

"Well, yes."

"And you were so brilliant that you turned him loose on us—this—this—tarantula."

"We didn't anticipate this would happen. When he didn't go into instant shock, we thought it was our first chance to test the process in the field. We thought he would break down after two or three days, or it would pass."

Prescott said, "If I hadn't been protected so damned well, I wouldn't have put the

whole thing out of my mind and I would have guessed what had happened when that bastard first pulled the computer bit and produced the details of correspondence he had no business remembering. —All right, we know where we are now. He's holding the company to ransom with a new plan of operations he can't be allowed to put through. Also, he can't be allowed to walk away from us."

Anderson said, "Considering Heath's capacity for recall and synthesis, is it possible that his plan of operations may be a good one?"

"I don't care if it is. That bastard is after my job and who knows what else and we've got to get rid of him."

"How do you mean, rid of him? He could be of vital importance to the cerebrochemical project."

"Forget that. It's a disaster. You're creating a super-Hitler."

Anderson said, in soft-voiced anguish, "The effect will wear off."

"Yes? When?"

"At this moment, I can't be sure."

"Then I can't take chances. We've got to make our arrangements and do it tomorrow at the latest. We can't wait any longer."

13

John was in high good humor. The manner in which Ross avoided him when he could and spoke to him deferentially when he had to affected the entire work force. There was a strange and radical change in the pecking order, with himself at the top.

Nor could John deny to himself that he liked it. He reveled in it. The tide was moving strongly and unbelievably swiftly. It was only nine days since the injection of the disinhibitor and every step had been forward.

Well, no, there had been Susan's silly rage at him, but he would deal with her later. When he showed her the heights to which he would climb in nine additional days—in ninety—

He looked up. Ross was at his desk, waiting for his attention but reluctant to do anything as crass as to attract that attention by as much as clearing his throat. John swiveled his chair, put his feet out before him in an attitude of relaxation, and said, "Well, Ross?"

Ross said, carefully, "I would like to see you in my office, Heath. Something important has come up and, frankly, you're the only one who can set it straight."

John got slowly to his feet. "Yes? What is it?"

Ross looked about mutely at the busy room, with at least five men in reasonable earshot. Then he looked toward his office door and held out an inviting arm.

John hesitated, but for years Ross had held unquestioned authority over him, and at this moment he reacted to habit.

Ross held his door open for John politely, stepped through himself and closed the door behind him, locking it unobtrusively and remaining in front of it. Anderson stepped out from the other side of the bookcase.

John said sharply, "What's all this about?"

"Nothing at all, Heath," said Ross, his smile turning into a vulpine grin. "We're just going to help you out of your abnormal state—take you back to normality. Don't move, Heath."

Anderson had a hypodermic in his hand. "Please, Heath, do not struggle. We wish you no harm."

"If I yell—" said John.

"If you make any sound," said Ross, "I will put a hammerlock on you and hold it till your eyes bug out. I would like to do that, so please try to yell."

John said, "I have the goods on both of you, safe on deposit. Anything that happens to me—"

"Mr. Heath," said Anderson, "nothing will happen to you. Something is going to *un*happen to you. We will put you back to where you were. That would happen anyway, but we will hurry it up just a little."

"So I'm going to hold you, Heath," said Ross, "and you won't move because if you do, you will disturb our friend with the needle and he might slip and give you more than the carefully calculated dose, and you might end up unable to remember anything at all."

Heath was backing away, breathless. "That's what you're planning. You think you'll be safe that way. If I forgot all about you, all about the information, all about its storage. But—"

"We're not going to hurt you, Heath," said Anderson.

John's forehead glistened with sweat. A near-paralysis gripped him.

"An amnesiac!" he said, huskily, and with a terror that only someone could feel at the possibility who himself had perfect recall.

"Then you won't remember this either, will you?" said Ross. "Go ahead, Anderson."

"Well," muttered Anderson, in resignation. "I'm destroying a perfect test-subject." He lifted John's flaccid arm and readied the hypodermic.

There was a knock at the door. A clear voice called, "John!"

Anderson froze almost automatically, looking up questioningly.

Ross had turned to look at the door. Now he turned back. "Shoot that stuff into him, doc," he said in an urgent whisper.

The voice came again, "Johnny, I know you're in there. I've called the police. They're on the way."

Ross whispered again, "Go ahead. She's lying. And by the time they come, it's over. Who can prove anything?"

But Anderson was shaking his head vigorously. "It's his fiancée. She knows he was treated. She was there."

"You jackass."

There was the sound of a kick against the door and then the voice sounded in a muffled, "Let go of me. They've got— Let go!"

Anderson said, "Having her push the thing was the only way we could get him to agree. Besides, I don't think we have to do anything. Look at him."

John had collapsed in a corner, eyes glazed, and clearly in a state of unconscious trance.

Anderson said, "He's been terrified and that can produce a shock that will interfere with recall under normal conditions. I think the disinhibitor has been wiped out. Let her in and let *me* talk to her."

14

Susan looked pale as she sat with her arm protectively about the shoulders of her ex-fiancé. "What happened?"

"You remember the injection of—"

"Yes, yes. What happened?"

"He was supposed to come to our office day before yesterday, Sunday, for a thorough examination. He didn't come. We worried and the reports from his superiors had me very perturbed. He was becoming arrogant, megalomaniacal, irascible— Perhaps you noticed. —You're not wearing your engagement ring."

"We—quarreled," said Susan.

"Then you understand. He was— Well, if he were an inanimate device, we might say his motor was overheating as it sped faster and faster. This morning it seemed absolutely essential to treat him. We persuaded him to come here, locked the door and—"

"Injected him with something while I howled and kicked outside."

"Not at all," said Anderson. "We would have used a sedative, but we were too late. He had what I can only describe as a breakdown. You may search his body for fresh punctures, which, as his fiancée, I presume you may do without embarrassment, and you will find none."

Susan said, "I'll see about that. What happens, now?"

"I am sure he will recover. He will be his old self again."

"Dead average?"

"He will not have perfect recall, but until ten days ago, he never had. —Naturally, the firm will give him indefinite leave on full salary. If any medical treatment is required, all medical expenses will be paid. And when he feels like it, he can return to active duty."

"Yes? Well, I will want all that in writing before the day is out, or I see my lawyer tomorrow."

"But Miss Collins," said Anderson, "you know that Mr. Heath volunteered. You were willing too."

"I think," said Susan, "that *you* know the situation was misrepresented to us and that you won't welcome an investigation. Just see to it that what you've just promised is in writing."

"You will have to, in return, sign an agreement to hold us guiltless of any misadventure your fiancé may have suffered."

"Possibly. I prefer to see what kind of misadventure it is first. —Can you walk, Johnny?"

John nodded and said, a little huskily, "Yes, Sue."

"Then let's go."

15

John had put himself outside a cup of good coffee and an omelet before Susan permitted discussion. Then he said, "What I don't understand is how you happened to be there?"

"Shall we say woman's intuition?"

"Let's say Susan's brains."

"All right. Let's! After I threw the ring at you, I felt self-pitying and aggrieved and after that wore off, I felt a severe sense of loss because, odd though it might seem to the average sensible person, I'm very fond of you."

"I'm sorry, Sue," said John, humbly.

"As well you should be. God, you were insupportable. But then I got to thinking that if you could get poor loving me that furious, what must you be doing to your co-workers. The more I thought about it, the more I thought they might have a strong impulse to kill you. Now, don't get me wrong. I'm willing to admit you deserved killing, but only at *my* hands. I wouldn't dream of allowing anyone else to do it. I didn't hear from you—"

"I know, Sue. I had plans and I had no time—"

"You had to do it all in two weeks. I know, you idiot. By this morning I couldn't stand it anymore. I came to see how you were and found you behind a locked door."

John shuddered. "I never thought I'd welcome your kicking and screaming, but I did then. You stopped them."

"Will it upset you to talk about it?"

"I don't think so. I'm all right."

"Then what were they doing?"

"They were going to re-inhibit me. I thought they might be giving me an overdose and make me an amnesiac."

"Why?"

"Because they knew I had them all. I could ruin them and the company."

"You really could."

"Absolutely."

"But they didn't actually inject you, did they? Or was that another of Anderson's lies?"

"They really didn't."

"Are you all right?"

"I'm not an amnesiac."

"Well, I hate to sound like a Victorian damsel, but I hope you have learned your lesson."

"If you mean, do I realize you were right, I do."

"Then just let me lecture you for one minute, so you don't forget again. You went about everything too rapidly, too openly, and with too much disregard for the possible violent counteraction of others. You had total recall and you mistook it for intelligence. If you had someone who was really intelligent to guide you—"

"I needed you, Sue."

"Well, you've got me now, Johnny."

"What do we do next, Sue?"

"First, we get that paper from Quantum and, since you're all right, we'll sign the release for them. Second, we get married on Saturday, just as we originally planned. Third, we'll see— But, Johnny?"

"Yes?"

"You're all right?"

"Couldn't be better, Sue. Now we're together, everything's fine."

16

It wasn't a formal wedding. Less formal than they had originally planned and fewer guests. No one was there from Quantum, for instance—Susan had pointed out, quite firmly, that that would be a bad idea.

A neighbor of Susan's had brought a video-camera to record the proceedings, something that seemed to John to be the height of schlock, but Susan had wanted it.

And then the neighbor had said to him with a tragic shrug, "Can't get the damn thing to turn on. You'd think they'd give me one in working order. I'll have to make a phone call." He hastened down the steps to the pay phone in the chapel lobby.

John advanced to look at the camera curiously. An instruction booklet lay on a small table to one side. He picked it up and leafed through the pages with moderate speed, then put it back. He looked about him, but everyone was busy. No one seemed to be paying attention to him.

He slid the rear panel to one side, unobtrusively, and peered inside. He then turned away and gazed at the opposite wall thoughtfully. He was still gazing even as his right hand snaked in toward the mechanism and made a quick adjustment. After a brief interval he put the rear panel back and flicked a toggle switch.

The neighbor came bustling back, looking exasperated. "How am I going to follow directions I can't make head or—" He frowned, then said, "Funny. It's on. It must have been working all the time."

17

"You may kiss the bride," said the minister, benignly, and John took Susan in his arms and followed orders with enthusiasm.

Susan whispered through unmoving lips, "You fixed that camera. Why?"

He whispered back, "I wanted everything right for the wedding."

She whispered, "You wanted to show off."

They broke apart, looking at each other through love-misted eyes, then fell into another embrace, while the small audience stirred and tittered.

Susan whispered, "You do it again, and I'll skin you. As long as no one knows you still have it, no one will stop you. We'll have it all within a year, if you follow directions."

"Yes, dear," whispered John, humbly.

Saving Humanity

My friend, George, sighing lugubriously, said to me, one evening, "I have a friend who is a klutz."

I nodded wisely. "Birds of a feather," I said.

George gazed at me in astonishment. "What have feathers to do with it? You have the most remarkable ability to skid away from a subject. It is the result, I suppose, of your thoroughly inadequate intellect—which I mention in pity, and not as reproof."

"Well, well," I said, "let that be as it may. When you refer to your friend the klutz, are you speaking of Azazel?"

Azazel was the two-centimeter demon or extraterrestrial being (take your pick) concerning whom George talks about constantly, ceasing only in response to a direct question. Freezingly, he said, "Azazel is not a subject for conversation, and I do not understand how you came to have heard of him."

"I happened to be within a mile of you one day," I said. George paid no attention, but said:

* * *

I first came across the uneuphonious word "klutz", in fact, through a conversation with my friend, Menander Block. You have never met him, I'm afraid, for he is a University man and therefore rather selective in his friendships, for which one, observing you, can scarcely blame him.

The word, klutz, he told me, referred to an awkward, clumsy person. "And that's me," he said. "It comes from a Yiddish word that, taken literally, means a piece of wood, a log, a block; and, of course, my name, as you will note, is Block."

He heaved an enormous sigh. "And yet I am not a klutz in the strict meaning of the word. There is nothing wooden, loggish or blockish about me. I dance as lightly as a zephyr and as gracefully as a dragonfly; I am sylph-like in every motion; and numerous young women could testify, if I thought it safe to allow them to do so, of my skill as a disciple of the amatory art. It is, rather, that I am a klutz at long distance. Without

being myself affected, everything about me becomes klutzish. The very Universe itself seems to trip over its own cosmic feet. I suppose if you want to mix languages and combine Greek with Yiddish, I am a 'teleklutz'."

"How long has this been going on, Menander?" I asked.

"All my life, but, of course, it was only as an adult that I realized this peculiar quality I possess. While still a youth, I simply assumed that what happened to me was the normal state of affairs."

"Have you discussed this with anyone?"

"Of course not, George, old fellow. I would be considered mad. Can you see a psychoanalyst, for instance, confronting the phenomenon of teleklutzism. He would have me in the funny house half way through my first session and write a paper on his discovery of a new psychosis and probably become a millionaire as a result. I'm not going to the booby hatch just to enrich some psychomedical leech. I cannot tell *anyone* this."

"Then why are you telling me this, Menander?"

"Because, on the other hand, it seems to me I must tell someone if I am to remain functional. As it happens, you are the least someone I know."

I did not follow his reasoning there, but I could see that I was about to be subjected once again to the unwanted confidences of my friends. It was the price, I well knew, of the fact that I was proverbial for my understanding, sympathy, and, most of all, for my close-mouthed reticence. No secret placed in my keeping would ever reach the ears of anyone else. —I make an exception in your case, of course, since it is well-known that you have an attention span of five seconds, and a memory-span of rather less.

I signalled for another drink and indicated, by a certain arcane sign that I alone know, that it was to be placed on Menander's tab. A laborer, after all, is worthy of his hire. I said, "Just how does this teleklutzism manifest itself, Menander?"

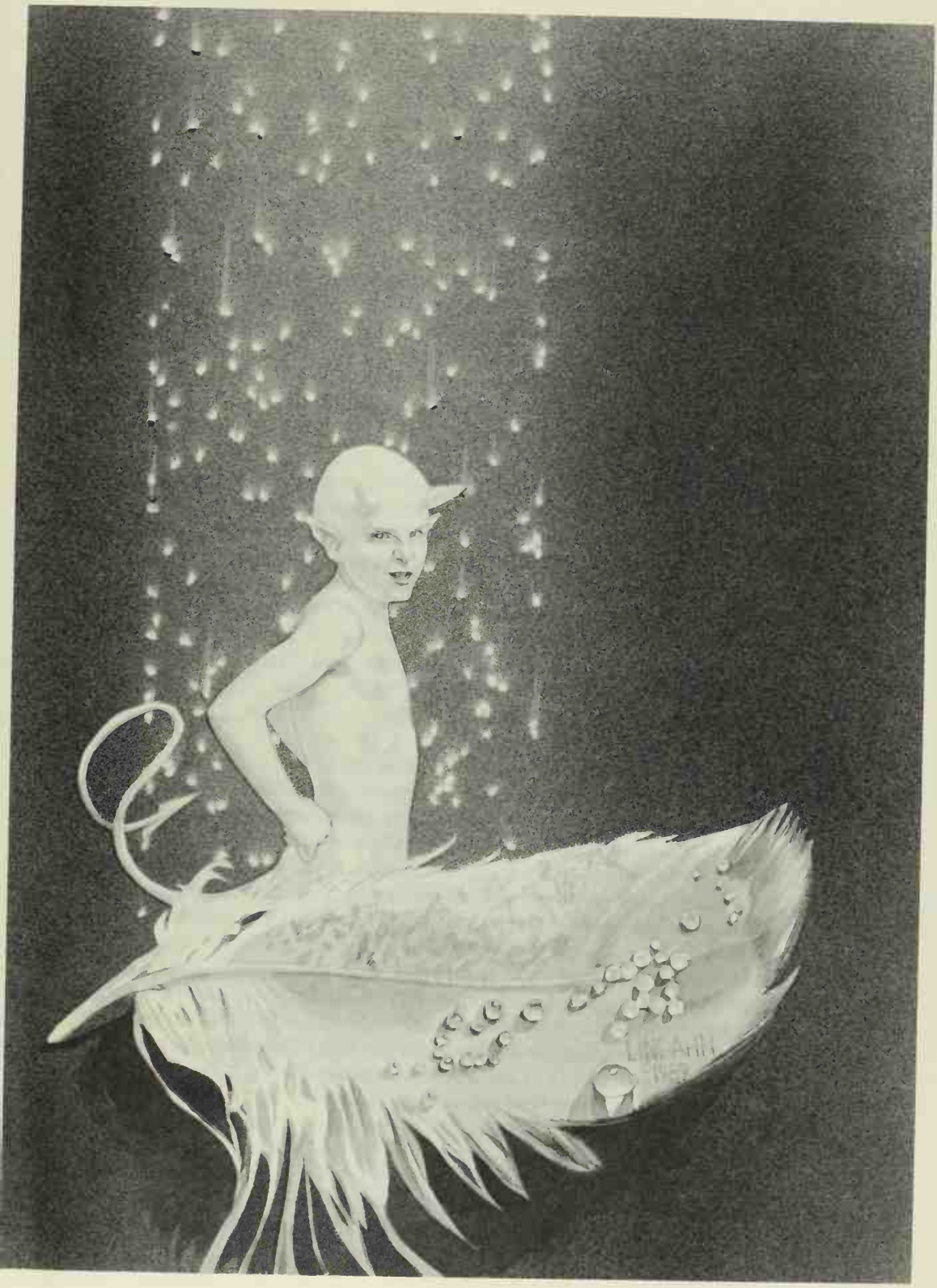
"In its simplest form, and in the manner that was first brought to my attention, it shows up in the peculiar weather that accompanies my travels. I do not travel very much, and when I do, I go by car, and when I do *that*, it rains. It doesn't matter what the weather forecast is; it doesn't matter how brightly the sun is shining when I start out. The clouds gather, grow darker and it begins to drizzle and then to pour. When my teleklutzism is in particular fettle, the temperature drops and we have an ice-storm.

"Of course, I am careful not to be foolish. I refuse to drive into New England until March is safely over. Last spring, I drove to Boston on April 6—which promptly had the first April blizzard in the history of the Boston Weather Bureau. I once drove to Williamsburg, Virginia, on March 28, assuming that I might be allowed a few days of grace considering that I was penetrating Dixie. Hah! Williamsburg had nine inches of snow that day and the natives were trying to rub some of it between their fingers and were asking each other what the white stuff was.

"I have often thought that if we imagined the Universe to be under the personal direction of God, we might picture Gabriel rushing into the divine presence to cry out, 'Holy One, two galaxies are about to collide in an unimaginably enormous catastrophe', and God would answer, 'Don't bother me now, Gabriel; I'm busy making it rain on Menander.'"

I said, "You might make the best of the situation, Menander? Why not sell your services, for fabulous sums, as a drought-breaker?"

"I have thought of that, but the mere thought dries up any rain that might occur during my travels. Besides, if the rain came when it was needed, it would probably produce a flood.



"And it's not only rain, or traffic jams, or the disappearance of landmarks; there are myriads of other things. Expensive objects break spontaneously in my presence, or are dropped by others through no fault attributable to myself. There is an advanced particle accelerator in operation in Batavia, Illinois. One day an enormously important experiment was ruined because of the failure of its vacuum; a completely unexplained failure. Only I knew (the next day, that is, when I read of the incident in the paper) that at the very moment of failure, I happened to be passing the outskirts of Batavia in a bus. It was raining, of course.

