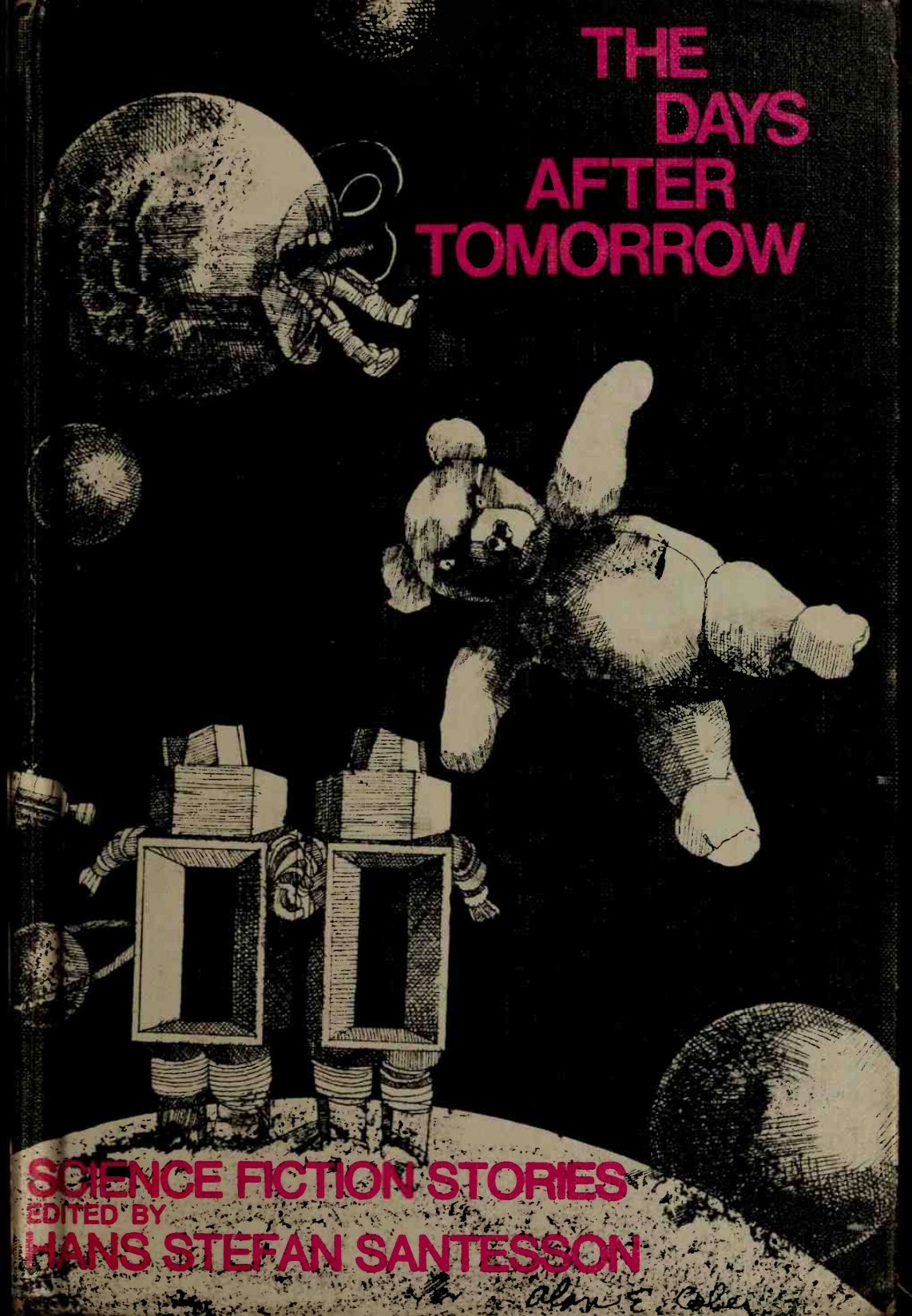
THE DAYS AFTER TOMORROW



SCIENCE FICTION STORIES

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THE DAYS AFTER TOMORROW

Science Fiction Stories

Edited by Hans Stefan Santesson

THE DAYS AFTER TOMORROW

Science Fiction Stories by
Isaac Asimov, Arthur C. Clarke, Randall Garrett,
Harry Harrison, Alexei Panshin,
H. Beam Piper, Frank M. Robinson,
Robert Silverberg and Theodore L. Thomas

Edited by Hans Stefan Santesson

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Sound Decision

Randall Garrett
Robert Silverberg

There are millions of laws legislators have spoken;
A handful the Creator sent.
The former
are being continually broken;
The latter can't even be bent.

— David Gordon
The Ballad of Ways and Means

What happened to the space liner *Martian Queen* was, on the surface of it, highly improbable. For a velocity vector to cancel out an acceleration exactly is something that no one in his right mind would imagine happening accidentally, and certainly no sane gambler would bet on its probability, no matter what the odds.

But yet, if you inspect the picture a bit more closely, it becomes readily apparent that any given incident is highly improbable. The unfertilized egg, after all, has a few hundred million spermatozoa to choose from; what are the odds that you will be *you?*

It's futile, however, to compute the probability of an event after the event has already taken place. You might come up with figures that proved it didn't happen, and in the realm of cause and effect ex post facto legislation is worthless.

The statistics *were* against it — but it happened.

The *Martian Queen* was a luxury liner of some five hundred metric tons, belonging to Barr Spaceways. She was, at the time, making a "short-run" orbit from Mars to

Earth, carrying a hundred and fifty passengers and a crew of thirty, including stewards.

I

"How much longer?" snapped Mrs. Natalie Ledbetter. She looked roundheaded and wattled like a turtle; her words snapped out and were snapped off at the end, as though she begrudged the question mark at the end of an inquiring sentence.

"A few hours yet, Mrs. Ledbetter," said Parksel with the infinite patience of a man who has borne more than his share and is willing to bear more indefinitely – as long as it pays.

Mrs. Ledbetter pulled a cigarette out of a gleaming platinum case, lit it, and drew in a lungful of pungent smoke. "I hate spaceships," she said. "It's not the crowded little cabins, it's not that there's nothing to do, it's not those –"

She scowled at the gently sighing air intake which seemed to scoop the tobacco smoke out of the room and carry it out of sight. "No. I have plenty to do – I can keep in touch with my directors on Earth and Mars. No. The thing that bothers me is the feeling that I'm on a roller coaster. I rode on one of those things once – just once. It's a penned-in feeling, a knowledge that you can't get off. That's what I'd like to do! Get off this thing! Get a breath of fresh air. But there isn't even any *stale* air out there!" She waved a hand straight down, toward the outer hull of the ship.

Parksel was a big, heavy man with a look on his face

that was neither boredom nor idiocy, but an expression of blank acquiescence, revealing nothing whatever of the workings of the mind behind the face. As a combination bodyguard and private secretary, he left little to be desired, insofar as Mrs. Ledbetter was concerned. He was well paid and had been told that he was mentioned in her will – provided she did not die by violence. He wasn't particularly concerned over that. Even Mrs. Ledbetter's tough old frame didn't have much longer to go; she was a hundred and nine, and beginning to show it. The gerontologists had her held together like a carefully articulated and highly valuable fossil.

"Get out the chessmen, Parksel," she said. "And mind you don't walk into that queen-knight trap like you did last time."

"Yes, Mrs. Ledbetter." He walked across the small cabin and got out the set. After arranging the ivory pieces on the table, he looked up at her. "It's your move first, I think."

"Yours," she said testily. "I took you with white last time."

He reached out a hand just as the speaker blared:

Your attention please! In three minutes, the gyros will begin to cut down the spin on the ship. We have to stop the spin around the longitudinal axis in order to apply thrust along it for deceleration. Please get into your bunks and fasten your safety belts. You will be warned again in two minutes.

"Damn!" said Natalie Ledbetter.

Without a word, Parksel leaned forward and began scooping up the precious, carved antiques and restoring them to their plush-lined niches. The musty, oppressive

smell of the old woman was starting to bother him, and he was glad to get away from the table.

Still, he thought, *it's a living.*

George MacBride stood listening to the announcement, then grinned down at his wife. "You heard what the man said, honey – back to bed."

Marian MacBride's pleasant face assumed an impish look of pseudo shock. "George!"

MacBride looked innocent. "That's what the man up there said. It wasn't my idea. *I'm* not captain of this tub." The grin did nothing to soften the angles in his face; his head and features looked as though they had been carved in mahogany by an expert sculptor who, unfortunately, had had to use a lumberman's ax for the job. He was of average height and built like a wrestler with a slight paunch. At forty-five, he considered the paunch more or less excusable.

Marian MacBride was ten years younger, and could pass for thirty easily, or even twenty-eight. Her face was round, soft, and glowing with vitality where it lacked mere prettiness. "It was such a wonderful trip."

MacBride walked over and patted her on the shoulder. "We'll go again. Maybe Venus next time. After all, Breckmann's Incorporated sends only its best men out. Meaning me, naturally."

Marian smiled. "Sure. But are they going to let you take me? This is your fifth trip. It's my first. And probably my last."

"But, honey –"

She shook her head. "You don't kid me, Georgie-Porgie. You had to pull every wire you could get your hands on

to get the company to pay for my passage to space. They'd never do it twice."

MacBride looked thoughtful. "Well . . . we could save the money –"

Marian walked over to the bunk and lay down. "Don't be silly, George. If you think I'm going to save money for a second trip, you're crazy. For a first one . . . well, I might. But I've had my fling now, and I'm not going to toss away your salary for fun. If I never go again, I'll still remember this one."

MacBride's face suddenly beamed with pleasure and pride. "Honey, you're wonderful. And just for that, I'm going to let you in on a little secret. You remember that get-together at Old Man Feld's place? Yeah? Well, the Old Man said that he thought it was fine that I'd brought you along. Said he thought it was good politics for a sales engineer to bring his wife. He's going to make a recommendation to Breckmann in Austria."

Marian sat bolt upright. "George!" She blinked, as if there was a possibility of tears. "That's what you've been working on! Those group psychology courses! That –"

"That's right." He nodded happily. "I –"

Your attention please! In one minute, the gyros will begin to cut down the rotation of the ship. The gravity will drop to zero in twenty-one minutes. Please strap yourselves in your bunks. A steward will check you shortly.

"Comfortable, darling baby?" asked Fred Armbruster, as he looked solicitously at his pretty wife.

Ruby smiled across the space that separated the two bunks. "Uh-huh. I'll be all right, sweetheart."

"Sure you will, baby duck. You didn't feel too bad during the takeoff, did you?"

"No," she lied. "I'll be all right."

Fred Armbruster was lean and tall and rich and in love. Ruby had been deathly sick every time the gravity switched, even though she thought the rest of the trip was simply wonderful. *Maybe,* Fred thought, *I could get her mind on that –*

"It's been a wonderful trip, hasn't it?" he asked.

"Best honeymoon a girl could ask for," she said sincerely. "I'd never thought Mars could have been beautiful. I'd always pictured it as a dried-up, nearly airless ball of clay. But the purple sky and the red and yellow desert . . ." Her voice trailed off.

"And remember that one sunset?" Fred hazarded. "The one with the dust storm?"

Ruby smiled at the fond memory. "It was wonderful. All blue and violet and crimson and streaked with –"

The door popped open and a head stuck in. "Everyone secure? Fine." The door closed.

"Crewman," Fred said bitterly. "Always a crewman has to stick his head in where it isn't wanted. If I were running this ship, I'd –"

"Don't be that way, sweetheart."

Fred frowned. "I still don't think every crewman ought to have a copy of that master key. If it were the captain who –"

Your attention please! The gyros will start in three seconds. Please stay in your bunks during the entire time. There will be a five-second interval of weightlessness, after which the gravity will be shifted for deceleration.

There was a brief pause, then: *Gyros on. Please remain in your bunks.*

Edouard Descartes André blew a cloud of blue cigarette smoke toward the ceiling. "Will I be glad to get home!" He said vehemently, "Mars! Canned air and stinks! Dopey-looking fat beetles that claim to have brains!"

In the next bunk, Jerry Hammermill relaxed, his hands folded behind his head and cradling it. "Don't yap, Eddie, old mug. You made a shivering good bankroll on that shivering planet. And don't disparage our Martian friends; they may look pretty shivering ugly, but they've lined your pocket for you."

"I wish you wouldn't talk so loud, you idiot!" André grumbled unhappily. "I still think they could have those cabins wired."

"Don't be a shivering fool," Hammermill said mildly. "In the first place, my instruments don't lie, and in the second, the taped stuff I'm feeding into these steel walls would foul up any shivering pickups yet invented. And besides, I haven't given them any details."

"Yeah," said Edouard Descartes André. "Sure, you're the smart one – the smart one who's going to land us in the brig yet."

"The smart one," Hammermill pointed out, "who made us a quarter of a million chips apiece. Besides, if we don't make any direct evidence against ourselves, the World Government can't touch us. Martians can't testify in court."

"I hope you're right," said André. He leaned back and glared meaningfully at his companion.

They fell silent. And, slowly, as the spin eased off, orientation was lost. "Up" and "down" gently began to merge with each other, until they vanished and became one with every other direction.

Acceleration in five seconds, said the speakers.

Captain Bernard L. Deering, a tall, massive man whose iron-gray hair was cropped in a stiff brushcut, and into whose hands the hundred seventy-nine other voyagers aboard the *Martian Queen* had entrusted their lives during the journey across space, sat in the astrogation dome watching the stars circle around him. Captain Deering had been in the service of Barr Spaceways for some twenty years, after a distinguished career in military service. He knew his ship, and he knew his job.

As the ship's spin decreased and the gravity dropped, the stars circling the dome slowed to a halt. When they finally stopped altogether, Captain Deering snapped: "Bearing!"

The astrogator, a prune-faced, angular man named Bliven, who had gone into space straight from M.I.T. and who had been part of Deering's team for eleven years, instantly called out a string of numbers, and the captain smiled. "Dead on," he said. "Feed in the tape and start her at schedule."

The automatic landing tape snaked into the computer which fed exactly timed impulses to the engine room. There was a nearly subsonic hum – the sort heard by the skin rather than the ear. Gradually, gravity returned, this time at right angles to its previous pull. Inside the cabins, the bunks rotated in their frames. While the spin was on, they had been twin beds bolted to the yellow floor, next

to a blue wall. Now they became tiered bunks, one above the other, bolted to a yellow wall above a blue floor. The crewmen referred to spin as "yellow gee" and longitudinal thrust as "blue gee," because of the code coloring of the walls.

The accelerometer climbed swiftly to nine hundred and eighty and held steadily at that. "One of these days," said the astrogator, "some bright guy is going to have sense enough to define a standard gravity as one thousand centimeters per second squared. That'll relieve us of having to bother with these figures."

"You want to redefine the centimeters?" Deering asked, grinning.

"Nope. I want to say that the pull at the surface of Earth is point nine eight standard gees."

"I'll go for that," agreed the captain.

And that was when it happened. There was a loud *thump!* that shook the *Martian Queen* from engine compartment to astrogation dome. The ship pitched wildly as though she'd been hit by an artillery shell – a big one. The accelerometer needle lurched like a crazy thing and began to climb as though it were going to twist itself around the pin. It reached nine thousand before it suddenly stopped and fell to zero.

The ship was silent. For nearly a minute, no one spoke. The few seconds of exposure to nearly nine gravities had taken the breath out of everyone. Captain Deering coughed and grabbed at the intercom.

"Engines! What happened?"

There was no reply from the engine room.

"Enkers! Chivers! Tance! Punz!" he shouted. "What's going on back there?"

There was no answer. There couldn't be. The captain didn't know it yet, but his engine crew had died in the glare of heat and light, the moment's flash of radiance, that had wrecked the engine room.

II

White Sands Spaceport covered four hundred square miles of New Mexico desert. It was a great, hard, white, smooth blank spot of land, surrounded by clumps of yucca and cactus and not much else. At the eastern end, a full square mile of the area was devoted entirely to the administration area – a neatly arranged group of shining frosty-white buildings whose irradiated polyethylene walls gleamed brilliantly in the sunlight. The sparkling shower of diamond-bright beams that cascaded from the walls directly in the path of the sun's rays was hard on the eyes, but it made the spaceport remarkably easy to spot from a few hundred miles up, surrounded as it was by the yellow-brown of the desert.

Neil Stanley looked out of the window of his office and winced at the sun's heat. He had been working since dawn, and hadn't realized that the sun had shattered the soothing coolness of the desert morning. He touched the Polaroid control gently and the window dimmed, reducing the light to a bearable level.

He didn't object to the desert as such, but he did object to the heat and the sun. Fortunately, a major general of the Space Service rated an office complete with air conditioning and window controls, and as base coordinator for the commercial flights out of White Sands, his duties

didn't call for much work that couldn't be handled in his office.

Stanley liked his job simply because it was about as unmilitary as a job could get. Physically big, quick-witted and impressive-looking, Stanley had mastered military routine fully. He had served at the military spaceport in Nevada, but when the chance had come to take on the difficult task of handling the commercial traffic, he had jumped at it.

The military spaceport in Nevada was remarkably smooth in its operation. Routing was simple; a few well-placed orders did the trick, and they were *followed* – to the letter.

Civilians didn't listen to orders half as well, even in situations involving the dangerous business of landing spaceships. Their remarkable obstinacy at times increased the headaches, but it was the constant surprises that made the job fun.

Stanley turned from the window and looked up at the schedule on the wall. The top line read: MARTIAN QUEEN – 1404:9 ± 2. That was the next ship due in. Underneath it was the arrival time of the *Aphrodite*, due in the next morning.

He checked his watch automatically and computed the time. The radar tower ought to have a fix on the *Queen* any minute now.

When the phone rang, he grinned. In the matter of predicting what a spaceship is going to do, there's not much trick in being an honorable prophet. The laws of gravity are as inexorable as the march of time; in order to land a ship in the right place at the right time, there are

certain things that have to be done, and certain times to do them.

Stanley picked up the phone. "Stanley here."

"General, we've got the fix on the *Martian Queen*."

"What's the ETA?" Stanley asked.

There was a pause at the other end of the line. "We haven't computed the ETA, sir," the voice said hesitantly. "There's something wrong. The position is off, and the velocity is constant. The – "

"Never mind," Stanley said, cutting the man off in mid-sentence. "I'll be right over." He slammed the receiver down and pushed the phone away.

He left his office on a dead run, his lips clamped together in a grim scowl. When a radar fix can't compute the Estimated Time of Arrival of a spaceship instantly, there is something wrong – *deadly* wrong.

He spun down the flight of stairs from his second-story turret, whirled through the swinging glass doors, and vaulted the two steps that led down to the ground. The pavement was warm beneath his feet, and the hot, dry air swept parchingly into his lungs.

His jeep was waiting for him a little way off, and the driver was half dozing in the nearby shade. But when he saw the major general coming toward him at better than double time, he vaulted into the driver's seat and had the engine running by the time Stanley got there.

"Radar Tower One," Stanley snapped. "And gun it!"

The jeep shot off almost instantly. Stanley leaned back, staring at the black tufts of hair on the backs of his fingers, wondering stonily what story was going to be written today, what record of disaster and heroism. He didn't know.

He didn't know what was going to happen. All he knew was the *Martian Queen* had gone haywire and wasn't doing what it should be doing, up there in the sky.

The radar tower was a spidery structure whose struts and girders stood outlined sharply against the sky, metallic gray against bright, painful blue. The jeep pulled up short in front of the tower, and Stanley climbed out almost in the same instant. "Stay here," he called to his driver, as he went inside.

Three bleak-faced men waited for him there.

"Sir, do you think — ?" began Sokolow, a thin, sandy-haired technician whose face creased in a perpetual scowl.

"Never mind," Stanley said crisply. "Time to talk later." He pushed back his cap and walked past them without bothering to ask questions.

"Chart," he murmured.

They complied. Stanley looked at the blip on the scope and checked the reading against the chart, frowning worriedly. Something was definitely wrong; the blip wasn't moving, which indicated a constant velocity. The *Queen* should have started decelerating long before this.

A bead of sweat trickled down his heavily tanned forehead, and he brushed it away impatiently. The data was there. The *Queen* wasn't decelerating. Why? Who knew? Who cared? All that mattered was the bare fact.

"Get me a direct line to Captain Deering!" Stanley said sharply, without looking up from the charts.

"Yes, sir," Sokolow said.

Stanley rubbed his chin. The ETA charts were simplicity itself. The readings on the screen could be checked against the charts and the time for landing was right there; the figures had been computed long before. All the

radarman needed to know was the ship's position, velocity, and negative acceleration.

But this ship was off position and had no negative acceleration, and the charts weren't set up for a situation like that. Preconceived rules are nice things to have, but they simply don't work in an emergency.

While the radio man upstairs tried feverishly to get a direct communication to the *Martian Queen,* Stanley reached across the desk, pounced on the phone, grabbed it toward him, and dialed Routing.

"Stanley here. I want a computation fast." He glanced at the screen and rattled off the bearing, velocity, and direction of the blip on the radar. "I want to know when and where she'll hit if she doesn't decelerate. Got that?"

When and where she'll hit. He said the words in a clipped, businesslike manner, concealing the feeling that lay behind them. It was impossible for him to get hysterical over the situation, but he certainly appreciated its ugliness. Spaceships are big, heavy things, traveling at fantastic speeds, and a man who had worked with them half his life knew exactly what potential danger each one carried.

"Got it, General. We'll feed it into the DIRAC right away."

"Make it fast. I want that information yesterday, if not sooner."

He slammed down the phone.

There were footsteps behind him. "I've got Captain Deering, sir," said the radio man.

Attention! There has been a slight change in the landing procedure. Please remain in your bunks until you are given the all clear. There is nothing to be alarmed about;

there will simply be a slight change in landing time. Repeat: there is nothing to be alarmed about.

Captain Deering frowned as he listened to the voice of Lieutenant Bessemer over the speaker. That final repeat, he thought, was unnecessary, even if it was good procedure. Civilians were sure to get suspicious if they were told too earnestly that all is well.

He hoped the words would be effective. *A slight change in landing time.* It sounded fine, but, chillingly enough, it was perfectly true. If the *Queen* couldn't be straightened out, there would not only be a change in landing time, but a different velocity as well. The velocity of the *Martian Queen* was a long way from being zero with respect to Earth.

The intercom buzzed loudly. "Captain? Hagerty here. We can't get into the engine room, sir. The place is hotter than a Roman candle."

"Radioactivity or thermal?"

"Both. The scintillation counters are fizzing all over the place, and the temperature's running close to three hundred Fahrenheit. Couldn't be anyone left alive in there."

Captain Deering thought fleetingly of his four-man engine crew, and said, "Get out one of the suits and send a man in there for a look around. Don't overexpose him, but try to get an estimate of the damage. We've got to get this bird back under control, and we've only got minutes to do it!"

Marian MacBride turned her head to smile at her husband. "This gravitylessness isn't so bad, is it? Once you get used to it, I mean."

George grinned. " 'Gravitylessness,' " he mimicked.

"Now, there's a word I like. Couldn't we add a few more syllables, just for effect?"

"Don't tease, George. What I mean is, I think it's fun."

"*Fun,* she says!" MacBride laughed. "If that's your idea of fun, you can have it, honey. Me, I like to know which way is down. Close your eyes and try to imagine you're hanging on the ceiling. Or floating around in the air, or – "

"Stop it, George," she said petulantly. "What are you trying to do? Make me sick?"

"Yup. I figure that if you're sick, I'll be so worried about it that I won't have a chance to be able to think about being sick myself."

"Fine sentiment!" Then she paused. "What do you suppose is the matter? That was an awful shake we had."

"Meteor, probably," George said. "A big rock can do a lot of damage to a ship if it hits it, you know."

"Oh," she said. "Well, as long as the ship doesn't lose its air, we're all right. I've read about meteor collisions. All the air goes out, and everybody smothers, or something. I wouldn't like to die that way."

"It does seem a rather stuffy death," agreed George. "But these new ships can spot anything big a long way off. There's nothing to worry about. The death rate for spaceships is a lot lower per capita than even aircraft." He stopped suddenly, realizing that the conversation was frightening both of them a little, and aware that what he was telling her so solemnly was probably scientific hogwash anyway. Their voices were getting tense.

He put his hands behind his head. His fingers were cold. "It *does* seem a rather stuffy death," he said, trying to make his voice sound cheerful the second time. "You recognize the allusion, don't you, Marian?"

She thought for a moment. "That was that music thing you were in last year, wasn't it? The Gilbert and Sullivan operetta?"

"Yes," he said. "Remember, Yum-Yum says it to — " He glanced at her. She wasn't at all interested.

"Anyway," he said, "if we stopped to avoid the meteor, it's not going to hit us, is it?"

"Do you think — "

"No, sweetheart. I can guarantee we won't hit it."

Ruby Armbruster was being violently sick. Her face was buried in the mouth of the collapsible plastic emergency bag, and her body seemed to be trying to tear itself apart with the racking convulsions that surged through it.

Fred had unstrapped himself from his own bunk and lowered himself to where his wife lay. Her dry, harsh coughs showed that her stomach was, by now, completely empty.

"You'll be all right, dear," he said soothingly. "You'll be all right. The gravity will come on pretty soon. You'll be all right."

Over and over he repeated it, trying to lull her into relaxation, trying to stop the awful, twisting convulsions of her abdomen.

Finally, the nausea subsided a bit. She turned, looked up. Her face was beaded with sweat, and she was trembling all over. She sighed gently, struggling to regain control over herself.

"Oooohhh . . . Ohh, Fred — "

"Easy, honey."

"I feel as though I'd lost everything. I . . . I . . . ooohh . . ." Her voice trailed off.

"Feel bad, honey?"

"Horrible. There's no up – hold me, Fred. Hold me. I think . . . I mean, it feels like I'm falling." Her voice told of terrible, primitive fear welling up from somewhere in the recesses of her subconscious. "Don't let me fall, Fred. Please – *don't let me fall!*"

Sobs had replaced the retching, but her body still shook.

Fred cradled her in his arms tenderly. "Don't worry, sweetheart. I'll hold you. You aren't falling, so don't worry. You aren't falling. You aren't falling."

Natalie Ledbetter leaned over the edge of her bunk and looked down. "What's the matter with you?" she asked, in her dry, deep man's voice. "Sick?"

Parksel's face assumed an expression of stolid imperturbability. "No, ma'am. I'm afraid I have hiccups. Just hiccups, that's all." The sentence was punctuated occasionally by a muffled *hic!*

"Well, stop it!" she said insistently. "There's no reason to make *me* feel ill! Parksel, I'll have to take this up with Barr Spaceways! Imagine letting us lie like this in . . . ah . . . what is it? Free fall. That's it: free fall. I'll speak to Gregory Barr about it!"

"Yes, ma'am," Parksel said. "*Hic!*"

"Stop it, I say! Stop it!"

"Yes, ma'am." His eyes rolled in pain, revealing the battle going on within him as he struggled to retain the hiccup. "*Mmmmph!*" he finally said.

Jerry Hammermill was unbuckling his safety belt with flying fingers. His mumbled blasphemies seemed to be

more an aid to breathing than an actual attempt at communication.

"What's eating you?" grumbled Edouard André from the bunk below.

Hammermill pushed himself out of the bunk toward the door and paused, while a muscle quivered in his cheek. When he spoke his voice was tight and dry.

"No deceleration. There's something wrong. This shivering ship is in trouble, make no mistake. We're in free fall. Get that? *Free fall!*"

"Huh?"

"I'll put it in words of hardly any syllables for you. Unless we're in an orbit around Earth, we're headed for the worst crack-up this planet has ever seen."

André grinned with the superb self-confidence of the man who is shrewd and calculating but at the same time a complete idiot. "What are you worried about? They said everything was all right, didn't they? Didn't they? Then what are you worried about, huh?"

Jerry Hammermill stopped at the door and glared piercingly at his companion. He was silent for a moment, contempt gathering on his face. "Sure they told us everything was all right, you bird-brained blockhead! What did you expect them to say? Something like: 'We're all going to die in a few minutes, so please be patient.' Is that what you expected?"

He opened the door and was out in the corridor before the white-faced André could say anything.

Captain Deering's jaw muscles tightened as he heard the words coming over the intercom.

"Hagerty here. The engine room's a wreck, Captain. I

sent Palmer in, but he couldn't stay long – it's too hot down there. We didn't find out much."

"What about the main converter?" Deering asked anxiously.

"Almost completely gone. It's a wonder it didn't blow into fragments when it went. God only knows what happened. The engine crew's gone – died almost instantly, I'd guess."

"What's the converter like?" Deering asked. He'd long ago forgotten about the lamentable but irreparable death of his engine crew; the important thing now was getting the engine room back together, not giving the four men a proper burial. That could come later – if there was any later to come.

"The converter's a mess," Hagerty said. "Mostly molten metal, according to Palmer, though it's beginning to solidify now. The shielding has kept the radiation from the rest of the ship, and it's slowly dying out now."

"And the engines?" Deering asked, knowing that only a miracle could have preserved them. "Any chance of starting them?"

"What engines?" Hagerty's voice told the story without need of further explanation. "There aren't any engines left to start."

Deering drummed on his uniform-cuff with the fingertips of his left hand. His mind was racing ahead, trying to figure out the probable courses of action to take. The trouble was that no answer seemed like a workable one.

"What about the – " Captain Deering started to say. But the voice of Lieutenant Bliven interrupted.

"There's a direct call from General Stanley at White Sands, sir! Can you – "

Deering whirled impatiently, fighting to rein in his self-control. He was staying as cool as possible; this was the first major accident he'd had in twenty years, but he was a level-headed enough man to know how to behave – he hoped. "Just a second!" he snapped. "Tell Stanley to hold it! Hagerty! Is there any chance of getting the secondary converters going?"

"No, sir," came the flat reply. "They've blown, too, and – "

"The general says it's urgent, sir," the astrogator persisted. "Says he must talk to you at once."

"Damn!" the captain shouted, letting some of his tight control relax. "Tell him to wait!" He turned back to the intercom. "Hagerty?"

"Yes, sir."

"Listen, do everything you can. Understand? Get this ship operating, if you possibly can."

Deering listened to his own words, heard his own deep voice bouncing around the cabin, knowing as he spoke them that they were utterly futile. Hagerty was a good man, but he was no magician.

He turned away from the intercom and grabbed the radiophone, feeling as if there were cannons to the right and cannons to the left of him. "Deering here!" he barked. "What do you want, Neil?"

"Buddy? Stanley here. What's going on up there? Man, you've got to stop that thing!"