"At this very moment, old fellow, some of the fine five-day-old wine in the cellars of this fine establishment, being aged in the plastic, is turning sour. Someone brushing past this table at this moment will, when he arrives home, find that the pipes in his cellar have burst at the precise moment he passed me; except that he won't know that he passed me at that precise moment and that the passage was the cause. And so it will be with myriads of accidents; supposed accidents, that is."

My heart bled for my young friend. And my blood froze at the thought that I was sitting next to him and that at my cozy digs unimaginable catastrophes might be taking place.

I said, "You are, in short, a jinx!"

Menander threw his head back and stared down his nose at me in a most unpleasant way. "Jinx," he said, "is the common term; teleklutz is the scientific one."

"Well, then, jinx or teleklutz, suppose I told you I could perhaps remove this curse from you?"

"Curse is right," Menander said, gloomily. "I have often thought that, at the time of my birth, an ill-natured fairy, irked at not having been invited to the christening— Are you trying to tell me you can cancel curses because you are a good fairy?"

"I am not any kind of fairy," I said severely. "Just suppose I can remove this cur—condition of yours."

"How on Earth could you do that?"

"Not exactly on Earth," I said. "But how about it?"

"What do *you* get out of it?" he asked, suspiciously.

"The heart-warming feeling of having helped save a friend from a horrible life."

Menander thought about it and then shook his head firmly. "That's not enough."

"Of course, if you want to offer me some small sum—"

"No, no. I wouldn't think of insulting you that way. Offer a sum of money to a *friend*? Place a fiscal value on friendship? How could you think that of me, George? What I meant was that removing my teleklutzism isn't enough. You must do more than that."

"How can one do more?"

"Consider! Through my life I have been responsible for anything from inconvenience to catastrophe to perhaps millions of innocent people. Even if I brought no ill-fortune to a single person from this moment on, the evil I have done thus far—even though none of it was voluntary or in any way to be considered my fault—is more than I can bear. I must have something that will cancel it all out."

"Like what?"

"I must be in a position to save humanity."

"Save humanity?"

"What else can possibly balance the immeasureable damage I have done? George, I insist. If you are going to remove my curse, replace it with the ability to save humanity in some great crisis."

"I'm not sure that I can."

"*Try*, George. Don't shy away at this crisis. If you're going to do a job, do it well, I always say. Think of humanity, old friend."

"Wait a moment," I said, alarmed, "you're putting this whole thing on my shoulders."

"Of course I am, George," Menander said, warmly. "Broad shoulders! Good shoulders! Made to bear burdens! Go home, George, and arrange to remove this curse from me. A grateful humanity will shower you with blessings except, of course, that they will never hear of it, for I will tell no one. Your good deeds are not be be shamed by exposure, and rely on me, I will never expose them."

There is something wonderful about unselfish friendship that can be duplicated by nothing else on Earth. I rose at once to get to my task and left so quickly that I neglected to pay my half of the dinner bill. Fortunately, Menander did not notice this till I was safely out of the restaurant.

* * *

I had some trouble getting in touch with Azazel and in opening the hyperdimensional gateway between his world and ours. Nor did he seem good-natured about it at all. His two-centimeter-tall body was wrapped in a pinkish glow and, in his piping voice, he said, "Has it occurred to you that I might be showering?"

And indeed there was a very faint smell of ammonia about him.

I said, humbly, "This is a rather enormous emergency, oh Mighty-One-For-Whom-Words-Are-Insufficient."

"Well then, tell me, but mind, don't take all day about it."

"Certainly!" I said, and outlined the matter with admirable conciseness.

"Hmm," said Azazel. "For once you have presented me with an interesting problem."

"I have? Do you mean there is indeed such a thing as teleklutzism."

"Oh, yes. It is common on my world and is usually removed by inoculation during childhood. You see quantum mechanics makes it quite clear that the properties of the Universe depend, to a certain extent, on the observer. Just as the Universe affects the observer, the observer affects the Universe. Some observers affect the Universe adversely, or at least adversely with respect to some other observers. Thus, one observer may accelerate the supernovadom of some star, which would irritate other observers who may find themselves uncomfortably close to that star at the time."

"I see. Well, can you inoculate my friend, Menander, and remove this quantum-observational effect of his?"

"Oh, of course! Simple! It will take ten seconds and then I can return to my shower and to the rite of laskorati I will undertake with two samini of unimaginable loveliness."

"Wait! Wait! That's not enough."

"Don't be silly. Two samini are *quite* enough. Only a lecher would want three."

"I mean removing the teleklutzism isn't enough. Menander also wants to be in a position to save humanity."

For a minute, I thought Azazel was going to forget our long friendship and all I had done for him in the way of supplying him with interesting problems that probably improved his mind and his scientific abilities. I did not understand all he said, for most of the words were in his own language but they sounded very much like saws scraping along rusty nails.

Finally, having cooled down to a dim red-heat, he said, "Now how am I going to do that?"

"Is anything too much for the Apostle-of-Incredibility?"

"You bet! —But let's see!" He thought for a while, and burst out, "But who in the Universe would *want* to save humanity? Where's the worth in doing that? You stink up this whole section— Well, well, I think it can be done."

It didn't take ten seconds. It took half an hour and a very uncomfortable half-hour it was, too, with Azazel groaning part of the time and the rest of the time stopping to wonder if the samini were going to wait for him.

He was done eventually and, of course, it meant I would have to test out the matter on Menander Block.

* * *

When I next saw Menander, I said, "You're cured."

He stared at me hostilely, "Do you know that you stuck me with the dinner check the other night?"

"Surely a minor point compared with the fact that you're cured."

"I don't feel cured."

"Well, come. Let's take a drive together. You take the wheel."

"It looks cloudy already. Some cure!"

"Drive! What have we to lose?"

He backed the car out of his garage. A man passing by on the other side of the street did not trip over an overloaded garbage can.

He drove down the street. The light did not turn red as he approached, and two cars skidding toward each other at the intersection next but one, missed each other by a comfortable margin.

By the time he was at the bridge, the clouds had thinned out and a warm sun was shining down upon the car. It was not in his eyes.

When we finally got home, he was weeping unashamedly, and I parked the car for him. I scraped it slightly, but it was not *I* that had had my teleklutzism cured. At that, it might have been worse. I might have scraped my own car.

For the next few days, he was seeking me out constantly. I was the only one, after all, who could understand the miracle that had taken place.

He would say, "I went to a dance, and not one couple tripped over each other's feet and fell down and broke a collar bone or two. I could dance sylph-like with utter abandon and my partner never got sick to her stomach, even though she had eaten most unwisely."

Or, "At work they were installing a new air-conditioning unit and not once did it fall upon a workman's toes, breaking them permanently."

Or even, "I visited a friend in a hospital, something I once wouldn't have dreamed of doing, and in not one of the rooms that I passed did the intravenous needle pop out of a vein. Nor did a single hypodermic needle miss its appropriate target."

Sometimes, he would ask me, brokenly, "Are you sure that I will have a chance to save humanity?"

"Absolutely," I would say. "That's part of the cure."

But then, one day he came to me and there was a frown on his face. "Listen," he said. "I just went to the bank to ask a question about my bank-balance, which is a little

lower than it should be because of the way you manage to get out of restaurants before the bill shows up, and I couldn't get an answer because the computer went down just as I walked in. Everyone was puzzled. —Is the cure wearing off?"

"It can't do that," I said. "Maybe it had nothing to do with you. There might be some other teleklutz around who hasn't been cured. Maybe he happened to walk in just as you did."

But that wasn't it. The bank's computer went down on two other occasions when he tried to check his bank balance. (His nervousness over the paltry sums I had neglected to take care of was quite nauseating in a grown man.) Finally, when the computer at his firm went down when he walked past the room in which it was housed, he came to me in what I can only describe as panic.

"It's back, I tell you. It's back!" he screamed. "I can't take it this time. Now that I'm accustomed to normality, I can't go back to my old life. I'll have to kill myself."

"No, no, Menander. That's going too far."

He seemed to check himself at the edge of another scream and thought over my sensible remark. "You're right," he said. "That *is* going too far. Suppose I kill you, instead. After all, no one will miss you, and it will make me feel a *little* better."

I saw his point, but only to a slight extent. I said, "Before you do anything at all, let me check this out. Be patient, Menander. After all, so far it's only happened with computers, and who cares about computers?"

I left quickly before he could ask me how he was supposed to get his bank balance if computers were always going down at his approach. He was really a monomaniac on the subject.

* * *

So was Azazel, on another subject. It seems that this time he was actually involved in whatever he was doing with the two samini, and he was still turning somersaults when he arrived. To this day, I don't know what the somersaults had to do with it.

I don't think he ever actually cooled down, but he did manage to explain to me what happened and then I was faced with having to explain it to Menander.

I insisted on meeting him in the park. I chose a fairly crowded section since I would have to rely on instant rescue if he should lose his head figuratively, and try to make me lose mine literally.

I said, "Menander, your teleklutzism still works, but only for computers. *Only for computers.* You have my word on that. You are cured for everything else *forever.*"

"Well, then, cure me for computers."

"As it happens, Menander, that can't be done. You are not cured for computers, and forever." I rather whispered the last word but he heard me.

"Why? What kind of a hare-brained, idiotic, malapropistic, oniklutzistic rear end of a diseased Bactrian camel are you?"

"You make it sound as though there are many kinds, Menander, which doesn't make sense. Don't you understand that you wanted to save the world, and that's why it happened?"

"No, I don't understand. Explain it to me and take your time. You have fifteen seconds."

"Be reasonable! Humanity is facing a computer-explosion. Computers are going to become rapidly more versatile, more capable and more intelligent. Human beings are

going to be ever-more dependent upon them. Eventually, a computer will be built that will take over the world and leave humanity with nothing to do. It may then well decide to wipe out humanity as unnecessary. Of course, we tell ourselves smugly that we can always 'pull the plug', but you know we won't be able to do that. A computer smart enough to do the work of the world without us will be able to defend its own plug and, for that matter, find its own electricity.

"It will be unbeatable, and humanity will be doomed. And that, my friend, is where you come in. You will be brought into its presence or perhaps you will only arrange to pass within a few miles of it and it will instantly break down, and humanity will be saved! *Humanity will be saved!* Think of it! Think of it!"

Menander thought of it. He didn't look happy. He said, "But meanwhile, I can't come near computers."

"Well, the computer-klutzism had to be nailed down and made absolutely permanent so that we could be sure that when the time came nothing would go wrong; that the computer would not somehow defend itself against you. It's the price you pay for this great gift of salvation that you yourself asked for and for which you will be honored through all future history."

"Yes?" he said, "and when is this salvation to take place?"

"I said, "According to Azaz—my sources, it should take place in sixty years or so. But look at it this way. Now you know that you will live to be at least ninety years old."

"And meanwhile," said Menander, in a loud voice, oblivious to the way people nearby turned to stare at us, "meanwhile, the world will grow more and more computerized and I will be unable to get near more and more places. I'll be unable to do more and more things and will be in a total prison of my own making—"

"But in the end you will save humanity! That's what you wanted!"

Menander shrieked, "To hell with humanity!" rose and hurled himself at me.

I managed to get away but only because there were people about who seized the poor fellow.

Today, Menander is in deep analysis with a Freudian psychiatrist of the most determined description. It will surely cost him a fortune and will, of course, do him no good whatever.

* * *

George, having finished his story, gazed into his pot of beer, for which I knew I would have to pay.

He said, "There's a moral to this story, you know."

"What is it?"

"People just don't have any gratitude!"

Neither Brute Nor Human

The monthly dinner of the Black Widowers was well under way and Emmanuel Rubin, his fork uplifted, and waving threateningly in the air, temporarily ignored his rack of lamb and said, "Edgar Allan Poe was the first important practitioner of the modern detective story and of the modern science fiction story. I'll give him that."

"Nice of you," murmured James Drake, the host of the occasion, in a low aside.

Rubin ignored him. "He lifted the horror story to new heights, too. Still, he had a morbid and unhealthy preoccupation with death."

"Not at all," said Geoffrey Avalon, in his deep voice, his thick eyebrows lowering into a frown. "Poe was writing in the first half of the nineteenth century, and there was still virtually no protection against infectious disease at the time. Life was short and death was ever-present. He wasn't being morbid; he was being realistic."

Roger Halsted said, "Absolutely! Read any fiction of the nineteenth century. Read Dickens and the death of Little Nell, or Harriet Beecher Stowe and the death of Little Eva. Children frequently died in fiction because they frequently died in real life."

Rubin's eyes, magnified by his thick glasses, took on a stubborn gleam, and his sparse beard seemed to bristle. "It's not death in itself. It's how you treat it. You can deal with it as the doorway to heaven, and treat the dying person as a saint—see the death of Beth in *Little Women*. That can be sickeningly sentimental, but it is meant to be uplifting. Poe, on the other hand, dwells with an unholy glee on the elements of degradation and decay. He makes death worse than it is and—Come on, you all know very well what 'morbid' is."

He returned to his lamb and attacked it with vigor.

Thomas Trumbull growled and said, "Certainly. 'Morbid' is talking about morbidity over what would otherwise be a pleasant dinner."

"I don't see that it makes any difference whether Poe was morbid or not," said Mario Gonzalo, who was neatly dissecting strips of meat off the ribs. "What counts is whether he was a good writer or not, and I suppose no one argues with the fact that he was good."

Avalon said, judiciously, "Even good writers aren't good all the time. James Russell Lowell described Poe as 'three fifths of him genius and two fifths sheer fudge,' and I would say that was pretty accurate."

Halsted said, "My feeling is that a seminal writer has to accept some responsibility for his imitators. There is something about Poe that makes it absolutely necessary for his imitators to be awful. Consider H. P. Lovecraft—"

"No," said Rubin, violently, "we are *not* discussing Lovecraft; we are talking about Poe—"

And oddly enough, Drake's guest, who, until now, had sat mute through the dinner, said suddenly in a loud, almost metallic voice, "*Why* are we talking about Poe?"

His name was Jonathan Dandle; short, plump around the middle, a round face that was now quite flushed, a large bald head with a fringe of white hair about the ears, and round gold-rimmed bifocals. He looked in his early sixties.

He had startled the company into silence, and even Henry, the imperturbable waiter who was the pride of the Black Widowers, allowed an expression of surprise to flit momentarily across his face.

Drake cleared his throat and stubbed out his cigarette. "We talk about anything we please, Jonathan. Poe is as good a subject as any, especially since Manny Rubin writes mysteries so that Poe might be considered his patron saint. Right, Manny?"

Dandle looked about the table from one to the other and some of the redness drained out of his face and left it a normal blue. He lifted his hands in a kind of shrug. "My apologies, gentlemen. It was not my intention to dictate the subject of the conversation."

He looked a trifle unhappy.

Rubin nodded at Dandle in slightly haughty forgiveness, and said, "Actually, if we're talking about the patron saint of mysteries, I could make a good argument in favor of Conan Doyle. The Mystery Writers of America may hand out Edgars, but the archetypical detective, as all of us know—" and, with that, Poe was abandoned.

Dandle listened intently to the further course of the conversation, but said nothing else until Henry had served the coffee, and Gonzalo had produced a quick caricature which he showed the guest.

Dandle regarded it solemnly, then smiled. "It is fortunate, Mr. Gonzalo, that I have no great opinion of my beauty. You make me look like the old-time actor Guy Kibbee. Perhaps you don't remember him."

Gonzalo said, "Certainly, I remember him, and now that you point it out there *is* a resemblance. A clever artist, with a few strokes of the pen, can bare essentials that are not necessarily obvious."

"What a pity, Mario," said Rubin, "that you don't find a clever artist who can teach you to do so."

"And yet," said Gonzalo easily, "you have met any number of clever writers and none has been able to help you."

At which point, Drake rattled his water glass with his spoon. "Grilling time, gentlemen, so that Manny and Mario are requested to shut up.—Jeff, will you do the honors."

* * *

Geoffrey Avalon stirred the melting ice in his half-consumed second Scotch with his middle finger, and said, "Mr. Dandle, how do you justify your existence?"

Dandle said, thoughtfully, "A good question. Since I had nothing to do with the initiation of my existence in this unfortunate world, I might justifiably deny any need to defend myself. However, I have accepted my existence for over six decades now—

after all, I might have killed myself easily enough—so I will defend. How would it be if I told you I am making it easier for people to communicate with each other. Would that serve as grounds for justification?"

"It depends on what they communicate," said Gonzalo. "Now Manny's attempts at—"

"Mario!" said Avalon, sharply, and turned a frowning look in Gonzalo's direction. Then, more gently, he said, "I have the floor and I would rather that we not descend into anarchy this time. —In what way, Mr. Dandle, do you make it easier for people to communicate?"

"I work in fiber optics, Mr. Avalon, and communications by laser light through glass, rather than by electricity through copper, will make for cheaper and thinner cables that would nevertheless carry more messages. I admit that not all the high technology in the world will of itself serve to improve the quality of those messages."

"And yet, sir, if I may be allowed to interject a personal note, you do not yourself show much tendency to communicate, considering that communication is your business. You have said hardly anything at all during cocktails or dinner. Is there a reason for that?"

Dandle looked about him, his face reddening again. It was quite apparent that he flushed easily, and, like almost all people who do, that he was quite aware of it and seemed the more embarrassed—and to redden more—because of it. He mumbled something.

"I beg your pardon, sir," said Avalon. "I didn't hear you."

Drake, who sat next to his guest, and who looked rather uncomfortable himself, said, "Jonathan, saying, 'I've nothing to say' is no answer."

Dandle said, "It's an answer if that's the answer I choose to give, Jim."

"No," said Drake, peering at his guest out of his wrinkle-nested eyes. "That's not among the permitted choices, Jonathan. I explained the deal on this meeting. You receive a good dinner and good company in exchange for substantive answers. No secrets. No evasions. My own experience is that you've always had plenty to say."

Avalon said, "Let me continue, Jim. —Mr. Dandle, I will accept your answer that you have nothing to say, though I wish you would speak up so that others besides your immediate neighbor might hear you. My next question is this: Why is it that you have nothing to say on this occasion considering that, if we are to believe Jim, such silence is not typical of you?"

Dandle spread out his hands and said loudly enough, "Is a man always accountable for his actions, Mr. Avalon? Does he always know the origins of his moods?"

Avalon said, "Then let me ask you another question. You did, on one occasion, interject a question into the general conversation. You asked why we were talking about Poe, and you did so quite forcibly. I interpreted your remark as indicating that you were offended, perhaps outraged, by the discussion. Is that so? And if it is so, why?"

Dandle shook his head. "No, no. I just asked."

Trumbull stood up and passed one hand over his tightly waved white hair. He said, with exaggerated patience, "Jim, as the host, you must make a decision. We are clearly getting nothing out of our guest, and I think that, under the rules of the club, we might be forced to adjourn the meeting now. In fact, I move you consider adjournment."

Drake waved a hand at him petulantly. "Take it easy, Tom. —Jonathan, you've got to answer honestly. Nothing that is said here will ever be repeated outside these walls. Our waiter, Henry, is a member of the club and he is as closemouthed as we are. More so. I know you well enough to know you haven't committed a crime, or are planning to commit one, but even so, we—"

"You're quite wrong," said Dandle, in a rather more high-pitched voice than before. "I am trying to commit what *I* consider a crime. I'm certainly trying to be dishonest."