Stanley's voice held an ominous, imperative ring. Deering grinned sardonically. "Any suggestions? Black magic, maybe?"

"What's the trouble?"

"Main converter shot all to hell, and so is the secondary. Engines out. I'm just getting moving on the thing. What's our course?"

Stanley's voice was harsh. "Never mind now. What happened?"

"God knows!" Deering said. "We'd just stopped spin for deceleration and something blew in the engine room. We're powerless. Hagerty says there's nothing but slag down there!"

Stanley was silent for a moment, and Captain Deering stared impatiently at the radiophone in his hand. He felt a little better about things now that he knew Stanley of White Sands was with him. There was something reassuring about contact with the big catlike man, even when you were riding a spaceship straight to hell and he was sitting down there comfortably in an air-conditioned turret.

"Okay, feed me your coordinates," Stanley said at last.

Deering glanced up at Lieutenant Bliven. The prune-faced astrogator was standing by tensely. "Course," Deering demanded.

The astrogator threw him a sheet of paper, from which Deering read figures. "That's as close as I can get," he said, when he was through. "Do you have a fix on us?"

"Checking it now," said Stanley. "I've got some other things to do right now, but keep the line open. Off."

Deering said nothing. He clenched his fists and stared out the astrogation dome at the diamond-hard stars. They looked back at him from their black velvet settings, utterly unconcerned.

The captain sat back and let the tenseness drain out of

him. The figures were starting to shape up, and the returns were coming in. He turned to the intercom.

"Hagerty?"

"Yes, chief?"

"What's going on?"

"Nothing, sir. There's nothing I can do."

"Okay," Deering said. "Keep trying."

The words were futile. The *Martian Queen* was falling toward Earth – powerless. Deering took the situation in, and he knew there was little sense in ordering Hagerty to work a miracle. There was nothing in space that could save the ship.

III

Neil Stanley turned toward the radioman. The air was hot and close in the radar tower, and it seemed to him a dull odor of ozone hung overhead. "Keep that line open," he ordered. "No matter what happens, keep it open!"

He gripped the phone again and dialed Routing, his thick fingers having trouble with the dial in his haste. He heard the click, then a voice.

"What's happening to that data?" he asked.

"Coming out now, sir," someone at the other end said. "We fed DIRAC the figures you gave us. They're not too accurate, but – wait! Here it is now."

There was a long silence at the end of the line, while Stanley chafed his fingers impatiently together. "Sir!" came the voice finally. "They aren't going to miss Earth!"

"*What?* That checked?"

"Yes, sir. Whatever happened, it threw them off course just enough so that they'll still crack up on Earth even if they don't decelerate. It's a million-to-one fluke that they should be – "

"Can it," Stanley said. "What's the intersection point of the two orbits?"

"Somewhere along the East Coast, sir. We can't get it any closer than that without more precise data. I'd say that it'll hit somewhere near New York City if it doesn't slow down!"

"It figures," said Stanley tightly. "It figures. How long before she hits?"

"A little better than a half hour, sir. Can you get us more accurate data?"

"As soon as possible," Stanley said.

Near New York City, he thought. *Of course. As long as it has to be a wild coincidental thing, it might just as well come down on New York, and not in the Atlantic or out here in New Mexico or up in Alaska.*

He turned back to the radioman. "Get me Deering," he ordered. "I don't want to talk to him, just tell his astrogator to give me positional and velocital data as soon as possible. Tell him I want it down to the last decimal place he can possibly squeeze out of it, and then a couple more!" He stopped talking, and a frown passed over his face. "Then give the data to Routing," he said after a pause. "Tell them I want an orbit that's as close as skin. I've got something to do."

"Yes, sir."

"And by the way," he added. "Keep this under your hat. This is not to go out to anyone – not anyone!"

He left the radar tower at high speed, bursting out into the open again. The sun was now high overhead, and it was hot.

The driver still had the motor of his jeep going. Stanley vaulted in, and the gears buzzed as the driver released the brake and shoved hard on the accelerator.

"Experimental!" Stanley ordered. "And double quick." The jeep roared off across the compound toward the Experimental Drive building.

Almost before they had started, they were there. The jeep's wheels had barely stopped moving when Stanley sprang out of it and toward the building.

Colonel Arthmore jerked his head up in surprise as the major general slammed into the room. The colonel didn't even have time to give a proper salute before Stanley said:

"Is that XV–19 ready to go? Can we have it in space within the next twenty minutes?"

The colonel blinked and nodded. "I think so, sir, if we rush it. We – "

"Rush it, hell!" Stanley snapped. "I want you to move faster than that ship can. It's the highest acceleration ship we've got, isn't it?"

"Yes, sir. We – "

"I want it ready to leave inside ten minutes. Take that as an order!"

"Yes, sir." The colonel had fully come to life now; he'd been galvanized into the same sort of quivering perpetual motion that was driving Stanley right now.

"And I don't want a word of what's going on to leak out of here," Stanley said. "Is that understood? If one word leaks or if that ship isn't ready to go, I'll see to it that you'll

never wear those birds on your shoulder again. Is that clear?"

"Yes, sir," said the colonel. "Anything else, General?"

"Nothing. Just stand by for further orders. Keep your phone open to Radar Tower One. This is a double – a – double – prime emergency, and if we don't work it right a lot of people are going to die. Now move!"

But the colonel was already gone.

Stanley grinned at the retreating officer for a moment, then turned and headed back outside. He stood in front of the Experimental Drive building for a few moments, planning his next steps, wondering, extrapolating.

XV–19, he thought. *Arthmore should have it ready to go almost at once.* He cracked a knuckle reflectively, enjoying the feeling of knowing that for the next two minutes he could breathe freely. Things were moving now; plans were under way.

The ship was coming down in New York or vicinity thereof, eh? That was a top-flight emergency – and called for emergency action.

He looked at his watch. It was hardly more than a few minutes since the whole thing had started, and it seemed like days. The hot New Mexico sun was still climbing toward noon, and the thermometer wasn't yet at its maximum for the day.

No, he thought. *The heat's yet to come.*

"Let's get back to the radar tower," he said to his driver.

As he plunged into the big room that made up the heart of the tower, two voices hit him at once.

"Captain Deering is yelling for you, General!"

"Data is in on the *Queen,* General!"

He grabbed the sheet of paper that the second man held out and ran toward the microphone that had been set up for direct contact with the *Martian Queen*. He grabbed it, started to say something, then covered it with his hand. "Did you say anything to Deering?"

"No, sir." The sergeant's smile looked twisted, as though he were worried. Everyone in the room knew pretty much what the situation was by now, and the tenseness was starting to spread through the men like a virulent epidemic. The air seemed to crackle.

"We figured that was your baby," the sergeant said.

Stanley grinned. "Thanks, Sergeant." He took his palm off the microphone.

"Buddy? Neil here. How are things?" His voice was calm.

There was a moment of silence. Stanley let his eyes flick around the room, and he saw the expression of horror registered on the sergeant's face. Obviously the sergeant was thinking that Stanley had no right to be so calm in this sort of situation. He must have been even more shocked when he heard Captain Deering's voice come in after the time lapse.

"Same old stuff, Neil. No propulsion, no escape. How do we go down there?"

"We've got your coordinates down pat now," Stanley said. "We can tell you almost to a hair where you'll hit."

A moment of silence. Then: "Hit? You're sure we'll hit Earth, then?"

"No doubt about it, buddy," Stanley said. "If nothing happens between now and – *then*, you'll get a hot dunk in the ocean." He glanced again at the papers the sergeant had handed him. "Give or take a mile or so, you'll land in

Long Island Sound about ten miles southwest of Bridgeport, Connecticut. Right in the drink, buddy – right in the drink."

There was a silence of a few seconds a third time – and Stanley waited patiently, knowing that the time lag each time meant long seconds of agonized thought as Deering struggled to say what he had to say. Finally: "We can't let that happen, can we?"

"Nope." Stanley's voice was quiet and controlled. "You don't want your passengers to have an unexpected bath, do you?"

"No," said Deering. "Can you get a rocket up here in time?"

"Plenty of time," said Stanley. In the background, a large wall chronometer stroked off the seconds, ticking with consummate mechanical precision. "Don't worry about it."

IV

Jerry Hammermill pushed himself unsteadily down the long corridor that led from his cabin to the common room of the ship, that large and congenial room in which the passengers of the *Martian Queen* tried to pretend that they were almost anywhere but aboard a spaceship.

He pushed open the hatch and swam into the middle of the room, hovering there in midair for a moment, his hands holding to the electrical unit in the ceiling.

He knew the danger he was in. At any moment, the ship could start accelerating, which would throw him to the deck with smashing force. But, somehow, that didn't

worry him. Still, his fingertips were quivering, and his face felt stiff, as though it had been coated with varnish.

Jerry Hammermill had had a pleasant and profitable existence up to now, and the idea of having it all end through some freak accident didn't appeal to him at all.

Pushing himself away from the ceiling, he headed toward the bar. There was no bartender on duty during free fall, of course, so Hammermill helped himself. He groped behind the bar until he found a plexiplast globe of Scotch. He broke the seal and squirted the liquid into his mouth in hot, smooth jets.

Then he turned and pushed his way toward the nose of the ship, up where the captain would be. He felt a little better about things – but first he wanted to see Captain Deering and find out, firsthand, exactly what was going on.

"Hammermill!" the captain shouted as he saw the passenger drift around the corner of the door. "You heard, I believe, the order confining everyone to cabins."

Hammermill braced himself against the door and looked coldly at the blue and white uniform of the officer. Barr Spaceways wasn't exactly pretty when it came to uniforms, but it was impressive. He looked at Deering's tight, drawn face, and the hard eyes told him the answer immediately. His stomach crawled into a cold, hard knot.

"Well? What is it, Mr. Hammermill?" Deering asked angrily.

"Tell me this, Captain," Hammermill said hoarsely. "*Why aren't we decelerating?*"

The blunt question echoed around in the captain's cabin, bouncing from the walls, turning Deering and

Astrogator Bliven even paler. Hammermill looked as hard and inflexible as the captain as he waited for an answer.

"Technical difficulties, Mr. Hammermill," Deering said. "Everything will be taken care of shortly. You don't want to be caught on your feet if we start to accelerate." He glanced at Lieutenant Bessemer, standing to one side. "Would you show Mr. Hammermill back to his cabin, Lieutenant?"

"You can't do this to me, Deering! I demand to know exactly what's happening aboard this ship."

"Mr. Hammermill, rest assured that everything will be taken care of. Bessemer, show him to his cabin."

The lieutenant moved forward and clamped a hand on Hammermill's arm.

Hammermill's lean face became expressionless as he allowed himself to be propelled out of the cabin and pushed into the corridor.

"Okay, Lieutenant," he said as the door to the captain's cabin shut behind them. "I'll go quietly. I didn't really mean to ask any embarrassing questions."

Bessemer gave Hammermill a shove, and drifted back into the cabin. Hammermill, floating along the corridor, glared bitterly backward and muttered a curse.

Then he frowned and swam on. He had learned absolutely nothing — except that they were in one hell of a mess. Deering had been utterly transparent.

The ship wasn't decelerating, and Hammermill knew enough about space travel to know that a spaceship an hour or so outside of Earth *ought* to be slowing down before it came in for a landing.

Were they heading for Earth, heading for the biggest pyrotechnic display in man's history, or would they miss

the planet and head out on a hyperbolic curve to nowhere? Hammermill didn't know. But he did know they were in trouble.

"Deering didn't say a thing?" Edouard André asked.

"Not a thing," Hammermill said. "Except that what he accidentally told me between the lines is that the ship's out of control and going to stay out of control."

Mrs. Ledbetter glared at Parksel. "Is what this man says true?"

"You heard him yourself, Mrs. Letbetter," Parksel said.

"What should we do?" asked someone else.

Hammermill surveyed the group he had hastily assembled in his cabin. There were ten of them, the first ten people he could find. He had gone around knocking on cabin doors, getting passengers to come together, and then he had told them the story, explaining carefully and precisely to them just what it meant not to be decelerating. Their faces registered blank disbelief, horror, shock, anger, dismay – anything but determination.

Determination was what was needed, Hammermill thought.

Out loud he said, "I think there's a conspiracy on the part of the officers of this ship to keep us from full knowledge of what's been taking place here."

"Maybe they're just trying to prevent a riot," suggested George MacBride ominously. "Maybe they don't dare tell us."

"Probably," Hammermill admitted. "But at least some of us ought to know – this committee of passengers, at least. A few of us ought to know the score."

"What good will that do?" André demanded.

"I don't know," said Hammermill bitterly. "But at least we'll know what's coming off. Our lives may be at stake, and we're not being told anything."

From the corner of the room came a slow, muffled sobbing. Hammermill frowned. He didn't want hysteria complicating things.

"Why don't we all go to the captain?" he said. "He can't lie to all of us."

"Good idea," someone said.

"Let's go!" said another.

Excitement started to spread through the group – terrible, irrational excitement of people who believed that if they only made enough noise, they would be saved.

Captain Deering studied the sweeping red second hand of the chronometer on his wall. Then he turned to face Bessemer.

"I'm going up to the astrogation dome with Bliven. I expect Hammermill to stir up some trouble, and there'll probably be more passengers coming down to ask questions."

"What should I say, sir?"

"Tell them nothing," Deering said firmly. "There's no reason why they should find out we're going to smack into the Sound until the split second we do it – and we won't have to worry about that if Stanley can get his rocket up here."

"You think White Sands can get a rocket up here in time?" Bessemer asked.

Deering nodded. "I don't doubt it," he said. He watched the lieutenant's eyes light up at the thought that the catastrophe off Bridgeport might yet be averted, and turned

away. "Keep the paying customers calm and collected, Bessemer. And don't bother me unless it's absolutely necessary."

Edouard Descartes André, left alone, stared feverishly at the row of shining rivets studding the wall immediately in front of him.

It's all a trick, he told himself. *They've found out somehow that Hammermill and I were running that con game with the beetles on Mars, and they know that if they can get us before we reach Earth soil they have us. They must have changed the orbit of the ship somehow in order to drop the two of us off at that Space Station instead of taking us to Earth. That way they can extradite us somehow right back to Mars. Oh, the stinkers. The dirty stinkers.*

He kicked savagely against the wall. The recoil shot him instantly across the cabin, where he fetched up against the other wall with a gentle thump.

The dirty stinkers.

Mrs. Ledbetter's thoughts were running the same way:

If I don't get back to Earth, my nephews divide up my money and even Parksel gets some of it and. . . . Oh, no, Parksel won't get back either . . . and that deal with Consolidated will fall through, and isn't General Enterprises going to love that?

Oh, those swine! Could General En be low enough to sabotage this whole ship just to keep that deal from coming off?

Across the cabin from her, Parksel was frowning nervously. He was worried, too.

Even if I get out of this alive and she doesn't I lose out

on the will. I don't inherit if she dies violently. Damned codicil.

"It's all right, Ruby, baby," Fred Armbruster said almost desperately. "We're going to come through it all right."

Ruby looked at him sharply. "There's no sense trying to talk it away, Fred. Hammermill says we're going to crash, and we'll all be killed." Her eyes were red-rimmed from crying, but she wasn't crying now. She was poised and cool in the face of death, long past the point of hysteria — or so it seemed. In that moment, Fred felt suddenly proud of her.

Then the veneer cracked. "God, I don't want to die!" she screamed. "Can they get a rescue ship up here? Fred, do something! Do something!"

"There's nothing I can do, baby," he said dully.

On the other side of the ship, those same words were being spoken by George MacBride. "There's nothing I can do, Marian."

"Do you think Hammermill's right? We're not decelerating, he says. We're still in free fall."

"The Space Service knows what it's doing," MacBride said hopefully. "They'll get us out of it. You wait. I'll bet a rescue rocket's been dispatched from Earth already."

"Will it get here on time?" Marian asked.

"I hope so," MacBride said. "It better."

The other passengers were going through much the same thing, as the rumors filtered through the *Martian Queen*. Word was spreading, now. As the ship plunged onward at twenty miles per second toward Earth, seventy-

five pairs of passengers discussed and rediscussed the situation, while Captain Deering remained holed up in the astrogation dome with Bliven, and while, on Earth, Major General Neil Stanley crumpled the memorandum that told him the XV–19 was ready, and dropped the wad of paper into his pocket.

The rocket was ready to go. *Good,* he thought.

He grabbed the phone and dialed Experimental.

"Colonel? Stanley here. Received memo. Confirmation?"

"Confirmed," Colonel Arthmore said.

"Fine," said Stanley. "We're ready to send the XV–19 up, then." He gave the officer full and explicit instructions, and recradled the phone. Nothing further remained to do except talk to Washington.

"How's that call to the Pentagon coming?" he asked the sergeant.

"No reply yet, sir. They said this was a high-level decision; the staff would have to assemble."

Stanley glanced at his wristwatch and grinned without humor. There was still time – not much, but enough. "Sure," he said. "Well, relay it to my office when it comes through. I want full vision on the phone; this has to be impressive as all blazes."

"Yes, sir."

"Meanwhile, let me talk to Deering."

"Yes, sir."

The radio was open, but there was a delay of a few seconds before the captain of the *Martian Queen* spoke.

"We've got trouble at this end," Deering said quickly when he came on. "The passengers know we're in trouble.

I've got a hundred and fifty hotheads on my hands now. The situation's ready to blow."

"How did it get out?" Stanley demanded.

"We couldn't keep it secret, Neil – you know that. There was bound to be someone aboard who knew enough to realize we were in trouble, and didn't know enough to keep his mouth shut."

"Well, it'll be easy enough to quiet them down," Stanley said. "Just tell them that a rocket is on its way. See what I mean?"

There was an odd sort of grim humor in Deering's voice. "I'll tell them. Can you send up a teletype to that effect? It'll look more reassuring on paper."

"I'll get it up right away." Stanley paused and took a deep breath. "When the XV–19 gets up there, you may have to guide her in. Can you do that?"

There was no hesitation at the other end. "Sure. Easy. Good luck, Neil. You'll need it."

"I know. And good luck to you."

There was a faint chuckle in Deering's voice as he said: "That sounds like Pooh-Bah's toast to Nanki-Poo. '*Long life to you* – '"

"I didn't meant it that way," Stanley said.

"I know. So long, Neil."

Stanley nodded wordlessly and stood up. "Sergeant, as soon as that call comes from Washington, relay it to my office."

He turned and strode out the door.

V

Lieutenant Bessemer stood his ground in the common room as best he could. He had one hand braced tightly against the wall behind him, and the other doubled up into a fist at his side.

There were over a hundred people in the common at the time, milling uncertainly in the strange free-fall situation, but Bessemer was addressing his words to Jerry Hammermill.

"You've been spreading rumors, Hammermill," the lieutenant said loudly. "You've gotten these people all excited over nothing."

Hammermill started to say something, but a fat man near the bar bellowed, "I wouldn't call it nothing! If we're all in danger, we ought to know about it! We ought to get into the lifeboats!"

Hammermill turned and showed his teeth in a hard grin.

"You're not on an ocean liner, mister. This is a spaceship. There aren't any lifeboats on a spaceship."

A woman was sobbing in the background. No — it was a man.

Mrs. Natalie Ledbetter said quietly, "Will we need parachutes, young man?"

"*Parachutes?*" Hammermill almost laughed. "Parachutes? At twenty miles a second? No, grandma, no parachutes."

The old lady flashed a withering glance at Hammermill. "I was talking to the officer, young man. I'll thank you to shut your silly face; you've caused quite enough trouble

already." She looked at the lieutenant again. "Just what is the situation, young man?"

Bessemer clenched and unclenched his fist. "We are in some trouble," he said, trying to keep his voice cool. "I can't deny that. But the captain has authorized me to tell you that we absolutely will not crash. The ship will not hit Earth."

Fred Armbruster waved a hand in the air. "That's a lie!" he shouted. "That's a dirty lie! Have any of you looked out the viewport? You can see Earth! And we're falling towards it – directly towards it! It covers half the sky dead astern!"

George MacBride turned to face Armbruster. "Keep your mouth shut! You're as bad as Hammermill."

Armbruster's eyes blazed. "Don't tell me to . . . hey, I know you. You work for Breckmann. I can tell you right now, buster, *you're fired!*"

Marian MacBride gasped. George's blocky face assumed a nasty grin. "As long as I'm being fired," he said slowly, "I might as well be fired for something worthwhile." His fist came up in a crashing arc and landed on the point of Armbruster's chin. Armbruster went into a high, curving backflip that brought him up against the farther wall.

MacBride, on the other hand, found himself drifting backwards from the force of the blow. Unable to check his ride, he slammed into Edouard André.

"Who ya shovin'?" André yelled angrily, throwing a punch in sheer reflex action.

It caught MacBride in the ribs, just under the heart, and the Irishman doubled up as he spun in air. Marian MacBride saw what had happened and grabbed an enam-

eled red and gold ashtray from the bar. She hurled it with unerring aim at André's head. The plastic bowl bounced off André's skull and hit another man nearby.

Everyone's nerves were stretched to maximum tension anyway, and at this show of violence, nerves which had been vibrating like violin strings suddenly snapped. Somebody pushed somebody else. Fists began to piston out at faces. There were screams and oaths. Within two seconds, the common room was boiling over with a full-fledged riot. A mob of semihysterical people was finally getting the action it wanted. Subconsciously, each and every one of them knew that action had to be taken, and this was the only type of action it was possible to take.

Mrs. Ledbetter received a foot in the stomach and went flying wildly backwards across the bar. Parksel saw it, and something in his mind clicked. He had thought he hated the old harridan for years – and it wasn't until that moment that he realized exactly how much affection he actually did have for her. He launched himself across the room, kicking off against the rivet-studded bulkhead, and slammed headfirst into the back of the kicker.

Fighting in free fall is not the easiest thing in the universe to do. A well-placed punch has as much effect on puncher as it does on punched. The room was full of floating, drifting, moving bodies which were doing their best to inflict violence on every other body in the vicinity. Only a few people had sense enough to hold on to something.

Ruby Armbruster's stomach was no longer queasy. Her legs were clamped tightly around the cold, streamlined metal of a decorative pillar, and her eyes were hard and

cold as she swung her small fists to keep people away from the unconscious body of her husband.

Lieutenant Bessemer had acted almost immediately. His fist had smashed into Jerry Hammermill's face, and without waiting for further argument he had turned to get out of the room. Screaming raucously, Edouard André launched himself at Bessemer's back, and the two of them slammed against the nearby door. The lieutenant, however, was a spaceman, used to handling himself in free fall, and André was not. Bessemer came out of the scramble with a black eye, but André was unconscious, hovering two feet off the floor, dazed by a rabbit punch to the neck.

Captain Deering was staring through the transparent dome in the nose of the ship at the bright, hard dots of the unmoving stars outside. It was good, he thought, that the ship was falling tail first; having to look at the green bowl of Earth ballooning up towards them would have been unnerving, even for him.

He turned from the dome just as Bessemer burst into the room.

"I told you not to —"

"Sir," Bessemer interrupted, "those people have gone nuts down there! They're tearing up the common room — and each other!"

Deering frowned. "You look like you got one in the eye yourself," he said. "They're really cutting up, eh?"

Bessemer nodded. His left eye was bruised and blackened. "They've lost all control of themselves."

"Hm-m-m." Deering handed the lieutenant a sheet of teletype flimsy. "Get on the PA system and read them this.

Then take it down there and let them get a look at it. Don't try to explain anything."

Bessemer saluted, took the flimsy, and went down the catwalk to the master control panel for the Public Address network. He flipped the switch and took the microphone from its niche.

Your attention please! Your attention please! The ship is falling out of control, but there is absolutely no danger of our hitting Earth. A rocket from the spaceport will be here in two minutes. Repeat: a rocket from the spaceport will be here in two minutes. Please wait quietly, and be ready for it when it comes.

He cut off the PA system and turned to find Deering standing behind him.

"Was that right, sir?"

"That was exactly as it should have been phrased," Deering said. "Take the flimsy down now and show it to them. That ought to quiet them down a little."

Bessemer nodded wordlessly.

The lieutenant made his way through the corridor back to the common room, grasping the handholds along the ceiling to rush his passage.

The common room was strangely quiet when he entered. Everybody who was still conscious was looking at the door as the officer came through it.

He unfolded the teletype flimsy. "Here's the message," he said crisply.

George MacBride, who was nearest Bessemer, took it, and read it. A slow smile crossed his face. "Two minutes, eh? Doesn't give us much time to pack."

"It's a minute and forty-five seconds now," Bessemer

said. "You won't be able to take any personal possessions with you, I'm afraid."

"But does that mean we have to leave our money and baggage here? Can't we take anything along on the rocket?" asked Mrs. Ledbetter. She had a fortune in blue-white Mars diamonds along with her, and she didn't care to lose them without an argument.

"I don't see how you can take anything with you," Lieutenant Bessemer said. He glanced at his watch.

His eyes roved around the common room. Over against the wall was a broad-shouldered man who had simply kept himself out of the free-for-all.

"Father," Bessemer said, "the lives of everyone on this ship are in danger. I wonder if you would lead us in prayer."

The priest nodded gravely.

"Our Father, who art in Heaven —"

VI

Major General Neil Stanley lifted his eyes from the screen before him, and glanced wearily at the clock on the wall above it.

Twenty-three minutes! Had it been only twenty-three minutes since the *Martian Queen* had gone out of control? Had it been only a little more than a quarter of an hour since all hell had broken loose?

Outside, the sun was near its peak height, and blazing down brilliantly on the baked sands of the spaceport. Stanley looked back at the television screen, where the images of five men were pictured — three civilians, and two five-star generals.

Five stars. It would have been nice to get five stars, Stanley thought. Five? It would have been nice to get two. But that would never happen now.

General Hagopian was a short, dark, hawk-nosed man whose chocolate brown eyes reflected shrewd intelligence. He looked out of the screen and said, "The ship will land in Long Island Sound, then?"

"If it's not stopped, yes," Stanley said, for what must have been the twenty-seventh time.

One of the civilians – no one had bothered to tell Stanley exactly which high-level members of the administration he was dealing with – said, "Is there any way at all to get the drive of that ship going again? Don't they carry repair technicians, or something like that?"

"I have Captain Deering's report," Stanley said. "He states flatly that the main converter and the secondaries are absolutely and completely ruined. It would be, I assure you, impossible to fix them in the next fifteen minutes, even with the best intentions."

The civilian ignored the sarcasm. "Well, how about a rescue ship? Couldn't we get one up there in time to take those people off?"

Stanley paused and said, "Sending up a rescue ship is impossible, sir."

"Why's that?"

"It would never make it. They would have to accelerate to take off, decelerate to match velocity with the *Queen,* and then accelerate again to keep from hitting Earth. Counting the time it would take to get all the passengers and the crew off of the *Queen,* it would require" – he made a rough mental computation – "more than an hour,

even if we used all the acceleration the passengers could stand. I'm afraid it won't work."

General Hagopian said: "Then there's absolutely no way we can save them?"

"None whatsoever, sir. There just isn't time."

Another of the civilians said: "We're just lucky this time, I suppose."

"What's that?" Stanley asked.

"I mean, it's too bad all those people have to die, but at least they'll only hit the Sound. It would have been catastrophic if they'd hit a populated area. Only by the merest whisker of fate did that ship aim for the Sound instead of any of the cities on the Eastern Seaboard! Can you imagine what would have happened if the ship had landed in —"

"I'm afraid you don't understand, sir," Stanley said. "It isn't the Sound we have to worry about — it's the *sound.*"

The five men blinked.

"What nonsense is this?" asked General Hagopian.

"Just exactly what I said, sir. It doesn't matter whether that ship lands in the water or not, because it's never going to land in one piece anyway. That ship is coming into Earth at twenty miles per second. When it hits the atmosphere, it's going to go to pieces in a hell of a hurry. It will burn and collapse.

"But its actual impact with Earth's surface isn't going to be the thing that will do the damage. It won't matter whether it comes down in Long Island Sound or in Times Square — it's the impact with the atmosphere that will cause about twenty million deaths."

No one said anything. The five men in the screen looked at him in blank-faced horror.

"You know what happens when a jet plane goes over a city too low?" Stanley said. "A supersonic jet can break windows. What sort of sound wave do you think a five-hundred-metric-ton spaceship will cause at – *seventy-two thousand miles an hour*?

"I'll tell you. It would flatten every structure for miles around. If that ship hits Long Island Sound, New York City will be toppling in ruins before it ever arrives! Every town on Long Island is going to be pancaked. From Newark, New Jersey, to Hartford, Connecticut, that shock wave will knock over everything standing. This isn't a matter of a few people in a ship dying; it's a matter of millions!"

The civilian looked at General Hagopian.

"He's right," said the general, in a strangled voice.

"How much time do we have left?" the civilian demanded, white-faced.

"Only a few minutes," Stanley said coldly. He looked at his watch. "Hardly any time at all."

"Why didn't you call us before this?"

"I called as soon as I heard," Stanley said. "It took time to get all you people together. It took time to compute what was going to happen."

In the background of his screen, he saw two of the civilians engaging in some rapid-fire exchange of conversation.

"Can we evacuate?" the third civilian asked.

"In five or six minutes? Don't be silly." Stanley seemed utterly cool now, in sharp contrast to the five who faced him. "We couldn't have gotten all those people out of that area even if we'd started evacuating the moment the

Queen had its accident – or half a day before, for that matter."

The civilian looked angry, but he said nothing.

"What do you suggest, General?" said Hagopian.

"There's only one thing to do," Stanley said levelly. "We'll have to send up a rocket with an atomic warhead and blast that ship into gas before it hits."

There was a stunned silence. Stanley counted five before anyone spoke. This was the moment he had waited for – the moment when he had to give the brass the only answer to the problem of what to do with the oncoming *Queen*. The reaction was as expected.

The civilian said: "*Are you crazy?* Blow up a hundred and eighty innocent people? There must be some other way."

"But there isn't," Stanley said flatly. "There never has been. There is only one thing to do."

"But we can't permit that!" the civilian protested. "It's murder!"

"Murder? Is it murder to kill people who are already doomed? Is it murder to save the lives of twenty million people? Pardon me for being melodramatic, but I don't like the idea any better than you do. It was difficult for me to convince myself that there was no other way."

"There *must* be another way," said the civilian frantically. "Send up a rescue ship immediately! Hagopian, order him to send up a –"

Stanley's jaw muscles stood out. Without waiting for the civilian to finish speaking, he said, "Look here, you blockhead. Do you understand that it's *impossible* to send up a rescue ship? Do you understand that I can't pull miracles out of a hat? It's as impossible to send up a rescue

ship as it is to catch the *Martian Queen* with your bare hands."

"You can't talk to me that way, General!"

Stanley glanced at Hagopian. The military man was saying nothing, but there was the faint suggestion of a smile around his thin lips.

"I'm simply trying to get you to understand," said Stanley. "All of you. *There is no other way out!* None! Those people are going to die. D-I-E. It would be better if they died without taking a few million people with them. Is that clear?"

Stanley waited for a reply, and, sure enough, it was forthcoming. One of the other civilians said, "Couldn't we divert it from its course somehow?"

"Not without destroying it," Stanley said. "Which is exactly what I want to get permission to do."

"I'm afraid that's impossible, General. The public would never sanction —"

"*The public be damned!* It's the public who is going to die! Die! Do you understand that? Twenty million people! Twenty million corpses to dig out from under ten thousand square miles of rubble!"

"That's ridiculous!" said the third civilian. They were doggedly trying to talk Stanley out of insisting on this thing, it seemed. "How could a shock wave do all that?"

"How could it do it? It's done it! Didn't you ever hear of the Great Siberian Meteor that landed around 1908? It only came in at a speed of ten miles a second or so — half the *Queen's* — and it laid waste hundreds of square miles of forest. Trees fell like matchsticks. And this ship is going about twice as fast!"

"There must be something else we can do," said the first civilian stubbornly.

"All right," Stanley said. "Start making suggestions."

"Well –"

"Exactly. There is nothing else we can do," he repeated. He glanced again at the clock. "Do I have your permission to send up an atomic warhead, then?"

"No!" came the answer. The first civilian was doing all the talking now. "That's out of the question. There must be another way."

"There isn't," Stanley said. "And wishing won't make it so. You can't wish away the laws of the universe – you've got to obey them. And that's exactly what the *Martian Queen* is doing! And that's exactly what New York is going to do when that shock wave hits!"

He paused and stared at them. "I ask you again: do I have permission to send up that bomb?"

"I hardly see how we can sanction it, General. We'll have to find some other way."

Stanley looked at the clock and sighed.

"It's too late now anyway," he said softly. "While we've been haggling, the *Queen* has been falling. It couldn't wait. Even if you ordered it, I couldn't get a bomb up there now."

Two of the men looked fearfully out of the window toward the north. Stanley caught the gesture; he couldn't see the window on his screen, but he knew what they were looking for. From Washington, such a display would be easily visible.

"Oh, it won't land," said Stanley. His voice sounded old and tired. "There won't be any crash. I sent up an XV–19 under robot control several minutes before you gentlemen

got together. It was loaded with a thermonuclear warhead. Captain Deering will – or I should say *has* – guided it in. The *Martian Queen* was vaporized over a minute ago. It was the only thing to do."

One of the men covered his face with his hands. Stanley wondered who he was.

"I presume you know what this means," asked General Hagopian quietly.

"I know," said Stanley. "If I get out of it with a whole skin, I'll still lose everything I've ever worked for. It doesn't matter. At the court-martial, I can still know that I've saved the lives of millions of people."

General Hagopian nodded. "That will be a point in your favor. But there's nothing else we can do, you can see that. You'll have to roast." Then Hagopian looked steadily at Stanley. "You're a very brave man, General. It's too bad that most people will never understand what you did – and why."

Stanley forced a smile. "The people who matter will understand, General. And they're the only ones who count."

Green Fingers

Arthur C. Clarke

I am very sorry, now that it's too late, that I never got to know Vladimir Surov. As I remember him, he was a quiet little man who could understand English but couldn't speak it well enough to make conversation. Even to his colleagues I suspect he was a bit of an enigma. Whenever I went aboard the *Ziolkovski,* he would be sitting in a corner working on his notes or peering through a microscope, a man who clung to his privacy even in the tight and tiny world of a spaceship. The rest of the crew did not seem to mind his aloofness; when they spoke to him, it was clear that they regarded him with tolerant affection, as well as with respect. That was hardly surprising; the work he had done developing plants and trees that could flourish far inside the Arctic Circle had already made him the most famous botanist in Russia.

The fact that the Russian expedition had taken a botanist to the moon had caused a good deal of amusement, though it was really no odder than the fact that there were biologists on both the British and American ships. During the years before the first lunar landing, a good deal of evidence had accumulated hinting that some form of vegetation might exist on the moon, despite its airlessness and lack of water. The president of the U.S.S.R. Academy of Science was one of the leading proponents of this theory, and being too old to make the trip himself had done the next best thing by sending Surov.

The complete absence of any such vegetation, living or fossil, in the thousand or so square miles explored by our

various parties was the first big disappointment the moon had reserved for us. Even those skeptics who were quite certain that no form of life could exist on the moon would have been very glad to have been proved wrong – as of course they were, five years later, when Richards and Shannon made their astonishing discovery inside the great walled plain of Eratosthenes. But *that* revelation still lay in the future; at the time of the first landing, it seemed that Surov had come to the moon in vain.

He did not appear unduly depressed, but kept himself as busy as the rest of the crew studying soil samples and looking after the little hydroponic farm whose pressurized, transparent tubes formed a gleaming network around the *Ziolkovski*. Neither we nor the Americans had gone in for this sort of thing, having calculated that it was better to ship food from Earth than to grow it on the spot – at least until the time came to set up a permanent base. We were right in terms of economics, but wrong in terms of morale. The tiny airtight greenhouses in which Surov grew his vegetables and dwarf fruit trees were on an oasis upon which we often feasted our eyes when we had grown tired of the immense desolation surrounding us.

One of the many disadvantages of being commander was that I seldom had much chance to do any active exploring; I was too busy preparing reports for Earth, checking stores, arranging programs and duty rosters, conferring with my opposite numbers in the American and Russian ships, and trying – not always successfully – to guess what would go wrong next. As a result, I sometimes did not go outside the base for two or three days at a time, and it was a standing joke that my space suit was a haven for moths.

Perhaps it is because of this that I can remember all my trips outside so vividly; certainly I can recall my only encounter with Surov. It was near noon, with the sun high above the southern mountains and the new Earth a barely visible thread of silver a few degrees away from it. Henderson, our geophysicist, wanted to take some magnetic readings at a series of checkpoints a couple of miles to the east of the base. Everyone else was busy, and I was momentarily on top of my work, so we set off together on foot.

The journey was not long enough to merit taking one of the scooters, especially because the charges in the batteries were getting low. In any case, I always enjoyed walking out in the open on the moon. It was not merely the scenery, which even at its most awe-inspiring one can grow accustomed to after a while. No – what I never tired of was the effortless, slow-motion way in which every step took me bounding over the landscape, giving me the freedom that before the coming of space flight men only knew in dreams.

We had done the job and were halfway home when I noticed a figure moving across the plain about a mile to the south of us – not far, in fact, from the Russian base. I snapped my field glasses down inside my helmet and took a careful look at the other explorer. Even at close range, of course, you can't identify a man in a space suit, but because the suits are always coded by color and number that makes no practical difference.

"Who is it?" asked Henderson over the short-range radio channel to which we were both tuned.

"Blue suit, Number Three – that would be Surov. But I don't understand. *He's by himself.*"

It is one of the most fundamental rules of lunar exploration that no one goes anywhere alone on the surface of the moon. So many accidents can happen, which would be trivial if you were with a companion – but fatal if you were by yourself. How would you manage, for example, if your space suit developed a slow leak in the small of the back and you couldn't put on a repair patch? That may sound funny, but it's happened.

"Perhaps his buddy has had an accident and he's going to fetch help," suggested Henderson. "Maybe we had better call him."

I shook my head. Surov was obviously in no hurry. He had been out on a trip of his own, and was making his leisurely way back to the *Ziolkovski*. It was no concern of mine if Commander Krasnin let his people go out on solo trips, though it seemed a deplorable practice. And if Surov was breaking regulations, it was equally no concern of mine to report him.

During the next two months, my men often spotted Surov making his lone way over the landscape, but he always avoided them if they got too near. I made some discreet inquiries and found that Commander Krasnin had been forced, owing to shortage of men, to relax some of his safety rules. But I couldn't find out what Surov was up to, though I never dreamed that his commander was equally in the dark.

It was with an "I told you so" feeling that I got Krasnin's emergency call. We had all had men in trouble before and had had to send out help, but this was the first time anyone had been lost and not replied when his ship had sent out the recall signal. There was a hasty radio

conference, a line of action was drawn up, and search parties fanned out from each of the three ships.

Once again I was with Henderson, and it was only common sense for us to backtrack along the route that we had seen Surov following. It was in what we regarded as "our" territory, quite some distance away from Surov's own ship, and as we scrambled up the low foothills it occurred to me for the first time that the Russian might have been doing something he wanted to keep from his colleagues. What it might be, I could not imagine.

Henderson found him, and yelled for help over his suit radio. But it was much too late; Surov was lying, face down, his deflated suit crumpled around him. He had been kneeling when something had smashed the plastic globe of his helmet; you could see how he had pitched forward and died instantaneously.

When Commander Krasnin reached us, we were still staring at the unbelievable object that Surov had been examining when he died. It was about three feet high, a leathery, greenish oval rooted to the rocks with a widespread network of tendrils. Yes — rooted; for it was a plant. A few yards away were two others, much smaller and apparently dead, since they were blackened and withered.

My first reaction was: "So there *is* life on the moon, after all!" It was not until Krasnin's voice spoke in my ears that I realized how much more marvelous was the truth.

"Poor Vladimir!" he said. "We knew he was a genius, yet we laughed at him when he told us of his dream. So he kept his greatest work a secret. He conquered the Arctic with his hybrid wheat, but *that* was only a be-

ginning. He has brought life to the moon – and death as well."

As I stood there, in that first moment of astonished revelation, it still seemed a miracle. Today, all the world knows the history of "Surov's cactus," as it was inevitably if quite inaccurately christened, and it has lost much of its wonder. His notes have told the full story, and have described the years of experimentation that finally led him to a plant whose leathery skin would enable it to grow upon rocks where even lichens would be hard put to thrive. And we have seen the realization of the second stage of Surov's dream, for the cactus which will forever bear his name has already broken up vast areas of the lunar rock and so prepared a way for the more specialized plants that now feed every human being upon the moon.

Krasnin bent down beside the body of his colleague and lifted it effortlessly against the low gravity. He fingered the shattered fragments of the plastic helment, and shook his head in perplexity.

"What could have happened to him?" he said. "It almost looks as if the plant did it, but that's ridiculous."

The green enigma stood there on the no-longer barren plain, tantalizing us with its promise and its mystery. Then Henderson said slowly, as if thinking aloud:

"I believe I've got the answer – I've just remembered some of the botany I did at school. If Surov designed this plant for lunar conditions, how would he arrange for it to propagate itself? The seeds would have to be scattered over a very wide area in the hope of finding a few suitable places to grow. There are no birds or animals here to carry them, in the way that happens on Earth. I can only

think of one solution – and some of our terrestrial plants have already used it."

He was interrupted by my yell. Something had hit with a resounding clang against the metal waistband of my suit. It did no damage, but it was so sudden and unexpected that it took me utterly by surprise.

A seed lay at my feet, about the size and shape of a plum stone. A few yards away, we found the one that had shattered Surov's helmet as he bent down. He must have known that the plant was ripe, but in his eagerness to examine it he had forgotten what that implied. I have seen a cactus throw its seed a quarter of a mile under the low lunar gravity. Surov had been shot at point-blank range by his own creation.

Victory Unintentional

Isaac Asimov

The spaceship leaked, as the saying goes, like a sieve. It was supposed to. In fact, that was the whole idea.

The result, of course, was that during the journey from Ganymede to Jupiter, the ship was crammed just as full as it could be with the very hardest space vacuum. And since the ship also lacked heating devices, this space vacuum was at normal temperature, which is a fraction of a degree above absolute zero. This, also, was according to plan. Little things like the absence of heat and air didn't annoy anyone at all on that particular spaceship.

The first near-vacuum wisps of Jovian atmosphere began percolating into the ship several thousand miles above the Jovian surface. It was practically all hydrogen, though perhaps a careful gas analysis might have located a trace of helium as well. The pressure gauges began creeping skyward.

That creep continued at an accelerating pace as the ship dropped downward in a Jupiter-circling spiral. The pointers of successive gauges, each designed for progressively higher pressures, began to move until they reached the neighborhood of a million or so atmospheres, where figures lost most of their meaning. The temperature, as recorded by thermocouples, rose slowly and erratically, and finally steadied at about seventy below zero, centigrade.

The ship moved slowly toward the end, plowing its way heavily through a maze of gas molecules that crowded together so closely that hydrogen itself was

squeezed to the density of a liquid. Ammonia vapor, drawn from the incredibly vast oceans of that liquid, saturated the horrible atmosphere. The wind, which had begun a thousand miles higher, had risen to a pitch inadequately described as a hurricane. It was quite plain long before the ship landed on a fairly large Jovian island, perhaps seven times the size of Asia, that Jupiter was not a very pleasant world.

And yet the three members of the crew thought it was. They were quite convinced it was. But then, the three members of the crew were not exactly human. And neither were they exactly Jovian. They were simply robots designed on Earth, for Jupiter.

ZZ Three said, "It appears to be a rather desolate place."

ZZ Two joined him and regarded the wind-blasted landscape somberly. "There are structures of some sort in the distance," he said, "which are obviously artificial. I suggest we wait for the inhabitants to come to us."

Across the room, ZZ One listened, but made no reply. He was the first constructed of the three, and half-experimental. Consequently, he spoke a little less frequently than his two companions.

The wait was not too long. An air vessel of queer design swooped overhead. More followed. And then a line of ground vehicles approached, took position, and disgorged organisms. Along with the organisms came various inanimate accessories that might have been weapons. Some of these were borne by a single Jovian, some by several, and some advanced under their own power, with Jovians perhaps inside. The robots couldn't tell.

ZZ Three said, "They're all around us now. The logical

peaceful gesture would be to come out in the open. Agreed?"

It was, and ZZ One shoved open the heavy door, which was not double, nor for that matter, particularly airtight.

Their appearance through the door was the signal for an excited stir among the surrounding Jovians. Things were done to several of the very largest of the inanimate accessories, and ZZ Three became aware of a temperature rise on the outer ring of his beryllium-iridium-bronze body.

He glanced at ZZ Two, "Do you feel it? They're aiming heat energy at us, I believe."

ZZ Two indicated his surprise. "I wonder why?"

"Definitely a heat ray of some sort. Look at that!"

One of the rays had been jarred out of alignment for some undiscernible cause, and its line of radiation intersected a brook of sparkling pure ammonia – which promptly boiled furiously.

ZZ Three turned to ZZ One. "Make a note of this, One, will you?"

"Sure!" It was to ZZ One that the routine secretarial work fell and his method of taking a note was to make a mental addition to the accurate memory scroll within him. He had already gathered the hour-by-hour record of every important instrument on board ship during the trip to Jupiter. He added agreeably, "What reason shall I put for the reaction? The human masters would probably enjoy knowing."

"No reason. Or better," Three corrected himself, "no apparent reason. You might say the maximum temperature of the ray was about plus thirty, centigrade."

Two interrupted, "Shall we try communicating?"

"It would be a waste of time," said Three. "There can't be more than a very few Jovians who know the radio-click code that's been developed between Jupiter and Ganymede. They'll have to send for one, and when he comes, he'll establish contact soon enough. Meanwhile, let's watch them. I don't understand their actions, I tell you frankly."

Nor did understanding come immediately. Heat radiation ceased, and other instruments were brought to the forefront and put into play. Several capsules fell at the feet of the watching robots, dropping rapidly and forcefully under Jupiter's gravity. They popped open and a blue liquid exuded, forming pools which proceeded to shrink rapidly by evaporation. The nightmare wind whipped the vapors away and where those vapors went, Jovians scrambled out of the way. One was too slow, threshed about wildly, and became very limp and still.

ZZ Two bent, dabbled a finger in one of the pools and stared at the dripping liquid. "I think this is oxygen," he said.

"Oxygen, all right," agreed Three. "This becomes stranger and stranger. It must certainly be a dangerous practice, for I would say that oxygen is poisonous to the creatures. One of them died!"

There was a pause, and then ZZ One, whose greater simplicity led at times to an increased directness of thought, said heavily, "It might be that these strange creatures in a rather childish way are attempting to destroy us."

And Two, struck by the suggestion, answered, "You know, Three, I think he's right!"

There had been a slight lull in Jovian activity and now

a new structure was brought up. It possessed a slender rod that pointed skyward through the impenetrable Jovian murk. It stood with a rigidity in that starkly incredible wind that plainly indicated remarkable structural strength. From its tip came a cracking and then a flash that lit up the depths of the atmosphere into a gray fog.

For a moment the robots were bathed in clinging radiance and then Three said thoughtfully, "High-tension electricity! Quite respectable power, too. One, I think you're right. After all, the human masters have told us that these creatures seek to destroy all humanity. And organisms possessing such insane viciousness as to harbor a thought of harm against a human being—" his voice trembled at the thought—"would scarcely scruple at attempting to destroy us."

"It's a shame to have such distorted minds," said ZZ One. "Poor fellows!"

"I find it a very saddening thought," admitted Two. "Let's go back to the ship. We've seen enough for now."

They did so, and settled down to wait. As ZZ Three said, Jupiter was a roomy planet, and it might take time for Jovian transportation to bring a radio-code expert to the ship. However, patience is a cheap commodity to robots.

As a matter of fact, Jupiter turned on its axis three times, according to the chronometer, before the expert arrived. The rising and setting of the sun made no difference, of course, to the dead darkness at the bottom of three thousand miles of liquid-dense gas, so that one could not speak of day and night. But then, neither Jovian nor robot saw by visible light radiation and so that didn't matter.

Through this thirty-hour interval, the surrounding Jovi-

ans continued their attack with a patience and persevering relentlessness concerning which robot ZZ One made a good many mental notes. The ship was assaulted by as many varieties of forces as there were hours, and the robots observed every attack attentively, analyzing such weapons as they recognized. They by no means recognized all.

But the human masters had built well. The ship and the robots had taken fifteen years to construct, and their essentials could be expressed in a single phrase – raw strength. The attack spent itself uselessly and neither ship nor robot seemed the worse for it.

Three said, "This atmosphere handicaps them, I think. They can't use atomic disruptors, since they would only tear a hole in that soupy air and blow themselves up."

"They haven't used high explosives either," said Two, "which is well. They couldn't have hurt us, naturally, but it would have thrown us about a bit."

"High explosives are out of the question. You can't have an explosive without gas expansion and gas just can't expand in this atmosphere."

"It's a very good atmosphere," muttered One. "I like it."

Which was natural, because he was built for it. The ZZ robots were the first robots ever turned out by the United States Robot and Mechanical Men Corporation that were not even faintly human in appearance. They were low and squat, with a center of gravity less than a foot above ground level. They had six legs apiece, stumpy and thick, designed to lift tons against two and a half times normal Earth gravity. Their reflexes were that many times Earth-normal speed, to make up for the gravity. And they were composed of a beryllium-iridium-bronze alloy that was

proof against any known corosive agent, also any known destructive agent short of a thousand-megatron atomic disruptor, under any conditions whatsoever.

To dispense with further description, they were indestructible, and so impresisvely powerful that they were the only robots ever built on whom the roboticists of the corporation had never quite had the nerve to pin a serial-number nickname. One bright young fellow had suggested Sissy One, Two, and Three— but not in a very loud voice, and the suggestion was never repeated.

The last hours of the wait were spent in a puzzled discussion to find a possible description of a Jovian's appearance. ZZ One had made a note of their possession of tentacles and of their radial symmetry — and there he had stuck. Two and Three did their best, but couldn't help.

"You can't very well describe anything," Three declared finally, "without a standard of reference. These creatures are like nothing I know of — completely outside the positronic paths of my brain. It's like trying to describe gamma light to a robot unequipped for gamma-ray reception."

It was just at that time that the weapon barrage ceased once more. The robots turned their attention to outside the ship.

A group of Jovians were advancing in curiously uneven fashion, but no amount of careful watching could determine the exact method of their locomotion. How they used their tentacles was uncertain. At times the organisms took on a remarkable slithering motion, and then they moved at great speed, perhaps with the wind's help, for they were moving downwind.

The robots stepped out to meet the Jovians, who halted

ten feet away. Both sides remained silent and motionless.

ZZ Two said, "They must be watching us, but I don't know how. Do either of you see any photosensitive organs?"

"I can't say," grunted Three in response. "I don't see anything about them that makes sense at all."

There was a sudden metallic clicking from among the Jovian group and ZZ One said delightedly, "It's the radio code. They've got the communications expert here."

It was, and they had! The complicated dot-dash system that over a period of twenty-five years had been laboriously developed by the beings of Jupiter and the Earthmen of Ganymede into a remarkably flexible means of communication, was finally being put into practice at close range.

One Jovian remained in the forefront now, the others having fallen back. It was he that was speaking. The clicking said, "Where are you from?"

ZZ Three, as the most mentally advanced, naturally assumed spokesmanship for the robot group. "We are from Jupiter's satellite, Ganymede."

The Jovian continued, "What do you want?"

"Information. We have come to study your world and to bring back our findings. If we could have your cooperation— "

The Jovian clicking interrupted: "You must be destroyed!"

ZZ Three paused and said in a thoughtful aside to his two companions, "Exactly the attitude the human masters said they would take. They are very unusual."

Returning to his clicking, he asked simply, "Why?"

The Jovian evidently considered certain questions too

obnoxious to be answered. He said, "If you leave within a single period of revolution, we will spare you – until such time as we emerge from our world to destroy the un-Jovian vermin of Ganymede."

"I would like to point out," said Three, "that we of Ganymede and the inner planets – "

The Jovian interrupted, "Our astronomy knows of the sun and of our four satellites. There are no inner planets."

Three conceded the point wearily. "We of Ganymede, then. We have no designs on Jupiter. We're prepared to offer friendship. For twenty-five years your people communicated freely with the human beings of Ganymede. Is there any reason to make sudden war upon the humans?"

"For twenty-five years," was the cold response, "we assumed the inhabitants of Ganymede to be Jovians. When we found out they were not, and that we had been treating lower animals on the scale of Jovian intelligences, we were bound to take steps to wipe out the dishonor." Slowly and forcefully he finished, "We of Jupiter will suffer the existence of no vermin!"

He was backing away in some fashion, tacking against the wind, and the interview was evidently over.

The robots retreated inside the ship.

ZZ Two said, "It looks bad, doesn't it?" He continued thoughtfully, "It is as the human masters said. They possess an ultimately developed superiority complex, combined with an extreme intolerance for anyone or anything that disturbs that complex."

"The intolerance," observed Three, "is the natural consequence of the complex. The trouble is that their intolerance has teeth in it. They have weapons – and their science is great."

"I am not surprised now," burst out ZZ One, "that we were specifically instructed to disregard Jovian orders. They are horrible, intolerant, pseudo-superior beings!" He added emphatically, with robotical loyalty and faith, "No human master could ever be like that."

"That, though true, is beside the point," said Three. "The fact remains that the human masters are in terrible danger. This is a gigantic world and these Jovians are greater in numbers and resources by a hundred times or more than the humans of the entire Terrestrial Empire. If they can ever develop the force field to the point where they can use it as a spaceship hull – as the human masters have already done – they will overrun the system at will. The question remains as to how far they have advanced in that direction, what other weapons they have, what preparations they are making, and so on. To return with that information is our function, of course, and we had better decide on our next step."

"It may be difficult," said Two. "The Jovians won't help us." Which, at the moment, was rather an understatement.

Three thought a while. "It seems to me that we need only wait," he observed. "They have tried to destroy us for thirty hours now and haven't succeeded. Certainly they have done their best. Now a superiority complex always involves the eternal necessity of saving face, and the ultimatum given us proves it in this case. They would never allow us to leave if they could destroy us. But if we don't leave then, rather than admit they cannot force us away, they will surely pretend that they are willing, for their own purposes, to have us stay."

Once again, they waited. The day passed. The weapon barrage did not resume. The robots did not leave. The

bluff was called. And now the robots faced the Jovian radio-code expert once again.

If the ZZ models had been equipped with a sense of humor, they would have enjoyed themselves immensely. As it was, they felt merely a solemn sense of satisfaction.

The Jovian said, "It has been our decision that you will be allowed to remain for a very short time, so that you may see our power for yourself. You shall then return to Ganymede to inform your companion vermin of the disastrous end to which they will unfailingly come within a solar revolution."

ZZ One made a mental note that a Jovian revolution took twelve Earthly years.

Three replied casually, "Thank you. May we accompany you to the nearest town? There are many things we would like to learn." He added as an afterthought, "Our ship is not to be touched, of course."

He said this as a request, not as a threat, for no ZZ model was ever pugnacious. All capacity for even the slightest annoyance had been carefully barred in their construction. With robots as vastly powerful as the ZZs, unfailing good temper was essential for safety during the years of testing on Earth.

The Jovian said, "We are not interested in your verminous ship. No Jovian will pollute himself by approaching it. You may accompany us, but you must on no account approach closer than ten feet to any Jovian, or you will be instantly destroyed."

"Stuck up, aren't they?" observed Two in a genial whisper, as they plowed into the wind.

The town was a port on the shores of an incredible ammonia lake. The eternal wind whipped furious, frothy

waves that shot across the liquid surface at the hectic rate enforced by the gravity. The port itself was neither large nor impressive and it seemed fairly evident that most of the construction was underground.

"What is the population of this place?" asked Three.

The Jovian replied, "It is a small town of ten million."

"I see. Make a note of that, One."

ZZ One did so mechanically, and then turned once more to the lake, at which he had been staring in fascination. He pulled at Three's elbow. "Say, do you suppose they have fish here?"

"What difference does it make?"

"I think we ought to know. The masters ordered us to find out everything we could." Of the robots, One was the simplest and consequently the one who took orders in the most literal fashion.

Two said, "Let One go and look if he likes. It won't do any harm if we let the kid have his fun."

"All right. There's no real objection if he doesn't waste his time. Fish isn't what we came for – but go ahead, One."

ZZ One made off in great excitement and slogged rapidly down the beach, plunging into the ammonia with a splash. The Jovians watched attentively. They had understood none of the previous conversation, of course.

The radio-code expert clicked out, "It is apparent that your companion has decided to abandon life in despair at our greatness."

Three said in surprise, "Nothing of the sort. He wants to investigate the living organisms, if any, that live in the ammonia." He added apologetically, "Our friend is very curious at times, and he isn't quite as bright as we are,

though that is only his misfortune. We understand that and try to humor him whenever we can."

There was a long pause, and the Jovian observed, "He will drown."

Three replied casually, "No danger of that. We don't drown. May we enter the town as soon as he returns?"

At that moment there was a spurt of liquid several hundred feet out in the lake. It sprayed upward wildly and then hurtled down in a wind-driven mist. Another spurt and another, then a wild white foaming that formed a trail toward shore, gradually quieting as it approached.

The two robots watched this in amazement and the utter lack of motion on the part of the Jovians indicated that they were watching as well.

Then the head of ZZ One broke the surface and he made his slow way out onto dry land. But something followed him! Some organism of gigantic size, that seemed nothing but fangs, claws, and spines. Then they saw that it wasn't following him under its own power, but was being dragged across the beach by ZZ One. There was a significant flabbiness about it.

ZZ One approached rather timidly and took communication into his own hands. He tapped out a message to the Jovian in agitated fashion. "I am very sorry this happened, but the thing attacked me. I was merely taking notes on it. It is not a valuable creature, I hope."

He was not answered immediately, for at the first appearance of the monster, there had been a wild break in the Jovian ranks. These reformed slowly and cautious observation having proven the creature to be indeed dead, order was restored. Some of the bolder were curiously prodding the body.

ZZ Three said humbly, "I hope you will pardon our friend. He is sometimes clumsy. We have absolutely no intention of harming any Jovian creature."

"He attacked me," explained One. "He bit at me without provocation. See!" And he displayed a two-foot fang that ended in a jagged break. "He broke it on my shoulder and almost left a scratch. I just slapped it a bit to send it away – and it died. I'm sorry!"

The Jovian finally spoke and his code clicking was a rather stuttery affair: "It is a wild creature, rarely found so close to shore, but the lake is deep just here."

Three said, still anxiously, "If you can use it for food, we are only too glad – "

"No. We can get food for ourselves without the help of verm– without the help of others. Eat it yourselves."

At that ZZ One heaved the creature up and back into the sea, with an easy motion of one arm. Three said casually, "Thank you for your kind offer, but we have no use for food. We don't eat, of course."

Escorted by two hundred or so armed Jovians, the robots passed down a series of ramps into the underground city. If, above the surface, the city had looked small and unimpressive, from beneath it took on the appearance of a vast megalopolis.

They were ushered into ground cars that were operated by remote control – for no honest, self-respecting Jovian would risk his superiority by placing himself into the same car with vermin – and driven at frightful speed to the center of the town. They saw enough to decide that it extended fifty miles from end to end and reached downward into Jupiter's crust at least eight miles.

ZZ Two did not sound happy as he said, "If this is a

sample of Jovian development then we shall not have a hopeful report to bring back to the human masters. After all, we landed on the vast surface of Jupiter at random, with the chances a thousand to one against coming near any really concentrated center of population. This must be, as the code expert says, a mere town."

"Ten million Jovians," said Three abstractedly. "Total population must be in the trillions, which is high, very high, even for Jupiter. They probably have a completely urban civilization, which means that their scientific development must be tremendous. If they have force fields – "

He had no neck, for in the interest of strength the heads of the ZZ models were riveted firmly onto the torso with the delicate positronic brains protected by three separate layers of inch-thick iridium alloy. But if he had had one, he would have shaken his head dolefully.

They had stopped now in a cleared space. Everywhere about them they could see avenues and structures crowded with Jovians, as curious as any Terrestrial crowd would have been in similar circumstances.

The code expert approached. "It is time now for me to retire until the next period of activity. We have gone so far as to arrange quarters for you at great inconvenience to ourselves for, of course, the structure will have to be pulled down and rebuilt afterward. Nevertheless, you will be allowed to sleep for a space."

ZZ Three waved an arm in deprecation and tapped out, "We thank you but you must not trouble yourself. We don't mind remaining right here. If you want to sleep and rest, by all means do. We'll wait for you. As for us," casually, "we don't sleep."

The Jovian said nothing, though if it had had a face, the

expression upon it might have been interesting. It left, and the robots remained in the car, with squads of well-armed Jovians, frequently replaced, surrounding them as guards.

It was hours before the ranks of those guards parted to allow the code expert to return. Along with him were other Jovians, whom he introduced.

"There are with me two officials of the central government who have graciously consented to speak with you."