Drake said, "You?"

"With what I think is considerable justification, of course."

"After that," said Trumbull, "if Dandle does not care to elaborate, Jim, then we can go no further."

There was silence. Trumbull remained standing. Drake looked at Dandle and said, "Well, Jonathan?"

Dandle said, "You told me, Jim, I would be grilled on the details of my profession. I did not expect this sort of thing."

"It can't be helped. If you had been yourself, none of this would have come up. What's wrong?"

Dandle looked helpless. He clenched his fist, made as though he was going to bring it down on the table, stopped the motion, and said, "It's my sister."

"Your crackp—" began Drake, and stopped suddenly.

"My crackpot sister," said Dandle. "She's dying. Cancer."

There was a sudden silence.

"We've known it for months," said Dandle, "and she may live for months more, but it does produce problems."

The silence continued. Finally, Henry said, "Brandy, gentlemen?"

Avalon said, absently, "Just a small portion, Henry. —What kind of problems, Mr. Dandle?"

"Her will."

"You mean, all this is a matter of money?" said Halsted, with rather more than a shade of disapproval in his voice.

"Not money at all," said Dandle, lifting his eyebrows. "Please understand, gentlemen, that my wife and I are well off. We have a son and daughter, but both are grown and both are reasonably well off. My sister has a house and some money that she inherited from our parents, but this is not something we lust for. At least, not the money. That she can dispose of as she wishes. She can leave it to a farm for homeless cats, if she wishes. It's the house."

He fell into momentary thought. "It was quite clear that she would never marry by the time my parents died. It made sense to leave the family house to her, even though it was unnecessarily large for one person. Still, it's belonged to the family since it was built; I was born there; lived there till I married; I have a profound emotional attachment to it. Now my sister, Rachel," Dandle looked briefly at Drake, "being, as you say, a crackpot, is planning to leave it to a crackpot organization, and I don't want her to. I'd be willing to have it sold to someone respectable. I'd even be willing to have it torn down in a decent way for a decent purpose. But I'm damned if I'm willing to let the—the Cosmic Order of Theognostics infest it."

"The *what?*" said Gonzalo.

Avalon said, "The word comes from the Greek and means 'knowing God.'"

Dandle said, "What they really know are methods for extracting money from fools and nuts."

Avalon said, "I assume they are extracting money from your sister."

"To some extent, yes, but not very much. She is a shrewd woman, financially, and is quite compos mentis outside her obsession. Still, they're angling to get it all when she dies. And they may."

"What is her obsession, sir?"

"I believe it started with her reading of Poe when she was young. I think she read everything he had written; memorized it, just about; and absorbed the unhealthy morbidity that Mr. Rubin mentioned. And she read Lovecraft, too, and grew inclined to believe in horrors from outer space, in elder intelligences, and so on. She lectured me often enough on that stuff. Naturally, she became part of the UFO mania."

"Naturally," muttered Rubin, with a look of distaste.

"She became convinced that intelligent beings from outer space are actually on Earth and have taken over Earth's leaders, and much of the general population. She thinks these aliens are themselves invisible, or can make themselves so, and can live within human beings parasitically. It's all quite mad."

"I suppose," said Avalon, "that if anyone disagrees with her, or tries to argue against her views, she considers it a sign the arguer has been taken over."

"Absolutely. I early on recognized the mistake of trying to oppose her."

Halsted said, "Why haven't the aliens taken over everybody? How does your sister explain that she herself hasn't been taken over?"

"I gather," said Dandle, "that the Cosmic Order of Theognostics fights them with prayer and introspection and meditation and incantation and whatever the devil they claim to do, and they have taught her the same. She has tried to teach me and I've just kept silent and listened. There's a lot of candle burning involved, and the recitation of whole pages of material that has no meaning whatever but I suppose she thinks it keeps me safe—so far."

Drake said, through the smoke of his cigarette, "When I referred to her as a crackpot, Jonathan, I was thinking of the UFO stuff. I didn't know about this alien intelligences bit."

"It's not something I like to talk about, obviously," said Dandle, "and wouldn't be talking about now except under pressure."

Avalon said, "You said you were thinking of committing a crime. Surely, you're not thinking of mayhem against the Theognostics."

"Nothing like that. Just a crime in my own eyes. I've been trying to cheat and deceive my sister, and I'm not really proud of that."

"Would you be willing to explain that, sir?" asked Avalon, stiffly.

"Well, since Rachel was found to have cancer, things are at a crisis. She won't submit to surgery because she is sure that under anesthesia she will be taken over. She is suspicious of radiotherapy, too, since radiation is a weapon of those beings. She is relying entirely on Theognostic ritual, therefore, and you can imagine how effective that is."

Rubin said, "The most ridiculous methods can sometimes help if you believe firmly that they will. The mind is a powerful instrument."

"That may be," said Dandle, "but it isn't helping her. She's going downhill, and, about a month ago, she began to talk of leaving the house and her money to the Theognostics so that they could continue the great fight against the aliens. —So I started a plan of my own." He reddened and stopped.

After a short pause, Avalon said, gently, "Yes, Mr. Dandle?"

"To put it bluntly," said Dandle, "I came to her as an enthusiastic convert. I said she had convinced me and that I was heart and soul with her; that she could leave the money to the Theognostics if she wished, but that she should leave the house to me and I would make it the center of the fight against the aliens. I would allow the Theognostics to use it freely but I merely wanted to keep title to it in honor of our parents. I was hypocritical and obsequious."

"No doubt," said Avalon, "but did it work? People who, like your sister, believe in invisible, untestable dangers would be suspicious of everything."

"I'm afraid so," said Dandle. "She's of two minds about me. She *wants* to believe, but, as you say, she is suspicious. She hesitates to tell me what I'm sure she believes to be the 'higher mysteries,' so to speak. I asked for details about the form and attributes of the mysterious aliens, for instance, and she was closemouthed about it—as though she was not sure I was worthy of initiation."

Trumbull said, "Maybe she doesn't know herself."

Rubin said, "She can easily invent anything she wishes and then come to believe it. Such things are very common."

"Last week she said something in a sort of singsong whisper and I thought I was making progress, but then there was nothing more."

"What did she say?"

"Well, they're hermaphroditic and are neither women nor men. And they weren't Earthly, of course. They aren't human beings or animals. And when they infest us they live on our spiritual nature rather than on our physical bodies, I gather, for she seized my arm, with a surprisingly strong grip, too, and whispered into my ear, 'They are *worse* than cannibals, and that is not surprising considering where they come from."

"Where do they come from?" asked Gonzalo.

"That's what I asked," said Dandle, "but she didn't say. She said that once you achieve a certain enlightenment, you *know* where they come from; that that is the test of enlightenment. It comes over you like a wave of revelation and gives you a certain power against them. *She* knows, and the Theognostics know; but they don't tell anyone because that's their test for the people who are strong against the aliens. It doesn't really make sense, but if I were to try to say that to her, it would mean the end of my chance to save the house. So I just said, earnestly, that I would meditate and try to gain the knowledge." He looked about the table with a grim face. "I'm supposed to be fasting. —She called me this morning."

"Things are coming to a crisis?" asked Avalon.

"Yes. That's why I've been preoccupied this evening, and didn't say much. I was of two minds whether to come here at all, but I didn't want to let Jim Drake down."

"But what was it your sister said to you this morning?"

"She says she wants to make a decision about her will. She feels herself weakening and she knows that she must become one with the Great Divine—which is the Theognostic term for God, apparently—and she wants to make sure she continues the fight from beyond the grave. She can't let me have the house unless she is certain I won't bar the Theognostics from it. And, of course, barring them is *exactly* what I intend to do so I am trying to flimflam her. —It's not exactly admirable of me."

Trumbull said, loudly, "We're on your side, Mr. Dandle. You're fighting a group of pernicious and vicious flimflam operators, and if counter-flimflam is required, so be it."

"Thank you," said Dandle, "but I don't see that I will win out. She wants me to visit her tomorrow at noon and tell her where the aliens come from. If I can't, then she can't rely on me to remain strong against them and the Theognostics will get the house. And, of course, I can't tell her where the aliens come from. They're from outer space, I'm sure. That would fit in with her UFO madness, for they undoubtedly reached Earth by UFO. But where in outer space?"

There was a short silence, then Gonzalo said, "She never gave you any hints?"

Dandle shook his head. "Only the remark about their being worse than cannibals and that that somehow was appropriate, considering where they come from. But what does that mean?"

"Nothing else?"

"Not that I can think of. If she did, it went right past me. —So tomorrow I lose the house."

Avalon said, "You know, sir, that you can contest the will."

"No, not really," said Dandle. "You were introduced to me as a lawyer—"

"A patent lawyer," said Avalon. "I am not knowledgeable on the intricacies of testamentary litigation."

"Well, on the one hand, there is a strong tendency to allow a testator to do as he wishes with his own property. It isn't easy to disallow a religious organization in favor of a relative who is already well off. I doubt that I can prove undue influence, nor would I care to try to make my sister seem to have been of unsound mind, if only out of family considerations. Then, even if I really thought I could win, it would be a long-drawn-out fight in which the legal fees would come to considerably more than I would care to pay. —So I'm going to lose the house."

Avalon said, "We might all of us think about this a bit."

A flicker of hope seemed to enliven Dandle. "Are any of you astronomers?"

"Not professionally," said Halsted, "but we have the usual superficial knowledge of the field that any intelligent and reasonably well-read individuals would have."

"Exactly," said Rubin, "and that means I can make a suggestion. We're looking for something in outer space that has cannibalistic associations. I've read articles recently that in clusters of galaxies, there are occasional collisions and that, in such collisions, the larger member gains stars at the expense of the smaller one. The result is that in some clusters, there is one galaxy that is larger than any of the others, having cannibalized them."

Halsted nodded vigorously. "You are right, Manny. I've read about it, too. There's one outsize galaxy that has five small bright regions within itself that resemble galactic centers. The thought is that it swallowed five small galaxies whole."

Gonzalo said, "Just for the record—what are galaxies?"

Avalon said, "Large conglomerations of stars, Mario. Our own Milky Way Galaxy has a couple of hundred billion stars in it."

Gonzalo said, "Well, then, has that cannibal galaxy—the one that swallowed up its five little sisters—got a name?"

The Black Widowers stared at each other. Finally, Halsted said, "It may, but if it does, it's probably not an ordinary name. Just a particular catalog number like NGC-1111, or something like that."

Gonzalo said, "I don't think Miss Dandle would be impressed by that."

Dandle said, "I don't think so, either. I'm grateful to you for your attempts to help, but if galactic cannibalization is a common phenomenon, which cannibal would be the correct one? And I'm sure my sister knows nothing about modern sophistications in astronomy, anyway. Nor would the Theognostics. Where would they hear of this phenomenon?"

Avalon said, "Does your sister read anything at all in the field of astronomy, Mr. Dandle?"

Dandle said, thoughtfully. "She certainly read everything there is on UFOs and some astronomy—not necessarily correct—is bound to creep in there. She reads up on astrology, of course, which means additional possibly distorted astronomy. And I have seen astronomy popularizations in the house. I haven't actually seen her reading them but I wouldn't be surprised if she did."

"Is she well-read otherwise, sir?"

"Yes. All of Poe as I said, and Lovecraft, and some science fiction. A great deal of general nineteenth-century fiction, I should say, and, of course, she reads the newspapers and a number of magazines thoroughly, if only to find evidence of how far the aliens have taken over the world. I've got to explain to you that there's nothing wrong with her intelligence, outside her—her crackpottery."

"In that case," said Avalon, with a certain sombre satisfaction, "I am quite sure I have the answer." He paused and cast a glance in the direction of the waiter, who was standing at the sideboard, listening with polite but silent attention.

"Henry," said Avalon, "I think that on this occasion we will not need your help."

"Yes, Mr. Avalon," said Henry, quietly.

Avalon cleared his throat. "You see, by far the best-known portion of the Universe, even to astronomers, and *certainly* to the general public, are the planets of our own Solar System. This is especially true for people like Miss Dandle, who are interested in astrology and similar aberrations.

"And of the planets, the one which in recent years has received the most attention and which is, in any case, the most spectacular, is the planet Saturn, with its rings and satellites. The Voyager probes have taken close-up photographs of the Saturnian system and these have made all the newspapers and magazines. Miss Dandle cannot have missed them."

Dandle said, "I'm sure she has not. But what then?"

"Saturn," said Avalon, "is named for an early Roman god of agriculture whom the Romans, with scant justice, equated with the Greek god Kronos. Kronos with his brothers and sisters made up the group of gods called the Titans, and they were the children of Ouranos and Gaea, the god of the sky and the goddess of the Earth, respectively. In a series of most unpleasant myths, the Greeks describe Kronos as castrating his father, Uranus, and taking over the rule of the Universe.

"Since the Fates had decreed that Kronos would, in turn, be replaced as ruler by his own son, the new lord of the Universe took to devouring each child as it was born. His wife, Rhea, managed to save one son by offering Kronos a rock wrapped in the baby's swaddling clothes. The rather stupid Kronos swallowed that without noticing the substitution. The son, still uneaten, was then hidden in Crete, and raised to maturity in secret. Eventually, the son, who was named Zeus (Jupiter, to the Romans), warred upon the Titans, defeated them, released his siblings, who were still alive within Kronos, and took over the Universe. All this Miss Dandle, in her reading, might very well have come across.

"Now, then, Saturn was clearly a cannibal. If there are degrees in such things, devouring one's own children is surely worse than fattening on strangers, so he might well be viewed as worse than an ordinary cannibal. Miss Dandle's statement that the aliens were worse than cannibals and that that was not surprising in view of where they came from would make sense if they came from Saturn."

And Avalon smiled at Dandle with self-conscious triumph.

Dandle said, "You think, then, I had better tell my sister the alien beings come from Saturn?"

"I can't say the matter is certain," said Avalon. "She may, after all, suppose them to have come from some entirely fictitious planet such as Zorkel, the fifth planet of the star Xanadu, in the galaxy of Yaanek. If, however, she has a real astronomical body in mind, then I am virtually certain that it is Saturn. It must be."

"It sounds good to me," said Gonzalo.

"It makes sense," admitted Rubin, looking distressed at having to say so.

Halsted said, "It's worth a try."

Trumbull said, "I can't think of anything better."

Drake said, "It seems unanimous. I'd take the chance, Jonathan."

Dandle began, "Well, since I can't think of anything better, either—"

Gonzalo interrupted. "Wait, Henry hasn't said anything. Henry, what do you think?"

Dandle looked up in astonishment at having the waiter referred to.

When Henry said, "May I ask Mr. Dandle if he shared in his sister's enthusiasm for Poe?" Dandle looked more astonished still.

Drake said, "Please answer, Jonathan. Henry is one of us."

Jonathan said, "No, definitely not. I know 'The Raven'; no one can avoid knowing that; but I know nothing else. I stay away from him."

"In that case," said Henry, "I fear that Mr. Avalon's suggestion, although most ingenious, is not the correct answer."

Avalon looked offended. "Indeed, Henry? Have you anything better to offer?"

Henry said, "Consider, sir, that Miss Dandle was a great devotee of Poe, and that in describing the aliens she said that they were neither female nor male, animal nor human."

"Well?"

"Well, Mr. Avalon, I, unlike Mr. Dandle but like his sister, am an admirer of Poe, though more so of his poetry than of his prose. Among my favorite poems by Poe is 'The Bells,' in the fourth part of which he describes the tolling of the funeral bells. There you have his morbid preoccupation with death, you see, something that is bound to follow his earlier descriptions of sleigh bells, wedding bells, and fire-alarm bells."

"Aha," said Rubin.

"Yes, Mr. Rubin," said Henry, "I suspect you already see what I mean. Part of the description of the funeral bells is—if I may quote:

"And the people—ah, the people—
They that dwell up in the steeple,
All alone,
And who, tolling, tolling, tolling,
In that muffled monotone,
Feel a glory in so rolling
On the human heart a stone—
They are neither man nor woman—
They are neither brute nor human—"

Henry paused, then said, "Miss Dandle was undoubtedly quoting those last two lines, I think. You stated that she said them in singsong fashion, Mr. Dandle, but not being a Poe enthusiast, you did not recognize them."

Avalon said, "But even so— How does that help?"

Henry said, "It is the next line that counts, as Poe identifies the people who toll the funeral bells."

And he and Rubin quoted simultaneously: "*'They are Ghouls.'*"

Henry said, "Ghouls are creatures of Middle Eastern legend who infest graveyards and feed on dead bodies. That might well strike Miss Dandle, or anyone, as worse than

ordinary cannibalism, just as vultures are worse than hawks in the general estimation."

Avalon said, "I grant that, but I still don't see the point."

"Nor I," said Trumbull.

Henry said, "There is a constellation in the sky named Perseus, named for the Greek hero who cut off the head of Medusa, a creature so dreadful in appearance that anyone looking at it turned to stone. The constellation is pictured as the hero holding the head of Medusa and that head is marked by a second-magnitude star, Beta Persei. I looked it up in the Columbia Encyclopedia during the discussion, to be sure of that fact.

"Because of its position in the constellation, Beta Persei is sometimes called the Demon Star, in consequence. The Arabs, who adopted the Greek view of the sky, named it *Al Ghul*, meaning 'The Ghoul,' their version of something as horrible as Medusa, and our English version of that Arabic name is 'Algol.' That is now the common name of the star.

"Since Miss Dandle quoted that poem to define the aliens, she meant that they were ghouls, and therefore worse than cannibals, and she must have meant that it was not surprising that they were since they came from the star known as 'The Ghoul'—a fact she could surely have picked up from some book on popular astronomy, as I did, originally. I would suggest, then, Mr. Dandle, that you say, when you see your sister tomorrow, that the aliens come from Algol."

Dandle smiled brightly for the first time that evening and broke into applause. "Henry, I will. That *should* be the answer, and I am sure it is."

Henry said, gravely, "Nothing may be completely sure in this case, sir, but it is worth the gamble."

The Fourth Homonym

"Homonyms!" said Nicholas Brant. He was Thomas Trumbull's guest at the monthly banquet of the Black Widowers. He was rather tall, and had surprisingly prominent bags under his eyes, despite the comparative youthfulness of his appearance otherwise. His face was thin and smooth-shaven, and his brown hair showed, as yet, no signs of gray. "Homonyms," he said.

"What?" said Mario Gonzalo, blankly.

"The words you call 'soundalikes.' The proper name for them is 'homonyms.'"

"That so?" said Gonzalo. "How do you spell it?"

Brant spelled it.

Emmanuel Rubin looked at Brant owlishly through the thick lenses of his glasses. He said, "You'll have to excuse Mario, Mr. Brant. He is a stranger to our language."

Gonzalo brushed some specks of dust from his jacket sleeve and said, "Manny is corroded with envy because I've invented a word-game. He knows the words but he lacks any spark of inventiveness, and that kills him."

"Surely Mr. Rubin does not lack inventiveness," said Brant, soothingly. "I've read some of his books."

"I rest my case," said Gonzalo. "Anyway, I'm willing to call my game 'homonyms' instead of 'soundalikes.' The thing is to make up some short situation which can be described by two words that are soundalikes—that are homonyms. I'll give you an example: If the sky is perfectly clear, it is easy to decide to go on a picnic in the open. If it is raining cats and dogs, it is easy to decide *not* to go on a picnic. But what if it is cloudy, and the forecast is for possible showers, but there seem to be patches of blue here and there, so you can't make up your mind about the picnic. What would you call that?"