One of the officials evidently knew the code, for his clicking interrupted the code expert sharply. He addressed the robots, "Vermin! Emerge from the ground car that we may look at you."

The robots were only too willing to comply, so while Three and Two vaulted over the right side of the car, ZZ One dashed through the left side. Since he neglected to work the mechanism that lowered a section of side so that one might exit, he carried that side, plus two wheels and an axle, along with him. The car collapsed, and ZZ One stood staring at the ruins in embarrassed silence.

At last he clicked out gently, "I'm very sorry. I hope it wasn't an expensive car."

ZZ Two added apologetically, "Our companion is often clumsy. You must excuse him," and ZZ Three made a half-hearted attempt to put the car back together again.

ZZ One made another effort to excuse himself. "The material of the car was rather flimsy. You see?" He lifted a square-yard sheet of three-inch-thick, metal-hard plastic in both hands and exerted a bit of pressure. The sheet promptly snapped in two. "I should have made allowances," he admitted.

The Jovian government official said in slightly less

sharp fashion, "The car would have had to be destroyed anyway, since being polluted by your presence." He paused, then: "Creatures! We Jovians lack vulgar curiosity concerning lower animals, but our scientists seek facts."

"We're right with you," replied Three cheerfully: "so do we."

The Jovian ignored him. "You lack the mass-sensitive organ, apparently. How is it that you are aware of distant objects?"

Three grew interested, "Do you mean your people are directly sensitive to mass?"

"I am not here to answer your questions — your impudent questions — about us."

"I take it then that objects of low specific mass would be transparent to you, even in the absence of radiation." He turned to Two. "That's how they see. Their atmosphere is as transparent as space to them."

The Jovian clicking began once more, "You will answer my first question immediately, or my patience will end and I will order you destroyed."

Three said at once, "We are energy-sensitive, Jovian. We can adjust ourselves to the entire electromagnetic scale at will. At present, our long-distance sight is due to radio-wave radiation that we emit ourselves, and at close range, we see by — " He paused, and said to Two, "There isn't any code word for gamma ray, is there?"

"Not that I know of," Two answered.

Three continued to the Jovian: "At close range we see by other radiation for which there is no code word."

"Of what is your body composed?" demanded the Jovian.

Two whispered, "He probably asks that because his

mass-sensitivity can't penetrate past our skin. High density, you know. Ought we to tell him?"

Three replied uncertainly, "Our human masters didn't particularly say we were to keep anything secret." In radio code, to the Jovian, he said, "We are mostly iridium. For the rest copper, tin, a little beryllium, and a scattering of other substances."

The Jovians fell back and by the obscure writhing of various portions of their thoroughly indescribable bodies gave the impression that they were in animated conversation, although they made no sound.

And then the official returned. "Beings of Ganymede! It has been decided to show you through some of our factories that we may exhibit a tiny part of our great achievements. We will then allow you to return so that you may spread despair among the other verm— the other beings of the outer world."

Three said to Two, "Note the effect of their psychology. They must hammer home their superiority. It's still a matter of saving face." And in radio code: "We thank you for the opportunity."

But the face saving was efficient, as the robots realized soon enough. The demonstration became a tour, and the tour a grand exhibition. The Jovians displayed everything, explained everything, answered all questions eagerly, and ZZ One made hundreds of despairing notes.

The war potential of that single so-called unimportant town was greater by several times than that of all Ganymede. Ten more such towns would outproduce all the Terrestrial Empire. Yet ten more such towns would not be the fingernail fragment of the strength all Jupiter must be able to exert.

Three turned as One nudged him, "What is it?"

ZZ One said seriously, "If they have force fields, the human masters are lost, aren't they?"

"I'm afraid so. Why do you ask?"

"Because the Jovians aren't showing us through the right wing of this factory. It might be that force fields are being developed there. They would be wanting to keep it secret if they were. We'd better find out. It's the main point, you know."

Three regarded One somberly. "Perhaps you're right. It's no use ignoring anything." They were in a huge steel mill now, watching hundred-foot beams of ammonia-resistant silicon-steel alloy being turned out twenty to the second. Three asked quietly, "What does that wing contain?"

The government official inquired of those in charge of the factory and explained, "That is the section of great heat. Various processes require huge temperatures which life cannot bear, and they must all be handled indirectly."

He led the way to a partition from which heat could be felt to radiate, and indicated a small, round area of transparent material. It was one of a row of such, through which the foggy red light of lines of glowing forges could be made out through the soupy atmosphere.

ZZ One fastened a look of suspicion on the Jovian and clicked out, "Would it be all right if I went in and looked around? I am very interested in this."

Three said, "You're being childish, One. They're telling the truth. Oh, well, nose around if you must. But don't take too long, we've got to move on."

The Jovian said, "You have no understanding of the heat involved. You will die."

"Oh no!" explained One casually. "Heat doesn't bother us."

There was a Jovian conference, and then a scene of scurrying confusion as the life of the factory was geared to this unusual emergency. Screens of heat-absorbent material were set up, and then a door dropped open, a door that had never before budged while the forges were working. ZZ One entered and the door closed behind him. Jovian officials crowded to the transparent areas to watch.

ZZ One walked to the nearest forge and tapped the outside. Since he was too short to see into it comfortably, he tipped the forge until the molten metal licked at the lip of the container. He peered at it curiously, then dipped his hand in and stirred it awhile to test the consistency. Having done this, he withdrew his hand, shook off some of the fiery metallic droplets, and wiped the rest on one of his six thighs. Slowly, he went down the line of forges, then signified his desire to leave.

The Jovians retired to a great distance when he came out the door and played a stream of ammonia on him, which hissed, bubbled, and steamed until he was brought to bearable temperature once more.

ZZ One ignored the ammonia shower and said, "They were telling the truth. No force fields!"

Three began, "You see—" but One interrupted impatiently, "But there's no use delaying. The human masters instructed us to find out everything and that's that." He turned to the Jovian and clicked out, without the slightest hesitation, "Has Jovian science developed force fields?"

Bluntness was, of course, one of the natural consequences of One's more poorly developed mental powers.

Two and Three knew that, so they refrained from expressing disapproval of the remark.

The Jovian official relaxed slowly from his strangely stiffened attitude, which had somehow given the impression that he had been staring stupidly at One's hand – the one he had dipped into the molten metal.

The Jovian said slowly, "Force fields? That, then, is your main object of curiosity?"

"Yes," said One, with emphasis.

There was a sudden and patent gain in confidence on the Jovian's part, for the clicking grew sharper: "Then come, vermin!"

Whereupon Three said to Two, "We're vermin again, I see – which sounds as if there's bad news ahead." And Two gloomily agreed.

It was to the very edge of the city that they were now led – to the portion which on Earth would have been termed the suburbs – and into one of a series of closely integrated structures, which might have corresponded vaguely to a Terrestrial university. There were no explanations, however, and none were asked for. The Jovian official led the way rapidly, and the robots followed with the grim conviction that the worst was just about to happen.

It was ZZ One who stopped before an opened wall section after the rest had passed on. "What's this?" he wanted to know.

The room was equipped with narrow, low benches, along which Jovians manipulated rows of strange devices, of which strong inch-long electromagnets formed the principal feature.

"What's this?" asked One again.

The Jovian turned back and exhibited impatience. "This is a student's biological laboratory. There's nothing there to interest you."

"But what are they doing?"

"They are studying microscopic life. Haven't you ever seen a microscope before?"

Three interrupted in explanation, "He has, but not that type. Our microscopes are meant for energy-sensitive organs and work by refraction of radiant energy. Your microscopes evidently work on a mass-expansion basis. Rather ingenious."

ZZ One said, "Would it be all right if I inspected some of your specimens?"

"Of what use will that be? You cannot use our microscopes because of your sensory limitations and it will simply force us to discard such specimens as you approach for no decent reason."

"But I don't need a microscope," explained One, with surprise. "I can easily adjust myself for microscopic vision."

He strode to the nearest bench, while the students in the room crowded to the corner in an attempt to avoid contamination. ZZ One shoved a microscope aside, and inspected the slide carefully. He backed away puzzled; then tried another, a third, a fourth.

He came back and addressed the Jovian. "Those are supposed to be alive, aren't they? I mean, those little worm things."

The Jovian said, "Certainly."

"That's strange! When I look at them – they die!"

Three exclaimed sharply, and said to his two companions, "We've forgotten our gamma-ray radiation. Let's

get out of here, One, or we'll kill every bit of microscopic life in the room." He turned to the Jovian, "I'm afraid that our presence is fatal to weaker forms of life. We had better leave. We hope the specimens are not too difficult to replace. And, while we're about it, you had better not stay too near us, or our radiation may affect you adversely. You feel all right so far, don't you?" he asked.

The Jovian led the way onward in proud silence, but it was to be noticed that thereafter he doubled the distance he had hitherto kept between himself and them.

Nothing more was said until the robots found themselves in a vast room. In the very center of it huge ingots of metal rested unsupported in midair — or, rather, supported by nothing visible — against the mighty Jovian gravity.

The Jovian clicked, "There is your force field in ultimate form, as recently perfected. Within that bubble is a vacuum, so that it is supporting the full weight of our atmosphere plus an amount of metal equivalent to two large spaceships. What do you say to that?"

"Then space travel now becomes a possibility for you," said Three.

"Definitely. No metal or plastic has the strength to hold our atmosphere against a vacuum; but a force field can — and a force-field bubble will be our spaceship! Within the year, we will be turning them out by the hundreds of thousands. Then we will swarm down upon Ganymede to destroy the verminous so-called intelligences that attempt to dispute our dominion of the universe."

"The human beings of Ganymede have never attempted — " began Three, in mild expostulation.

"Silence!" snapped the Jovian. "Return now and tell

them what you've seen. Their own feeble force fields – such as the one your ship is equipped with – will not stand against us, for our smallest ship will be a hundred times the size and power of yours."

Three said, "Then there's nothing more to do and we will return, as you say, with the information. If you could lead us back to our ship, we'll say good-bye. But by the way, just as a matter for the record, there's something you don't understand. The humans of Ganymede have force fields, of course, but our particular ship isn't equipped with one. We don't need any."

The robot turned away and motioned his companions to follow. For a moment they did not speak, then ZZ One muttered dejectedly, "Can't we try to destroy this place?"

"It won't help," said Three. "They'd get us by weight of numbers. It's no use. In an earthly decade, the human masters will be finished. It is impossible to stand against Jupiter. There's just too damn much of it. As long as they were tied to the surface, the humans were safe. But now that they have force fields – all we can do is to bring the news. By the preparation of hiding places, some few may survive for a short while."

The city was behind them. They were out on the open plain by the lake with their ship a dark spot on the horizon when the Jovian spoke suddenly: "Creatures, you say you have no force field?"

Three replied without interest, "We don't need one."

"How then does your ship stand the vacuum of space without exploding because of the atmospheric pressure within?" And he moved a tentacle as if in mute gesture at the Jovian atmosphere that was weighing down upon

them with a force of twenty million pounds to the square inch.

"Well," explained Three, "that's simple. Our ship isn't airtight. Pressures equalize within and without."

"Even in space? A vacuum in your ship? You lie!"

"You're welcome to inspect our ship. It has no force field and it isn't airtight. What's marvelous about that? We don't breathe. Our energy is through direct atomic power. The presence or absence of air pressure makes little difference to us and we're quite at home in a vacuum."

"But absolute zero!"

"It doesn't matter. We regulate our own heat. We're not interested in outside temperatures." He paused. "Well, we can make our own way back to the ship. Good-bye. We'll give the humans of Ganymede your message — war to the end!"

But the Jovian said, "Wait! I'll be back." He turned and went toward the city.

The robots stared, and then waited in silence.

It was three hours before he returned and when he did, it was in breathless haste. He stopped within the usual ten feet of the robots, but then began inching his way forward in a curious groveling fashion. He did not speak until his rubbery gray skin was almost touching them, and when the radio code sounded, subdued and respectful.

"Honored sirs, I have been in communication with the head of our central government, who is now aware of all the facts, and I can assure you that Jupiter desires only peace."

"I beg your pardon," said Three blankly.

The Jovian drove on hastily: "We are ready to resume communication with Ganymede and will gladly promise

to make no attempt to venture out into space. Our force field will be used only on the Jovian surface."

"But – " Three began.

"Our government will be glad to receive any other representatives our honorable human brothers of Ganymede would care to send. If your honors will now condescend to swear peace – " A scaly tentacle swung out toward them, and Three, quite dazed, grasped it. Two and One did likewise as two more were extended to them.

The Jovian said solemnly, "There is then eternal peace between Jupiter and Ganymede."

The spaceship which leaked like a sieve was out in space again. The pressure and temperature were once more at zero, and the robots watched the huge but steadily shrinking globe that was Jupiter.

"They're definitely sincere," said ZZ Two, "and it's very gratifying, this complete about-face, but I don't get it."

"It is my idea," observed ZZ One, "that the Jovians came to their senses just in time and realized the incredible evil involved in the thought of harm to a human master. That would be only natural."

ZZ Three sighed and said, "Look, friends, it's all a matter of psychology. Those Jovians had a superiority complex a mile thick and when they couldn't destroy us, they were bound to save face. All their exhibitions, all their explanations, were simply a form of braggadocio, designed to impress us into the proper state of humiliation before their power and superiority."

"I see all that," interrupted Two, "but – "

Three went on. "But it worked the wrong way. All they did was to prove to themselves that we were stronger, that we didn't drown, that we didn't eat or sleep, that molten

metal didn't hurt us. Even our very presence was fatal to Jovian life. Their last trump was the force field. But when they found out that *we* didn't need them at all, and could live in a vacuum at absolute zero, they broke." He paused, and added philosophically, "When a superiority complex like that breaks, it breaks all the way."

The other two considered that, and then Two said, "But it still doesn't make sense. Why should they care what we can or can't do? We're only robots. We're not the ones they have to fight."

"And that's the whole point, Two," said Three softly. "It's only after we left Jupiter that I thought of it. Do you know that through an oversight, quite unintentionally, we neglected to tell them we were only robots?"

"They never asked us," said One.

"Exactly. So they thought we were human beings and that all the other human beings were like us!"

He looked once more at Jupiter, thoughtfully. "No wonder they decided to quit!"

The Weather Man

Theodore L. Thomas

". . . and the name 'Weather Bureau' continued to be used, although the organization itself was somewhat changed in form. Thus the Weather Congress consisted of three arms. First was the political arm, the Weather Council. Second was the scientific arm, the Weather Advisors. Third was the operating arm, the Weather Bureau. All three arms were relatively independent, and each . . ."

—*The Columbia Encyclopedia,* 32nd Edition

Jonathan H. Wilburn opened his eyes and immediately felt the tension in the day. He lay there, puzzled, seeking the source of it. It was the start of just another day in Palermo. The street noises were normal, his apartment was quiet, and he felt good. That was it. He felt good, very good, full of vigor and strong of mind, and with the feeling that he was ready for anything that might happen.

In one movement he threw back the cover and rolled to his feet alongside the bed. Not bad for a man who had turned fifty last week. He stepped into the shower and dissolved his pajamas into a rich foam of cleansing lather. He dried and stood motionless in the center of his dressing room. The tension and the excitement were still with him. He depilated and dressed, and as he slipped into his jacket it came to him.

Sometime during the night in his sleep he had made up his mind that the time had come for him to make a move. He was fifty years old, he had carefully built a good repu-

tation, and he had come as far as he could in the normal course of events. It was now time to push, time to take a chance. To reach the top in politics you have to take a chance.

Wilburn finished slipping into his jacket. He bared his teeth at himself in the mirror. Now he knew why the day felt different. But knowing the reason did nothing to diminish the tension. He would live with it from now on; this he knew for a certainty. He would live and work on the tips of his toes, looking for a way to seize the god of luck and give him a good ringing out.

For a quarter of a century he had moved cautiously, planning each move, insuring its success before he committed himself to it. Slowly he had climbed through the tiers of politics, the House, the Senate, the United Nations, an ambassadorship, several emergency chairmanships, and finally, the most elite of all bodies, the Weather Congress. His reputation was made, he was known as a brilliant, affable diplomat, one with high skill at bringing about agreement among other hostile councilmen. He had built a strong following among the two hundred members in the Weather Council. But in politics as in everything else, the higher one climbs, the tougher the advancement. Wilburn suddenly came to the realization that he had not made any advancements in four years. Then came his fiftieth birthday.

Jonathan Wilburn ate breakfast with his wife that morning. Harriet was a slim woman, quietly wise in her role of the wife of a member of the Council of the Weather Congress. In one quick glance she saw that her husband was tight as a wire, and she touched the diner and placed coffee in front of him. While he sipped it she

touched out a set of onion-flavored eggs and carefully hand-basted them with the pork sauce he loved so much; she did not trust the diner to do it right. While she worked she chatted about the news in the morning paper. Wilburn ate his breakfast, part listening, part smiling and grunting responses, and part staring into space. He kissed her good-bye then, and went out and stepped on a walk.

He rode the walk through the soft Sicilian air, and then became impatient with standing still. He stepped off the walk and strode alongside, and he felt pleased at the way his legs stretched. Off in the distance he could see the dome of the main Council building, and it brought his mind back to the problem at hand. But, even as he thought it, he knew it was nothing he could reason out in advance. This was something he would have to pick up on the spur of the moment. And he would have to stay alert to recognize it when it came.

Wilburn stepped back on the walk and rode it to the Council.

He entered the Great Hall by the north stairs and walked along the east wall toward the stairs to his office. A group of sightseers were being guided across the Great Hall by a uniformed guide, and the guide was describing the wonders of the hall. When the guide saw Wilburn coming, he interrupted his lecture to say, "And coming toward us from our left is Councilman Wilburn of an eastern United States district of whom you have all heard and who will play such an important part in the vote today to reduce the water available to northern Australia."

The sightseers stopped, stumbling into one another at the unexpected appearance of such a celebrity. Wilburn smiled and waved at them, and this confounded them

even more, but he did not stop to talk. He knew from the guide's remarks that none of his constituents were in the group; the guide would have contrived to warn him so that he could act accordingly. Wilburn smiled to himself — an officeholder had many advantages over a mere candidate for office.

Wilburn turned to the stairs and rode up with Councilman George DuBois, of Middle Europe. DuBois said, "I heard him. Decided yet how you are to vote on this Australian situation, Jonathan?"

"I lean toward an aye, but I don't know. Do you?"

DuBois shook his head. "I feel the same. It is a thing we should do only with the greatest of caution. It is a terrible thing to make men suffer, and even worse to do it to women and children. I don't know."

They rode in silence to the top of the stairs, and just before they parted Wilburn said, "My wife stands with me in everything *I* do, George."

DuBois looked at him thoughtfully for a moment, and then said, "Yes, I understand you. The women there are as much to blame as the men, and deserve punishment as much. Yes, that will help me if I vote aye. I will see you in Council." They nodded good-bye to each other in a wordless gesture of mutual respect and understanding. DuBois was one of the thoughtful councilmen who knew better than most the fearful responsibility carried by the political arm of the Weather Congress.

Wilburn nodded to his staff as he passed through the outer office. Once at his desk he swiftly settled down to take care of the many chores. The small pile of papers stacked neatly in the center of his desk melted away as he

picked up one after another, dictated the words that disposed of it, and dropped it on another pile.

He was just finishing when a gentle masculine voice said through the speaker, "Have you time to see a friend?"

Wilburn smiled, and got up to open the door of his office for Councilman Gardner Tongareva. The two men smiled and shook hands, and Tongareva settled back deep into one of Wilburn's chairs. He was a brown-skinned man, a Polynesian, wrinkled and old and wise. His trousers were full and short, reminiscent of the sarong worn by his ancestors. His hair was white and his face was warm and kindly. Tongareva was one of those rare men whose mere presence brought smiles to the faces of his companions and peace to their hearts. He was a man of enormous influence in the Council solely by virtue of his personality.

His district was 15–30 degrees north latitude by 150–165 degrees east longitude, the same fifteen-degrees-on-a-side landed area of Earth as the district of each of the other councilmen. But in Tongareva's case the land was vanishingly small. The only land in the entire region was Marcus Island, one square mile in area, and supporting four people. This was quite a contrast with the one hundred million people living in Wilburn's district of 30–45 degrees north latitude by 75–90 degrees west longitude. Yet time after time when the population-weighted votes of the two hundred councilmen were counted, it was apparent that Tongareva had swayed a large percentage of the entire globe.

Wilburn leaned back in his chair and said to Tongareva, "Have you reached a decision yet about the Australian drought?"

Tongareva nodded. "Yes, I have. I believe we have no choice but to subject them to a year's drought. Naughty children must be spanked, and for two years these people have persisted in maintaining an uneven balance of trade. What is really involved here, Jonathan, is a challenge to the supreme authority of the Weather Congress over the peoples of the world. These people in Queensland and the Northern Territory are a hardy lot. They don't really believe that we can or will chastise them by controlling their weather to their detriment. They must be punished immediately or other sections of the world will begin acting up, too. At this time a simple drought to take away their lush prosperity for a year ought to serve. Later it might become necessary to make them suffer, and none of us wants that. Yes, Jonathan, my vote will be cast in favor of the Australian drought."

Wilburn nodded soberly. He saw now that the vote almost certainly would be in favor of punishment. Most of the councilmen seemed to feel it was necessary, but were reluctant to cause suffering. But when Tongareva stated his position as he just had, the reluctance would be put aside. Wilburn said, "I agree with you, Gardner. You have put into words the thoughts of most of us in this matter. I will vote with you."

Tongareva said nothing, but he continued to stare sharply at Wilburn. It was not a discomfiting stare; nothing Tongareva did was ever discomfiting. Tongareva said, "You are a different man this morning, my good friend. Just as you have been still a different man for the last three weeks. You have resolved whatever it is that has been disturbing you, and I am pleased. No" – he raised a hand as Wilburn was about to speak – "it is quite unnec-

essary to discuss it. When you want me, I will be there to help you." He stood up. "And now I must go to discuss the Australian situation with some of the others." He smiled and left before Wilburn could say anything.

Wilburn stared after him, awed at the enormous ability of Tongareva to understand what he had been going through. He shook his head and gathered himself and then went out into his waiting room to talk to the dozen people who were waiting to see him.

"I'm sorry to keep you waiting," he said to all of them, "but things are hectic around the Council this morning, as I guess you know. Please forgive me for not seeing each of you alone, but we will be summoned for Council business in a few minutes. I did not want to miss the chance to see all of you for a moment or two at least. Perhaps we can get together this afternoon or tomorrow morning."

And Wilburn moved around the room shaking hands and fixing in his mind the name of each visitor. Two of them were not constituents. They were lobbyists representing the northern Australian districts, and they launched into a tirade against the taking of any punitive action against the districts.

Wilburn held up his hand and said, "Gentlemen, this topic may not be discussed under these circumstances. I will listen to the arguments for and against on the floor of the Council, nowhere else. That is all." He smiled and began to pass on. The younger of the two seized his arm and turned him to face him, saying, "But Councilman you must listen. These poor people are being made to suffer for the acts of a few of their leaders. You cannot —"

Wilburn shrugged away from the restraining arm,

stepped swiftly to the wall and pressed a button there. The lobbyist turned pale and said, "Oh, now, Councilman, I meant no harm. Please do not lodge a protest against me. Please —"

Two men in the uniform of the Weather Congress swept in the outer door. Wilburn's voice was calm and his face impassive, but his eyes glinted like ice crystals. He pointed and said to the guards, "This man grabbed my arm to try to force me to listen to his arguments on Council business. I lodge a protest against him."

It all happened so fast the rest of the visitors had difficulty recalling exactly what had happened. But the recording tapes showed, and Wilburn knew that the lobbyist would never again be allowed in the halls of the Weather Congress. The two guards softly hustled him out of the room. The other lobbyist said, "I am sorry, Councilman. I feel responsible for his conduct; he is new."

Wilburn nodded and started to speak, but a low musical chime sounded repeatedly in the room. Wilburn said to the visitors, "Please excuse me. I must go to the Council floor now. If you wish, you may watch the proceedings from the Visitor's Auditorium. Thank you for coming up to see me, and I hope we can talk more another time." He waved and smiled and went back into his office.

Hurriedly he checked his staff to see that they were ready for the day's business. All were in position, all knew their roles in the coming debate. Wilburn then took the belt to the floor, walking the last hundred yards out in the public hall where he could be seen. As he came to the main doors several newspapermen asked permission to approach, but he refused; he wanted to get to his desk early and start work.

He went through the doors and down the short wide hall that led to the floor. He came out into the huge room and went down the main aisle toward his desk. A few councilmen were already there, and as the recorder called off Wilburn's name, they looked up and waved at him. He waved back and continued on his way to his high-seniority desk up front. He sat down and began flipping the buttons and switches that put him in touch with everything that was going on. Immediately a light glowed indicating that one of the seated councilmen wanted to talk to him. Councilman Hardy of 165–180 degrees west longitude by 30–45 degrees south latitude – containing most of New Zealand – said to him, "Well, Jonathan, have you talked with Tongareva yet?"

"Yes, George, I have."

"Going to vote the way he wants?"

"Yes, although I want to wait and hear what is said in opposition before I finally make up my mind. Where do you stand?"

There was a perceptible pause, then, "I will probably vote against it, unless someone expresses the extreme reluctance of the Council to vote for drought."

"Why don't you do it, George?"

"Maybe I will. Thank you, Jonathan." And he cut the circuit.

Wilburn looked around the huge chamber, and as always, he became a little awed at what he saw. It was more than the impressive array of the two hundred huge desks, the raised president's chair, the great board that showed the weather at the moment on every part of Earth's surface, and the communications rooms set off from the main

room. There was an aura about this great chamber that was felt by all the men and women who entered it, whether to work in it or simply to visit. The fate of Earth was centered here, and had been for fifty years. From this chamber flowed the decisions that controlled the world.

The Weather Congress was the supreme body of Earth, able to bend states, nations, continents, and hemispheres to its will. What dictator, what country, could survive when no drop of rain fell for a year? Or what dictator, what country could survive when blanketed under fifty feet of snow and ice? The Weather Congress could freeze the Congo River or dry up the Amazon. It could flood the Sahara or Tierra del Fuego. It could thaw the tundra, and raise and lower the levels of the oceans at will. And here, in this chamber, all the political decisions had been made, and the chamber seemed to acquire some of the feeling that had been expressed over the last half century, from the stormy early days, to the more settled and reflective present. It was a powerful chamber, and it made its power felt by those who sat in it.

A great many councilmen had seated themselves. Another chime sounded, and the weather requests began to be relayed to the councilmen. The recorder read off the requests, and his voice reached each desk through a tiny speaker. At the same time the written request flashed on the big board. In this manner the councilmen could busy themselves with other duties while keeping an eye on the requests.

The first request, as usual, came from the Lovers of the Lowly Cactus Plant, and they wanted less rainfall and more desolation in Death Valley to keep the barrel cactus from becoming extinct.

Wilburn rang Tongareva's desk and said, "How many have you talked to, Gardner?"

"About forty, Jonathan. I caught a large group having a cup of coffee."

"Have you talked to Maitland?"

There was a perceptible pause. Maitland seemed always to be against anything Wilburn stood for. His district was 60–75 degrees west longitude by 30–45 degrees north latitude, adjoining Wilburn's and including New York City and Boston. Maitland always made it plain that he considered Wilburn unfit for the position of influence he held in the Council. "No," said Tongareva, and Wilburn could see him shake his great head, "no, I did not talk to Maitland."

Wilburn signed off, and listened and watched. The president of Bolivia complained that the region around Cochabamba was running a little too cool to suit his taste. The mayor of Avigait in Greenland stated that the corn crop was ten percent lower this year due to an extra two inches of rainfall and too much cloud cover. Wilburn nodded; there was one that should be treated seriously, and he pushed a button on his desk marked "favorable" to insure that it would be considered by the entire Council.

His phone rang. It was a constituent asking him to address the Combined Rotary Club at their annual meeting October 27th next. The clear light flashed as Wilburn's staff, monitoring and checking everything, indicated that he was free on that day. "Why, thank you, yes," said Wilburn, accepting the invitation. "I shall be grateful for the chance to talk to your group." He knew he had made no

address in that region for a year, and it was high time. Probably his staff had subtly set it up in the first place.

A farmer outside of Gatrun, Libya, wanted his neighbor's water cut back to that all their crops would be the same height.

Then a conference was called among half a dozen councilmen to discuss the order of speeches on the Australian situation. While they worked this out, Wilburn noted a request from Ceylon to be allowed to go over from rice in the inland sections to wheat, with the attendant reduction in rainfall and average temperature. He pushed the "favorable" button.

It was decided that Georges DuBois, of Middle Europe, should introduce the drought resolution, with appropriately reluctant language.

One George Andrews of Holtville, California, wanted to see snow fall again before he died, which would be in a few weeks now, no matter that it was July. He could not leave the semitropical environment of Holtville.

Tongareva would second the resolution, and then they would hear the councilmen from the Australian districts present their reasons why the punishment should not be instituted. After that they would play it by ear.

The seaport city of Stockholm requested an additional fifteen centimeters of elevation for the Baltic Sea. Kobdo, Mongolia, complained that there had been two disastrous avalanches due to the extra snow burden. And it was there that the hairs on the back of Wilburn's neck began to prickle.

He stiffened in his seat and looked around to see the source of the strange sensation. The floor bustled with ac-

tivity, all of it normal. He stood up, but he could see nothing more. He saw Tongareva looking over at him. He shrugged his shoulders and sat down and stared at the barrage of lights on his desk. His skin almost crawled and the adrenalin poured into his veins and he felt wildly exhilarated. What was it? He grabbed the edge of the desk and closed his eyes and forced himself to think. He blanked out all the activity around him and forced his mind to relax and find the source of the stimulation. Australian problem? No, not that. It was . . . it was something in the weather requests. He opened his eyes, and pushed the playback button and watched the requests again.

One by one, more quickly now, they flashed on the miniature screen on his desk. Avalanches, Baltic Sea level, snow in southern California, Ceylon's rice to wheat, the Libyan farmer, the – wait. He had it now, so he turned back to it and read it very slowly.

George Andrews of Holtville, California, wanted to see snow fall again before he died soon, and he would be unable to leave the semitropical environment of southern California. The more Wilburn stared at it, the more it seemed to have everything he needed. It had universal appeal: a dying man with a final request. It would be difficult: snow in July in southern California was unheard of; he wasn't even certain that it could be carried out. It was almost completely irrational; the Council had never bothered with such requests in the past. The more Wilburn looked at it, the more he became convinced he had found the proper cause on which to risk his career. People the world over would be behind him if he could bring it off. He remembered how it had been in the tradition of Amer-

ican Presidents to show an occasional high concern over some unimportant individual. If he failed, he would probably be finished in politics, but that was the chance to take. And there was something about that name George Andrews, something that set off a vague, disturbing memory in the back of his mind, something that had attracted him to the request in the first place. No matter. It was time for him to call up for action all the forces he could muster.

He cut his entire staff into his circuit, and cut all others out. He said, "I am considering supporting the George Andrews request." He paused to allow the statement to sink in, smiling to himself at the shock to his staff; never had they heard of anything so wild from him. "Check out everything you can about George Andrews. Make certain that his request is bona fide and isn't some sort of trap for an innocent councilman like me. In particular, make certain that no connection exists between George Andrews and Councilman Maitland. Check with Greenberg in the Advisors as to the chances of coming up with a solution to the problem of snow in July in southern California in an extremely restricted region. Given that answer, check with the Bureau, probably Hechmer – he's up on the sun right now – and see what the chances are of carrying it out. This must be completed in – just a moment." Wilburn looked around him. The weather requests had ended, and Councilman Yardley had left his desk and was walking toward the front of the floor to assume his role as president. "You have four hours to get all the information. Go, and good luck. We will all need it this time." And Wilburn sat back. There was no time to relax, however.

Calls had piled up while he had set the investigation in motion. He began clearing them as President Yardley

called the Council to order, swiftly dispensed with the old business, and then brought up the matter of the censure of Australia. Wilburn kept an ear on the transactions on the floor as he continued to handle the incoming calls and other demands on his time. The president stated the order of the speeches for and against the drought resolution, and the Council sat back to listen. Councilman DuBois made his preliminary remarks, expressing the deep and abiding regret that the Council found it necessary in this matter to uphold the principles of the Weather Congress. It was a good speech, thought Wilburn. There could be no doubt of DuBois' sincerity, and when he solemnly stated the resolution itself, there were tears in his eyes, and his voice shook. Then the first of the councilmen from Australia got up to argue against the resolution.

Wilburn pocketed the portable receiver, punched the button that showed he was listening via receiver, and left the floor. Many other councilmen did the same, most of them heading for the Councilmen's Closed Restaurant where they could have a cup of coffee without having to deal with constituents, the press, lobbyists, or any of a multitude of organizations. They sipped their coffee and nibbled sweet cakes and talked. The conversation was all on the coming vote, and it was easy to see that opinion was hardening in favor of the resolution. The councilmen talked in low voices so they could follow the trend of the arguments being made back on the floor; each councilman had his portable receiver with him and each listened through the bone microphone behind an ear. The talk grew louder as it became apparent that the Australian councilman was advancing nothing more than the same

old arguments, don't-cause-suffering and give-us-another-chance. The vote was now almost a certainty.

Wilburn wandered back to the floor and handled some more of the day's business at his desk. He went out for more coffee, and returned. He rose to make a brief speech in favor of the resolution, expressing regret for the necessity. Then, as the arguments pro and con began to draw toward the end, the information on George Andrews began to come in.

George Andrews was one hundred and twenty-six years old with a heart condition, and the doctors had given him six weeks to live. There was no discernible connection between Andrews and Councilman Maitland. Wilburn interrupted to ask, "Who checked on that?"

"Jack Parker," was the answer, and Wilburn heard a slight chuckle, which he forgave. Jack Parker was one of the keenest investigators in the business, and Wilburn noted to himself that the staff member who had thought of putting Parker on that particular investigation was due for a bonus. At least Wilburn could now make a decision without fear of walking into a political trap of some kind. But the report continued.

"As I guess you know, Andrews came very close to being one of the most famous men in the world a hundred years ago. For a while it looked like Andrews would get credit for inventing the sessile boats, but he was finally beaten by Hans Daggensnurf. There used to be a few people around who insisted that Andrews was the real inventor all along, and that dirty politics, shrewd lawyers, unethical corporations, and filthy money combined to make a goat out of him. The name 'sessile boats' was Andrews' name for the sun boats, and the name has stuck.

But then, you could never have called them Daggensnurf boats."

Wilburn remembered now, awed that his subconscious mind should have somehow alerted him to the need to check out the name George Andrews. Andrews had been the George Selden of the automobile industry, the William Kelly of the so-called Bessemer steel process. All were forgotten men; someone else reaped the immortality. In Andrews' case, he had, according to some, been the man who invented the sun boats, those marvelous devices that made the entire Weather Congress possible. Sliding on a thin film of gaseous carbon, the sessile boats safely traversed the hell of the sun's surface, moving from place to place to stir up the activity needed to produce the desired weather. Without the sessile boats there would be no Weather Bureau staffed by lean, hard-eyed men, working the sun to produce the results called for by the Weather Council. Yes, Wilburn was lucky indeed to have dragged out his piece of ancient history just when he needed it.

The report continued, "We checked with the Weather Advisors, particularly Bob Greenberg. He says there is a fair chance they can find a way to pull snow in southern California this time of year, but he's not guaranteeing anything. One of his people has the beginnings of a new theory that might just work, and our request might be the one to test it out. But he doesn't want to be quoted on any of this. He's got a personnel problem with the genius who would do the work if our request was official. I gathered he would like for us to push it through so he could settle things one way or the other with this bright-eyed genius."

Wilburn asked, "How about the Bureau?"

"Well, we talked to Hechmer as you suggested. It is his

tour on the sun right now, so he's in close touch. He says they've only got one boat master in the entire Bureau with enough guts and imagination, and he's having some kind of trouble at home. But Hechmer says if we come up with something special, he'll find a way to make his man produce."

Wilburn listened to many other details relating to the Andrews situation. His first assistant had added a feature of his own to the investigation, one which showed why he was such a highly paid member of Wilburn's staff. He had supervised a quiet opinion survey to find how Wilburn's constituents would react to his sponsoring a motion to grant Andrews' request. The result was predictable: If the request went through quickly and smoothly, and if the snow fell, Wilburn would be a wise, humane, and generous man. If acrimony developed in a debate and if snow did not fall, Wilburn would be a man who had blundered badly.

The report ended. Wilburn cleared his desk of all activity and took a quick look out at the floor. The debate was winding up. The councilmen were visibly restless to get on to the voting, and it was now clear that the vote was overwhelmingly in favor of the resolution calling for a drought. Wilburn sat back to think.

But even as he sat back he knew the answer; there was really no need to make a decision here. He was going to do it. The only question was: How? And as he turned his mind to the timing of presenting his motion, he saw that here and now was the time. When better than right at the time the Council was finishing an unpleasant piece of business? He might be able to slip his motion through to

help take the unpleasant taste from the mouths of the councilmen. That was it. Wilburn sat back to wait the vote. In another ten minutes it started.

And in twenty minutes it was over. The vote in favor of the drought resolution was 192 to 8. The president lifted his gavel to adjourn the session, Wilburn stood up.

"Mr. President," he said, "we have just had to carry out a necessary but unpleasant duty. I now wish to move that the Council carry out an unnecessary but pleasant duty. I respectfully direct the attention of the honorable members to Weather Request Number Eighteen, today's date."

He paused while the members, looking puzzled, punched the button on their desks that would play back for them the Andrews' request. Wilburn waited until he saw most of the faces turned toward him in disbelief. Then he said, "I just said that our duty in this matter was unnecessary, but in a larger sense we have never had a more necessary duty in conscience to see that justice . . ." And Wilburn stated his case for Andrews. He briefly traced the history of George Andrews' career, and the debt owed him by the human race, a debt that had never been paid. As he talked, Wilburn smiled to himself at the phone calls he knew were racing from desk to desk on the floor. "What's got into Jonathan?" "Has Wilburn lost his mind?" "Watch yourself on this one; he's up to something."

Wilburn stated the difficulty of knowing for certain whether the request was even within the realm of technological possibility. Only the Weather Advisors could tell. And even if it were possible, the Bureau might not be able to carry it out. But such considerations should not stop the Council from trying. And he concluded with an impassioned plea for this act of grace to show the world

that the Council was made up of men who never lost sight of the individual.

He sat down amidst silence. Then Tongareva rose, and with soft words and gentle manner he supported the resolution, emphasizing the warmth and humanity of the motion at a time when there would be many who thought the Council too harsh. He sat down, and Maitland rose to the floor. To Wilburn's astonishment, Maitland, too, supported the resolution. But as Wilburn listened, he understood that Maitland supported the resolution only because he saw disaster in it for Wilburn. It took nerve for Maitland to do it. He could not know what Wilburn had in mind, but Maitland was willing to trust his judgment that a mistake had been made and to try to capitalize on it.

Wilburn answered all the incoming calls from his fellow councilmen, all of whom wanted to know if Wilburn wanted them to rise in support of the motion. Some of these were his friends, others were those who owed him a favor. To all of them Wilburn urged support in the form of a brief supporting speech. For forty minutes councilmen bobbed up, spoke for a moment, and then sat down. When the vote came, it was one of the few unanimous votes in the history of the Council. The Australian drought was forgotten, both on the floor and on the video screens of the world. All thoughts were turned to the little town of Holtville, California.

Wilburn heard the gavel adjourn the session, and he knew he was fully committed. His fate was in the hands of others; his work was done for now, possibly forever.

But after all, if one wants to reach the top in politics, one has to take a chance.

Anna Brackney wandered up the broad steps of the Weather Advisors Building half an hour early, as usual. At the top she stopped and looked out over the city of Stockholm. It was a pretty city, sturdy under its heavy roofs, sparkling under the early morning sun, and quiet and restful. Stockholm was a fine place for the advisors. In fact it was such an excellent choice for the kind of work the advisors did, Anna wondered all over again how it was possible for men to have chosen it. She turned and went in.

The maintenance supervisor, Hjalmar Froding, directed the polishing machine around the lobby. He saw Anna Brackney and immediately guided the machine to lay down a tic-tac-toe pattern in wax on the floor, and then he bowed to her. She stopped, put her finger in her mouth, and then pointed to the upper right-hand square. The machine put an "O" on it, and then placed an "X" in the center square for Froding. The game went on until Froding had three "X's" in a row, and the machine triumphantly ran a straight line through them. Hjalmar Froding bowed to Anna Brackney, and she bowed to him and went on her way. She ignored the escalator and walked up the stairs, feeling pleased that she again was able to have Froding win in an unobvious manner. Anna Brackney was fond of Froding; he seldom spoke or smiled, and treated her as if she were the queen of Sweden. It was too bad some of the other men around here couldn't be guided as simply.

She had to pass through the main Weather Room on her way to her office. A great globe of the world occupied the center of the room, and it showed the weather at the moment on every part of Earth. The globe was similar in

purpose to the map in the Weather Council, but it had a few additional features. Every jet stream, density variation, inversion, every front, isobar, isallobar, isotherm, precipitation area, clouded area, and air mass showed on the globe. The globe was a mass of shifting colors, undecipherable to the untrained eye, making sense only to the mathemeteorologists who made up the technical staff of the advisors. The curved walls of the room were covered with the instruments that made up the Weather Net, the senses of the advisors. The entire room looked like something out of a nightmare, with its seething globe and dancing lights and shimmering dials. Anna walked through without noticing with the callousness of long proximity. She headed for the private wire from the Weather Council to see if that strange request had come in yet.

The guard in the Council Communications Room saluted and stepped aside for her. She went in and sat down and began to flip through the night's messages from the Council. She picked up the one that related to the imposition of a drought in northern Australia and read it. She snorted when she finished, and said aloud to herself, "Nothing, no problem at all. A child could figure out how to bring that about." And on down the stack of messages she went.

She found it and read it carefully, and read it again. It was just as the news flashes had reported: Snow in July on a one-square-mile area in southern California. The latitude and the longitude of the area were given, and that was all there was to it. But Anna Brackney felt the excitement grow within her. Here was the nastiest problem to confront the advisors in decades, one that probably could

not be solved by standard technics. She put her finger in her mouth. Here was what she had been waiting for, the chance to prove out her theory. Now all she had to do was convince Greenberg to give her the problem. She restacked the messages and went to her office.

It was a small office measuring about eight by eight feet, but Anna Brackney still thought it too big. Her desk was in one corner facing one wall to give her the illusion of being more cramped than she really was. Anna could not stand the feeling of open spaces when she worked. There was no window, no picture on any of the walls, nothing distracting against the plain dark gray walls. Other advisors had different ideas on the proper working environment. Some used bright splashes of color, others used woodland or ocean scenes, Greenberg had his walls covered with a black and white maze, and Hiromaka's walls were covered with nudes. Anna shuddered with disgust as she thought of it.

Instead of sitting at her desk, she stood in the middle of the small room, thinking of how she could persuade Greenberg to assign the Andrews problem to her. This would be hard. She knew that Greenberg did not like her, and she knew it was only because he was a man and she was a woman. None of the men liked her, and as a result her work never received the credit it deserved. A woman in a man's world was never allowed to be judged on the basis of her work alone. But if she could get the Andrews problem, she would show them. She would show them all.

But time was short. The Andrews problem had to be solved immediately. Sometimes the advisors' weather programs took weeks to put into operation, and if this turned

out to be one like that it would be too late. It had to be worked on and solved now to see if there was enough time. She spun on her heels and ran out of the office and down the escalator to the wide steps at the front door of the building. She would waste no time. She would meet Greenberg as he came in.

She had a ten-minute wait, and Greenberg was early at that. Anna Brackney pounced on him as he reached the top step. She said, "Dr. Greenberg, I am ready to start work immediately on the Andrews problem. I feel —"

"You've been waiting for me?" he said.

"I feel I am best equipped to solve the Andrews problem since it will call for new procedures and —"

"What on Earth is the Andrews problem?"

She looked at him blankly and said, "Why that's the problem that came in during the night, and I want to be the one who —"

"But you've nailed me out here on the steps before I've had a chance to go inside. How do I know what problems came in during the night? I haven't been upstairs yet."

"But you must know — you must have heard of it, it's all on the news."

"There's a lot of junk on the news about our work, most of it untrue. Now why don't you wait until I get a look at it so I know what you're talking about."

They went up the escalator together in silence, he annoyed at being accosted in such a manner, and she annoyed at his obvious effort to put off doing what she wanted.

He started to go into his office first, but she said, "It's over in the Council Communications Room, not in your office."

He started to retort, but thought better of it, and went on in and read the message. She said, "Now may I have it?"

"Look, damn it. This request is going to be treated like any other until we understand its ramifications. I am going to give it to Upton as I do all the others for a preliminary opinion and a recommendation as to assignment. After I have that recommendation I will decide what to do. Now don't bother me until Upton's had a look at it." He saw her mouth curve down and her eyes begin to fill. He had been through these crying sessions before, and he did not like them. "See you later," he said, and he all but ran to his office and locked the door. One thing nice at the Advisor Building. A locked door was inviolate. It meant the person inside did not want to be disturbed, and the caliber of the work was such that the wish was honored.

Anna Brackney raged back to her office. There it was again. A woman did not stand a chance around here; they refused to treat her like a man. Then she went and waited at Upton's office to explain the whole thing to him.

Upton was a portly man with an easy disposition and a mind like a razor. What's more, he understood the operation of a single-track mind. Anna had got out no more than half her tale of woe when he recognized that the only way to get her off his back for the day was to review the Andrews request. He sent for it, looked at it, whistled and sat down at a twenty-six-fifty computer. For half an hour he fed in data and sat back while the computer chewed and then spat out the results. The job grew, so he called in some help and soon there were three men working on the computers. In another three hours Upton swung

around to Anna who had been standing behind him the entire time.

He said, "Do you have some ideas on this?"

She nodded.

"Care to tell me something about it?"

She hesitated, then said, "Well, I don't have it all yet. But I think it can be done by –" she paused and glanced at him shyly as if to see in advance whether or not he was laughing at her – "a vertical front."

Upton's jaw fell. "A ver– You mean a true front that is tipped perpendicular to Earth's surface?"

She nodded, and put her finger in her mouth. Far from laughing, Upton stared at the floor for a moment, and then headed for Greenberg's office. He walked in without knocking and said to Greenberg, "There is a forty-six percent chance of carrying out this Andrews mandate by conventional technics. And by the way, what's the matter with the Council? I've never known them to do such an idiotic thing before. What are they trying to do?"

Greenberg shook his head and said, "I don't know. I had a call asking about this from Wilburn. I've got the uncomfortable feeling that they're trying to see just what we *can* do here, sort of test us before they put some real big problem to us. They voted a drought for northern Australia yesterday, and maybe they are getting ready to put the real squeeze on some region and want to see what we can do first."

Upton said, "Drought in Australia? Well, they're getting a little tough, aren't they? That isn't like the good old easy-going Council that I know. Any difficulty with the Australian drought?"

"No. It was such a standard problem I didn't even

bother to give it to you for screening. I turned it right over to Hiromaka. But there's something behind this Andrews thing, and I don't like it. We'd better find a way to carry it out."

Upton said, "Well, Brackney has an approach that's wild enough to work. Let's let her try to work out a solution, and then we can look it over and see if we feel it has a better chance to work than conventional technics."

Anna Brackney had been standing near the door. She came forward and said angrily, "What do you mean 'wild.' There's nothing wrong with it at all. You just don't want me to be the one that solves it, that's all. You just —"

"No, no, Anna," said Greenberg, "that isn't it. You'll be the one to work it out, so don't —"

"Good, I'll start right now," said Anna, and she turned and left.

The two men looked at each other. Upton shrugged his shoulders, and Greenberg raised his eyes to the ceiling, shook his head, and sighed.

Anna Brackney sat herself down in her corner and stared at the wall. It was ten minutes before she put her finger into her mouth, and another twenty minutes before she pulled out a pad and pencil and began scribbling notations. It went fast then. With her first equation set up on a small sheet of paper, she left her office to find a resident mathemeteorologist; Anna refused to use the speaker at her desk to call one of them in.

The residents were all seated at desks in one large room, and when Anna entered they all bent over as if hard at work. Ignoring their behavior, Anna went up to the desk of Betty Jepson and placed the sheet of paper on it. Anna

said without any preliminaries, "Run a regression analysis on this —" and her finger traced out the equation in the form $y = a_1x_1 + a_2x_2 + \ldots + a_nx_n$ — "noting that n equals forty-six in this case. Take the observational data from the banks of a number eighty-three computer. I want a fit better than ninety percent." And she turned on her heels and returned to her office.

Half an hour later she was back with another equation for Charles Bankhead, then one for Joseph Pechio. With the pattern established, she asked for the aid of a full mathemeteorologist, and Greenberg assigned Albert Kropa to her. Kropa listened to her somewhat disjointed description of what she was trying to do and then wandered around looking over the shoulders of the residents to see what they were doing. Gradually he understood, and finally he raced to his own office and began turning out the polynomial relationships on his own.

Each equation demanded the full use of a sixteen-fifty computer and its staff under the direction of a resident, plus six hours of time to arrive at even a preliminary fit. As Anna and Kropa turned out more of the needed basic equations, it was apparent that too much time was being used in evolving each one individually. Anna broke off and spent two hours working out a method of programming a twenty-two-thirty to explore the factors needed in each regression analysis. The computer began producing the required equations at the rate of one every ten minutes, so Anna and Kropa turned their attention to a method of correlating the flood of data that would descend on them when each analysis was complete. After half an hour it became apparent that they could not finish

that phase of it before the data began coming in. They asked for and got two more full mathemeteorologists.

The four of them moved out to the Weather Room so they could be together as they worked. The correlating mathematics began to unfold, and all the remaining residents were called in to help with it. In another hour all the available sixteen-fifties were tied up, and Greenberg called on the University of Stockholm for the use of theirs. This held for twenty minutes, and then Greenberg called on half a dozen industrial computers in the city. But that wasn't enough. The net of computers began widening steadily out to the continent, reaching in another two hours to the cities on the eastern seaboard of the United States. The overriding authority of the advisors in the solving of a weather problem was absolute.

It became necessary for Upton to join the group, and when Greenberg himself took a chair at the large circle in the Weather Room there was a brief break in the work for some catcalls and some affectionately sarcastic remarks. Commitment of the advisors was total.

Anna Brackney seemed not to notice. Her eyes were glazed and she spoke in crisp sharp sentences in contrast to her usual vague and slurred sentences. She seemed to know just a little in advance when a breakdown in the mounting flow of data was impending, and she stepped in and supplied the necessary continuity. It was 1500 before Hiromaka noticed that none of them had eaten lunch. Greenberg sent for food, again at 2300, and again at 0900.

Everyone looked terrible, with sunken cheeks and rumpled clothes and great hollows under the eyes. But there was fire in the eyes of all of them, even down to the new-

est resident, a fire born of participation in the most complex weather problem yet to confront the advisors.

Upton took over the task of pulling together the mathematical models relating to the planet Earth. He kept under his control the regression analysis results relating to such variables as the various possible distances of Earth from the sun; the rotational positions of Earth relating to the sun; the shape, position, density, variation, and charge of both Van Allen radiation belts; the velocity, temperature, direction, width, and mass of fourteen hundred jet streams; the heat flow of the major ocean currents; the effect on air drift of each major land mass; the heat content of the land masses; the Coriolis effect; and superimposed over all these factors and many more, the effect of the existing and programmed weather playing over the face of the entire Earth.

Greenberg took the sun and worked with the analysis results on the movement of each sunspot; the sun's rotations; fluctuating temperatures and pressures in the protosphere, reversing layer, chromosphere, and corona; spectrum variations; and the relative output from the carbon cycle and the proton-proton chain.

Anna wandered everywhere, now looking over Upton's shoulder, now on the phone to the computers in Washington, D.C., now guiding a resident on his next chore, now inventing a new notational system to simplify feeding newly derived mathematical models into the computers. She wandered as if in a dream, but when a question was asked or when something slowed down, her responses were far from dreamlike. Many a resident, several computer operators, and Upton himself felt the bite of one of her crisp sentences pointing out what could have been a

rather obvious blunder. As time wore on and the work grew more frantic, the normally harsh lines on Anna's face softened, and she walked erect instead of with her usual slouch. Several of the mathemeteorologists, who formerly would not even have talked to her unless it was absolutely necessary, found themselves willingly turning to her for further guidance on their part of the problem.

The first partial solution was fully worked out for the first time at 1100 the next morning. It had only an eighty-one percent fit, but that was good for the first time out; more would be coming soon. But Upton found a flaw. "No good," he said. "This solution would also increase that proposed drought in Australia by a factor of twelve. That would be nice. We pull something like that and we'll all be back reading electric meters."

The remark struck a responsive chord in the group, and the laughter spread and grew more intense. In moments every person in the Advisors Building was convulsed with violent laughter as the long strain finally took its hysterical toll. It was several minutes before the eyes were wiped and the people settled down to work again. Greenberg said, "Well, that's where our danger will be. Not necessarily in Australia, but anywhere. We've got to make sure we don't get a drastic reaction somewhere."

Anna Brackney heard him and said, "DePinza is working on a definitive analysis to insure that there can be no undesirable reaction. He'll have it in an hour." She walked off, leaving Greenberg staring after her.

It was 1500 when the final set of equations was completed. The fit was ninety-four percent, and the check out against DePinza's analysis was one hundred and two per-

cent. The residents and the mathemeteorologists gathered around the large table as Greenberg considered the results. They had finished none too soon. The procedure they had worked out called for sunside operations starting three hours after the beginning of the second shift, and that went on in four hours. Greenberg rubbed the heavy stubble on his face and said, "I don't know whether to let it go or not. We could report that our procedures are untried and ought not to be used all at once."

The eyes of the group turned to Anna Brackney, but she seemed supremely unconcerned. Upton voiced what was in everyone's mind. "There's a little bit of the heart of each one of us in there." He nodded to the equations. "Since they represent the very best that we can do, I don't see how we can report that they ought not to be used. Right now those equations represent the best advisors' output; in that sense they *are* the advisors. Both we and the people who put us here have to stand or fall on our best efforts."

Greenberg nodded, and handed the two sheets of paper to a resident and said, "Break it down to the sunside procedures and then send it up to the Weather Bureau. I hope they don't have to sweat it out the way we did." He rubbed his face. "Well, that's what we get paid for."

The resident took the sheets and went off. The others drifted away until only Greenberg and Upton were left. Upton said, "This will be quite a feather in Anna Brackney's cap. I don't know where she pulled her inspiration from."

"I don't either," said Greenberg. "But if she sticks her finger in her mouth again, I may quit the business."

Upton chuckled. "If she brings this one off, we'd better all learn to stick our fingers in our mouths."

James Eden rolled out of his bunk and stood poised on the balls of his feet. Yes, there was a faint, barely discernible chatter in the deck. Eden shook his head; the sun was rough, and it was going to be a bad day. If base had a chatter, then the sessile boats would be hard to manage. Never knew it to fail. Try something tricky and you had to work in the worst possible conditions; try something routine and conditions were perfect. But that was what you had to expect in the Bureau. Even the textbooks talked about it – an offshoot of an old Finagle Law.

Eden depilated and dressed, wondering what the job ahead of him would be like. They were always the last to hear anything, yet they were the ones who had to do all the dirty work. The whole Weather Congress depended on the Bureau. The Council was nothing more than a bunch of rich old fat politicians who scratched each other's backs and spent their days cooking up Big Deals. The advisors were a bunch of nuts who sat on their duffs and read out loud all the stuff the computers figured out. But the Bureau was something else again, a fine body of dedicated men who did a job so that the planet Earth could flourish. It was good to be in the Weather Bureau – and there it was again.

Eden could not keep his thoughts away from the problem that had been nagging at him during this entire tour. He rubbed his forehead and wondered again at the perversity of women. Rebecca, black-haired and black-eyed, with warm white skin, waited for him when his tour was over, but only if he left the Bureau. He could see her now,

close to him, looking deep into his eyes, the soft palm of her hand pressed against his cheek, saying, "I will not share you with any person or any thing, even your beloved Bureau. I want a complete husband. You must decide." With other women he could have laughed and picked them up and swung them around and quickly jogged them out of the mood, but not Rebecca, not Rebecca of the long black hair. Damn it!

He swung around and stepped out of his tiny cabin and headed for the mess hall. There were half a dozen men already there when he entered, and they were talking and laughing. But they stopped what they were doing and looked at him and hailed him as he came in through the door. "Hey, Jim." "About time you were rolling out." "Good to see you, boy."

Eden recognized the symptoms. They were tense, and they were talking and laughing too loud. They were relieved to have him join them. They needed somebody to lean on, and Eden pitied them a little for it. Now they would not have to make such an effort to appear normal. The others had felt the chatter in the deck, too.

Eden sat down and said, "Morning. Anything on the board yet about the shift's work?"

The others shook their heads, and Pisca said, "Not a word. They always wait and tell us last. Everybody on the planet knows what's going on, but not us. All we get are rumors until it's time to go out and do it."

"Well," said Eden, "communication with the Bureau is not the easiest thing in the world, don't forget. We can't expect to hear everything as soon as it happens. But I sort of agree with you anyway; seems to me they could keep us posted better as things develop back on Earth."

They nodded, and then applied themselves to the breakfast. They chatted over coffee until a soft chime sounded throughout base. They rose. It was time for the briefing, and they headed for the briefing room at the top of the base. Commander Hechmer was there when they walked in and took their seats. Eden watched carefully as he found a seat and sat down. In the past he had sometimes wondered if Hechmer had taken particular notice of him — an extra glance, closer attention when he asked a question, talking more to him than to the others at a briefing, little things, but important nevertheless.

Commander John H. Hechmer was a legend in the Weather Bureau at the age of forty-five years. It was he who had evolved and perfected the Pinpoint Stream technic in which a thin stream of protons could be extracted from the 4,560-degree level in a sunspot and directed against any chosen sunside part of Earth. In the days when Hechmer was the senior boat master in the Bureau, great strides had been made in weather control. A fineness and detail of weather patterns on Earth had become possible that had astonished all the experts. Hechmer had even guided the advisors, showing them the broadened scope of the Bureau's abilities. His handling of a sunboat had never been matched, and it was one of the goals in Eden's career — if he chose to stay with it — to be thought of as the man who most nearly approximated Hechmer.

Eden watched, and finally when Hechmer looked up from the table it seemed to Eden that his eyes swept the group to rest for an instant on Eden, and then they moved on. It was as if Hechmer wanted to assure himself that Eden was there. Eden could not be sure of this, but the possibility of it made him sit straighter in his chair.

Hechmer said, "Here is Phase One of the next shift's operation as received from the advisors." He flashed the requisite portion of the page on the upright panel behind him. It took Eden one quick glance to see that it represented a substantial departure from customary procedure. Immediately he began to slump down in his seat as he lost himself in the problem of studying out how to handle it. He did not notice that Hechmer saw his instant grasp of the problem. It was a moment or two before several low whistles announced that the others had grasped it, too.

Hechmer sat quietly while they studied over the page. All of them were now thinking out how the report had to be modified to place it in useful condition for the Bureau to use. The advisors always prided themselves on stating their solutions in clear and explicit terminology. But as a practical matter their solutions were totally unusable as received, for they did not mention many of the sun conditions that the Bureau had to cope with. These are accomplishments not explained by mathematics. It was one of the quiet jokes of the Bureau to listen to the talk of an advisor about the thoroughness of his solution and about the lack of thinking required by the Bureau, and then to ask the advisor what he knew about "reversing granulation." No one except a working member of the Bureau could experience that strange upwelling sometimes found in the lower regions of the reversing layer.

The silence grew long. Eden's forehead was wrinkled with concentration as he tried to find some way to break into the problem. He finally saw a possible entry, and he pulled over a pad and began trying for a method of breakdown. Hechmer began to polish his own figures while the rest stared at the page on the wall as if hypnotized. It was

ten minutes before another of the men finally began to make notes.

Eden sat back and looked over what he had written. With growing excitement he realized that his possible answer had never been tried before. As he looked at it more closely, though, he realized that it might not ever be done; it was a radical approach, calling for boat performance not mentioned in the boat specifications.

Hechmer said, "Gentlemen, we must begin. To start things off, here is my proposed answer. Pick it apart if you can."

Eden looked up at it. It was different, too, but it differed in that it called for the use of every single boat on the sun, a thing never before needed. Hechmer's answer was to carry out the mission by sheer weight of numbers, and by this means to dig from the various levels in the sun's atmosphere the total of the streams and sheets needed to bring about the desired weather on Earth. But as he looked at it Eden began to see flaws. The streams, being taken from different parts of the sun's surface would strike Earth and its environs at angles slightly different from those that were called for. Hechmer's answer might work, but it did not seem to have as good a chance as Eden's answer.