"A stupid story," said Trumbull, tartly, passing his hand over his crisply-waved white hair.

"Come on," said Gonzalo, "play the game. The answer is two words that sound alike."

There was a general silence and Gonzalo said, "The answer is 'whether weather.' It's the kind of weather where you wonder whether to go on a picnic or not. 'Whether weather', don't you get it?"

James Drake stubbed out his cigarette and said, "We get it. The question is: How do we get rid of it?"

Roger Halsted said, in his soft voice, "Pay no attention, Mario. It's a reasonable parlor game, except that there don't seem to be many combinations you can use."

Geoffrey Avalon looked down austerely from his 72-inch height and said, "More than you might think. Suppose you owned a castrated ram that was frisky on clear days and miserable on rainy days. If it were merely cloudy, however, you might wonder whether that ram would be frisky or miserable. That would be 'whether wether weather.'"

There came a chorus of outraged "What!"s.

Avalon said, ponderously. "The first word is 'w-h-e-t-h-e-r', meaning 'if.' The last word is 'w-e-a-t-h-e-r', which refers to atmospheric conditions. The middle word is 'w-e-t-h-e-r', meaning 'a castrated ram.' Look it up if you don't believe me."

"Don't bother," said Rubin. "He's right."

"I repeat," growled Trumbull. "This is a stupid game."

"It doesn't have to be a game," said Brant. "Lawyers are but too aware of the ambiguities built in to the language, and homonyms can cause trouble."

The gentle voice of Henry, that waiter-for-all-seasons, made itself heard over the hubbub by some alchemy that worked only for him.

"Gentlemen," he said. "I regret the necessity of interrupting a warm discussion, but dinner is being served."

* * *

"Here's another one," said Gonzalo, over the smoked trout. "Someone has written down all the digits and on all of them but one he has drawn a very clever face. A child watching this is delighted, but dissatisfied with the incompleteness of the project. What does he say?"

Halsted, who was spreading the horseradish sauce daintily over his trout, said, "The child says, 'Do that to two, too.'"

Gonzalo said in an aggrieved manner, "Have you heard that somewhere before?"

"No," said Halsted, "but it's a mathematical instance of the game. What's the use of teaching mathematics at junior high school, if I can't solve problems involving the number, two."

Gonzalo frowned. "You're trying to be funny, aren't you, Roger?"

"Who me?"

Trumbull said, "As host of the evening, I would like to recommend that we change the subject."

No one gave any sign of hearing. Avalon said, "Homonyms are usually the result of the accidents of language history. For instance, 'night' by which I mean the opposite of 'day', is cognate to the German, 'Nacht,' while 'knight', by which I mean a warrior of the Table Round, is cognate with the German 'knecht'. In English, the vowels changed and the 'k' is invariably silent in an initial 'kn', so you end up with two words pronounced in identical fashion."

"The initial 'kn' does not invariably have a silent 'k'," said Rubin. "There are some words not yet sufficiently Anglicized. I have a Jewish friend, who maried a young lady of the Gentile persuasion. Anxious to please her new husband, she bought some ethnic delicacies for him which she displayed proudly. Listing her purchases, she said, finally,

'And I also bought you this nish,' and was quite puzzled when he broke into hysterical laughter."

Drake said, "I don't get it."

Rubin said, with a touch of impatience, "The word is 'knish'—with the 'k' heavily pronounced. It is a ball of dough in whose interior one places spiced mashed potatoes, or possibly some other filling, with the whole then being fried or baked. Any New Yorker should know that."

Trumbull sighed and said, "Well, if you can't lick them, join them. Can anyone give me a group of four homonyms, four words all pronounced alike, with spelling and meaning different in each case? I'll give you five minutes in which I expect blessed silence."

The five minutes passed pleasantly enough, with only the sound of cracking lobster shells impinging upon the ear-drums, and then Trumbull said, "I'll give you one of the words: 'right' meaning 'the opposite of left.' What are the other three?"

Halsted said, his mouth fairly full of lobster claw, "There's 'write' meaning 'to inscribe words', and 'rite' meaning 'a fixed religious procedure', but I don't think there's a fourth."

Avalon said, "Yes, there is. It's 'wright', 'w-r-i-g-h-t', meaning 'a mechanic.'"

"That's archaic," protested Gonzalo.

"Not entirely," said Avalon, "We still speak of a 'playwright', who would be 'someone who constructs plays.'"

Brant said, "My friend, Tom, mentioned 'right', defining it as 'the opposite of left.' What about 'right' meaning 'the opposite of wrong', and 'right' meaning 'perpendicular'? Would that be a fifth and sixth homonym?"

"No," said Gonzalo, "the spelling has to be different for the words to be homonyms."

Avalon said, "Not always, Mario. Two words can be spelled the same but have different meanings and have different etymological origins; they would count as homonyms. For instance, 'bear' meaning the animal, and 'bear' meaning 'to carry', have the same spelling and pronunciation, but have different origins, so I would call them homonyms; along with 'bare' meaning 'unclothed', of course. The different uses of 'right', however, as in 'right hand', 'right answer', and 'right angle', all stem from the same root with the same meaning, so they would not be homonyms."

* * *

There were fifteen additional minutes before Trumbull felt justified in rattling his spoon against the water glass and bringing the conversation to a halt.

"I have never been so glad," he said, "at any of the banquets of the Black Widowers to put an end to a conversation. If I had absolute power as a host, I would fine Mario five dollars for starting it."

"You took part in it, Tom," said Gonzalo.

"In self-defense—and shut up," said Trumbull. "I would like to present my guest, Nicholas Brant, and Jeff, you seem civilized even if you were more homonymized than anyone else, so would you do the honors and begin the grilling."

Avalon's formidable eyebrows lifted, and he said, "I scarcely think that 'homonymized' is English, Tom." Then, turning to the guest, he said, "Mr. Brant, how do you justify your existence?"

Brant smiled ruefully. "As a lawyer, I don't think I can. You know the old joke, perhaps, of the time God threatened to sue Satan, and Satan answered, 'How can you?

I've got all the lawyers.' In my defense, however, I'm not the kind of lawyer who plays tricks in front of a judge and jury. Mostly I sit in my office and try to write documents that actually mean what they are supposed to mean."

Avalon said, "I'm a patent lawyer myself, so I ask the following question without evil intent. Do you ever try to write them so that they *don't* mean what they're supposed to mean? Do you try to build in loopholes?"

Brant said, "Naturally, I try to draw up a document that leaves my client as much freedom of action as possible, and the other side as little freedom of action as possible. However, the other side has a lawyer, too, who is working hard for the reverse, and the usual result is that the contract ends up reasonably iron-bound in both directions."

Avalon paused, then said, "In the earlier discussion on homonyms, you said, if I remember correctly, that homonyms are ambiguities that could cause trouble. Does that mean you ran into a homonym professionally, in your preparation of contracts, that brought about unexpected complications?"

Brant raised both hands. "No, no, nothing like that. What I had in mind when I made that statement was completely irrelevant to the subject now under discussion."

Avalon ran his finger around the rim of his water glass. "You must understand, Mr. Brant, that this is not a legal cross-examination. There is no particular subject under discussion, and nothing is irrelevant. I repeat my question."

Brant remained silent for a moment, then he said, "It's something that took place a little over twenty years ago, and that I have thought about only very occasionally since then. Mr. Gonzalo's game of homonyms brought it mind, but it's—nothing. It doesn't involve any legal problems or any complications whatever. It's just a—puzzle. It's an insoluble matter that isn't worth discussing."

"Is it confidential?" put in Gonzalo. "Because if it is—"

"Nothing confidential about it," said Brant. "Nothing secret, nothing sensitive—and therefore nothing interesting."

Gonzalo said, "Anything that's insoluble is interesting. Don't you agree, Henry?"

Henry, who was filling the brandy glasses, said, "I find it so when there is at least room for speculation, Mr. Gonzalo."

Gonzalo began, "Well, then, if—"

Avalon said, "Mario, let me continue, please. —Mr. Brant, I wonder if you could give us the details of this insoluble puzzle of yours. We would greatly appreciate hearing it."

"You'll be very disappointed."

"That's a chance we will take."

"Well, then," said Brant, "if you'll just give me a chance to think back—"

He rested his face in one hand, thinking, while the six Black Widowers watched him expectantly, and Henry took his usual place by the sideboard.

Brant said, "Let me begin with Alfred Hunzinger. He was a poor boy of an immigrant family, and he had no education worth mentioning. I'm pretty sure he never went to high school. By the time he was fourteen, he was working. Those were the decades before World War I and education was by no means considered one's birthright, or even particularly desirable for what used to be called workingmen.

"Hunzinger wasn't your usual workingman, however. He was incredibly industrious and incredibly intelligent. Intelligence and education don't necessarily go hand in hand, you know."

Rubin said, forcefully, "Indeed, they don't. I've known some very thoroughly educated jackasses."

"Hunzinger was the reverse," said Brant. "He was a very thoroughly uneducated business genius. He had a green thumb, but it was the green of dollar bills. Whatever he touched prospered, and he built a formidable business before he died.

"Nor was this enough for him. He always felt keenly his lack of education, and he embarked on a program of home study. It wasn't continuous, for his business was his first preoccupation and there were periods when he had little time. And it was spotty, for he read promiscuously and without outside guidance. Conversation with him was an exposure to a curious mixture of pedantry and naivete."

Avalon said, "You knew him personally, I take it."

Brant said, "Not really. Not intimately. I did some work for him. Mainly, I prepared his will. This, when properly done, and when there are complex business matters to consider, takes a long time and produces a long document. Periodically, it must be updated or revised, and the wording considered carefully in the light of continually changing tax laws. Believe me, it was virtually a career in itself and I was forced to spend many hours in conference with him and to engage in extensive correspondence, too. However, it was a very limited and specialized relationship. I got to know the nature of his finances rather thoroughly, but to know him, as a person, only superficially."

"Did he have children?" asked Halsted.

"Yes, he did," said Brant. "He married late in life; at the age of 42, if I remember correctly. His wife was considerably younger. The marriage, while not idyllically happy, was a successful one. There was no divorce nor any prospect of one at any time, and Mrs. Hunzinger died only about five years ago. They had four children, three boys and a girl. The girl married well; she's still alive, still married, has children of her own, and is, and has been, very comfortably off. She scarcely figured in the will. Some investments were turned over to her during Hunzinger's lifetime and that was it.

"The business was left on an equal basis, one-third each, to the three sons, whose names were Frank, Mark and Luke."

"In that order of age?" asked Drake.

"Yes. The oldest was, to use his legal signature, B. Franklin Hunzinger. The middle son is Mark David Hunzinger. The youngest son is Luke Lynn Hunzinger. Naturally, I pointed out to Hunzinger that to leave his business in equal shares to his three sons was asking for trouble. The income might be divided equally, but the directing power, the decision-making power, had to be placed in the hands of one.

"He was very stubbornly resistant to that, however. He said he had brought up his sons in accordance with the ideals of the old Roman republic; that they were all faithful to him, the paterfamilias—he actually used the term, to my intense surprise—and to each other. There would be no trouble at all, he said.

"I took the liberty of pointing out that they might well be ideal sons while he was alive and with his forceful personality directing affairs. After he was gone, however, hidden rivalries might show up. Never, he insisted, never. I thought him blind, and wondered how anyone so alive to any hint of chicanery in business affairs, so realistic in matters of the world, could be so foolishly romantic where his own family was concerned."

Drake said, "What was the daughter's name?"

"Claudia Jane," said Brant. "I don't remember her married name at the moment. Why do you ask?"

"Just curious. She might have had ambitions, too, mightn't she?"

"I don't think so. At least not with respect to the business. She made it quite clear

she neither expected nor wanted any share in it. Her husband was rich—old money—social position—that sort of thing. The last thing she wanted was to be identified with what was—in a manner of speaking—a giant hardware store."

"Well, I see that," said Drake.

"I must admit that the family seemed entirely harmonious," said Brant. "I met the sons at one time or another, singly and together, and they seemed fine young men, much at ease with one another, and obviously fond of their father. What with one thing and another, I reached the stage where it seemed appropriate to invite me to the festivities celebrating the old man's eightieth birthday. It was on that occasion that Hunzinger had the heart attack that carried him off. It was not entirely unexpected. He'd had a heart condition for years, but it was totally unfortunate for it to happen on his birthday.

"The party broke up, of course. He was laid, gently, on the nearest couch and doctors were called in. There was a kind of hushed pandemonium. The confusion was sufficient for me to be able to stay on. It may sound ghoulish, but I conceived myself to have a job to do. He had not yet assigned any son to be the head of the firm. It was too late to have anything in writing; but if he would say something, it might have some force.

"The sons, I suppose, did not know what I had in mind. They were there, of course. Their mother, half in shock, had been led away. No one seemed to notice I was present. I leaned across to the old man's ear and said, 'Which of your sons is to be the head of the firm, Mr. Hunzinger?'

"It was too late. His eyes were closed, his breathing was stertorous. I wondered if he had heard me. A doctor approached and I knew he would stop me, so I tried again quickly. This time, the dying man's eyelids fluttered, and his lips moved as though he were trying to speak. However, only one sound came out. It seemed to be the word 'to'. I heard nothing else. He lingered on for another hour but never said another word, and died, without regaining consciousness, on the couch on which he had been laid. —And that's it."

Gonzalo said, "What happened to the business?"

"Nothing," said Brant, with what seemed the residuum of a vast surprise. "The old man was right. The three sons get along famously. It's a sort of triumvirate. When a decision must be made, they get together and come to one quickly. It's really an amazing thing and if that sort of thing should become infectious, lawyers would all starve to death."

"Then it doesn't matter what the old man said, does it?" said Gonzalo.

"Not in the least, except that for a while it roused my curiosity. What was he trying to say? You see the difficulty, I suppose?"

"Of course," said Drake, fingering his small gray mustache. "You can't do much with the word 'to.'"

"It's worse than that," said Brant. "Which homonym? Was it t-o, or t-o-o, or t-w-o. There are *three* to's in the English language. Incidentally, how so you write that sentence? I've often wondered. You can *say* 'three to's', since all three are pronounced alike, but how do you write it, since each one of the homonyms is spelled differently?"

Avalon said, "I would say, 'There are three words pronounced t-o-o.' The double-o is the most unambiguous way of indicating the pronunciation that all three share and you spell it out."

"Well, in any case, even if I knew which t-o-o it was, it wouldn't help me."

Trumbull said, "Mightn't it not have been a word, Al? Suppose he were saying a

longer word such as 'constitution.' That's four syllables and he managed to sound only the third. All you'd have would be t-o-o."

"Maybe," said Brant. "I can't prove that that's not so. Just the same, at the time, I got the impression that it was a word, one of the three t-o-o's, however you want to spell it. I suppose I was desperately trying to read his lips and he might have said 'Headship to so-and-so' and all I got was the 'to'. Which leaves me with nothing. Of course, as I said, it doesn't matter. The sons are doing well. Still—"

Brant shook his head. "I'm a lawyer. It bothers me that I came so close to having it done *right*. Even if he were refusing to choose anyone. Even if he were saying 'Not to anyone', he would have been expressing his last wish and that would have been better than just falling into a situation by default. So for a while I kept wondering, and now you've put it back in my head, and I'll keep on wondering for another while. —And getting nowhere because there's nowhere to be gotten."

A heavy silence descended about the table, one which was finally broken by Gonzalo who said, "At least it's an interesting version of the game of homonyms. Which of the soundalikes was it?"

Trumbull said, "What's the difference? Not one of the three would help us make sense of what the old man was trying to say."

"I told you," said Brant, glumly. "It's an insoluble problem. There just isn't enough information."

"We don't have to *solve* it," said Halsted, "since there's no crisis that has to be eased, or criminal on whom we must visit retribution. All we have to do is point out a reasonable possibility to ease your mind. For instance, suppose he was saying t-w-o."

"Well, suppose he was," said Avalon.

"Then it may be that he was saying something like, 'Give it to son number two.'"

Brant shook his head, and said, "The impression I got was that the t-o I heard was in the middle of the message. His lips moved before and after I heard the t-o."

Rubin said, "I'm not sure you can go by that. His lips were scarcely under control. Some of what appeared to be movement might have been only trembling."

"Which makes it all the worse," said Brant.

"Now wait a while," said Halsted. "My idea works even with the word in the middle of the message. It could have been something like 'Give it to number two son', or 'Number two son gets it.'"

Trumbull growled, "Charlie Chan might say it, but was Hunzinger likely to do so. —Al, did you ever hear this man refer to his children by number."

"No," said Brant. "I don't think I ever did."

"Well, then," said Trumbull, "Why on earth should he start doing so on his deathbed?"

"I wonder," said Rubin. "Consider this. His second son is named Mark, which is also the name of the writer of the second gospel. His third son is named Luke, which is the name of the writer of the third gospel. I'll bet that if he had had a fourth son, that son's name would have been John."

"What's the good of a bet like that?" said Gonzalo. "We can't ever settle it and decide on a winner."

"Why wasn't the first son's name Matthew, then?" asked Avalon.

Rubin said, "Maybe old Hunzinger didn't think of it till after the first son was born. Maybe he simply didn't like 'Matthew'. Anyway, it strikes me that if the word *were* 'two', it would have a double meaning. It would refer to the second son *and* the second gospel and it would mean Mark in either case."

Trumbull said, "There could be a million reasons why the number, two, might point to Mark, but put them all together and they wouldn't be any more likely to get him to refer to 'my number two son' than just one reason would. Why wouldn't he just say 'Mark', if he meant Mark?"

Brant said, "Well he might have said 'to Mark' at that and all I heard was 'to.'"

Avalon said, "Mr. Brant, I wonder if you at any time noted that old Mr. Hunzinger trusted one of his sons more than another, valued more highly the business acumen of a particular son, loved one more."

Brant bent his head in thought. Then he shook it. "I can't say I did. I have no recollection of anything of the sort. Of course, as I said, my relationship with the family was not a matter of warm personal friendship. It was business, entirely. The old man never confided family matters beyond anything that was relevant to the will."

Gonzalo said, "We keep talking about the sons. How do you know the old man didn't give some thought to his daughter? Suppose he left the business to his three sons, in thirds, but wanted his daughter to make crucial decisions. He might have thought she had the best business sense and should run the show even though she wouldn't want to be connected with the business in any open way."

"What gives you that idea, Mario?" asked Avalon.

"Suppose the word was t-o-o. He might have been saying, 'My daughter, too, should be involved.' Something like that."

"I don't think so," said Brant. "Mr. Hunzinger never mentioned his daughter in connection with the business. Remember, too, that his prejudices are pre-World War I, when women couldn't even vote. In no way was he a feminist. His wife was strictly a homebody and that's the way he liked it. He took care to have his daughter marry a rich man, and as far as he was concerned, that was the limit of his responsibility toward her. At least, I am forced to that conclusion as I think of our various discussions of the will."

Again, there fell a silence around the table, and finally Avalon said, with a rather theatrical sigh, "It doesn't matter what hypotheses we set forward. No matter how clever and ingenious they might be, there's no way in which we can show that they are true. I'm afraid that this once we have to decide that our guest is correct and that the problem, by its very nature, is insoluble."