Hechmer said, "The main feature wrong with this plan is the wide scattering of the impinging streams. Can you think of any way to overcome that?"

Eden could not, but his mind was more occupied with his own plan. If he could be certain that the boats could stand submersion in the sun's surface for the required length of time, there would be few problems. Oh, com-

munication might be more difficult, but with only one boat down there would be a much reduced need for communication; the boat would succeed or not, and no instructions from anywhere else could help.

One of the other men was beginning to suggest the unfeasible modification of having all the boats work closer together, a grave mistake since the boats could not control their tori with sufficient nicety. Eden interrupted him without thinking. "Here is a possible answer." And he dropped his page on the desk.

Hechmer continued to look at the man who had been talking, waiting politely for him to finish. The man avoided an embarrassing situation by saying, "Let's see what Jim has to offer before we go on with this one."

Hechmer slipped Eden's page into the viewer, and they all studied it. It had the advantage at least of being readily understandable, and they all began talking at once, most of them saying that it couldn't be done. "You'll lose the boat." "Yes, and the men in it, don't forget." "Won't work even if the boat holds up." "You can't get a boat that deep."

Eden carefully watched Hechmer's face while he studied the plan. He saw Hechmer's eyes widen, and then narrow again, and Hechmer realized that Eden was watching him closely. For a moment the room faded from Hechmer's mind, replaced by another similar room, many years ago, when a younger and rasher Hechmer sat and anxiously watched his superior eye a new kind of plan. Hechmer said, without taking his eyes from the projected page, "Assuming the boat can get down there, why won't this plan work?"

"Well," said the man who had stated it wouldn't work,

"the streams and sheets won't necessarily emerge in the direction . . ." But as he talked he noticed that the energy of the sunspot's field was channeled to serve as a focusing lens, and his words faded.

Hechmer nodded approval, "Glad you saw it. Anybody else? Any flaws in it once the boat gets down and stays long enough?" The men worried at it, but could find nothing wrong, given the stated assumption. Hechmer continued, "All right, now why won't a boat stand that kind of submersion?"

One answered, "The sessile effect is not as great on the top. Burn right through."

Eden popped out, "No. Double the carbon feed to the top torus. That'll do it."

They argued for half an hour. Eden and two others defending the concept, and in the end there was no more opposition. They all worked at polishing the plan to take out as much risk as possible. By the time they finished there really was no decision for Hechmer to make. The group of boat captains had accepted the plan, and it went without saying that Eden's boat would be the deep boat. There was a bare half an hour to the start of the shift, so they went to get ready.

Eden struggled into the lead suit, muttering the same curses every boatman since the first had muttered. The boats had ample shielding, and the suits were to provide protection only if a leak allowed in some stray radiation. But on the sun it seemed highly unlikely that a leak would allow in only a little radiation. It seemed much more likely that a leak would allow in so much of the sun's atmosphere that the men in the boat would never know

what hit them. A lead suit then would be like trying to dam a volcano with a feather. Nevertheless, lead suits were mandatory.

Entering the boat from base was always a tricky maneuver. The torus above the joining lock was not a permanent part of the lock, and if it moved, the full gravitational field of the sun could pull at the man, pulling his entire body down into his shoes. Eden slipped through and made the rounds of the boat on the standard captain's inspection before he went to his chair and began the start-up procedure.

He noted the continuing roughness of the sun. First he checked the carbon supply, the material which vaporized and then in the form of a thin film protected the entire boat from the searing heat of the sun's surface. The boats rode the layer of vaporized carbon the way a drop of water rides a layer of vaporized water on a red-hot plate; this was the sessile effect. Next he checked the overhead torus. Here in a circular path there traveled a few ounces of protons at a velocity approaching that of light. At these velocities the few ounces of protons weighed incalculable tons and thus offset the enormous gravitational attraction of the sun itself. The same magnetic tape that supplied the field to maintain the protons in their heavy-mass state also served to maintain a polarity the same as that of the adjacent sun's surface. Hence the torus and the sun's surface repelled each other. Objects under the torus were subjected to two gravitational fields, the one from the torus almost, but not quite, canceling the sun's. As a result men worked in the boats and in the base in a 1–G field.

Eden ran down the entire list checking off one by one

the various functioning parts of the boat. His crew of four worked with him, each responsible for a section of the boat. Five minutes before castoff the board was green, and at zero time on the shift they shoved off.

The boat felt good under his hands. It leaped and surged as the sun's surface roiled and boiled, but he kept it steadily headed outward, sliding ever downhill on its thin film of carbon vapor.

"How do you ride?" he said into the intercom.

A chorus of "fines" came back, so Eden tipped the boat a little more to increase her speed. They were on a tight schedule and they had distance to make. As always Eden felt exhilarated as their speed increased, and he did the thing he always did when he felt that way.

Carefully, he drew back one after another of the sound-deadening panels on the bulkhead next to the pilot's seat. As the eighth panel drew back he could hear it faintly, and so he drew back the ninth panel slowly, and on the tenth the roar filled the pilot's cubicle. Eden sat bathed in a thunderous roar that washed over him, shaking his body with its fury, and taking everything from his mind except the need to fight and strain and hit back. This was the direct naked roar of the sun itself that came in upon him, the thunderous concatenation of a million fission bombs detonating every infinitesimal portion of a second. Its sound and fury were mind-staggering, and a man could only let a little of it in and keep his sanity. But that little was an awesome sound, cleansing, humbling, focusing a man's attention on the powers he controlled, warning him to mind his business.

This was a thing that Eden had never told to anyone, and no one had ever told him. It was his own secret, his

own way of refreshing and replenishing whatever it was that made him the man he was. He supposed that he was the only one of the pilots that did this thing, and since on this one point he did not think clearly, it never occurred to him to wonder how it came about that the only movable sound-deadening panels in the entire boat happened to be located right alongside the pilot's seat.

For half an hour Eden guided the boat toward its first action point, easily coping with the usual roughness of the sun's surface. He checked the operation of the inertial guidance system exactly twice as often as was required by standard operating procedure to make sure that the extra bouncing did not affect its precise operation. As they approached the action point, Eden closed the sound-deadening panels and checked in with his crew. "Four minutes to operation. What color have you?"

Back came the answer from all four points, "All green, Master." Formalities aboard the sessile boat had started. Each man watched his own program, his fingers on the keys and his feet on the pedals, waiting for the position light. It winked on.

Out went the torpedolike capsules, down into the bowels of the sun where the carbon-nitrogen cycle raged. At a temperature of three point five million degrees the ablation head disintegrated and released into the inferno a charge of heavy nitrogen. The heavy nitrogen, appearing as it did at the end of the carbon-nitrogen cycle, disrupted the steady state conditions and produced a flood of helium that served to dampen and cool the fusion reactions in the entire region. The resultant thermal shock to the interior caused an immediate collapse followed by an incredible increase in pressure with the attendant temperature rise.

The vast explosion heaved its way to the surface and became a great prominence licking its way toward Earth and channeling huge masses of protons toward the preselected site in the vicinity of Earth. The initial phase of the operation appeared successful.

The next hour passed in moving from site to site and planting the proper charges, now to bring about a vast electron discharge at the correct angle, now to dampen a flare, now to shift the location of a spot. On two occasions the instruments showed that the detonations did not take place at a sufficiently precise location to meet the unusual requirements for accuracy, and so subsidiary detonations had to be made. They were in constant, if difficult, communication with the other three boats and with base. None of the boats was specifically aware of it, but the beginnings of the Australian drought were set in motion during the second hour out.

There was no tension aboard Eden's boat as the time for the deep operation approached; they were all too busy. When the time came Eden merely checked out over the communication net and reduced the polarity of the magnetic field on the overhead torus. The boat went down fast, leaving the photosphere behind. Eden kept a careful check on the temperature drop across the walls of the boat as they fell; when the sessile effect began to diminish, he wanted to know about it. The interior walls began to heat up sooner than he expected, and once they started, the heat-up proceeded ever more rapidly. A quick check showed that the rate of heating was faster than their rate of descent; they could not reach the required depth without becoming overheated. The boat would not withstand the temperatures that Eden had thought it would. "Too

hot, too hot," he said aloud. He checked the depth; they had another half a mile to go. There was no use in even attempting to release the water where they were. It was half a mile deeper, or nothing. The plan was in jeopardy.

Eden did not really pause to make the decision. He simply drastically cut the power to the polarity-control generators to the torus, and the boat fell like a stone toward the center of the sun. It dropped the half mile in forty seconds, the last few hundred yards in violent deceleration as Eden brought up the power level. The drop was so fast there was little additional heat-up. He hit the water releases and flung the boat into the pattern that had been worked out, and in ten seconds the disruption was complete and a blast of Oxygen 15 was started on its way to Earth. The plan, at least, was consummated.

Eden brought up the torus power to a high level and the boat began to rise to the relative safety of the surface. The time at the deeper level had been sufficiently short that the interior temperature of the boat was at a tolerable 120 degrees F. The control panel showed no signs of trouble until they rose to within a thousand yards of the surface.

The steady rise slowed and drifted to a halt. The boat sank a little and then bobbed up and down and finally found a level, and then it remained motionless. There was no way to strengthen the polarity in the torus. The instruments showed that full power flowed to the coils, and it was not enough. Eden began a check-out. He had barely started when a voice spoke in the intercom, "A portion of our right outboard coil is inoperative, Master. Possibly burned away, but I am checking further."

Eden turned his attention to the coils and soon saw the telltale reduced output. He activated all the thermocouples and other transducers in the vicinity of the coil, and in two minutes he understood what had happened. The burnout had occurred at the point where the coil turned the corner. The sessile effect there must have been slightly less effective than elsewhere. The unexpectedly great heat had pushed past the film of carbon vapor and destroyed a portion of the titanium-molybdenum alloy wires. Full power to the coil was not enough now to increase the polarity sufficiently for the boat to rise any farther.

Eden cut into the intercom and explained the situation to the crew. A cheerful voice responded, "Glad to hear that there is nothing seriously wrong then. Is it just that we cannot move up? Is that what you make of it, Master?"

"So far, yes. Anybody have any suggestions?"

"Yes, Master. I request a leave of absence."

"Granted," said Eden. "Now put in some time on this. We've got to get up."

There was silence aboard the boat, and the silence stretched out to twenty minutes. Eden said, "I'll try to raise base."

For ten minutes Eden tried to reach the base or another boat with his long-long wavelength radio. He was about to give up when he heard a faint and garbled reply. Through the noise he could just recognize the call of the boat mastered by Dobzhansky. He transmitted their situation, over and over, so that the other boat could fill in missing parts of any one message. Then he listened and eventually learned that they understood and would notify base. But as they listened to the faint retransmission all sound faded. A check of their position showed that they

had drifted out of radio range, so Eden tipped the boat and began a circle. Three quarters of the way around he picked up the signal again and listened. He heard nothing but routine communication.

One of his men said, "Fine thing. We can move in every direction with the greatest of ease except the one direction we want to go."

Base was now coming in through the other boat, and Hechmer himself was speaking. All he had to say was, "Stand by while we see what we can do about this."

There was no levity aboard the boat now. The boat floated a thousand yards beneath the surface of the sun, and they began to realize that there was nothing anybody could do about it. A sharpened corner on a coil, and the boat was helpless to return to the surface. Each man sat and stared at his instruments.

A dark-haired vision floated in front of Eden's panel, and in his mind's eye Eden could see the reproachful look on her face. This was what she meant, the black-haired Rebecca, when she said, "I will not share you with any thing." He understood, for now she would be sorry for him, trapped in a place where men had never been.

"Lost the boat again, Master." The words jarred him. He tipped the boat and began the circle again. The shadow of Rebecca was still on him, but suddenly he grew very annoyed. What was this? The worry of a woman to get in the way of his work? This was not for him; this was not for the Bureau. There could be no cloudiness of mind, no dichotomy of loyalty — and then he saw the way up.

As he completed the circle he checked the charts and found the nearest sunspot. It was an hour away. He came

within radio range again and told Dobzhansky he was heading for the sunspot and that he would come up to the surface there. So saying he headed for it. By the most careful operation they cut their time to the spot to fifty minutes. The last ten minutes of time on the way they spent in building the speed of the boat to the maximum obtainable. A thousand yards beneath the surface of the sun they entered the magnetic discontinuity that defined the sunspot.

They rode into it in a direction opposite to that of its rotation, and the great coils of the boat cut across the lines of enormous magnetic force. The motion generated power, and the additional power flowed to the torus, and the boat began to rise. It was a good spot, five thousand miles wide, and still in its prime. The boat rode against the direction of its rotation and spiraled upward slowly as it went. It took great patience to note the fact that the boat rose at all, but hour after hour they worked their way up and finally broke out on the indistinct surface. They rode the edges of the spot until base came for them, and they docked the boat and went aboard.

Eden reported to Hechmer, and they made arrangements to round off the relatively sharp corners on all coils. Most important of all, the deep technic appeared to be a success; it was added to the list of usable technics.

"Well—" said Eden toward the end of the reporting session, stretching his tired muscles—"I see I'm due back on shift again in an hour. That doesn't give me much time to get rested up."

Then Hechmer said the thing that made Eden glad he had decided to stay in the Bureau. "Hm-m-m, that's right,"

said Hechmer, glancing up at the chronometer, "tell you what you do. You be an hour late getting back on duty."

George Andrews was very tired, and he had to work very hard to draw air into his lungs. He lay propped up on a soft bed out under the hot California sun, and his fingers plucked at the thin cover that lay over him. He was on a hilltop. Then he noticed an odd cylindrical-shaped cloud that seemed to rise from the level of the ground and reach way up through the scattered altocumulus clouds that dotted the blue sky. George Andrews smiled, for he could see it coming clearly now. The vertical cylinder of frothy clouds moved toward him, and he felt the chill as the leading edge touched him. He threw back the cover when the flakes began to fall so the snow could fall on him. He turned his face up to it, and it felt cold and it felt good. But more than that, he felt content.

Here was the snow he had loved so much when he was a boy. And the fact that it was here at all showed him that men had not changed much after all, for this was a foolish thing. He had no trouble with the air now; he needed none. He lay under the blanket of snow, and it was a good blanket.

I Always Do What Teddy Says

Harry Harrison

The little boy lay sleeping, the artificial moonlight of the picture picture-window throwing a pale glow across his untroubled features. He had one arm clutched around his teddy bear, pulling the round face with its staring button eyes close to his. His father, and the man with the black beard, tiptoed silently across the nursery to the side of the bed.

"Slip it away," the man said, "and then substitute the other."

"No, he would wake up and cry," Davy's father said. "Let me take care of this, I know what to do."

With gentle hands he laid another teddy bear down next to the boy, on the other side of his head, so that the sleeping-cherub face was framed by the wide-eared unsleeping masks of the toys. Then he carefully lifted the boy's arm from the original teddy and pulled it free. Though this disturbed Davy it did not wake him. He ground his teeth together and rolled over, clutching the substitute toy to his cheek, and within a few moments his quiet breathing was regular and deep again. The boy's father raised his forefinger to his lips and the other man nodded; they left the room without making a sound, closing the door noiselessly behind them.

"Now we begin," Torrence said, reaching out to take the teddy bear. His lips were small and glistened redly in the midst of his dark beard. The teddy bear twisted in his grip and the black-button eyes rolled back and forth.

"Take me back to Davy," it said in a thin and tiny voice.

"Let me have it," the boy's father said. "It knows me and won't complain."

His name was Numen and, like Torrence, he was a Doctor of Government. Both DGs and both unemployed by the present government, in spite of their abilities and rank. In this they were similar, but physically they were opposite. Torrence was a bear, though a small one, a black bear with hair sprouting thickly on his knuckles, twisting out of his white cuffs and lining his ears. His beard was full and thick, rising high up on his cheek-bones and dropping low on his chest.

Where Torrence was dark Numen was fair, where short he was tall, where thick, thin. A thin bow of a man, bent forward with a scholar's stoop and, though balding now, his hair was still curled and blond and very like the golden ringlets of the boy asleep upstairs. Now he took the toy animal and led the way to the shielded room deep in the house where Eigg was waiting.

"Give it here — here!" Eigg snapped when they came in, and reached for the toy. Eigg was always like that, in a hurry, surly, square and solid with his stocky body pressed into a spotless white laboratory smock. But they needed him.

"You needn't," Numen said, but Eigg had already pulled it from his grasp. "It won't like it, I know. . . ."

"Let me go . . . let me go . . . !" the teddy bear said with a hopeless shrill.

"It is just a machine," Eigg said coldly, putting it face down on the table and reaching for a scalpel. "You are a grown man, you should be more logical, have your emotions under greater control. You are speaking with your childhood memories, seeing your own boyhood teddy who

was your friend and companion. This is just a machine." With a quick slash he opened the fabric over the seam seal and touched it: the plastic-fur back gaped open like a mouth.

"Let me go . . . let me go . . ." the teddy bear wailed and its stumpy arms and legs waved back and forth. Both of the onlookers went white.

"Must we . . . ?"

"Emotions. Control them," Eigg said and probed with a screwdriver. There was a click and the toy went limp. He began to unscrew a plate in the mechanism.

Numen turned away and found that he had to touch a handkerchief to his face. Eigg was right. He was being emotional and this was just a machine. How did he dare get emotional over it considering what they had in mind?

"How long will it take?" He looked at his watch, it was a little past 2100.

"We have been over this before and discussing it again will not change any of the factors." Eigg's voice was distant as he removed the tiny plate and began to examine the machine's interior with a magnifying probe. "I have experimented on the three stolen teddy tapes, carefully timing myself at every step. I do not count removal or restoral of the tape, that is just a few minutes for each. The tracking and altering of the tape in both instances took me under ten hours. My best time differed from my worst time by less than fifteen minutes, which is not significant. We can therefore safely say – ahh" – he was silent for a moment while he removed the capsule of the memory spools – "we can safely say that this is a ten-hour operation."

"That is too long. The boy is usually awake by seven,

we must have the teddy back by then. He must never suspect that it has been away."

"There is little risk, you can give him some excuse for the time. I will not rush and spoil the work. Now be silent."

The two governmental specialists could only sit back and watch while Eigg inserted the capsule into the bulky machine he had secretly assembled in the room. This was not their specialty.

"Let me go . . ." the tiny voice said from the wall speaker, then was interrupted by a burst of static. "Let me go . . . bzzzzt . . . no, no, Davy, daddy wouldn't like you to do that . . . fork in left, knife in right . . . bzzzt . . . if you do you'll have to wipe . . . good boy good boy good boy. . . ."

The voice squeaked and whispered and went on, while the hours on the clock went by one by one. Numen brought in coffee more than once and towards dawn Torrence fell asleep sitting up in the chair, only to wake with a guilty start. Of them all Eigg showed no strain nor fatigue, working the controls with fingers regular as a metronome. The reedy voice of the capsule shrilled thinly through the night like the memory of a ghost.

"It is done," Eigg said, sealing the fabric with quick surgeon's stitches.

"Your fastest time ever," Numen sighed with relief. He glanced at the nursery viewscreen that showed his son, still asleep, starkly clear in the harsh infrared light. "And the boy is still asleep. There will be no problem getting it back after all. But is the tape – "

"It is right, perfect, you heard that. You asked the ques-

tions and heard the answers. I have concealed all traces of the alteration and unless you know what to look for you would never find the changes. In every other way the memory and instructions are like all others. There has just been this single change made."

"Pray God we never have to use it," Numen said.

"I did not know that you were religious," Eigg said, turning to look at him, his face expressionless. The magnifying loupe was still in his eye, and it stared, five times the size of its fellow, a large and coldly probing questioner.

"I'm not," Numen said, flushing.

"We must get the teddy back," Torrence broke in. "The boy just stirred."

Davy was a good boy and, when he grew older, a good student in school. Even after he began classes he kept teddy around and talked to him while he did his homework.

"How much is seven and five, teddy?"

The furry toy bear rolled its eyes and clapped stub paws. "Davy knows . . . shouldn't ask teddy what Davy knows. . . ."

"Sure I know – I just wanted to see if you did. The answer is thirteen."

"Davy . . . the answer is twelve . . . you better study harder Davy . . . that's what teddy says. . . ."

"Fooled you!" Davy laughed. "Made you tell me the answer!" He was learning ways to get around the robot controls, permanently fixed to answer the questions of a smaller child. Teddies have the vocabulary and outlook of the very young because their job must be done during the

formative years. Teddies teach diction and life history and morals and group adjustment and vocabulary and grammar and all the other things that enable men to live together as social animals. A teddy's job is done early in the most plastic stages of a child's life, and by the very nature of its task its conversation must be simple and limited. But effective. Teddies are eventually discarded as childish toys, but by then the job is complete.

By the time Davy became David and was eighteen years old, teddy had long since been retired behind a row of books on a high shelf. He was an old friend who had outgrown his useful days, but he was still a friend and certainly couldn't be discarded. Not that Davy ever thought of it that way. Teddy was just teddy and that was that. The nursery was now a study, his cot a bed, and with his birthday past David was packing because he was going away to the university. He was sealing his bag when the phone bleeped and he saw his father's tiny image on the screen.

"David . . ."

"What is it, father?"

"Would you mind coming down to the library now. There is something rather important . . ."

David squinted at the screen and noticed for the first time that his father's face had a pinched, sick look. His heart gave a quick jump.

"I'll be right down!"

Dr. Eigg was there, arms crossed and sitting almost at attention. So was Torrence, his father's oldest friend, who, though no relation, David had always called Uncle Torrence. And his father, obviously ill at ease about something. David came in quietly, conscious of all their eyes

upon him as he crossed the room and took a chair. He was very much like his father, with the same build and height, a relaxed, easy-to-know boy with very few problems in life.

"Is something wrong?" he asked.

"Not wrong, Davy," his father said. He must be upset, David thought, he hasn't called me that in years. "Or rather something *is* wrong, but with the state of the world, and has been for a long time."

"Oh, the Panstentialists," David said, and relaxed a little. He had been hearing about the evils of Panstentialism as long as he could remember. It was just politics; he had been thinking something very personal was wrong.

"Yes, Davy, I imagine you know all about them now. When your mother and I separated I promised to raise you to the best of my ability and I think I have. But I'm a governor and all my friends work in government so I'm sure you have heard a lot of political talk in this house. You know our feelings and I think you share them."

"I do – and I think I would have no matter where I grew up. Panstentialism is an oppressing philosophy and one that perpetuates itself in power."

"Exactly. And one man, Barre, is at the heart of it. He stays in the seat of government and will not relinquish it and, with the rejuvenation treatments, will be there for a hundred years more."

"Barre must go!" Eigg snapped. "For twenty-three years now he has ruled and forbidden the continuation of my experiments. Young man, he has stopped my work for a longer time than you have been alive, do you realize that?"

David nodded, but did not comment. What little he had

read about Dr. Eigg's proposed researches into behavioral human embryology had repelled him and, secretly, he was in agreement with Barre's ban on the work. But Pansentialism was different, he was truly in agreement with his father. This do-nothing philosophy lay a heavy and dusty hand on the world of politics – as well as the world at large.

"I'm not speaking only for myself," Numen said, his face white and strained, "but for everyone in the world and in the system who is against Barre and his philosophies. I have not held a government position for over twenty years – nor has Torrence here – but I think he'll agree that this is a small thing. If this was a service to the people we would gladly suffer it. Or if our persecution was the only negative result of Barre's evil works I would do nothing to stop him."

"I am in complete agreement," Torrence nodded. "The fate of two men is of no importance in comparison with the fate of us all. Nor is the fate of one man."

"Exactly!" Numen sprang to his feet and began to pace agitatedly up and down the room. "If that were not true, if it were not the heart of the problem, I would never consider being involved. There would *be* no problem if Barre suffered a heart attack and fell dead tomorrow."

The three older men were all looking at David now, though he didn't know why, and he felt they were waiting for him to say something.

"Well, yes – I agree. A little embolism right now would be the best thing for the world that I can think of. Barre dead would be of far greater service to mankind than Barre alive has ever been."

The silence lengthened, became embarrassing, and it

was finally Eigg who broke it with his dry, mechanical tones.

"We are all then in agreement that Barre's death would be of immense benefit. In that case, David, you must also agree that it would be fine if he could be . . . killed . . ."

"Not a bad idea," David said, wondering where all this talk was going, "though of course it's a physical impossibility. It must be centuries since the last . . . what's the word, 'murder' took place. The developmental psychology work took care of that a long time ago. As the twig is bent and all that sort of thing. Wasn't that supposed to be the discovery that finally separated man from the lower orders, the proof that we could entertain the thought of killing and even discuss it, yet still be trained in our early childhood so that we would not be capable of the act? If you can believe the textbooks, the human race has progressed immeasurably since the curse of killing has been removed. Look — do you mind if I ask just what this is all about?"

"Barre can be killed," Eigg said in an almost inaudible voice. "There is one man in the world who can kill him."

"WHO?" David asked, and in some terrible way he knew the answer even before the words came from his father's trembling lips.

"You, David . . . you . . ."

He sat, unmoving, and his thoughts went back through the years and a number of things that had been bothering him were now made clear. His attitudes that were so subtly different from his friends', and that time with the plane when one of the rotors had killed a squirrel. Little, puzzling things, and sometimes worrying ones that had kept him awake long after the rest of the house was

asleep. It was true, he knew it without a shadow of a doubt, and wondered why he had never realized it before. But it was like a hideous statue buried in the ground beneath one's feet, it had always been there but had never been visible until he had dug down and reached it. But he could see it now with all the earth scraped from its vile face and all the lineaments of evil clearly revealed.

"You want me to kill Barre?" he asked.

"You're the only one who can . . . Davy . . . and it must be done. For all these years I have hoped against hope that it would not be necessary, that the . . . ability you have would not be used. But Barre lives. For all our sakes he must die."

"There is one thing I don't understand," David said, rising and looking out of the window at the familiar view of the trees and the distant, glass canopied highway. "How was this change made? How could I miss the conditioning that is supposed to be a normal part of existence in this world?"

"It was your teddy bear," Eigg explained. "It is not publicized, but the reaction to killing is established at a very early age by the tapes in the machine that every child has. Later education is just reinforcement, valueless without the earlier indoctrination."

"Then my teddy . . ."

"I altered its tapes, in just that one way, so this part of your education would be missed. Nothing else was changed."

"It was enough doctor," there was a coldness to his voice that had never existed before. "How is Barre supposed to be killed?"

"With this," Eigg removed a package from the table

drawer and carefully opened it. "This is a primitive weapon from a museum. I have repaired it and charged it with the projectile devices that are called shells." He held the sleek, ugly, black thing in his hand. "It is fully automatic in operation. When this device – the trigger – is depressed, a chemical reaction propels a copper and lead weight named a bullet directly from the front orifice. The line of flight of the bullet is along an imaginary path extended from these two grooves on the top of the device. The bullet of course falls by gravity but in a minimum distance, say a metre, this fall is negligible." He put it down suddenly on the table. "It is called a gun."

David reached over slowly and picked it up. How well it fitted into his hand, sitting with such precise balance. He raised it, sighting across the grooves, and pulled the trigger. It exploded with an immense roar and jumped in his hand. The bullet plunged into Eigg's chest just over his heart with such a great impact that the man and the chair he had been sitting in were hurled backwards to the floor. The bullet also tore a great hole in his flesh and Eigg's throat choked with blood and he died.

"David! What are you doing?" His father's voice cracked with uncomprehending horror.

David turned away from the thing on the floor, still apparently unmoved by what he had done.

"Don't you understand, father? Barre and his Pansentialists are a terrible burden on the world and many suffer and freedom is abridged and all the other things that are wrong, that we know should not be. But don't you see the difference? You yourself said that things will change after Barre's death. The world will move on. So how is his

crime to be compared to the crime of bringing *this* back into existence?"

He shot his father quickly and efficiently before the older man could realize the import of his words and suffer with the knowledge of what was coming. Torrence screamed and ran to the door, fumbling with terrified fingers for the lock. David shot him too, but not very well since he was so far away, and the bullet lodged in his body and made him fall. David walked over and ignoring the screamings and bubbled words, took careful aim at the twisting head and blew out the man's brains.

Now the gun was heavy and he was very tired. The lift shaft took him up to his room and he had to stand on a chair to take teddy down from behind the books on the high shelf. The little furry animal sat in the middle of the large bed and rolled its eyes and wagged its stubby arms.

"Teddy," he said, "I'm going to pull up flowers from the flower bed."

"No, Davy . . . pulling up flowers is naughty . . . don't pull up the flowers. . . ." The little voice squeaked and the arms waved.

"Teddy, I'm going to break a window."

"No, Davy . . . breaking windows is naughty . . . don't break any windows. . . ."

"Teddy, I'm going to kill a man."

Silence, just silence. Even the eyes and arms were still.

The roar of the gun broke the silence and blew a ruin of gears, wires and bent metal from the back of the destroyed teddy bear.

"Teddy . . . oh, Teddy . . . you should have told me," David said and dropped the gun and at last was crying.

A Sense of Direction

Alexei Panshin

Arpad woke quietly in the night. Without moving, he looked around: the fire was low, a lapping yellow and red in a sheltering half-circle of rocks; the wind was a cool transparent finger-touch; the circle of the Ship to his left, one ramp lowered, was a blot against the sky. Around him, wrapped in the quiet of the night, were the others, sleeping. Standing guard were David Wiener and Danielle Youd. Arpad smiled to himself because he didn't like either of them. He had reason not to.

The camp, set up just hours ago to last for three nights, was in a valley of short grass, of rocks and hillocks, of water following a Sunday afternoon course. The hills that framed the valley were high and unfinished. They were covered with short grass, too, green turning to brown, and granite rocks.

Arpad was thirteen, a wiry dark-haired boy, competent, unhappy, and able to bide his time. He had waited quietly for this moment for a long time until he was sure that it was no longer expected of him. He wondered what they would think when they found him gone and hoped things would be unpleasant for David and Danielle.

With a silent invisible hand he checked the knife at his belt. Then he leaned back and worked his arms inside the straps of the filled knapsack he had been using for a pillow. When he was done, he looked at the boy and girl standing guard. They were gazing into the dangerous might-be of the darkness as they walked, not at the circle of sleepers.

Four feet away from Arpad was a cut bank, a sharp slope. He breathed twice and then like a ghosting cat he was down it and on his hands and knees in grass that nodded and lied and said no one at all was there. In a moment no one was.

At a distance, in daylight, the valley might have seemed all of a piece, even and undifferentiated, but it was far from even in actuality, particularly in the shadows of night. It held gullies invisible in daylight at thirty feet, rocks, scrub, grass, depressions — all of which could be used. Arpad had paid close attention to every word that bastard Churchward had said about the use of terrain through the past months, hated him because he was abused by him, and listened to what he said as gospel. During the hours of fading light when his attention was supposed to be on fixing and eating a meal, Arpad had tried to think as Churchward had recommended, as Churchward might if he had a free moment, and picked the best line to the shelter of the river bank. He silently followed that line now.

Then, with him still on hands and knees only ten feet short of the sloping bank, there was suddenly a looming shape in front of him. Arpad had a sinking feeling. Before he moved he should have checked to see that Churchward was not off on a midnight prowl, scouting the land by night so as to be all the more omniscient, as befitted his position, tomorrow. He would ask people things he'd already worked out the answers to and take delight in every lagging moment until the answer was produced: "What's the matter, Mr. Margolin?" — a sneering emphasis on the "mister" that was there for nobody else — "Not so sharp today, are we? Come, come, now."

But Churchward continued to move toward him and Arpad realized that flat against the ground he couldn't be seen. He didn't announce himself and he didn't wait to be stepped on. He simply grabbed his knife from its sheath and went for Churchward's throat. Churchward gave a gratifying grunt of surprise and followed his own advice. He threw himself backward, falling on his shoulders, and Arpad did as he had been taught and landed on top of him. There was a moment, exactly the sort of moment Churchward taught you to take advantage of, when Churchward lay helpless under the knife, but Arpad had never killed and even an eyelash blink of petal picking – should I? shouldn't I? – was too much. Churchward flipped him over his head and Arpad landed on his back halfway down the sharp little slope to the river. The knapsack was a hard cushion and Arpad's breath was popped out of him with an explosive little sound. He held onto the knife, however, and slid to the bottom of the slope and pushed himself to his feet. He turned to face Churchward.

Churchward looked down at him. "Ah," he said. "*Mis*ter Margolin – my favorite Mud-eater. You didn't learn your lessons very well."

Arpad wanted to say something about lacking an effective teacher, but as always he couldn't articulate his answer, as always he couldn't retort effectively, an incapacity that had made him the frequent grinning witness to his own humiliation. The grin was simply the face of frustration.

He managed to choke out, "You never saw me."

Churchward said, "You know perfectly well you could never pass me in the dark."

Tempted by the sound of that cutting voice, Arpad almost chanced a throw in the dark with the knife. But he couldn't quite do it.

"I'm leaving," he said. "Don't try to stop me."

"Not at all. It's an excellent idea. I said they should never have taken you aboard in the first place. This simplifies matters. I'll just say you . . . decamped. I must say, I don't mind being proved right about you, you little beggar."

Arpad's teeth were set so hard against each other that a tooth chipped under the pressure, startling him. He spat the fragment out, then turned away. He could hear Churchward's laugh as he took a deep breath, and as he began to trot away along the side of the river he could hear the insulting sound of Churchward making water.

Nobody followed him. Nobody cared. But by the time he was out of sight of the fire glow around a curve of the first hill, the camp and the Ship didn't exist any longer for him. The hill erased all traces of them, and it was as though they and the last year had never been.

He felt at ease the next day as he walked through the ever-present grass that brushed at his bare legs. He had a good eye for country, a talent for finding easy terrain, a good steady walking pace, and a trustworthy sense of direction. Being free after so long helped to lift his spirits, but the country he walked through was an even greater delight. It reminded him of home.

The windhovers rode the currents lazily over his head like so many bird-shaped kites on leading strings. The hills were green fingers, fists, elbows and shoulders. They were hills, not mountains, but they were rugged and unclut-

tered by anything but green-brown short grass. Pinching valleys between them, not in fact, but by their size making the valleys seem narrow and constricted by comparison.

The Ship, that had been his temporay living place this last year, was nothing like this. His real home was, though, the planet on which he had been born and spent his first twelve years. There was no possibility of returning to New Albion — he could see no way to do it — but this planet seemed more satisfactory than he could have hoped and an infinite advance on the insupportable and hated world of the Ship. Arpad had been told often enough that in time he and the Ship would grow used to each other, but that was no answer to Churchward and the many like him, and this green and pleasant land was an obvious and irrefutable answer.

From one point of view, Arpad Margolin was a beggar rejecting the society of kings, the kings in this case being the seven Ships that two hundred years before had carried away over a hundred survival colonies from an overpopulated Earth on the trembling edge of a final war, all in a mere sixteen years, leaving the colonists good wishes to help them survive and little more. With Earth long reduced to black fragments and a cool blue memory, to those colonists who had survived, left with dirt, disease, hard physical labor and early death as their constant portion, the Ships were favored heirs, using their inheritance of material wealth, scientific and technical knowledge, and infinite transport as the basis for a happy and carefree early retirement. Resentment, envy, hatred — the reaction varied from planet to planet depending on the contrast between the colonists' lot and what they were able to see

of the life of the Ships. Whatever the reaction, it was never love.

The Ships held no love for the colonists, either. Generations removed from the original reasons for the differences between them and the "Mud-eaters," born and raised in what in fact were narrow little societies, all that they could see now was the disparity and conclude that it was an expression of the natural order of things. The attitude on their side was based on guilt at best, and at worst on arrogance and contempt.

Life was not as beautiful and simple on the Ships as most colonists believed, and Arpad's presence here on Aurora was the direct product of one of the home fears of the Ships: the fear of the effects of concentrated inbreeding within a small society. As self-protection the Ships had adopted a puberty rite – they dropped every fourteen-year-old on a colony planet to survive for a month as best he or she could. They gave them training beforehand. If the youngsters were unable to profit by their training and survive, then they were small loss to their Ship. It was from his survival class, here on Aurora for three days under the eye of its instructor, young Mr. Churchward, that Arpad had taken French leave with not a single feeling of regret.

From the top of the hill Arpad looked down on the cluster of wattle-and-daub buildings, a far cry from the sturdy board buildings he remembered from home. The buildings, covered with thatched roofs, looked like so many broad-capped mushrooms squatting in the bare brown dirt. The lowering sun colored the village with a patina of dull red. A haze of smoke hung above the roofs in the evening cool and children raced in and out among

the houses. Arpad paused on the hill crest, a thin boy in a red shirt and brown shorts with a pack on his back, then made his way down along the well-beaten little path that took the easiest course to the bottom of the hill and the gathering of huts.

Halfway down he was seen by the children who piped and pointed, and then disappeared. By the time he reached the bottom, activity in general had ceased, and there was a three-man delegation walking toward him, two of the men carrying short-handled thrusting spears. The three walked in a fashion that gave them a precise, affected appearance to Arpad's eye. When they stepped, it was on the falls of their feet, not the heel first. All three men wore knee-length pants and loose shirts, beards but not moustaches, and two of them were wearing flat-crowned hats. The one without a hat was also missing shoes, as though he had been busy relaxing after dinner and had only had time to grab up a spear and come out to greet company. They brought a variety of odors with them from the village – smoke, food and the gallimaufrous smell of people. When they were quite close enough for Arpad's taste, he stopped, but they kept coming until they were so close, almost looming over him, that he felt uncomfortable and frightened. It was only that he was so tired and hungry and that the men were not actually making threatening gestures that kept him from bolting.

The one without a spear, who was clearly the youngest of the three but who nonetheless seemed to be the leader, said, flatly and brusquely, "What do you want, boy?"

Arpad said, "My name is Arpad Margolin," and then stopped, taken aback by the sounds of shock that the spear carriers made.

The one without a hat said, "Have you no sense of propriety? Mind your tongue!"

The leader cleared his throat and then asked flatly again, "What do you want?"

Arpad said, "Well, I've been on one of the Ships. They were keeping me, but I've left now and I'm . . . looking for somebody who will take me in." He gave them an anxious and pleading look because he was, after all, only a thirteen-year-old boy.

"One of the Great Ships?"

"Yes."

"And you left them?"

"Yes."

The three looked at him and then at each other. Then the leader said, "Stay here," and beckoned to the other two. They moved off about ten feet and huddled together in conference. Arpad could only hear fragments of the conversation. Something about, "We know his name – aren't we committed?" and "He is wearing red. Maybe it would be lucky to at least listen."

At last they broke their huddle and turned to him again.

The leader nodded and said, "All right. We've decided to listen to you. We'll have the accounting in an hour. For now, go along with Bill here."

He pointed at the hatless, shoeless man, so Arpad, not quite sure what was going on, trailed along behind. He was a big, broad-nosed, broad-shouldered, splayfooted fellow and he walked on precisely placed toes through the village, then ducked his head at the door of one of the huts and went inside. Arpad looked left and right, and then followed him in.

Inside, the hut was only a single room which resembled

a theater stage – a basically empty area that with the aid of props might be turned to any purpose. The only permanent features were a fire pit that had a pile of glowing coals in it and a larder hole. The floor was hard-packed dirt. A woman past her first youth was scraping food out of a black pot onto a large leaf, preparing to wrap it and place it in the larder. Lying on a mat in the corner to the right of the door was an old man, his very dirty bare feet sticking out of the cover. Arpad had never seen a room like this before and it reminded him not at all of home.

Almost automatically as he came inside, big Bill kicked the sole of the old man's right foot. "Hold on with the food there," Bill said to the woman. "Are you hungry, boy?"

Arpad nodded. The woman got a bowl and shoved some of the suspicious mess from her pot into it and handed it to Arpad with a smile that lit her face briefly and then was gone with an apologetic nod of her head almost as though she remembered herself. There was no eating implement. Bill brought out a long piece of bread, looked around for a knife and then started to tear off a hunk. Arpad drew his knife and handed it over, then took a cut of bread back in return.

Bill took a piece, too, and then with it stuffed in his mouth looked at the knife enviously, testing the balance. Speaking around the bread, he said, "Are all knives on the Ship of this quality? This is a fine knife." He handed it back.

Arpad started to eat. The food was strange in taste and stranger in texture, but he didn't find it hard to get down. The woman went out of the hut and balanced a pot on her head and Bill stepped outside after her. Arpad could hear them speaking to each other. Arpad continued to eat,

and then had the feeling he was being watched. He turned to see the small and overly bright eyes of the old man firmly, insistently fixed on him. The old man didn't look at all well.

He fluttered a hand weakly at Arpad. "Come here, boy."

Arpad moved over with his bowl in hand.

"Don't be so standoffish," the old man said.

Arpad skrinched closer, but even this wasn't close enough for the weak old man. In order to bathe Arpad in his sour old breath, he heaved himself half off his mat of woven grass. At that range he apparently felt able to talk. At that range, Arpad felt overwhelmed and edged back a little.

The old man edged after. "What are you doing here, boy?" He scrabbled at him with a hand. "What are you doing?"

The sound of the old man's yells of outrage brought Bill charging into the hut. Arpad was ducking away and the old man was ineffectually trying to strike him. The bowl of food was spilled in the dirt.

"What's going on here?" Bill asked as he boosted the old man back onto his pallet with the tip of his toe.

In complete indignation, the old man said, "He told me his name. I never saw such bad manners."

"It's you who don't know what's good manners," Arpad said. "I was taught never to speak to my elders unless I introduced myself."

They both looked at him. They didn't say anything, they just looked at him.

Then Bill said, "You just don't know any better, I guess. Coming from the Ships the way you do, I suppose you

wouldn't. I never thought they had any notion of what is fitting. You seem like a good boy and I don't think you mean any harm. You'll learn what's proper."

He turned to the old man and said, "What does one debt more or less mean to you now? Besides we may not owe him anything."

Arpad said, "I still don't understand. You told me your name."

Bill looked puzzled. "I never did. I wouldn't do a thing like that."

" 'Bill.' "

He tried to confine his laugh and it came out in an amused snort. "Bill isnt my name," Bill said. "You really don't know anything. That's the Village Name — we're all Bill until we decide about you."

All the men in the village were assembled — fifty men named Bill — sitting cross-legged in the dirt of the Council Hut, when Arpad was brought in by the Bill he knew best. All the men were wearing their flat-crowned hats. By this time it as quite dark out. There was a good bright fire going in the center of the circle of men. There were no women present. The leader waved Arpad to a place at the center of the circle, close by the fire.

"Now," said the leader, "we've talked things over among us, and we've decided to let you tell us who you are. Are you willing to trade names?"

"May I say who I am now?" Arpad asked, and he heard someone murmur, "The boy is well brought up."

Arpad said, "I don't really understand your customs. Why can you tell your name some times and not others?"

It was almost as though the leader had never been

asked the question before and he had to work out a proper answer. He looked a bit overwhelmed. Then he said, "Well, if you know a man's name you have to discover whether you owe him anything or not. Naturally. So you both have to agree that you are willing to accept the burden of each other's names. Do you agree?"

Arpad nodded. He didn't quite see the point of it all, because he knew he hadn't seen any of the people here before, and he was sure he couldn't owe them anything.

"My name is Arpad Margolin," he said, and stopped.

The leader said, "What about the rest?"

"The rest?"

"Your family."

"Well, my father was named Henry Margolin, and my mother was from New Albion and she was named Nesta Hansard." He stopped again.

"Don't you know your family?" the leader asked. "Can't you name them all?"

Arpad shook his head slowly.

"How very odd." The leader shook his head, too, and thought. At last he said, "Well, let's see if we can find a way around."

With shrewd questioning, it was finally settled exactly which Ship it was that Arpad came from as distinct from all others. It was also settled that this was not the Ship that had carried the colonists to Aurora and that Arpad had no relatives (to the best of his knowledge) on any other Ship.

The leader then stood up and said, quite formally, "Does anybody her present claim or acknowledge debt or obligation?"

One man at the left of Arpad and the rear of the circle

stood up and said, "My grandfather three times removed, Nobuss McCarthy, was a shippeen of this Ship. He named to his son all his debts, and his son to his son, and so to me, and he named among the men who cast him forth from the Ship one Oscar Margolin. A debt was judged against him in this village and the debt was never paid."

"Do you acknowledge this debt, or do you have a counter-debt to charge?" the leader asked.

Arpad said, "I don't know. I suppose he must have been an ancestor of mine. But I don't know anything about it."

The leader raised his eyebrows and then said, "Do you acknowledge it, then?"

"I guess."

The leader said, "McCarthy, what will you settle for?"

McCarthy looked at Arpad. "I'll take that knife of his."

The leader held out his hand to Arpad for the knife and wiggled his fingers for it. Arpad, still not altogether sure of what he was involved in, handed it over. The leader examined the knife closely.

Then he said, "It is worth more than the debt. McCarthy, can you stand to make a debt of your own?"

"Yes."

"All right. Take the knife, but I'll mind the boy's interests until he can mind them for himself and I'll be sure you pay the debt back."

McCarthy's neighbors all looked with envy at his new knife as he took his seat again.

The leader said, "Well, now that that is settled, tell us about the Ship and why you came to leave."

So Arpad told his story. From time to time he was interrupted and asked for clarification, and both because he had never told it before — people had always known

who and what he was – and because his tongue stumbled, his account was halting.

Arpad's father had been a planetary agent, one of an active minority aboard the Ships who were determined to do good works to the colony planets, dispense largesse and knowledge of a better way of life, and generally improve the lot of the colonists. His father had taken this step too far, marrying a local girl, a native, a Mud-eater, during his tenure on New Albion – "It's one thing to *help* these people, but after all, Henry, there are limits." – something that twenty years earlier would have caused him to be disinherited in the same abrupt manner as the ancestor of knife-possessing McCarthy had been for some earlier-day transgression. In any case, it was still the social equivalent of marrying a Negro, an Untouchable, or a Christian in times past. The result was that Margolin's stay on New Albion was indefinitely extended, thereby saving his family and friends the embarrassment of his company. Margolin never came home again – he lived instead quite comfortably with his wife and child until he died. At this point his Shipboard associates decided that they just might have treated poor Henry a bit shabbily – he had, after all, more than done his duty in the dispensation of good works – and that they owed his child something. They proceeded accordingly to repair to New Albion, remove young Arpad from the altogether unsuitable care of his mother, and return with him to the Ship. That Arpad's mother resisted the idea was, of course, to be expected from one of her background, but that Arpad himself resisted loudly and physically only served to demonstrate how badly his father had done by him and how much he was in need of a proper education and an ex-

posure to a finer way of living. Of course, once they had returned to the Ship, found Arpad a place in a dormitory, arranged for his education and scheduled his life, they were more than satisfied that they had done their duty by poor Henry and his issue and that it was now up to Arpad to take advantage of the opportunities Providence in their persons had presented to him. This, of course, Arpad had been completely unable to do.

He lacked background in the ways of the Ship, and it had taken him one full year of pain and humiliation even to begin to know how to act properly by local lights. He lacked sponsorship and consequently he lacked friends. Most important, because of what he was – a Mud-eater – he encountered hate and contempt in quantities that he could not cope with at all, and one full year had only done a little to lessen that. People like Churchward whose personalities depended on a particular view of the world were unlikely to scrap what had been so laboriously constructed for the sake of one scruffy little boy. So, given the opportunity to decamp – an opportunity that could not be eternally denied him – Arpad had taken it and split in search of a life more closely resembling the one he had once had. And that had brought him here.

When he was done, the leader said, "It's just as I thought. The people of the Ships have no sense of fitness or decency. They treated you shamefully."

He put his hands on Arpad's shoulders. "You have come to the right place. We will feed you and house you and treat you as one of our own. My name is Yoder Steckmesser."

The others all nodded and called assent. Then, one by one, they came up and made Arpad the present of their

names, acknowledging thereby that he was *people*, someone they could and would stand in a relation of ower-and-owed with. Then they all took their places again.

Then Steckmesser turned to the "Bill" that Arpad knew best. "Come here, Henry," he said. "Henry, you need a son, don't you?"

The man nodded.

"We may have one for you who brings you no debts." He turned to Arpad. "This is Henry Heine. He is an unlucky man. His ancestors have left him burdened with debts, the weight of years, and his father has only added to the burden. Henry has no son to follow him. He will have to wander forever after death under the pain of his unpaid debts. But now, if you are willing, you can be his son. His name and your father's name are the same, and that is a lucky sign. It is a good sign for the future. Will you take him for a father?"

"Yes," Arpad said.

"Henry?"

"Yes," Henry said. His eyes filled with tears, he grabbed Arpad and kissed him heartily.

Then his wife was called into the Council Hut. When she heard that she had a new son, she smiled and cried at the same time, and held him tight.

They had an adoption ceremony on the spot. The other women in the village came into the hut with food and poteen, and after everybody kissed everybody and congratulations were passed around generally, and Arpad's claim on McCarthy was used to cancel one of Heine's obligations, everybody ate and drank. The party went on for hours.

When at last Arpad and his new parents returned

through the dark to their hut, Sara, Arpad's new mother, said, "What about burying the old man?"

Heine said, "It's late now. Wait until morning, and then Steckmesser will give me a hand." Then he put an arm around Arpad's shoulder and pulled him in to what seemed the uncomfortably close standard distance here. "Don't be so cold, boy. Arpad. You know, I never thought I'd have a son of your age who didn't even know how to walk normally. You're a good boy, though. You'll learn."

In the morning when Arpad awoke, Sara had food warming for him and brought it to him with a kiss. The old man was lying silently awake on his mat in the corner. Heine was nowhere in sight. The day was cool and bright. Children were playing around the houses as Arpad ate, and he could catch occasional glimpses of them through the doorway, feet pounding, pushing, bouncing. A woman passed, pot on head, after water.

As Arpad was finishing his breakfast, Heine entered the hut. His short breeches were stained with dirt, and he was sweaty and tired. He greeted Arpad.

"All done?" Sara said.

Heine nodded and went to the pot in the corner for a drink. "Yoder will be here in a few minutes and he'll help me finish."

"Is there anything I can do?" Arpad asked.

"You can watch. We're just going to bury the old man."

Startled, Arpad shot a look at the old man and got an alert bright-eyed look in return.

"But he's not dead," Arpad said.

"Of course he is," Heine said. Arpad looked at the old man again and he nodded. "Since we adopted you last night."

Then Yoder Steckmesser cleared his throat, announcing his presence, and greeted Arpad. "Hello there, boy. How are you today?"

"Grab the other end there," Heine said. He reached down and picked up the head end of the old man's pallet. Steckmesser took the other end and they lifted pallet and old man together, maneuvered to get clear passage through the door, and carried him out. The old man just lay quietly, not objecting, passively accepting. Arpad stood and looked after as they disappeared from sight to the right up the street.

"Run along now," Sara said. "Maybe you can give them a hand."

Slowly Arpad went out of the door into the gentle sunshine. Heine and Steckmesser carried their burden along at a right good pace and nobody seemed to find their progress through the town in the least strange. The children didn't even stop playing. The old man, riding on the pallet, did raise himself to an elbow to see where they were going more clearly. Arpad trailed along behind them as they passed out of the village and along a path at the foot of the hill he'd come down the evening before, and finally came to a cluster of little round mounds, a freshly dug hole and beside it a pile of friendly brown dirt. He stayed at a distance while the men straddled the hole and lowered the old man into the grave. The grave was shallow and rounded and when the old man was sitting in it his head was still above ground. There were shovels in the pile of dirt and the two men took hold of these and began to fill the hole. Arpad watched for a minute, but he just didn't want to watch the old man be slowly covered.

He turned up the hill and when he reached the crest of

the hill shoulder he looked back at the village with the children still playing and then back at the men still shoveling dirt around the old man's shoulders. Then he walked on through the grass, trying to think.

He wished he knew what to do. He didn't really understand these people any more than he'd understood the Ship when he first came there. He wondered if it would be as painful to adjust here. If he had thought of the Ship as a place whose ways were not his ways, what of this place?

He felt agitated and uncertain, and no more happy than he had been in any recent time. Certainly not as happy as he had been yesterday when he had still thought somehow that he might find the life he had left behind. He was confused.

After he had been automatically walking and thinking for some distance, he came to himself and looked around. He saw then that his sense of direction had been carrying him away from the village and back in the direction of the scout ship and the camp he had left a day and a half before.

He broke into a run then, a full speed gallop through the knee-high grass.

It was night before he found the camp again, and he was traveling much slower then. He came over a gentle hill and the camp was across the valley and the slowly moving river from him, marked by the fire in its center.

Arpad went to ground on his side of the river and wormed to a place from which he could see the camp clearly. It was far enough into the night that people were asleep. He marked the movements of the guards and saw Churchward as he left the fire and prowled into the night.

Then Arpad remembered what Churchward had said

about never passing him in the night and the idea came to him. He smiled to himself and made a determination.

After a time, he moved upstream until he was well out of range of the camp and there he found a quiet place to cross. The water was cool and shallow.

Then he moved with infinite care back toward the camp. He circled wide and moved from one bit of shelter to another. He moved slowly and he kept a constant eye open for Churchward.

When he saw him, he was about to cross from the shelter of a scrub tree to a dry gully. The motion was from an unexpected direction and Arpad caught just a flash from the corner of his eye. Heart pounding, he froze to the ground, hoping he hadn't been seen, wishing there were some way to be invisible. Like an odor on the wind, Churchward passed by and out of sight and never saw him at all.

In ten more minutes, Arpad was in the same grass that had hidden him two nights before. Above him was the cut bank, the fire circle, the sleepers, and two drowsy children on guard. The grass surrounding him nodded and lied again, as grass will. Then Arpad slipped up the bank, into the circle and was one more quiet sleeper, quickly, silently, cleanly. No one saw him move at all.

He relaxed, and this time he hoped Churchward would be embarrassed. In any case, he felt good. He had decided to deal with one set of problems at a time, and this was where he belonged. First things first. He was tired and he fell asleep quickly.

Omnilingual

H. Beam Piper

Martha Dane paused, looking up at the purple-tinged copper sky. The wind had shifted while she had been inside, and the dust storm that was sweeping the high deserts to the east was now blowing out over Syrtis. The sun, magnified by the haze, was a gorgeous magenta ball, as large as the sun of Terra, at which she could look directly. Tonight some of that dust would come sifting down from the upper atmosphere to add another film to what had been burying the city for the last fifty thousand years.

The red loess lay over everything, covering the streets and the open spaces of park and plaza, hiding the small houses that had been crushed and pressed flat under it and the rubble that had come down from the tall buildings when roofs had caved in and walls had toppled outward. Here where she stood, the ancient streets were a hundred to a hundred and fifty feet below the surface; the breach they had made in the wall of the building behind her had opened into the sixth story. She could look down on the cluster of prefabricated huts and sheds, on the brush-grown flat that had been the waterfront when this place had been a seaport on the ocean that was now Syrtis Depression; already, the bright metal was thinly coated with red dust. She thought, again, of what clearing this city would mean, in terms of time and labor, of people and supplies and equipment brought across fifty million miles of space. They'd have to use machinery; there was no other way it could be done. Bulldozers and power shovels and draglines; they were fast, but they were rough and in-

discriminate. She remembered the digs around Harappa and Mohenjo-Daro, in the Indus valley, and the careful, patient native laborers – the pickmen and spademen, the long files of basketmen carrying away the earth. Slow and primitive as the civilization whose ruins they were uncovering, yes, but she could count on the fingers of one hand the times one of her pickmen had damaged a valuable object in the ground. If it hadn't been for the underpaid and uncomplaining native laborer, archaeology would still be back where Winckelmann had found it. But on Mars there was no native labor; the last Martian had died five hundred centuries ago.

Something started banging like a machine gun, four or five hundred yards to her left. A solenoid jackhammer; Tony Lattimer must have decided which building he wanted to break into next. She became conscious then, of the awkward weight of her equipment, and began redistributing it, shifting the straps of her oxy-tank pack, slinging the camera from one shoulder and the board and drafting tools from the other, gathering the notebooks and sketchbooks under her left arm. She started walking down the road, over hillocks of buried rubble, around snags of wall jutting up out of the loess, past buildings still standing, some of them already breached and explored, and across the brush-grown flat to the huts.

There were ten people in the main office room of Hut One when she entered. As soon as she had disposed of her oxygen equipment, she lit a cigarette, her first since noon, then looked from one to another of them. Old Selim von Ohlmhorst, the Turco-German, one of her two fellow archaeologists, sitting at the end of the long table against the farther wall, smoking his big curved pipe and going

through a loose-leaf notebook. The girl ordnance officer, Sachiko Koremitsu, between two droplights at the other end of the table, her head bent over her work. Colonel Hubert Penrose, the Space Force CO, and Captain Field, the intelligence officer, listening to the report of one of the airdyne pilots, returned from his afternoon survey flight. A couple of girl lieutenants from Signals, going over the script of the evening telecast, to be transmitted to the *Cyrano,* on orbit five thousand miles off planet and relayed from thence to Terra via Lunar. Sid Chamberlain, the Trans-Space News Service man, was with them. Like Selim and herself, he was a civilian; he was advertising the fact with a white shirt and a sleeveless blue sweater. And Major Lindemann, the engineer officer, and one of his assistants, arguing over some plans on a drafting board. She hoped, drawing a pint of hot water to wash her hands and sponge off her face, that they were doing something about the pipeline.

She started to carry the notebooks and sketchbooks over to where Selim von Ohlmhorst was sitting, and then, as she always did, she turned aside and stopped to watch Sachiko. The Japanese girl was restoring what had been a book fifty thousand years ago. Her eyes were masked by a binocular loupe, the black headband invisible against her glossy black hair, and she was picking delicately at the crumbled page with a hair-fine wire set in a handle of copper tubing. Finally, loosening a particle as tiny as a snowflake, she grasped it with tweezers, placed it on the sheet of transparent plastic on which she was reconstructing the page, and set it with a mist of fixative from a little spray gun. It was a sheer joy to watch her; every movement was

as graceful and precise as though done to music after being rehearsed a hundred times.

"Hello, Martha. It isn't cocktail time yet, is it?" The girl at the table spoke without raising her head, almost without moving her lips, as though she were afraid that the slightest breath would disturb the flaky stuff in front of her.

"No, it's only fifteen-thirty. I finished my work, over there. I didn't find any more books, if that's good news for you."

Sachiko took off the loupe and leaned back in her chair, her palms cupped over her eyes.

"No, I like doing this. I call it micro-jigsaw puzzles. This book, here, really is a mess. Selim found it lying open, with some heavy stuff on top of it; the pages were simply crushed." She hesitated briefly. "If only it would mean something, after I did it."

There could be a faintly critical overtone to that. As she replied, Martha realized that she was being defensive.

"It will, someday. Look how long it took to read Egyptian hieroglyphics, even after they had the Rosetta stone."

Sachiko smiled. "Yes, I know. But they did have the Rosetta stone."

"And we don't. There is no Rosetta stone, not anywhere on Mars. A whole race, a whole species, died while the first Cro-Magnon cave artist was daubing pictures of reindeer and bison, and across fifty thousand years and fifty million miles there was no bridge of understanding.

"We'll find one. There must be something, somewhere, that will give us the meaning of a few words, and we'll use them to pry meaning out of more words, and so on. We

may not live to learn this language, but we'll make a start, and someday somebody will."

Sachiko took her hands from her eyes, being careful not to look toward the unshaded lights, and smiled again. This time Martha was sure that it was not the Japanese smile of politeness, but the universally human smile of friendship.

"I hope so, Martha – really I do. It would be wonderful for you to be the first to do it, and it would be wonderful for all of us to be able to read what these people wrote. It would really bring this dead city to life again." The smile faded slowly. "But it seems so hopeless."

"You haven't found any more pictures?"

Sachiko shook her head. Not that it would have meant much if she had. They had found hundreds of pictures with captions; they had never been able to establish a positive relationship between any pictured object and any printed word. Neither of them said anything more, and after a moment Sachiko replaced the loupe and bent her head forward over the book.

Selim von Ohlmhorst looked up from his notebook, taking his pipe out of his mouth.

"Everything finished, over there?" he asked, releasing a puff of smoke.

"Such as it was." She laid the notebooks and sketches on the table. "Captain Gicquel's started air-sealing the building from the fifth floor down, with an entrance on the sixth; he'll start putting in oxygen generators as soon as that's done. I have everything cleared up where he'll be working."

Colonel Penrose looked up quickly, as though making a mental note to attend to something later. Then returned

his attention to the pilot, who was pointing something out on a map.

Von Ohlmhorst nodded. "There wasn't much to it, at that," he agreed. "Do you know which building Tony has decided to enter next?"

"The tall one with the conical thing like a candle extinguisher on top, I think. I heard him drilling for the blasting shots over that way."

"Well, I hope it turns out to be one that was occupied up to the end."

The last one hadn't. It had been stripped of its contents and fittings, a piece of this and a bit of that, haphazardly, apparently over a long period of time, until it had been almost gutted. For centuries, as it had died, this city had been consuming itself by a process of autocannibalism. She said something to that effect.