Gonzalo said, "Not until we ask Henry."

"Henry?" said Brant, in surprise. His voice dropped to a whisper. "Do you mean the waiter?"

Trumbull said, "No need to whisper, Al. He's a member of the club."

"So I'll ask him," said Gonzalo. "Henry, do you have any ideas about this?"

From his place at the sideboard, Henry smiled very slightly and said, "I must admit, Mr. Gonzalo, that I've been wondering what the first name of the eldest son might be."

Gonzalo said, "Frank. Don't you remember?"

"I beg your pardon, Mr. Gonzalo, but I seem to recall the oldest son is B. Franklin Hunzinger. I wondered what the B stood for."

All eyes turned to Brant, who shrugged and said, "He's identified as B. Franklin even in his father's will. That's the legal form of his signature. I always assumed, however, that the B stood for Benjamin."

"It's a natural assumption," said Henry. "Any American named B. Franklin, it would seem, would be bound to be a Benjamin. But did you ever hear any member of the family, or anyone for that matter, address him as Benjamin or Ben."

Slowly, Brant shook his head. "I don't recall any such incident, but it was over twenty years ago and I was not really part of the family circle."

"Or since the death of the elder Hunzinger?"

"Oh, well, I've rarely had any contact with them at all since then, not even with respect to legal matters."

Trumbull said, "What's all this about, Henry?"

"Why, it occurred to me that there are, in a manner of speaking, four homonyms with the sound t-o-o."

Avalon said, in an astonished voice, "Four? You mean that one of the homonyms has two meanings of unrelated derivation as in the case of b-e-a-r?"

"No, Mr. Avalon. I am referring to four homonyms with four different spellings."

Avalon thought briefly, "Impossible, Henry. Manny, can you think of a fourth homonym beyond t-o, t-o-o, and t-w-o."

"No," said Rubin, flatly, "there is no fourth homonym."

Henry said, "I said 'in a manner of speaking.' It all depends on the first name of B. Franklin."

Drake said, "Henry, you're being mysterious and you've got us all confused. Now *explain*."

"Yes, Dr. Drake. Mr. Brant had said that the elder Hunzinger was self-educated, and he had indicated that he was particularly interested in Roman history. He raised his children in what he thought was the Roman tradition. He used terms such as 'pater-familias' and so on. And he gave his children traditional Roman names. His daughter he named Claudia; one son is Mark, from the Roman Marcus; another is Luke from the Roman Lucius.

"It is possible, in fact, that the original names were indeed Marcus and Lucius, and that the youngsters found Mark and Luke more palatable to their peers. Now what if the eldest had a Roman name also, which had no common Anglicized form. He might not have used it at all, but stayed with Franklin, which becomes the very common and acceptable Frank.

"One common Roman name beginning with B is Brutus, and that has no Anglicized form that is likely to be acceptable."

"Aha," said Rubin.

"Yes, Mr. Rubin," said Henry. "If the elder Mr. Hunzinger had picked up scraps of Latin, undoubtedly Julius Caesar's last words, one of the most famous of all Latin phrases, would be known to him. It contains the word 'tu' which is Latin for the familiar form of 'you,' and is so well known among educated English-speaking people—if only from this phrase—that it might almost rank as a fourth homonym.

"Asked about which of his sons should head the firm, the dying man thought of the oldest, remembered the name he had been given him as a child and may have said something like 'all my sons share, and you, Brutus, will lead.' The phrase 'and you, Brutus' becomes the muttered Caesarian exclamation of 'et tu, Brute', and only the 'tu' was loud enough to hear."

"Good God," muttered Brant, "who could possibly think of something like that?"

"But it's *most* ingenious," said Avalon. "I hope you're right, Henry. I'd hate to see that reasoning wasted. I suppose we could call Hunzinger and try to persuade him to give us his first name."

Gonzalo said, excitedly, "Wait, Jeff, wouldn't it be in *Who's Who in America*? They usually include businessmen."

Avalon said, "They might well have only the legal version of his name—B. Franklin Hunzinger. Of course, they sometimes include the name beyond the period in parentheses to indicate it exists but is not to be used."

"Let's see," said Gonzalo. He took down the first volume of the tome and for a few moments there was the sound of flipping pages. Then it stopped and Gonzalo cried out in triumph, "Brutus Franklin Hunzinger, the r-u-t-u-s in parentheses."

Brant buried his head in his hands, "Twenty years, on and off, this had bothered me, and if I had looked him up in *Who's Who*— But why would it occur to me to look him up." He shook his head. "I must tell them. They will have to know."

Henry said, "I don't think that would be wise, Mr. Brant. They get along well as it is, but if they find out that their father had chosen one of them to head the firm—which even as it is we can't be *certain* of—bad feelings might break out. Surely one shouldn't attempt to fix what isn't broken."

The Eye of the Beholder

George and I were sitting on a bench at the boardwalk and contemplating the broad expanse of the beach and the sparkling sea in the distance. I was immersed in the innocent pleasure of watching the young ladies in their bikinis and wondering what they could get out of the beauties of life that was half as much as they contributed.

Knowing George as I did, I rather suspected his own thoughts to be considerably less nobly esthetic than mine. I was certain that they would deal with the more useful aspects of those same young ladies.

It was with considerable surprise, then, that I heard him say, "Old man, here we sit, drinking in the beauties of nature in the shape of the female form divine—to coin a phrase—and yet surely true beauty is not, and cannot be, so evident. True beauty, after all, is so precious that it must be hidden from the eyes of trivial observers? Have you ever thought that?"

"No," I said, "I've never thought that and, now that you mention it, I still don't. What's more, I don't think that you have ever thought that."

George sighed. "Talking with you, old chap, is like swimming in molasses—very little return for very great effort. I have watched you observing that tall goddess there, the one whose wisps of fine textile do nothing to conceal the few square inches they purport to cover. Surely, you understand that those are mere superficialities that she displays."

"I have never asked for much out of life," I said, in my humble way. "I'll be satisfied with superficialities of that sort."

"Think how much more beautiful a young woman would be—even a woman quite unprepossessing to the untutored eyes of one such as you—if she possessed the eternal glories of goodness, unselfishness, cheerfulness, uncomplaining industry, and concern for others; all the virtues, in short, that shed gold and grace on a woman."

"What I'm thinking, George," I said, "is that you must be drunk. What on earth can you possibly know about virtues such as those?"

"I am totally familiar with them," said George, haughtily, "because I practice them assiduously, and to the full."

"Undoubtedly," I said, "only in the privacy of your own room and in the dark."

* * *

Disregarding your crude remark [George said] I must explain that even if I did not have personal knowledge of these virtues, I would have learned of them through my acquaintance with a young woman named Melisande Ott, nee Melisande Renn, and known to her loving husband, Octavius Ott, as Maggie. She was known to me as Maggie also, for she was the daughter of a dear friend of mine, now, alas, deceased, and she always considered me her Uncle George.

I must admit that there is a bit of me, that like you, appreciates the subtle qualities of what you call 'superficialities.' —Yes, old boy, I know I used the term first but we will not get anywhere if you are going to interrupt me constantly over trivialities.

Because of this small weakness in myself, I must also admit that when, in an excess of joy at seeing me, she would squeal and throw her arms about me, my delight at the event was not quite as great as it would have been had she been more generously-proportioned. She was quite thin and her bones were painfully prominent. Her nose was large, her chin weak, her hair rather lank and straight and pure mouse in color, and her eyes an undefinable gray-green. Her cheekbones were broad so that she rather resembled a chipmunk that had just completed a fine collection of nuts and seeds. In short, she was not the type of young woman whose arrival on the scene would cause any young man present to begin breathing rapidly and striving to get closer.

But she had a good heart. She bore up, with a wistful smile, at the visible winces that shook the average young man who met her for the first time, without warning. She served as bridesmaid for all her friends in turn with a fresh group of wistful smiles. She served as godmother to innumerable children, and as baby-sitter to others, and was as deft a bottle-feeder as you could see in a long month of Sundays.

She brought hot soup to the deserving poor, and to the undeserving as well, though there were some who said that it was the undeserving who more nearly deserved the visitation. She performed various duties at the local church, several times over—once for herself and once each for those of her friends who preferred the guilty splendors of the movie palaces to selfless service. She taught classes at Sunday school, keeping the children cheerful by making (as they thought) funny faces at them. She also frequently led them all in a reading of the nine commandments. (She left out the one about adultery for experience had taught her that this invariably led to inconvenient questions.) She also served as a volunteer at the local branch of the public library.

Naturally, she lost all hope of getting married somewhere about the age of four. Even the chance of having a casual date with a member of the opposite sex seemed to her to be a rather impossible dream by the time she had reached the age of ten.

Many a time she would say to me, "I am not unhappy, Uncle George. The world of men is sealed to me, yes, always excepting your dear self and the memory of poor pappa, but there is far more true happiness in doing good."

She would then visit the prisoners in the county jail in order to plead for repentance, and for conversion to good works. It was only one or two of the crasser sort who volunteered for solitary confinement on those days on which she was due to arrive.

* * *

But then she met Octavius Ott, a newcomer to the neighborhood, a young electrical engineer with a responsible position at the power company. He was a worthy young man—grave, industrious, persevering, courageous, honest and reverent—but he was not what you or I would call handsome. In fact, not to put too fine a point on it, he

was not what anyone in recorded history would have called handsome.

He had a receding hairline—or, more accurately, a receded one—a bulbous forehead, a snub nose, thin lips, ears that stood well away from his head, and a prominent Adam's apple that was never entirely still. What there was of his hair was rather rust-colored, and he had an irregular sprinkling of freckles on his face and arms.

I happened to be with Maggie when she and Octavius met in the street for the first time. Both were equally unprepared and both started like a pair of skittish horses suddenly confronted by a dozen clowns in a dozen fright wigs who were blowing a dozen whistles. For a moment, I expected both Maggie and Octavius to rear and whinny.

The moment passed, however, and each successfully weathered the flash of panic they had experienced. She did nothing more than place her hand on her heart as though to keep it from leaping out of the rib cage in search of a more secure hiding place, while he wiped his brow as though to erase a horrid memory.

I had met Octavius some days before and so I was able to introduce them to each other. Each held out a tentative hand as though not anxious to add the sense of touch to that of vision.

Later that afternoon, Maggie broke a long silence and said to me, "What an odd young man that Mr. Ott seems to be."

I said, with that originality of metaphor which my friends all enjoy, "You mustn't judge a book by its cover, my dear."

"But the cover exists, Uncle George," she said, earnestly, "and we must take that into account. I dare say that the average young woman, frivolous and unfeeling, would have little to do with Mr. Ott. It would be a deed of kindness, therefore, to show him that not all young women are totally heedless, but that one at least does not turn against a young man for nothing more than his unfortunate resemblance to—to—" She paused as no comparable member of the animal kingdom occurred to her, so that she had to end lamely, but warmly, with "whatever it is that he resembles. I must be kind to him."

I do not know whether Octavius had a confidant to whom he could unburden himself in similar fashion. Probably not, for few of us—if any—are blessed with Uncle Georges. Nevertheless, I'm quite certain, judging from later events, that precisely the same thoughts occurred to him—in reverse, of course.

In any case, each labored to be kind to the other, tentatively and hesitantly at first, then warmly, and at last passionately. What began as casual encounters at the library, became visits to the zoo, then an evening at the movies and at dances, until, finally, what took place could only be described—if you'll excuse my language—as trysts.

People began to expect to see one whenever they saw the other, for they had become an indissoluble pair. Some of those in the neighborhood complained bitterly that to get a double dose of Octavius and Maggie was more than the human eye could be expected to endure, and more than one supercilious elitist invested in sunglasses.

I will not say that I was totally lacking in sympathy for these extreme views, but others—more tolerant and, perhaps, more reasonable—pointed out that the features on one were, by some peculiar chance, quite opposite to the corresponding features of the other. Seeing the two together tended to introduce a cancelling effect, so that both together were more endurable than either separately. Or at least, that was what some claimed.

Finally, there came a day when Maggie burst in on me and said, "Uncle George, Octavius is the light and life of my existence. He is staunch, strong, steady, sturdy and stable. He is a lovely man."

"Internally, my dear," I said, "I'm sure he is all of these things. His outward appearance, however, is—"

"Adorable," she said staunchly, strongly, steadily, sturdily, and stably. "Uncle George, he feels about me as I feel about him, and we are going to be married."

"You and Otto?" I said, faintly. An involuntary image of the likely issue of such a marriage swam before my eyes and I turned rather faint.

"Yes," she said. "He has told me that I am the sun of his delight and the moon of his joy. Then he added that I was all the stars of his happiness. He is a very poetic man."

"So it seems," I said, dubiously. "When are you going to be married?"

"As soon as possible," she said.

There was nothing to do but grit my teeth. The announcement was made, the preparations were carried through, the marriage was performed with myself giving away the bride. Everyone in the neighborhood attended out of disbelief. Even the minister allowed a reverent look of astonishment to cross his face.

Nor did anyone seem to gaze gladly at the young couple. All through the ceremony, the audience stared at its various knees. Except the minister. He kept his eyes firmly fixed on the rose window over the front door.

* * *

I left the neighborhood some time after, took up lodgings in another part of the city and rather lost touch with Maggie. Eleven years later, however, I had occasion to return over a matter of an investment in a friend's learned studies of the racing qualities of horses. I seized the opportunity of visiting Maggie, who was, among her other well-hidden beauties, a marvelous cook.

I arrived at lunch time. Octavius was away at work, but that didn't matter. I am not a selfish man and I gladly ate his portion in addition to mine.

I could not help but notice, however, that there was a shade of grief on Maggie's face. I said, over the coffee, "Are you unhappy, Maggie? Is your marriage not going well?"

"Oh, no, Uncle George," she said, vehemently, "our marriage was made in heaven. Although we remain childless, we are so wrapped up in each other that we are barely aware of the loss. We live in a sea of perpetual bliss and have nothing more to ask of the universe."

"I see," I said, my teeth rather on edge, "then why this shade of grief I seem to detect in you?"

She hesitated, and then burst out, "Oh, Uncle George, you are such a sensitive man. There *is* one thing that does interpose a bit of grit in the wheels of delight."

"And that is?"

"My appearance."

"Your appearance? What is wrong—" I swallowed and found myself unable to finish the sentence.

"I am not beautiful," said Maggie, with the air of one imparting a well-hidden secret.

"Ah!" I said.

"And I wish I were—for Octavius' sake. I want to be lovely just for him."

"Does he complain about your appearance?" I asked cautiously.

"Octavius? Certainly not. He bears his suffering in noble silence."

"Then how do you know he is suffering?"

"My woman's heart tells me so."

"But, Maggie, Octavius is himself—well—not beautiful."

"How can you say that?" said Maggie, indignantly. "He's gorgeous."

"But perhaps he thinks *you're* gorgeous."

"Oh, no," said Maggie, "how could he think that?"

"Well, is he interested in other women?"

"Uncle George!" said Maggie, shocked. "What a base thought. I'm surprised at you. Octavius has no eyes for anyone but me."

"Then what does it matter if you are beautiful or not?"

"It's for *him*," she said. "Oh, Uncle George, I want to be beautiful for *him*."

And, leaping into my lap in a most unexpected and unpleasant way, she moistened the lapel of my jacket with her tears. In fact, it was wringing wet before she was quite through.

I had by then, of course, met Azazel, the two-centimeter extraterrestrial I may have mentioned to you on occa— Now, old man, there is no need for you to mutter 'ad nauseam' in that supercilious manner. Anyone who writes as you do should be embarrassed at bringing up the thought of nausea in any connection whatever.

In any case, I called up Azazel.

* * *

Azazel was asleep when he arrived. He had a bag of some green material covering his tiny head and only the muffled sound of quick soprano squeaking from within gave evidence that he was alive. That, and the fact that every once in a while his little sinewy tail stiffened and vibrated with a tinny hum.

I waited several minutes for him to wake up naturally, and when that did not happen, I gently removed his head-bag with a pair of tweezers. His eyes opened slowly and focussed on me, whereupon he gave an exaggerated start.

He said, "For a moment I thought I was merely having a nightmare. I didn't count on *you*!"

I ignored his childish petulance and said, "I have a task for you to do for me."

"Naturally," said Azazel sourly. "You don't suppose I am expecting you to offer to do a task for me."

"I would, in a moment," I said, suavely, "if my inferior abilities were sufficient to do anything a personage of your stature and power would find of significant use."

"True, true," said Azazel, mollified.

It is truly disgusting, I might add, at the susceptibility of some minds to flattery. I've seen you, for instance, go out of your mind with fatuous joy when someone asks you for an autograph. —But back to my tale—

"What is involved?" asked Azazel.

"I wish you to make a young woman beautiful."

Azazel shuddered. "I'm not sure I could bring myself to do that. The standards of beauty among your bloated and miserable species of life are atrocious."

"But they are ours. I will tell you what to do."

"*You* will tell *me* what to do," he shrieked, vibrating with outrage. "*You* will tell *me* how to stimulate and modify hair follicles, how to strengthen muscles, how to grow or dissolve bone? Indeed? *You* will tell *me* all this."

"Not at all," I said, humbly. "The details of the mechanism that such a deed would require are only to be handled by a being of your magnificent attainments. Allow me, however, to tell you the superficial effects to be achieved."

Azazel was once again mollified, and we went over the matter in detail.

"Remember," I said. "The effects are to be brought to fruition over a period of at least sixty days. A too-sudden change might excite remark."

"Do you mean," said Azazel, "I'm to spend sixty of your days supervising and adjusting and correcting? Is my time worth nothing in your opinion?"

"Ah, but you could then write this up for one of your world's biological journals. It is not a task that many on your world would have the ability or patience to undertake. You will be greatly admired as a result."

Azazel nodded, thoughtfully. "I scorn cheap adulation, of course," he said, "but I suppose I have a duty to hold myself up as a role model for inferior members of my species." He sighed with a shrill, whistling sound. "It is troublesome and embarrassing, but it is my duty."

* * *

I had a duty as well. I felt I ought to remain in the neighborhood during the interval of change. My horse-racing friend put me up in return for my expertise and advice on the results of various experimental runnings, with the result that he lost very little money.

Each day I sought an excuse to see Maggie and the results slowly began to show. Her hair grew fuller-bodied, and developed a graceful wave. Red-gold glints began to appear, lending it a welcome richness.

Little by little, her jawbone grew more prominent, her cheekbones more delicate and higher. Her eyes developed a definite blue that deepened from day to day to what was almost violet. The eyelids developed just the tiniest oriental slant. Her ears grew more shapely and lobes appeared. Her figure rounded and grew almost opulent, bit by bit, and her waist narrowed.

People were puzzled. I heard them myself. "Maggie," they would say. "What have you done to yourself? Your hair looks simply marvelous. You look ten years younger."

"I haven't done *anything*," Maggie would say. She was as puzzled as all the others were. Except me, of course.

She said to me, "Do you notice any change in me, Uncle George?"

I said, "You look delightful, but you have always looked delightful to me, Maggie."

"Maybe so," she said, "but I have never looked delightful to me until recently. I don't understand it. Yesterday, a bold young man turned to look at me. They always used to hurry by, shading their eyes. This one *winked* at me, however. It caught me so by surprise, I actually smiled at him."

A few weeks later, I met her husband, Octavius, at a restaurant, where I was studying the menu in the window. Since he was about to enter it to order a meal, it was the work of a moment for him to invite me to join him and the work of half another moment for me to accept.

"You look unhappy, Octavius," I said.

"I *am* unhappy," he said. "I don't know what's got into Maggie lately. She seems so distracted that she doesn't notice me half the time. She wants to be constantly socializing. And yesterday—" A look of such woebegone misery suffused his face that almost

anyone would have been ashamed of laughing at it.

"Yesterday?" I said. "What of yesterday?"

"Yesterday she asked me to call her—Melisande. I can't call Maggie a ridiculous name like Melisande."

"Why not? It's her baptismal name."

"But she's my Maggie. Melisande is some stranger."

"Well, she has changed a bit," I said. "Haven't you noticed that she looks more beautiful these days?"

"Yes," said Octavius, biting off the word.

"Isn't that a good thing?"

"No," he said, more sharply still. "I want my plain, funny-looking Maggie. This new Melisande is always fixing her hair, and putting on different shades of eye-shadow, and trying on new clothes and bigger bras, and hardly ever talking to me."

The lunch ended in a dejected silence on his part.

I thought I had better see Maggie and have a good talk with her.

"Maggie," I said.

"Please call me Melisande," she said.

"Melisande," I said. "It seems to me that Octavius is unhappy."

"Well, so am I," she said, tartly. "Octavius is getting to be such a bore. He won't go out. He won't have fun. He objects to my clothes, my makeup. Who on earth does he think he is?"

"You used to think he was a king among men."

"The more fool, I. He's just an ugly little fellow I'm embarrassed to be seen with."

"You wanted to be beautiful just for him."

"What do you mean *wanted* to be beautiful. I *am* beautiful. I was always beautiful. It was just a matter of developing a good hair-style and knowing how to fix my makeup just right. I can't let Octavius stand in my way."

And she didn't. Half a year later, she and Octavius were divorced and in another half-year Maggie—or Melisande—was married again to a man of superficial good looks and unworthy character. I once dined with him and he hesitated so long at picking up the check, I was afraid I might have to pick it up myself.

I saw Octavius about a year after his divorce. He, of course, had not re-married, for he was as odd-looking as ever and milk still curdled in his presence. We were sitting in his apartment which was filled with photos of Maggie, the old Maggie, each one more atrocious than the next.

"You must still be missing her, Octavius," I said.

"Dreadfully!" he replied. "I can only hope she is happy."

"I understand she isn't," I said. "She may come back to you."

Sadly, he shook his head. "Maggie can never come back to me. A woman named Melisande may wish to come back but I couldn't accept her if she did. She isn't Maggie—my lovely Maggie."

"Melisande," I said, "is more beautiful than Maggie."

He stared at me for a long time. "In whose eyes," he said. "Certainly, not in mine."

It was the last time I saw either.

* * *

I sat for a moment in silence, then I said, "You amaze me, George. I was actually touched."

It was a poor choice of words. George said, "That reminds me, old fellow— Could I touch you for five dollars for about a week. Ten days tops."

I reached for a five-dollar bill, hesitated, then said, "Here! The story is worth it. It's a gift. It's yours." (Why not? All loans to George are gifts *de facto*.)

George took the bill without comment and put it in his well-worn wallet. (It must have been well-worn when he bought it, for he never uses it.) He said, "To get back to the subject. Could I touch you for five dollars for about a week. Ten days tops."

I said, "But you *have* five dollars."

"That is *my* money," said George, "and no business of yours. Do I comment on the state of your finances when you borrow money from me?"

"But I have never—" I began, then sighed and handed over five dollars more.

The Quiet Place

Emmanuel Rubin, who was host of the Black Widowers banquet that evening, had been at his loudest and most quarrelsome.

He had insisted on the unimportance of algebra to Roger Halsted who taught the subject in a junior high school; denounced the patent system to Geoffrey Avalon, who was a patent lawyer; denied the validity of quantum theory in connection with molecular structure to James Drake, the chemist; pointed out the uselessness of espionage in modern warfare to Thomas Trumbull, the cipher expert; and finally placed the cherry on the sundae by watching Mario Gonzalo, as, with consummate ease and skill, he drew a cartoon of that evening's guest, and telling him he knew nothing at all about caricature.

Trumbull, who, of all the Black Widowers, was least likely to be amused by Rubin in his wilder moments, finally said, "What the devil is wrong with you, Manny? We're used to having you wrong at the top of your voice, and taking on one or another of us with some indefensible point of view, but this time you're tackling us all."

It was Rubin's guest who answered Trumbull in a quiet voice and, at that, it was almost the first time he had spoken that evening. He was a young man, not far gone into his thirties, it would appear, with thin blond hair, light blue eyes, a face that was wide across the cheekbones, and a smile that seemed to come easily and yet had something sad about it. His name was Theodore Jarvik.

"I'm afraid, gentlemen, the fault is mine, if it be a fault to follow professional procedure. I have recently become Manny's editor and I was forced to hand back his latest manuscript with requests for revision."

"For eviscerative revision," muttered Rubin.

"I did offer to cancel out the invitation for this evening," said Jarvik, with his sad smile, "on the supposition that Manny would just as soon not look at me right now."

Gonzalo raised his eyebrows and said, "Manny doesn't mind this sort of thing. We've all heard him say about a thousand times that the true professional writer takes revisions and even rejections in stride. He says that one way you can tell an amateur or a beginner is by noting that he considers his every word sac—"

"Oh, shut up, Mario," said Rubin, clearly chafing. "You don't know the details."

"Actually," said Jarvik, "Manny and I will work it out."

Avalon, from his 74 inches of height said, in his grave baritone, "I'm curious, Manny, have you called Mr. Jarvik a 'young punk' yet?"

"Oh, for God's sake," said Rubin, reddening.

"No, he hasn't, Mr. Avalon," said Jarvik, "but he's *thought* it very loudly."

"That is *not true*," shouted Rubin, at the top of his considerable decibel rating.

"Let's wash out this night," said Drake, in resignation. "You're going to be in such a foul humor, Manny, that—"

"When have I *ever* been in a foul—" began Rubin and then, Henry, the pearl-beyond-price of waiters, interrupted.

"Gentlemen, please be seated," he said. "Dinner is served."

* * *

To due Rubin justice, he did his best to control himself during the dinner. His eyes, behind his thick glasses, flashed; his sparse beard bristled; and he snarled unceasingly; but he managed to say little and leave the conversation to the others.

Gonzalo, who sat next to Jarvik, said to him, "Pardon me, but you keep humming."

Jarvik flushed again, something his fair skin made easy. "I'm sorry, I didn't mean to disturb you."

"It doesn't exactly disturb me. It's just that I don't recognize the tune."

"I don't know. I'm just improvising, I suppose."

"Is that so?" and Gonzalo was quiet for the remainder of the dinner until the rattle of spoon on glass marked the beginning of the questioning of the guest.

Gonzalo said, "May I volunteer to do the grilling?"

"You can for all of me," growled Rubin, who, as host, had the task of appointing the griller. "Just don't ask him to justify his existence. The editor doesn't live who can do that."

"On the contrary," said Gonzalo, "any editor who has handed back a manuscript of yours has already justified his existence a hundred times over."

Halsted said, "May I suggest we go ahead with grilling out guest and not needling each other?"

Gonzalo brushed some imaginary dust off the sleeve of his loudly checked jacket and said, "Exactly. Mr. Jarvik, during the course of the dinner I asked you what tune you were humming and you said you were improvising. I don't think that's quite right. Once or twice you hummed again after that and it was always the same tune. Now that you are being grilled, you are forced to give full and honest answers, as I hope Manny has explained to you. I therefore repeat: What was the tune you were humming?"

Trumbull intervened. "What kind of stupid question is that?"

Gonzalo turned a haughty face on Trumbull. "As the griller, I am under the impression I can ask any question I choose consistent with human dignity. Host's decision."

"Go ahead, Manny," said Rubin, thus appealed to. "Ask away. —And leave him alone, Tom."

Gonzalo said, "Answer the question, Mr. Jarvik." And when Jarvik still hesitated, Gonzalo said, "I'll help you out. This is the tune," and he hummed a few bars.

Avalon said, at once, "I know what that is. It's 'The Lost Chord.' The music is by Arthur Sullivan of the Gilbert and Sullivan operettas. Except for those operettas, Sullivan is known only for the music to two songs. One is 'Onward, Christian Soldiers' and the other is the aforementioned 'The Lost Chord.'"

"Is that what you were humming, Jarvik?"

"I suppose so. You know how a song gets trapped in your mind and won't get out."

There was a chorus of agreement from the others and Avalon said, sententiously, "It's a universal complaint."

"Well, whenever I'm trapped in some sort of loudness," said Jarvik, "that song keeps going through my head."

Drake chuckled. "If you're going to be dealing with Manny, you'll be humming it till either you or he dies."

Gonzalo said, "Does it have some significance in that connection? What are the words?"

"I only know a few words, actually."

"*I* know the words," said Avalon.

"Don't sing them," cried out Trumbull in sudden alarm.

Avalon, whose singing voice was well-known to resemble the sound of an alligator in heat, said, with dignity, "I shall recite them. The words are by a lady named Adelaide Anne Proctor, concerning whom I know nothing, and the poem goes as follows:" (He cleared his throat)

"Seated one day at the organ, I was weary and ill at ease
And my fingers wandered idly over the noisy keys.
I don't know what I was playing, or what I was dreaming then;
But I struck one chord of music, like the sound of a great Amen.
It flooded the crimson twilight, like the close of an angel's psalm,
And it lay on my fevered spirit with a touch of infinite calm.
It quieted pain and sorrow, like love overcoming strife;
It seemed like the harmonious echo from our discordant life.
It linked all perplexed meanings into one perfect peace,
And trembled away into silence as if it were loth to cease.
I have sought, but I seek it vainly, that one lost chord divine,
Which came from the soul of the organ, and entered into mine.
It may be that Death's bright angel will speak in that chord again,
It may be that only in Heaven shall I hear that grand Amen."

There was a short silence and then Halsted said, "You know, I wonder about that. I don't know how many different chords you can strike on a large organ considering all the different stops you can push and pull and the things you do with your feet. I suppose it is a very large number indeed and you're not likely to find a particular chord just by fooling around at random."

Rubin said, testily, "We'll leave it to your mathematical bent to work out the total number of chords, Roger. As for you, Ted Jarvik, we can at least see why you hum that song when things are noisy. All that talk about infinite calm and one perfect peace and trembling away into silence. Naturally, your mind reverts to the song."

"No," said Jarvik quietly, shaking his head, "that's not it."

"Hah," shouted Gonzalo in triumph. "I knew it. I knew it. I have a sixth sense about these things. What is it? What does that song mean to you?"

"Quiet, Mario," said Avalon. "Now, Mr. Jarvik, if Mario has managed to touch a sore point, something about which you do not like to speak, please do so anyway. I assure

you nothing you say will ever leave this room."

Jarvik looked about at the assembled Black Widowers in bewilderment, and said, "How did this ever manage to come up? It's a sore point, certainly, but I can talk about it without trouble. It's just something that's totally uninteresting to anyone but me."

"You can never tell," said Gonzalo, grinning.

Henry refilled the brandy glasses, and Jarvik sighed and began:

* * *

I'm a quiet man said Jarvik as perhaps you can tell. I'm told it shows. There's something ironic in the fact that I have to live and work in Manhattan, but a man must earn a living.

Still, I'm a single man; I don't have a wife and children to support—not yet, anyway—and I can indulge myself now and then. So, two or three times a year I take a week off and go to a resort up the Hudson river. It's a large rambling mansion, with a Victorian atmosphere. The clientele is composed largely of people who are middle aged or older and everything about the place is staid and respectable. Even the young people who happen to come there, are impressed, or perhaps *oppressed*, by the atmosphere and behave themselves.

It means that it is quiet to some degree and, at night, particularly, it is very quiet. Soothing. I love it and, naturally, I try to escape even the noise that exists. People will talk after all and since there are hundreds in the house at all times, the talk can mount up. There are also vehicles—trucks, lawn-mowers and so on.

However, the place is set in an estate of thousands of acres of hilly woodland laced by road and pathways, some of which are very rough indeed. It's my particular pleasure to walk those pathways, looking for some place where I can see only trees and huge glacier-brought rocks, seat myself in one of the gazebos that dot the roads and look at the wildness of the scenery and listen to the silence. There are, of course, the calling of the birds, the rustling of the leaves—but that is no bother. Such natural sounds simply punctuate and emphasize the silence.

But no matter where I go, where I sit, sooner or later, usually sooner, I can hear human voices. There are groups, tramping on nearby trails, or following along the one I just took. I always found it irritating and would feel invaded. It's silly, I know. After all, I was only one of hundreds, but I felt I ought to be undisturbed. I would get up and keep on wandering, looking always for a quiet place, a really quiet place—and never finding it.

One time, as I was sitting in one of my favorite gazebos, a man passed, looked at me, hesitated a moment, and said, in half a whisper, "May I join you?"

I nodded. I couldn't refuse, though I resented him at once; and I couldn't rise and immediately leave without being unbearably discourteous.

After we had been there, in utter silence, some five minutes, the inevitable sound of conversation came from up the road, and there was an explosion of feminine laughter. My new-found companion grimaced and said, "Isn't that annoying?"

My heart warmed to him at once. I shook my head. "You can't get away from it."

He said, "In one place you can," then stopped short as though he had been trapped into saying too much. But I waited with an inquiring look on my face, and didn't say anything, and he said, "There's a place I discovered three-four years ago. —Would you like to see it?"

"Quiet?"

"Oh, yes."

"That would be nice."

"Come with me." He rose, and looked about as if he were taking his bearings. It was a beautifully sunny day, clear blue sky, unclouded, not too warm at all, so when he set off, I followed gladly.

I didn't like to speak, but finally, I had to say, "I haven't seen you about."

"I'm usually out on the trails."

"So am I," I said, my heart warming further. "Ted Jarvik is my name," I said, putting out my hand.

He took it and shook it heartily. "Call me Dark Horse," he said.

And at this point, he suddenly walked right into the woods and began scrambling through and around the underbrush. I was glad I had on a pair of slacks. Had it been warmer, I might have been in shorts and I would undoubtedly have been plant-scratched and insect-bitten. As it was, I followed dutifully.

I couldn't make out where he was going. There was no path and we were clambering over boulders as though we were mountain-climbing. Despite the coolness of the day, I was puffing, hot, and sweaty before long. Finally, we stopped for a bit under the hemlocks and my companion said, "I usually stop here to catch my breath. It takes me longer these days."

I panted a bit, welcoming the break, and said, "How do you know where you're going?"

"Landmarks. A tree that looks just so. A rock with a particular pattern of moss. I notice these things automatically and don't forget them. It's just a knack, but I never get lost."

I said, ruefully, "You're lucky. I have no sense of direction at all. I get irretrievably lost in hotel corridors. Maids have to take me by the hand and lead me to my room."

My companion laughed and said, "I'm sure you have many talents. My inability to get lost is the only one I've got."

"You said your name is Dark Horse. You're not an Indian, are you? A Native American?" I was staring at him. He looked as little an Indian as I did.

"Not at all. It's not my name. I just said to call me that. You see I believe if you really want to come out on a vacation, you should shuck all the paraphernalia of your ordinary life. I have to give my real name to the hotel, because I have to make a reservation and I have to use my credit card, but while I'm here, I won't be called by my name. Nor will I talk about my business. I simply won't recognize any part of my ordinary self. Whatever I am, officially, is back in Manhattan. It isn't here."

I was struck by that. "Interesting idea. I ought to do the same. Not that I'm very social when I come up here."

He said, "Rested a bit? Let's go then. We don't have much farther."

I tried to watch where he turned and to observe landmarks, but it was no use. I'm not a noticing man. To me, a tree is a tree and a rock is a rock. —But then we half-slid downward into a hollow and Dark Horse whispered, "This is it."

I looked about. The rocks enclosed us on almost every side. There were trees growing between them here and there. Ferns flourished. It was cool, very cool, welcomingly cool.

Above all else, it was quiet. There was not a sound. A rustle of leaves now and then. A faint insect stridulation. Once a brief bird call. But it was quiet, a healing silence in a world which was one large, long, eternal cacophony of noise.

There was a rocky ledge at a convenient height and my companion indicated it

silently. We sat down and I let the silence flow into me. What did the poem say? 'It lay on my fevered spirit with a touch of infinite calm.'

We sat there half an hour and in all that time, I said nothing, and my companion said nothing, and there was not a human sound of any kind. No distant laughter, no crackle of far-off conversation, no vibration of any internal-combustion engine. Nothing. I had never experienced anything like it.

Finally, my companion rose and without saying anything asked the question as to whether we ought to go now. Reluctantly, and without saying anything, I answered that we might.

Out we went. We were a quarter mile away before I dared speak. "How did you find the quiet place?" I asked.

"Accident at first. Since then, I've gone back half a dozen times at least. I love it. It's somewhere out of reach of all the trails and, as far as I know, it's not on any of the hotel maps and it's just a hidden undiscovered nook, known only to me, I think—and now you."

"Thanks for showing me. Really," I said, with infinite gratitude. "You wouldn't think there would be a spot untrodden by human feet in a place like this."

"Why not?" said Dark Horse. "I imagine that all over the world, there are little areas undisturbed by humanity, sometimes in places that are very busy and crowded overall. There are fewer than there used to be, I'm sure, and perhaps someday they'll be all gone—but not yet, not yet."

He led me back to one of the main trails without hesitation. We scrambled over rocks and roots and through the underbrush again and to me it seemed it was uphill both ways—but he got us back. I said good-bye and thanked him again and we shook hands. I went back to the room, got cleaned up and was eventually ready for dinner.

I didn't see him at dinner, though I looked and, in fact, I didn't see him again during the remainder of the stay. To put it baldly, I have never seen him again from that day to this.

The day after he had taken me to the quiet place, I tried to return on my own. I took a book with me and some sandwiches I had begged at the kitchen, and it was my intention to stay there most of the day if the weather held, but of course I never made it. I had no luck at all. I was wrong from the first turning, I believe.

I didn't give up, though. After I returned to the city, I kept dreaming of the quiet place and as soon as I could manage, I returned to the resort, studied the map and marked off the area that I felt must contain it. I could make my way to the gazebo where I met Dark Horse and, from there, I set about a systematic course of exploration.

It did me no good whatever. I could never find the place. No matter how I tried to remember the twists and turns; no matter how I kidded myself into believing I recognized one of those blasted trees or rocks, no matter what bogs I slogged through, what crags I stumbled over, I ended up nowhere. I had bites, and scratches, and bruises, and contusions, and sprains. What I didn't have was the place.

I think it's become an obsession with me. I happened to know that passage of "The Lost Chord" and I suppose I began to hear it go through my head with appropriate changes in words, "I have sought, but I seek it vainly, That one lost place divine, From which came the spirit of silence that entered into me."

And I suppose I hum it when things grow loud and chaotic—

* * *

There was a pronounced pause when Jarvik concluded.

Finally, Halsted said, "I suppose you simply need this fellow who took you there to take you there again so that you can mark off each twist and turn on the map as best you can."

Gonzalo said, hesitantly, "I suppose the fellow really existed. You didn't dream it, did you?"

Jarvik frowned. "Believe me, I didn't dream it. And he wasn't an elf leading me into fairyland, either. It happened exactly as I told you. The problem is that he had a precise sense of direction and I have none at all."

"Then you ought to find him," said Rubin, flatly, "if you're that stuck on being in the middle of nowhere."

"Fine," said Jarvik. "I agree. I ought to find him. Now tell me how. I don't know his room number. I don't know his name. It didn't occur to me to try to identify him at the front desk that evening or the next day."

He shook his head and seemed to debate with himself whether to go on or not. Then he shrugged and said, "I might as well tell you how obsessed I've become. The last time I was at the resort, I spent half the day with the various desk-employees trying to get a list of the people who had been at the hotel the day on which I was taken to the quiet place.

"It took a lot of negotiating and a lot of scurrying through records, and then they were kind enough to make me up an alphabetized list containing two hundred forty-nine names. They did it for me because I was a regular customer and because I spread fifty dollars among them.

"They didn't include addresses because they said that was against policy and if they were caught doing that they would be fired and blacklisted and who knows what else. I had to make do with the list of names. I made one last effort to find the place the next day—and failed, of course, and then spent the remainder of the stay studying the list of names.

"And you know, I've memorized them. Not on purpose, of course. I just memorized them. I can rattle them off in the alphabetical order in which they were arranged. I happen to have one of those memories." He brooded a little, "If my sense of direction were as good as my memory for trivial items on a list; that is, if my sense of observation could give me small variations I could then remember; I suppose I wouldn't be in the fix I am now."

Drake said, frowning through the smoke of his cigarette, "How would the list of names help you?"

Jarvik said, "The first thing that occurred to me was that the false name he used must have some reason behind it. Why would anyone call himself Dark Horse? Possibly because the initials were the same as those of his real name. So I went through the list and there was only one D. H. and the name was Dora Harboard. Well, whatever my friend was, he was not a woman, so that was out.

"Then I thought that perhaps the initials were reversed. So I looked for an H. D. and there was none. Then I looked for unattached males. A great many people were listed as, let us say, Ira and Hortense Abel, to take the first names on the list. It seemed to me I ought to eliminate them, especially if they had children with them. That left me with seventeen unattached males and at first I thought that that was a big advancement.

"But then I realized that Dark Horse gave me no indication that he was unattached. He might well have had a wife and child back in his room, or out attending the mah

jong game that was being played in the lounge that afternoon."

Trumbull said, "You could try *force majeure*. Follow up every male name on the list and see if one of them is Dark Horse. Who knows, you may strike it lucky the first name you try. And you know he lives in Manhattan. He said so. Try the phone book to begin with."

Jarvik said, "One of the people listed is S. Smith. I dread the thought of how many Smiths there are in the phone book with S as the first initial. Besides, if I recall correctly, he said that whatever he was officially was back in Manhattan. It seems to me that meant he worked in Manhattan but not necessarily that he lived there. He could live in any of the five boroughs, or in New Jersey, or Connecticut, or Westchester.

"Listen, I've thought of *force majeure*. Just to show you, I thought that I might hire someone at some small nearby airfield to fly me over the resort so that I could see the spot from above, but I know I wouldn't recognize it. Not from above, in a hurried pass. And even if I did, they'd have to land me back at the airport and if I then tried to reach the quiet place from the ground I'd fail again.

"Then I thought that perhaps I could hire a helicopter and if I recognized the spot, I could have myself lowered by some sort of rope while the helicopter hovered overhead. That's ridiculous, though. I wouldn't have the nerve to dangle from a helicopter even if I recognized the place and then, after I left it, what if I still couldn't find my way back. I couldn't very well use a helicopter every time, could I?"

Gonzalo said, "Dark Horse! Isn't that a racing term?"

"Originally, yes," said Avalon. "It refers to some horse of unknown potential that might have an outside chance to win, especially if it enters a race in which all the other horses are known quantities."

"Why *dark* horse, then?" said Halsted.

"I presume," said Avalon, "as an indication of how minimal the information is. After all, most horses are dark in coloring. Besides, 'dark' gives the impression of mystery, of the unknown."

"Well," said Gonzalo, "perhaps this fellow has some connection with the racing game."

Jarvik said, bitterly, "Fine. Suppose he does. How does that help me find him?"

"Besides," said Trumbull. "It seems to me that 'dark horse' has spread out to mean anyone who enters a contest without being a known item. In boxing, tennis; in politics, even."

"And how does *that* help me find him?" said Jarvik.

Avalon sighed heavily and said, "Mr. Jarvik, why don't we look at 'The Lost Chord' from another angle? Roger Halsted pointed out that a complex organ might have many, many varieties of chords and that one chord could be easily lost among the quantity. But that is surely a way of looking at it that is rather too simplistic.

"Any sensation consists of the sensation itself, objectively, and of the person receiving the sensation, subjectively. The same chord is always the same chord if it is measured by an instrument that analyzes its wave function. However, the chord one *hears* may well vary with the mood and immediate circumstances of the listener.

"The person playing the organ in the poem was 'weary and ill at ease.' For that reason, the chord had a particular effect on him. 'It quieted pain and sorrow' which he may have been feeling. From then on, when he sought the chord again, his mood would be one of anxious expectation, of careful attention. Even if he heard the same chord again, the *same* chord precisely, it would not strike him in the same way and he would not consider it to be the same chord. No wonder he sought it vainly. He was

seeking to duplicate not only the chord but himself as he had been."

Jarvik said, "You are saying?"

"I am saying, Mr. Jarvik," said Avalon, "that perhaps you ought to attach less importance to the place. You found it on a perfect day. You found it when someone else was guiding you there so that you were, in a sense, carefree. If you find it again a second time, it may be on a less desirable day—when it is hotter, or colder, or cloudier. You yourself will be seeking anxiously, you will not be at ease. The result is that it may not be the same place you remember. You will be bitterly disappointed. Would it not be better to remain with the memory and let it go at that?"

Jarvik's head bent and for a few moments, he seemed lost in thought. Then he said, "Thank you, Mr. Avalon. I think you're right. If I fail to find the place, I will certainly try to follow your advice and find solace in it. However— I would like, if I can, to find it once more, just to make sure. After all, Dark Horse found it a number of times, and enjoyed it each time."

"Dark Horse knew how to get there," said Avalon. "His own mood was fairly constant, and it might be he always chose days of particularly favorable weather to go there."

"Even so," said Jarvik, stubbornly. "I would like to find it once more, if there were only a way of finding it."

"But apparently there isn't," said Avalon. "You must admit that."

"I don't know," said Mario. "No one has asked Henry."

"In this case," said Avalon, stubbornly, "even Henry can do nothing. There is nothing to seize on."

"What have we to lose?" demanded Mario. "Henry, what can you tell us?"

Jarvik, who had been listening in astonishment, now turned to Rubin and jerking his thumb over his shoulder, mouthed silently: The waiter?

Rubin put a finger to his lips and shook his head slightly.

Henry, who had been listening with absorption, said, "I must say that I agree fully with Mr. Avalon with respect to the subjective nature of the charms of the place and would hate to have Mr. Jarvik spoil an idyllic memory. Nevertheless—"

"Aha," said Gonzalo. "Go on, Henry."

Henry smiled in his avuncular fashion, and said, "Nevertheless, the one thing to seize upon is the phrase 'dark horse', which everyone has been seizing upon, as it happens. May I ask, Mr. Jarvik, if, by any chance, there was anyone on the list named Polk—not a very common name. A James Polk, perhaps."

Jarvik's eyes opened wide. "You're kidding."

"Not at all. May I take it there *was* such a name?"

"There's a J. Polk certainly. It could be James."

'Then perhaps that is your man."

"But why?"

"Mr. Trumbull mentioned I believe that 'dark horse' is used in politics. That, I suspect, is its most common use these days. A dark horse is some politician who is never thought of in connection with nomination by a major party, but who is nevertheless nominated as a way of breaking what otherwise seems an intransigeant deadlock. Nowadays, dark horses rarely show up because the nomination is decided by primary contests. However, as recently as 1940, Wendell Willkie was a dark horse named by the Republican party.

"However, the name is most often used in American history for the very first party

nominee who was a dark horse. In 1844, the Democrats were all set to nominate ex-President Martin Van Buren, but he needed a two-thirds majority and intransigeant Southern opposition prevented that. Out of sheer weariness, the convention switched to Tennessee Senator, James Knox Polk, whom no one had thought of in connection with the nomination. He was the first dark-horse candidate, and went on to win the election. He made a pretty good one-term President."

"He's right," said Rubin. "Do you know everything, Henry?"

"No, Mr. Rubin," said Henry, "but I had a dim memory of it and while the discussion was going on, I checked our reference shelf. It may be that the J. Polk on Mr. Jarvik's list is a lineal, or collateral descendant, which is why he took the name of Dark Horse."

"Amazing," muttered Jarvik.

"However," said Henry, "you may still have trouble finding him, Mr. Jarvik, and even if you find him, he may still be the wrong person, and even if he is the right person, you may still end up disappointed in the quiet place. However—may good luck be with you."

I Love Little Pussy

George and I were sitting on a park bench on a perfect late spring day when a rather ordinary tabby cat wandered into our vicinity. I knew there were feral cats in the park that would be dangerous to approach, but this specimen had the inquisitive look of a tame pussy. Since I am proud of the fact that cats are attracted to me, I held out my hand and sure enough she sniffed at it and allowed me to stroke her head.

I was rather surprised to hear George mutter, "Wretched little beast."

"Don't you like cats, George?" I asked.

"Would you expect me to, in the light of my sad history?" he said, sighing heavily.

"I know your history is sad," I said. "Inevitably so, considering your character, but I didn't know that cats had a role in it."

"That," said George, "is because I never told you of my second cousin, Andromache."

"Andromache?"

* * *

Her father [said George] was a classical scholar, hence the name. He also had a little money, which he left to Cousin Andromache on the occasion of his early death and she, by shrewd investment, considerably increased it.

He did not include me in his bounty. I was a child of five at the time of his death and he could scarcely have left me anything outright, but a more generous soul would have set up a trust fund.

As I grew older, however, I realized that Cousin Andromache, who was 22 years older than I, might well predecease me. It did occur to me—for I was a precocious lad, thoughtful and far-sighted—that, in that case, I might receive a sizable share of the loot.

—Yes, provided, as you say, that I sucked up to her. Please do not try to anticipate my words, however, for that is not the phraseology I intended to use. What I was going to say was that I realized I might inherit a portion of her estate if I gave her the warmth and affection she so richly deserved.

As it happened, Cousin Andromache needed warmth and affection not only richly, but also desperately. When I was still in my teens and she was approaching forty, I realized that she was a dedicated spinster, untouched by human hands. Even at my tender age, I found the situation understandable. She was tall and rawboned, with a long plain face, large teeth, small eyes, limp hair, and no figure worth mentioning.

I said to her once, out of a natural curiosity to determine how unlikely an event might be and yet come to pass, "Cousin Andromache, has any fellow ever asked you to marry him?"

She turned a threatening face on me and said, "Asked me to marry *him*? Hah! I'd like to see some fellow ask me to marry *him*!"

(I rather thought she would indeed like to see it happen, but I had early reached the years of discretion and did not put the thought into words.)

She went on, "If any man ever has the *gall* to ask me to marry *him*, I'll give *him* what for. I'll show *him* a thing or two. I'll teach *him* to approach a respectable woman with any of his lollygagging notions."

I didn't quite see what was lollygagging about a marriage proposal, or what might be in it to offend a respectable woman, but I didn't think it would be wise—or even safe—to ask.

For a few years, I kept hoping that some person, perverse enough to be interested in Cousin Andromache, might indeed make a suggestion or two because I wanted to see what she would do—while I remained at a safe distance, to be sure. There seemed, however, no chance of that. Not even her gathering wealth seemed to suffice to make her an object of marriageability to the male half of the population. One and all, it seemed, weighed the price that would have to be paid, and one and all turned away.

An abstract consideration of the situation showed me that it was exactly what I wanted. A Cousin Andromache without husband and without children would be less apt to dismiss a second cousin as a testamentary possibility. Furthermore, since she was an only child, the vicissitudes of life had left her with no relative closer than I was. That seemed an appropriate situation for me, since it meant I didn't have to work *too* hard at supplying affection. A little bit, now and then, to reinforce my position as the natural heir, would be quite enough.

When she passed that fortieth milestone, however, it must have seemed to her that if no human male wished to dare her wrath with a proposal of marriage, she would make use of a non-human companion, instead.

She disliked dogs, because she had the notion that, one and all, they lusted to bite her. I would have liked to reassure her that no dog, however gaunt, would find her a toothsome morsel, but I had the feeling this would not reassure her, and would cripple me, so I kept silent on the matter.

She also thought that horses were too large for comfort, and hamsters too small, so she finally persuaded herself that what she wanted was a cat.

Thereupon, she obtained a little grey female kitten of nondescript appearance and bestowed every bit of her ungainly affection upon it.

With an appalling lack of even a modicum of wit, she named the kitten "Pussy" and that name was retained by the cat forever after, despite changes in size and temperament.

What's more, she took to cuddling the kitten and saying, in a revoltingly hoarse sing-song:

I LOVE LITTLE PUSSY

"I love little pussy, her coat is so warm
And if I don't tease her, she'll do me no harm.
I'll pet her and stroke her, and give her some food,
And pussy will love me because I'm so good."

It was simply nauseating.

I won't conceal from you, old man, that I was quite perturbed at first. Thoughts danced through my mind of besotted old maids who left all their money to their pampered, uncaring pets.

It did occur to me, as to whom would it not, that the kitten could easily be kidnapped and drowned, or taken to the zoo and fed to the lions, but then Cousin Andromache would merely get another.

Besides, she might suspect me of a hand in the felicide. Considering the paranoia peculiar to spinsters, I knew that it was perfectly possible for her to get it into her head that I was primarily after her money and that she could interpret many things in that light and come fearsomely near the truth. In fact, I strongly suspected that she had already gotten it into her head.

It occurred to me, therefore, to invert matters. Why not display a passionate love of the kitten? I took to playing moronic games with it, dangling a piece of string for it to fight with, stroking it (sometimes, a little longingly, in the region of its neck), and feeding it tid-bits—sometimes even (when Cousin Andromache was watching) from my own plate.

I must say it worked. Cousin Andromache softened distinctly. I presume she reasoned that I couldn't possibly be after Pussy's money, for she had none, so she chalked it up to the pure and unalloyed love I had for all of God's creatures. I helped strengthen that notion by telling her, in fervent tones, of how pure my love for them was. It made her accept my love for her with fewer fears concerning any ulterior motives I happened to have.

However, the trouble with a kitten's that eventually it becomes a cat. —Oh, did Ogden Nash say that also? Well, my best bits are constantly being stolen. I'm quite resigned to it.

I don't know, old man, if you have ever owned a cat, but with age, they grow larger, more self-centered, more self-assured, more contemptuous of their owners, more inert, more utterly uninterested in anything but food and sleep. The last thing on their contemptible little minds is the comfort and peace of mind of the person who feeds them.

In addition, Pussy grew rather ill-tempered. It had always seemed to me that tabby cats are comparatively placid and that it is the tomcats who are aggressive. It was clear, however, that Pussy had the disposition of a tomcat, despite her sex,—and an unaltered tomcat at that. What's more, she seemed quite intolerant of me and would deliberately go out of her path in order to pass near me and scratch me surreptitiously. I tell you, old man, I could almost believe the beast could read my mind.

Considering Pussy's disposition, it is not at all surprising that Cousin Andromache went into a small decline. I found her in tears one day, or as close to tears as her tough and scraggy temperament would allow her to be.

"Oh, Cousin George," she said to me, "Pussy doesn't love me."

Pussy was, at the time, sprawled in comfort five feet away and was looking at Cousin Andromache with haughty distaste—its usual expression except when it looked

at me, at which time the expression became one of settled hate.

I called the creature to my side, whereupon it favored me with a sneer and a bit of a snarl and stayed where it was. I strode to her and picked her up. She weighed 14 pounds of solid inertia and the task was not an easy one, particularly since she kept adjusting her right forepaw (the most dangerous one) into a position where a rapid swipe could be made.

I clutched both her forepaws to prevent that, whereupon she hung in such a way as to double the pull of gravity upon her. I believe that only cats and truly obnoxious human infants know the secret and I am constantly surprised that scientists do not investigate the phenomenon.

I placed her in Cousin Andromache's lap, pointed at the tableau and said, "See, Cousin Andromache, Pussy loves you."

But I had taken my mind off the malignant devil, so that she had the chance of biting my pointing finger, and promptly did so to the bone. She then got off Cousin Andromache's lap and walked away.

Cousin Andromache wailed, "You see, she doesn't love me!" Characteristically, she said nothing about my massacred finger.

I sucked bitterly at the damage and said, "That's the way cats are. Why not give Pussy to someone you hate and get a new kitten."

"Oh, no," said Cousin Andromache, turning on me one of her censorious looks. "I love little Pussy. Isn't there some way of training a cat to display affection?"

I longed to make some clever comment to the effect that it would be easier to train Cousin Andromache to be pretty, and was able to suppress the longing only because a brilliant idea had illuminated the interior of my skull.

I had recently formed my friendship with Azazel, whom I may have mentioned to you. —Oh, I did? Well, all right. You needn't add "ad nauseum" merely to display your knowledge of Latin.

In any case, why shouldn't I use Azazel's abilities in this respect? What was the use of having a two-centimeter extraterrestrial being of advanced technological abilities on call, so to speak, if one didn't make use of it?

I said, "Cousin Andromache, I believe I could train Pussy to show you affection."

"*You?*" she said, nastily. It was a word, and an intonation, she had used on me before, and I often thought how effectively I would resent it if I were only in a position to do so safely.

But the idea was looking better and better to me as I pictured Cousin Andromache's gratitude to me if I could pull it off.

"Cousin Andromache," I said, earnestly, "let me have Pussy for one day—*one day*. I will then bring back a loving Pussy who will ask for nothing better than to sit in your lap and purr in your ear."

Cousin Andromache hesitated. "Are you sure you will be kind to her while you have her. You know, Pussy is a very sensitive creature, shy and gentle."

Yes, indeed, about as shy and gentle as a particularly irritated grizzly bear.

"I would take very good care of her, Cousin Andromache," I murmured insinuatingly.

And, in the end, Cousin Andromache's longing for an affectionate Pussy overcame her uncertainties and she gave her permission with many an injunction to keep the little thing from being harmed by the cruel, outside world.

Of course, I had to buy a cage first, one with bars as thick as my thumb. This I felt might retain Pussy, if she didn't get too angry, and off we went together.

* * *

Azazel didn't get as angry in those days as he does now when I call him up. He was curious about Earth in those days.

On this occasion, though, what he was, was terrified. He screamed all but ultrasonically. It pierced my eardrums like an icepick.

"What's the matter?" I said, my hands over the affected organs.

"That creature." Azazel's tail pointed to Pussy. "What is it?"

I turned to look at Pussy. It had flattened itself at the bottom of the cage. Its wicked green eyes stared at Azazel with fixed longing. Its tail twitched slowly and then it launched itself at the bars of the cage, which shook and rattled. Azazel screamed again.

"It's just a cat," I said, soothingly. "A little kitten."

"Put me in your pocket," shrieked Azazel. "Put me in your pocket."

On the whole, that seemed a good idea. I plunked him into my shirt-pocket where he trembled like a tuning fork and Pussy, angered and puzzled at his disappearance, spat her displeasure.

Finally, I could make out coherent words from within my pocket.

"Oh, my supple tail," moaned Azazel. "It is just like a drakopathan—just like. They're ferocious beasts that bite and claw and tear, but this cat thing is much bigger and more ferocious by the look of it. Why have you exposed me to this, O Excrescence of a Rubbishy Planet?"

"O Fearless Master of the Universe," I said, "it is precisely in connection with this animal, whose name is Pussy, that I need a demonstration of your matchless might."

"No, no," came his muffled cry.

"It is to make him a better cat. I want Pussy to love my Cousin Andromache who owns the animal. I want Pussy to give my cousin affection and tenderness and sweetness—"

Azazel poked a frightened eye over the top of the pocket and stared at Pussy for a moment. He said, "That creature has no love in it for anything but itself. That is quite obvious from its C-aura."

"Exactly! You must add love for Cousin Andromache."

"What do you mean, add love. Have you never heard of the Law of Conservation of Emotion, you sub-technological dolt. You can't add love. You can only transfer it from one object within a creature's emotional nexus to another."

"Do so," I said. "Take from the superfluity of love Pussy devotes to herself and fashion a strong attachment to Cousin Andromache."

"Taking from the self-love of that super-drakopathan is a task too formidable. I have seen my people strain their intensifiers permanently at lesser tasks."

"Then take the love from elsewhere in Pussy, O Superlative One. Do you wish word to get out that you failed a challenge so small?"

Vanity was, of course, Azazel's besetting fault, and I could see the possibility I had mentioned was gnawing at him.

He said, "Well, I will try. Do you have a likeness of your cousin? A good likeness?"

I certainly had, though I doubt that any photograph of Cousin Andromache could be both a likeness and good at the same time. Putting that philosophical matter to one side, I had a large cabinet photograph of her that I always placed in a prominent position when she came on a visit. I did have to take the fig tree out of the living room on those occasions, though, for the photo had a tendency to wither its leaves.

Azazel looked at the picture dubiously, and sighed. "Very well," he said, "but remember that this is not magic, but science. I can only work within the limits of the Law of Conservation of Emotion."

But what did I care for Azazel's limits of action as long as he did his job?

* * *

The next day I brought Pussy back to Cousin Andromache. Pussy had always been a strong and malevolent cat, but her indifference to others had induced a customary apathy that had kept her evil nature within bounds. Now, apparently, with her sudden wild love for Cousin Andromache frustrated by the absence of her object of affection, she had turned into a demon. She made it quite plain that, were it not for the bars of her cage, which gave dangerously under her pressure, she would tear me into shreds, and I was sure she could do it.

Pussy's mood changed completely, however, when she spied her mistress. The spitting, snarling, slashing devil became at once a panting, purring, picture of delight. She turned on her back, exposing a massively sinewy belly that she clearly wanted scratched.

Cousin Andromache, with a cry of delight, placed a finger through the bars to oblige. I then opened the gate and Pussy went sailing out into Cousin Andromache's waiting arms, purring as loudly as a truck going over a cobbled road, and striving to strop its rasping tongue on my cousin's leathery cheek.

I will draw the curtain over what followed, because it will not bear description. Suffice it to say that, among other things, Cousin Andromache said to the vile cat, "And did you miss your loving Andromache-Womickey?"

It was enough to make me vomicky, let me tell you.

Stolidly, however, I remained, for I was waiting to hear what I wanted to hear and, finally, Cousin Andromache looked up with a pallid glitter in her opaque little eyes and said, "Thank you, Cousin George. I apologize for doubting you, and I promise you I won't forget this to my dying day and will then make you a suitable return."

"It was my pleasure, Cousin Andromache," I said, "and I hope your dying day is far, far in the future."

What was more, if she had at that moment consented to settle a goodly sum on me effective immediately, I believe I would actually have meant what I said. —Within limits.

* * *

I stayed away from Cousin Andromache for a while, not wishing to push my luck, since my presence in her vicinity had, in the past, always seemed to sour her. —I don't know why.

I did phone her every now and then, though, just to make sure all was well, and, to my continuing delight, all *was* well. At least, she would each time trill coyly into my ear, "I love little Pussy", and then cite nauseating details of the cat's affectionate behavior.

Then, about three months after I had brought back Pussy, Cousin Andromache called and asked me to drop in for lunch. Naturally, under the circumstances, Cousin Andromache's wish was my law, so I hurried over at the set time. Since she had sounded cheerful on the phone, I had no apprehensions.

Nor did I have any when I entered her apartment, even though I nearly slipped to destruction on the throw-rug she kept on her polished floor near the entrance for what I could only assume were homicidal reasons. She greeted me with what was intended, I imagine, as a jolly grin.

"Come in, Cousin George," she said. "Say hello to little Pussy."

I looked down at little Pussy and shied in horror. Little Pussy, perhaps because it was so full of love, had grown still farther, and at a rapid pace. She seemed nearly three feet along exclusive of lashing tail and I judged her to weigh, conservatively, twenty-five pounds of whipcord and gristle. Her eyes were flat, her mouth was open in a silent snarl, her eye-teeth gleamed like burnished needles, and her eyes, as they glared at me, were filled with indescribable loathing. She stood between Cousin Andromache and me quite as though guarding the silly woman against any false move on my part.

I dared make no move at all, for who knew what that monstrous creature might consider false.

I tried to be strong, but there was a distinct quaver in my voice as I said, "Is Pussy safe, Cousin Andromache?"

"Perfectly safe," said Cousin Andromache, giggling rather in the same fashion a rusty hinge would, "for she knows you are a relative and mean me well."

"Good," I said, hollowly, wondering if it were possible for Pussy to read my mind. I decided she couldn't or I would not at that moment have been alive, I'm sure.

Cousin Andromache seated herself on the couch and motioned me to take the armchair. However, I waited till Pussy had also jumped on the couch and had placed her head in Cousin Andromache's lap in luxurious abandon, before daring to move sufficiently to sit down myself.

"Of course," said Cousin Andromache, "my loving little Pussy is just a little unreasonable when she thinks someone is trying to harm me. A couple of weeks ago, the newsboy threw the paper just as I was coming out the door. It hit me on the shoulder. It didn't really hurt, but Pussy was after him like a flash. If he hadn't pedalled his bicycle at top speed, I really don't know what would have happened to him. Now the boy won't return and I have to go out every morning and buy the paper at a newsstand. It is comfortable to know, though, that I'm protected from any mugger or burglar."

At the words "mugger or burglar", Little Pussy seemed to be reminded of me, for she turned to look at me and her eyes blazed with the fires of Hell.

It seemed to me I saw what had happened. After all, hate is negative love.

Pussy had had a mild hatred for everything and everyone but herself and, just possibly, Cousin Andromache. To increase Pussy's love for Andromache, Azazel, following the dictates of the Law of Conservation of Emotion, had to withdraw love from all other objects. Since that love was already negative, it grew more negative than ever. And since Azazel had added love with no sparing hand, the other loves grew *much* more negative. In short, Pussy now hated everyone and everything with an extravagant hatred that had strengthened and enlarged her muscles, sharpened her teeth and claws, and turned her into a killing machine.

Cousin Andromache chattered on. "Last week," she said, "Pussy and I were out for a morning stroll and we met Mr. Walsingham with his Doberman-pinscher. I had every intention of avoiding him and crossing the street, but the dog had seen Pussy and snarled at the little innocent creature. Pussy didn't seem to mind, but it frightened me—I don't like dogs at *all*—and I'm afraid I let out a small shriek. That activated dear little Pussy's protective instinct, and she fell on the dog at once. There was no hope of separating them and the dog, I understand, is still at the vet's. Mr. Walsingham is trying

to have Pussy declared a dangerous animal, but of course it was the dog that took the initiative and Pussy was merely acting in my defense."

She hugged Pussy and she said that, placing her face in actual contact with the cat's canines, and with no perceptible nervousness. And then she got to the real reason for the invitation to lunch.

She simpered horribly and said, "But I called you here to give you some news I felt I should tell you personally and not on the telephone. —I have a gentleman caller."

"A what!" I jumped slightly, and Pussy at once rose and arched its back. I quickly froze.

I have since thought it out. It seems clear that the sensation of being loved—even if only by a cat out of Golgotha—had softened Cousin Andromache's sinewy heart and made her ready to gaze with eyes of affection on some poor victim. And who knows? Perhaps the consciousness of being loved had changed her inner being to the point of making her seem marginally toothsome to someone particularly dim of vision and particularly lacking in taste.

But that was a later analysis. At the time Cousin Andromache broke the news, my keen mind quickly grasped the vital point—my prosperous relative might possibly have someone else to whom to leave her cash and possessions.

My first impulse was to rise from my seat, seize Cousin Andromache, and shake some sense of family responsibility into her. My second impulse, following a millisecond later, was not to move a muscle. Pussy's hate-filled eye was on me.

"But Cousin Andromache," I said, "you always told me that if any fellow came lollygagging around you, you'd show *him*! Why not let Pussy show him? That will fix him."

"Oh, no, Hendrik is *such* a nice man and he loves cats, too. He stroked Pussy, and Pussy *let* him. That's when I knew he was all right. Pussy is a good judge of character."

I suppose even Pussy would have trouble matching the look of hatred I let *her* have.

"In any case," said Cousin Andromache, "Hendrik is coming over tonight and I believe he will propose that we formalize conditions by getting married. I wanted you to know."

I tried to say something, but couldn't. I tell you I felt as though I had been thoroughly emptied of my internal organs and I was nothing but hollow skin.

She went on, "I want you also to know, Cousin George, that Hendrik is a retired gentleman, who is quite well off. It is understood between us that, if I predecease him, none of my small savings will go to him. They will go to you, dear Cousin George, as the person who turned Pussy into a loving and efficient companion and protector for me."

Someone had turned the sun and the daylight back on again and all my internal organs were in place once more. It occurred to me, in the merest trice, that if Hendrik predeceased Cousin Andromache, his estate would be very likely added to hers, and would also eventually come to me.

I said, ringingly, "Cousin Andromache. Your money does not concern me. Only your love and your future happiness do. Marry Hendrik, be happy, and live forever. That's all I ask."

I said it with such sincerity, old fellow, that I came within this much of convincing myself I meant it.

* * *

And then, that evening—

I wasn't there, of course, but I found out about it later. Hendrik—seventy, if he was a day, a little over five feet tall and pushing a hundred and eighty pounds in weight—came to call.

She opened the door for him, and skipped skittishly away. He threw his arms wide, called out, "My love!", advanced heavily, slipped on the throw-rug, went hurtling forward into Cousin Andromache feet-first, and bowled her over.

That was all Pussy needed. She knew an attack on her mistress when she saw one. By the time the screaming Andromache pulled the screaming Pussy off screaming Hendrik, it was too late for any hope of a romantic marriage proposal that night. It was indeed very nearly too late for anything at all that would involve Hendrik.

Two days later, I visited him at the hospital at Cousin Andromache's hysterical request. He was still bandaged to the eyebrows and a team of doctors were discussing the various possible strategies of skin-grafting.

I introduced myself to Hendrik, who wept copiously, drenching his bandages, and begged me to tell my fair relative that all this was a visitation upon him for being unfaithful to his first wife, Emmeline, dead these seventeen years, and for even dreaming of marrying anyone at all.

"Tell her," he said, "we will always be the dearest of friends, but I dare not ever see her again, for I am but flesh and blood and the sight of her might arouse loving thoughts and I would then once more be attacked by a grizzly bear."

I carried the sad news to Cousin Andromache, who took to her bed at once, crying out that through her doing, the best of men had been permanently maimed—which was undoubtedly true.

The rest, old man, is unalloyed tragedy. I would have sworn that Cousin Andromache was incapable of dying of a broken heart, but a team of specialists maintained that that was exactly what she proceeded to do. That was sad, I suppose, but the unalloyed tragedy I refer to was that she had had time to alter her will.

In the new will, she expressed her great affection for me and her certainty that I was far too noble to concern myself over a few pennies so that she left her entire estate of $300,000, not to me, but to her lost love, Hendrik, hoping it would make up to him for the suffering and the medical bills he had incurred because of her.

All this was expressed in terms so affecting that the lawyer who read the will to me wept uncontrollably and so, as you can well imagine, did I.

However, I was not entirely forgotten. Cousin Andromache stated in her will that she left me something she knew I would value far more than the paltry dross of cash. In short she had left me Pussy.

* * *

George just sat there, staring numbly at nothingness and I couldn't help saying, "Do you still have Pussy?"

He started, focussed on me with an effort, and said, "No, not exactly. The very day I received her, she was trampled by a horse."

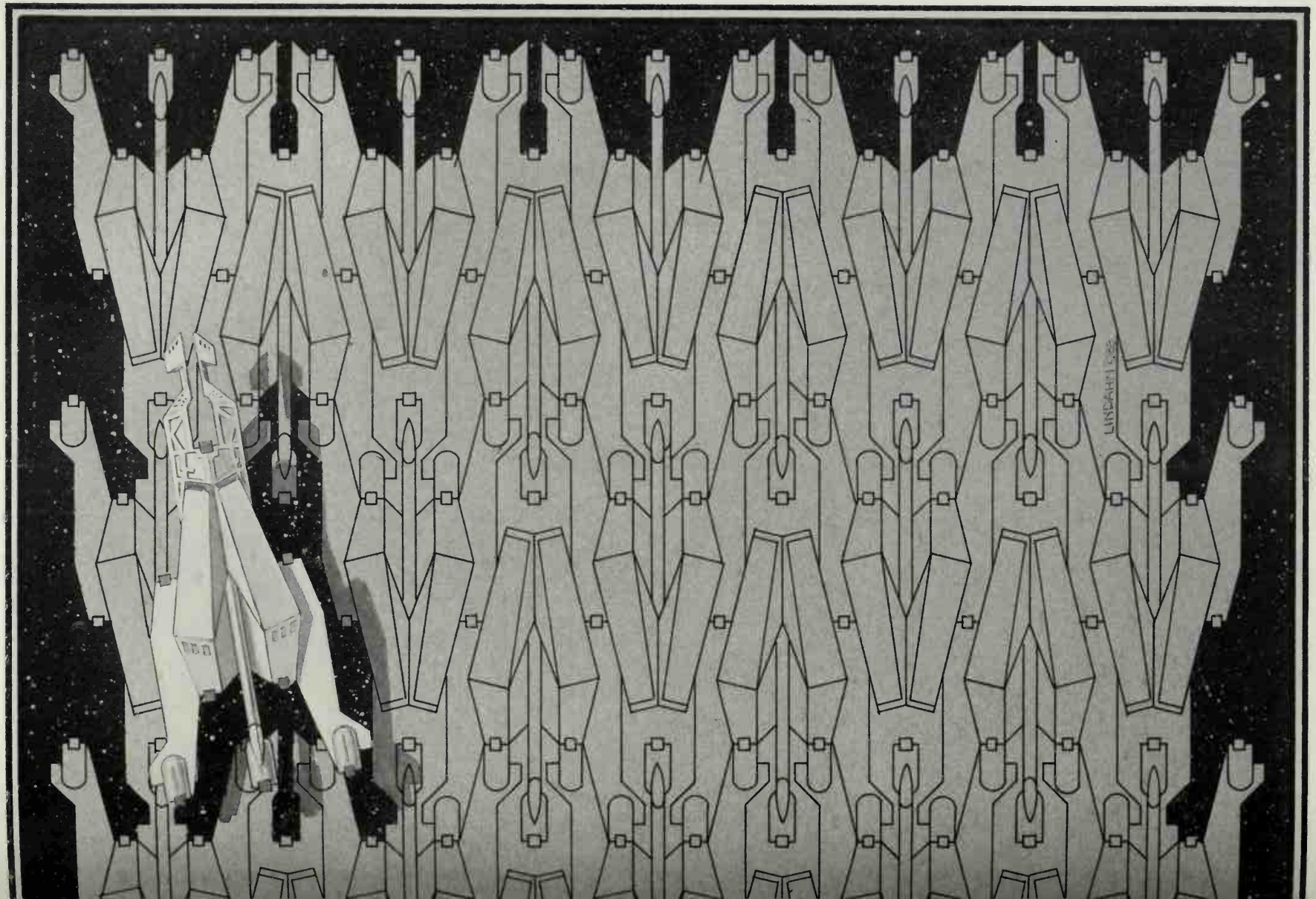
"By a horse!"

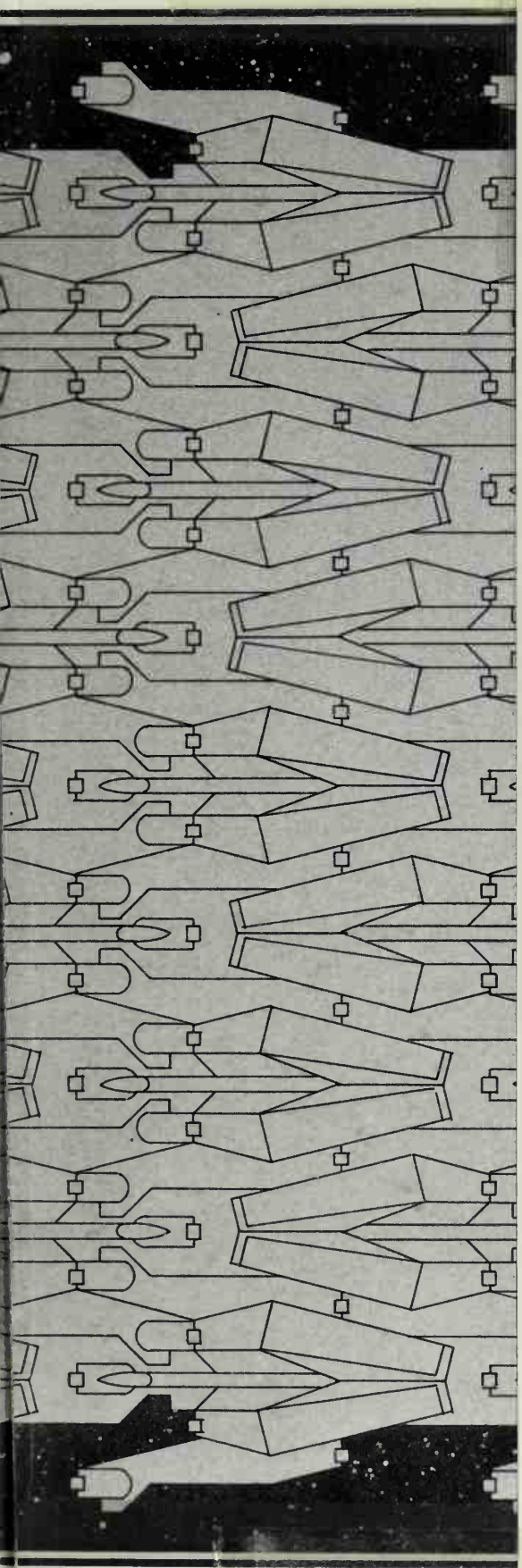
"Yes. The horse died of its wounds the next day. A shame, for it was an innocent horse. It's fortunate, on the whole, that no one had seen me open Pussy's cage and shake her into the horse's stall."

His eyes glazed over again, and his lips mouthed, silently: Three—hundred—thousand—dollars!

Then he turned to me and said, "So can you lend me a tenner?"

What could I do?





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