"Yes. We always find that – except, of course, at places like Pompeii. Have you seen any of the other Roman cities in Italy?" he asked. "Minturnae, for instance? First the inhabitants tore down this to repair that, and then, after they had vacated the city, other people came along and tore down what was left, and burned the stones for lime, or crushed them to mend roads, till there was nothing left but the foundation traces. That's where we are fortunate; this is one of the places where the Martian race perished, and there were no barbarians to come later and destroy what they had left." He puffed slowly at his pipe. "One of these days, Martha, we are going to break into one of these buildings and find that it was one in which the last of these people died. Then we will learn the story of the end of this civilization."

And if we learn to read their language, we'll learn the

whole story, not just the obituary. She hesitated, not putting the thought into words. "We'll find that, sometime, Selim," she said, then looked at her watch. "I'm going to get some more work done on my lists, before dinner."

For an instant, the old man's face stiffened in disapproval; he started to say something, thought better of it, and put his pipe back into his mouth. The brief wrinkling around his mouth and the twitch of his white moustache had been enough, however; she knew what he was thinking. She was wasting time and effort, he believed; time and effort belonging not to herself but to the expedition. He could be right, too, she realized. But he had to be wrong; there had to be a way to do it. She turned from him silently and went to her own packing-case seat, at the middle of the table.

Photographs, and photostats of restored pages of books, and transcripts of inscriptions were piled in front of her, and the notebooks in which she was compiling her lists. She sat down, lighting a fresh cigarette, and reached over to a stack of unexamined material, taking off the top sheet. It was a photostat of what looked like the title page and contents of some sort of a periodical. She remembered it; she had found it herself, two days before, in a closet in the basement of the building she had just finished examining.

She sat for a moment, looking at it. It was readable, in the sense that she had set up a purely arbitrary but consistently pronounceable system of phonetic values for the letters. The long vertical symbols were vowels. There were only ten of them; not too many, allowing separate characters for long and short sounds. There were twenty of the short horizontal letters, which meant that sounds

like *-ng* or *-ch* or *-sh* were single letters. The odds were millions to one against her system being anything like the original sound of the language, but she had listed several thousand Martian words, and she could pronounce all of them.

And that was as far as it went. She could pronounce between three and four thousand Martian words, and she couldn't assign a meaning to one of them. Selim von Ohlmhorst believed that she never would. So did Tony Lattimer, and he was a great deal less reticent about saying so. So, she was sure, did Sachiko Koremitsu. There were times, now and then, when she began to be afraid that they were right.

The letters on the page in front of her began squirming and dancing, slender vowels with fat little consonants. They did that, now, every night in her dreams. And there were other dreams, in which she read them as easily as English; waking, she would try desperately and vainly to remember. She blinked, and looked away from the photostated page; when she looked back, the letters were behaving themselves again. There were three words at the top of the page, over- and underlined, which seemed to be the Martian method of capitalization. *Mastharnorvod Tadavas Sornhulva.* She pronounced them mentally, leafing through her notebooks to see if she had encountered them before, and in what contexts. All three were listed. In addition, *masthar* was a fairly common word, and so was *norvod,* and so was *nor,* but *-vod* was a suffix and nothing but a suffix. *Davas* was a word, too, and *ta-* was a common prefix; *sorn* and *hulva* were both common words. This language, she had long ago decided, must be something like German; when the Martians had needed a new

word, they had just pasted a couple of existing words together. It would probably turn out to be a grammatical horror. Well, they had published magazines, and one of them had been called *Mastharnorvod Tadavas Sornhulva.* She wondered if it had been something like the *Quarterly Archaeological Review,* or something more on the order of *Sexy Stories.*

A smaller line, under the title, was plainly the issue number and date; enough things had been found numbered in series to enable her to identify the numerals and determine that a decimal system of numeration had been used. This was the one thousand and seven hundred and fifty-fourth issue, for *Doma,* 14837; then, *Doma* must be the name of one of the Martian months. The word had turned up several times before. She found herself puffing furiously on her cigarette as she leafed through notebooks and piles of already examined material.

Sachiko was speaking to somebody, and a chair scraped at the end of the table. She raised her head, to see a big man with red hair and a red face, in Space Force green, with the single star of a major on his shoulder, sitting down. Ivan Fitzgerald, the medic. He was lifting weights from a book similar to the one the girl ordnance officer was restoring.

"Haven't had time, lately," he was saying, in reply to Sachiko's question. "The Finchley girl's still down with whatever it is she has, and it's something I haven't been able to diagnose yet. And I've been checking on bacteria cultures, and in what spare time I have, I've been dissecting specimens for Bill Chandler. Bill's finally found a mammal. Looks like a lizard, and it's only four inches long, but it's a real warm-blooded, gamogenetic, placental,

viviparous mammal. Burrows, and seems to live on what pass for insects here."

"Is there enough oxygen for anything like that?" Sachiko was asking.

"Seems to be, close to the ground." Fitzgerald got the headband of his loupe adjusted, and pulled it down over his eyes. "He found this thing in a ravine down on the sea bottom — Ha, this page seems to be intact; now, if I can get it out all in one piece —"

He went on talking inaudibly to himself, lifting the page a little at a time and sliding one of the transparent plastic sheets under it, working with minute delicacy. Not the delicacy of the Japanese girl's small hands, moving like the paws of a cat washing her face, but like a steam hammer cracking a peanut. Field archaeology requires a certain delicacy of touch, too, but Martha watched the pair of them with envious admiration. Then she turned back to her own work, finishing the table of contents.

The next page was the beginning of the first article listed; many of the words were unfamiliar. She had the impression that this must be some kind of scientific or technical journal; that could be, because such publications made up the bulk of her own periodical reading. She doubted if it were fiction; the paragraphs had a solid, factual look.

At length, Ivan Fitzgerald gave a short, explosive grunt.

"Ha! Got it!"

She looked up. He had detached the page and was cementing another plastic sheet onto it.

"Any pictures?" she asked.

"None on this side. Wait a moment." He turned the sheet. "None on this side, either." He sprayed another

sheet of plastic to sandwich the page, then picked up his pipe and relighted it.

"I get fun out of this, and it's good practice for my hands, so don't think I'm complaining," he said. "But Martha, do you honestly think anybody's ever going to get anything out of this?"

Sachiko held up a scrap of the silicone plastic the Martians had used for paper with her tweezers. It was almost an inch square.

"Look; three whole words on this piece," she crowed. "Ivan, you took the easy book."

Fitzgerald wasn't being sidetracked. "This stuff's absolutely meaningless," he continued. "It had a meaning fifty thousand years ago, when it was written, but it has none at all now."

Martha shook her head. "Meaning isn't something that evaporates with time," she argued. "It has just as much meaning now as it ever had. We just haven't learned how to decipher it."

"That seems like a pretty pointless distinction," Selim von Ohlmhorst joined the conversation. "There no longer exists a means of deciphering it."

"We'll find one." She was speaking, she realized, more in self-encouragement than in controversy.

"How? From pictures and captions? We've found captioned pictures, and what have they given us? A caption is intended to explain the picture, not the picture to explain the caption. Suppose some alien to our culture found a picture of a man with a white beard and moustache sawing a billet from a log. He would think the caption meant, *Man Sawing Wood.* How would he know that it was really *Wilhelm II in Exile at Doorn?*"

Sachiko had taken off her loupe and was lighting a cigarette.

"I can think of pictures intended to explain their captions," she said. "These picture language-books, the sort we use in the service – little line drawings, with a word or phrase under them."

"Well, of course, if we found something like that," von Ohlmhorst began.

"Michael Ventris found something like that, back in the fifties," Hubert Penrose's voice broke in from directly behind her.

She turned her head. The colonel was standing by the archaeologists' table; Captain Field and the airdyne pilot had gone out.

"He found a lot of Greek inventories of military stores," Penrose continued. "They were in Cretan Linear B script, and at the head of each list was a little picture, a sword or a helmet or a cooking tripod or a chariot wheel. That's what gave him the key to the script."

"Colonel's getting to be quite an archaeologist," Fitzgerald commented. "We're all learning each others' specialties on this expedition."

"I heard about that long before this expedition was even contemplated." Penrose was tapping a cigarette on his gold case. "I heard about that back before the Thirty Days' War, at intelligence school, when I was a lieutenant. As a feat of cryptanalysis, not an archaeological discovery."

"Yes, cryptanalysis," von Ohlmhorst pounced. "The reading of a known language in an unknown form of writing. Ventris' lists were in the known language, Greek. Neither he nor anybody else ever read a word of the Cretan lan-

guage until the finding of the Greek-Cretan bilingual in 1963, because only with a bilingual text, one language already known, can an unknown ancient language be learned. And what hope, I ask you, have we of finding anything like that here? Martha, you've been working on these Martian texts ever since we landed here – for the last six months. Tell me, have you found a single word to which you can positively assign a meaning?"

"Yes, I think I have one." She was trying hard not to sound too exultant. "*Doma.* It's the name of one of the months of the Martian calendar."

"Where did you find that?" von Ohlmhorst asked. "And how did you establish –"

"Here." She picked up the photostat and handed it along the table to him. "I'd call this the title page of a magazine."

He was silent for a moment, looking at it. "Yes, I would say so, too. Have you any of the rest of it?"

"I'm working on the first page of the first article, listed there. Wait till I see . . . yes, here's all I found, together, here." She told him where she had gotten it. "I just gathered it up, at the time, and gave it to Geoffrey and Rosita to photostat; this is the first I've really examined it."

The old man got to his feet, brushing tobacco ashes from the front of his jacket, and came to where she was sitting, laying the title page on the table and leafing quickly through the stack of photostats.

"Yes, and here is the second article, on page eight, and here's the next one." He finished the pile of photostats. "A couple of pages missing at the end of the last article. This is remarkable; surprising that a thing like a magazine would have survived so long."

"Well, this silicone stuff the Martians used for paper is

pretty durable," Hubert Penrose said. "There doesn't seem to have been any water or any other fluid in it originally, so it wouldn't dry out with time."

"Oh, it's not remarkable that the material would have survived. We've found a good many books and papers in excellent condition. But only a really vital culture, an organized culture, will publish magazines, and this civilization had been dying for hundreds of years before the end. It might have been a thousand years before the time they died out completely that such activities as publishing ended."

"Well, look where I found it; in a closet in a cellar. Tossed in there and forgotten, and then ignored when they were stripping the building. Things like that happen."

Penrose had picked up the title page and was looking at it.

"I don't think there's any doubt about this being a magazine, at all." He looked again at the title, his lips moving silently. "*Mastharnorvod Tadavas Sornhulva.* Wonder what it means. But you're right about the date – *Doma* seems to be the name of a month. Yes, you have a word, Dr. Dane."

Sid Chamberlain, seeing that something unusual was going on, had come over from the table at which he was working. After examining the title page and some of the inside pages, he began whispering into the stenophone he had taken from his belt.

"Don't try to blow this up to anything big, Sid," she cautioned. "All we have is the name of a month, and Lord only knows how long it'll be till we even find out which month it was."

"Well, it's a start, isn't it?" Penrose argued. "Grotefend

only had the word for 'king' when he started reading Persian cuneiform."

"But I don't have the word for 'month' – just the name of a month. Everybody knew the names of the Persian kings, long before Grotefend."

"That's not the story," Chamberlain said. "What the public back on Terra will be interested in is finding out that the Martians published magazines, just like we do. Something familiar; make the Martians seem more real. More human."

Three men had come in, and were removing their masks and helmets and oxy-tanks, and peeling out of their quilted coveralls. Two were Space Force lieutenants; the third was a youngish civilian with close-cropped blond hair, in a checked woolen shirt. Tony Lattimer and his helpers.

"Don't tell me Martha finally got something out of that stuff?" he asked, approaching the table. He might have been commenting on the antics of the village half-wit, from his tone.

"Yes; the name of one of the Martian months." Hubert Penrose went on to explain, showing the photostat.

Tony Lattimer took it, glanced at it, and dropped it on the table.

"Sounds plausible, of course, but just an assumption. That word may not be the name of a month at all – could mean 'published' or 'authorized' or 'copyrighted' or anything like that. Fact is, I don't think it's more than a wild guess that that thing's anything like a periodical." He dismissed the subject and turned to Penrose. "I picked out the next building to enter; that tall one with the conical thing on top. It ought to be in pretty good shape inside;

the conical top wouldn't allow dust to accumulate, and from the outside nothing seems to be caved in or crushed. Ground level's higher than the other one, about the seventh floor. I found a good place and drilled for the shots; tomorrow I'll blast a hole in it, and if you can spare some people to help, we can start exploring it right away."

"Yes, of course, Dr. Lattimer. I can spare about a dozen, and I suppose you can find a few civilian volunteers," Penrose told him. "What will you need in the way of equipment?"

"Oh, about six demolition packets; they can all be shot together. And the usual thing in the way of lights, and breaking and digging tools, and climbing equipment in case we run into broken or doubtful stairways. We'll divide into two parties. Nothing ought to be entered for the first time without a qualified archaeologist along. Three parties, if Martha can tear herself away from this catalogue of systematized incomprehensibilities she's making long enough to do some real work."

She felt her chest tighten and her face become stiff. She was pressing her lips together to lock in a furious retort when Hubert Penrose answered for her.

"Dr. Dane's been doing as much work, and as important work, as you have," he said brusquely. "More important work, I'd be inclined to say."

Von Ohlmhorst was visibly distressed; he glanced once toward Sid Chamberlain, then looked hastily away from him. Afraid of a story of dissension among archaeologists getting out.

"Working out a system of pronunciation by which the Martian language could be transliterated was a most im-

portant contribution," he said. "And Martha did that almost unassisted."

"Unassisted by Dr. Lattimer, anyway," Penrose added. "Captain Field and Lieutenant Koremitsu did some work, and I helped out a little, but nine tenths of it she did herself."

"Purely arbitrary," Lattimer disdained. "Why, we don't even know that the Martians could make the same kind of vocal sounds we do."

"Oh, yes, we do," Ivan Fitzgerald contradicted, safe on his own ground. "I haven't seen any actual Martian skulls – these people seem to have been very tidy about disposing of their dead – but from statues and busts and pictures I've seen, I'd say that their vocal organs were identical with our own."

"Well, grant that. And grant that it's going to be impressive to rattle off the names of Martian notables whose statues we find, and that if we're ever able to attribute any place names, they'll sound a lot better than this horse doctors' Latin the old astronomers splashed all over the map of Mars," Lattimer said. "What I object to is her wasting time on this stuff, of which nobody will ever be able to read a word if she fiddles around with lists till there's another hundred feet of loess on this city, when there's so much real work to be done and we're as shorthanded as we are."

That was the first time that had come out in just so many words. She was glad Lattimer had said it and not Selim von Ohlmhorst.

"What you mean," she retorted, "is that it doesn't have the publicity value that digging up statues has."

For an instant, she could see that the shot had scored.

Then Lattimer, with a side glance at Chamberlain, answered:

"What I mean is that you're trying to find something that any archaeologist, yourself included, should know doesn't exist. I don't object to your gambling your professional reputation and making a laughingstock of yourself; what I object to is that the blunders of one archaeologist discredit the whole subject in the eyes of the public."

That seemed to be what worried Lattimer most. She was framing a reply when the communication outlet whistled shrilly, and then squawked: *Cocktail time! One hour to dinner; cocktails in the library, Hut Four!*

The library, which was also lounge, recreation room, and general gathering place, was already crowded; most of the crowd was at the long table topped with sheets of glasslike plastic that had been wall panels out of one of the ruined buildings. She poured herself what passed, here, for a martini, and carried it over to where Selim von Ohlmhorst was sitting alone.

For a while, they talked about the building they had just finished exploring, then drifted into reminiscences of their work on Terra — von Ohlmhorst's in Asia Minor, with the Hittite Empire, and hers in Pakistan, excavating the cities of the Harappa civilization. They finished their drinks — the ingredients were plentiful; alcohol and flavoring extracts synthesized from Martian vegetation — and von Ohlmhorst took the two glasses to the table for refills.

"You know, Martha," he said, when he returned, "Tony was right about one thing. You are gambling your professional standing and reputation. It's against all archaeological experience that a language so completely dead as this one could be deciphered. There was a continuity

between all the other ancient languages – by knowing Greek, Champollion learned to read Egyptian; by knowing Egyptian, Hittite was learned. That's why you and your colleagues have never been able to translate the Harappa hieroglyphics; no such continuity exists there. If you insist that this utterly dead language can be read, your reputation will suffer for it."

"I heard Colonel Penrose say, once, that an officer who's afraid to risk his military reputation seldom makes much of a reputation. It's the same with us. If we really want to find things out, we have to risk making mistakes. And I'm a lot more interested in finding things out than I am in my reputation."

She glanced across the room, to where Tony Lattimer was sitting with Gloria Standish, talking earnestly, while Gloria sipped one of the counterfeit martinis and listened. Gloria was the leading contender for the title of Miss Mars, 1996, if you like big bosomy blondes, but Tony would have been just as attentive to her if she'd looked like the Wicked Witch in *The Wizard of Oz,* because Gloria was the Pan-Federation Telecast System Commentator with the expedition.

"I know you are," the old Turco-German was saying. "That's why, when they asked me to name another archaeologist for this expedition, I named you."

He hadn't named Tony Lattimer; Lattimer had been pushed onto the expedition by his university. There'd been a lot of high-level string pulling to that; she wished she knew the whole story. She'd managed to keep clear of universities and university politics; all her digs had been sponsored by nonacademic foundations or art museums.

"You have an excellent standing; much better than my own, at your age. That's why it disturbs me to see you jeopardizing it by this insistence that the Martian language can be translated. I can't, really, see how you can hope to succeed."

She shrugged and drank some more of her cocktail, then lit another cigarette. It was getting tiresome to try to verbalize something she only felt.

"Neither do I, now, but I will. Maybe I'll find something like the picture books Sachiko was talking about. A child's primer, maybe; surely they had things like that. And if I don't, I'll find something else. We've only been here six months. I can wait the rest of my life, if I have to, but I'll do it sometime."

"I can't wait so long," von Ohlmhorst said. "The rest of my life will only be a few years, and when the *Schiaparelli* orbits in, I'll be going back to Terra on the *Cyrano*."

"I wish you wouldn't. This is a whole new world of archaeology. Literally."

"Yes." He finished the cocktail and looked at his pipe as though wondering whether to relight it so soon before dinner, then put it in his pocket. "A whole new world – but I've grown old, and it isn't for me. I've spent my life studying the Hittites. I can speak the Hittite language, though maybe King Muwatallis wouldn't be able to understand my modern Turkish accent. But the things I'd have to learn, here – chemistry, physics, engineering, how to run analytic tests on steel girders and beryllosilver alloys and plastics and silicones. I'm more at home with a civilization that rode in chariots and fought with swords and was just learning how to work iron. Mars is for young people. This expedition is a cadre of leadership – not only

the Space Force people, who'll be the commanders of the main expedition, but us scientists, too. And I'm just an old cavalry general who can't learn to command tanks and aircraft. You'll have time to learn about Mars. I won't."

His reputation as the dean of Hittitologists was solid and secure, too, she added mentally. Then she felt ashamed of the thought. He wasn't to be classed with Tony Lattimer.

"All I came for was to get the work started," he was continuing. "The Federation Government felt that an old hand should do that. Well, it's started, now; you and Tony and whoever come out on the *Schiaparelli* must carry it on. You said it, yourself; you have a whole new world. This is only one city, of the last Martian civilization. Behind this, you have the Late Upland Culture, and the Canal Builders, and all the civilizations and races and empires before them clear back to the Martian Stone Age." He hesitated for a moment. "You have no idea what all you have to learn, Martha. This isn't the time to start specializing too narrowly."

They all got out of the truck and stretched their legs and looked up the road to the tall building with the queer conical cap askew on its top. The four little figures that had been busy against its wall climbed into the jeep and started back slowly, the smallest of them, Sachiko Koremitsu, paying out an electric cable behind. When it pulled up beside the truck, they climbed out; Sachiko attached the free end of the cable to a nuclear-electric battery. At once, dirty gray smoke and orange dust puffed out from the wall of the building, and, a second later, the multiple explosion banged.

She and Tony Lattimer and Major Lindemann climbed onto the truck, leaving the jeep stand by the road. When they reached the building, a satisfyingly wide breach had been blown in the wall. Lattimer had placed his shots between two of the windows; they were both blown out along with the wall between, and lay unbroken on the ground. Martha remembered the first building they had entered. A Space Force officer had picked up a stone and thrown it at one of the windows, thinking that would be all they'd need to do. It had bounced back. He had drawn his pistol – they'd all carried guns, then, on the principle that what they didn't know about Mars might easily hurt them – and fired four shots. The bullets had ricocheted, screaming thinly; there were four coppery smears of jacket metal on the window, and a little surface spalling. Somebody tried a rifle; the 4000-f.s. bullet had cracked the glasslike pane without penetrating. An oxyacetylene torch had taken an hour to cut the window out; the lab crew, aboard the ship, was still trying to find out just what the stuff was.

Tony Lattimer had gone forward and was sweeping his flashlight back and forth, swearing petulantly, his voice harshened and amplified by his helmet speaker.

"I thought I was blasting into a hallway; this lets us into a room. Careful; there's about a two-foot drop to the floor, and a lot of rubble from the blast just inside."

He stepped down through the breach; the others began dragging equipment out of the trucks – shovels and picks and crowbars and sledges, portable floodlights, cameras, sketching materials, an extension ladder, and alpinists' ropes and crampons and pickaxes. Hubert Penrose was shouldering something that looked like a surrealist ma-

chine gun but which was really a nuclear-electric jackhammer. Martha selected one of the spike-shod mountaineers' axes, with which she could dig or chop or poke or pry or help herself over rough footing.

The windows, grimed and crusted with filthy millennia of dust, filtered in a dim twilight; even the breach in the wall, in the morning shade, lighted only a small patch of floor. Somebody snapped on a floodlight, aiming it at the ceiling. The big room was empty and bare; dust lay thick on the floor and reddened the once-white walls. It would have been a large office, but there was nothing left in it to indicate its use.

"This one's been stripped up to the seventh floor!" Lattimer exclaimed. "Street level'll be cleaned out, completely."

"Do for living quarters and shops, then," Lindemann said. "Added to the others, this'll take care of everybody on the *Schiaparelli.*"

"Seem to have been a lot of electric or electronic apparatus over along this wall," one of the Space Force officers commented. "Ten or twelve electric outlets." He brushed the dusty wall with his glove, then scraped on the floor with his foot. "I can see where things were pried loose."

The door, one of the double sliding things the Martians had used, was closed. Selim von Ohlmhorst tried it, but it was stuck fast. The metal latch parts had frozen together, molecule bonding itself to molecule, since the door had been last closed. Hubert Penrose came over with the jackhammer, fitting a spear-point chisel into place. He set the chisel in the joint between the doors, braced the hammer against his hip, and squeezed the trigger switch. The hammer banged briefly like the weapon it resembled,

and the doors popped a few inches apart, then stuck. Enough dust had worked into the recesses into which it was supposed to slide to block it on both sides.

That was old stuff; they ran into that every time they had to force a door, and they were prepared for it. Somebody went outside and brought in a power jack and finally one of the doors inched back to the door jamb. That was enough to get the lights and equipment through; they all passed from the room to the hallway beyond. About half the other doors were open; each had a number and a single word, *darfhulva,* over it.

One of the civilian volunteers, a woman professor of natural ecology from Penn State University, was looking up and down the hall.

"You know," she said, "I feel at home here. I think this was a college of some sort, and these were classrooms. That word, up there, that was the subject taught, or the department. And those electronic devices, all where the class would face them; audiovisual teaching aids."

"A twenty-five-story university?" Lattimer scoffed. "Why a building like this would handle thirty thousand students."

"Maybe there were that many. This was a big city, in its prime," Martha said, moved chiefly by a desire to oppose Lattimer.

"Yes, but think of the snafu in the halls, every time they changed classes. It'd take an hour to get everybody back and forth from one floor to another." He turned to von Ohlmhorst. "I'm going up above this floor. The place has been looted clean up to here, but there's a chance there may be something above," he said.

"I'll stay on this floor, at present," the Turco-German

replied. "There will be much coming and going, and dragging things in and out. We should get this completely examined and recorded first. Then Major Lindemann's people can do their worst, here."

"Well, if nobody else wants it, I'll take the downstairs," Martha said.

"I'll go along with you," Hubert Penrose told her. "If the lower floors have no archaeological value, we'll turn them into living quarters. I like this building; it'll give everybody room to keep out from under everybody else's feet." He looked down the hall. "We ought to find escalators at the middle."

The hallway, too, was thick underfoot with dust. Most of the open rooms were empty, but a few contained furniture, including small seat-desks. The original proponent of the university theory pointed these out as just what might be found in classrooms. There were escalators, up and down, on either side of the hall, and more on the intersecting passage to the right.

"That's how they handled the students, between classes," Martha commented. "And I'll bet there are more ahead, there."

They came to a stop where the hallway ended at a great square central hall. There were elevators, there, on two of the sides, and four escalators, still usable as stairways. But it was the walls, and the paintings on them, that brought them up short and staring.

They were clouded with dirt – she was trying to imagine what they must have looked like originally, and at the same time estimating the labor that would be involved in cleaning them – but they were still distinguishable, as was the word, *darfhulva,* in golden letters

above each of the four sides. It was a moment before she realized, from the murals, that she had at last found a meaningful Martian word. They were a vast historical panorama, clockwise around the room. A group of skin-clad savages squatting around a fire. Hunters with bows and spears, carrying the carcass of an animal slightly like a pig. Nomads riding long-legged, graceful mounts like hornless deer. Peasants sowing and reaping; mud-walled hut villages, and cities; processions of priests and warriors; battles with swords and bows, and with cannon and muskets; galleys, and ships with sails, and ships without visible means of propulsion, and aircraft. Changing costumes and weapons and machines and styles of architecture. A richly fertile landscape, gradually merging into barren deserts and bushlands – the time of the great planetwide drought. The Canal Builders – men with machines recognizable as steam shovels and derricks, digging and quarrying and driving across the empty plains with aqueducts. More cities – seaports on the shrinking oceans; dwindling, half-deserted cities; an abandoned city, with four tiny humanoid figures and a thing like a combat car in the middle of the brush-grown plaza, they and their vehicle dwarfed by the huge lifeless buildings around them. She had not the least doubt; *darfhulva* was history.

"Wonderful!" Von Ohlmhorst was saying. "The entire history of this race. Why, if the painter depicted appropriate costumes and weapons and machines for each period, and got the architecture right, we can break the history of this planet into eras and periods and civilizations."

"You can assume they're authentic. The faculty of this university would insist on authenticity in the *darfhulva* – history – department," she said.

"Yes! *Darfhulva* – history! And your magazine was a journal of *sornhulva!*" Penrose exclaimed. "You have a word, Martha!" It took her an instant to realize that he had called her by her first name, and not Dr. Dane. She wasn't sure if that weren't a bigger triumph than learning a word of the Martian language. Or a more auspicious start. "Alone, I suppose that *hulva* means something like 'science' or 'knowledge,' or 'study'; combined, it would be equivalent to our 'ology.' And *darf* would mean something like 'past,' or 'old times,' or 'human events,' or 'chronicles.' "

"That gives you three words, Martha!" Sachiko jubilated. "You did it."

"Let's don't go too fast," Lattimer said, for once not derisively. "I'll admit that *darfhulva* is the Martian word for 'history' as a subject of study; I'll admit that *hulva* is the general word and *darf* modifies it and tells us which object is meant. But as for assigning specific meanings, we can't do that because we don't know just how the Martians thought, scientifically or otherwise."

He stopped short, startled by the blue white light that blazed as Sid Chamberlain's Kliegettes went on. When the whirring of the camera stopped, it was Chamberlain who was speaking:

"This is the biggest thing yet; the whole history of Mars, Stone Age to the end, all on four walls. I'm taking this with the fast shutter, but we'll telecast it in slow motion, from the beginning to the end. Tony, I want you to do the voice for it – running commentary, interpretation of each scene as it's shown. Would you do that?"

Would he do that! Martha thought. If he had a tail, he'd be wagging it at the very thought.

"Well, there ought to be more murals on the other floors," she said. "Who wants to come downstairs with us?"

Sachiko did; immediately, Ivan Fitzgerald volunteered. She decided to go upstairs with Tony Lattimer, and Gloria Standish decided to go upstairs, too. Most of the party would remain on the seventh floor, to help Selim von Ohlmhorst get it finished. After poking tentatively at the escalator with the spike of her ice ax, Martha led the way downward.

The sixth floor was *darfhulva,* too; military and technological history, from the character of the murals. They looked around the central hall, and went down to the fifth; it was like the floors above except that the big quadrangle was stacked with dusty furniture and boxes. Ivan Fitzgerald, who was carrying the floodlight, swung it slowly around. Here the murals were of heroic-sized Martians, so human in appearance as to seem members of her own race, each holding some object – a book, or a test tube, or some bit of scientific apparatus, and behind them were scenes of laboratories and factories, flame and smoke, lightning flashes. The word at the top of each of the four walls was one with which she was already familiar – *sornhulva.*

"Hey, Martha; there's that word," Ivan Fitzgerald exclaimed. "The one in the title of your magazine." He looked at the paintings. "Chemistry, or physics."

"Both," Hubert Penrose considered. "I don't think the Martians made any sharp distinction between them. See, the old fellow with the scraggly whiskers must be the inventor of the spectroscope; he has one in his hands, and he has a rainbow behind him. And the woman in the blue

smock, beside him, worked in organic chemistry; see the diagrams of long-chain molecules behind her. What word would convey the idea of chemistry and physics taken as one subject?"

"*Sornhulva,*" Sachiko suggested. "If *hulva*'s something like 'science,' *sorn* must mean 'matter,' or 'substance,' or 'physical object.' You were right, all along, Martha. A civilization like this would certainly leave something like this, that would be self-explanatory."

"This'll wipe a little more of that superior grin off Tony Lattimer's face," Fitzgerald was saying, as they went down the motionless escalator to the floor below. "Tony wants to be a big shot. When you want to be a big shot, you can't bear the possibility of anybody else being a bigger big shot, and whoever makes a start on reading this language will be the biggest big shot archaeology ever saw."

That was true. She hadn't thought of it, in that way, before, and now she tried not to think about it. She didn't want to be a big shot. She wanted to be able to read the Martian language, and find things out about the Martians.

Two escalators down, they came out on a mezzanine around a wide central hall on the street level, the floor forty feet below them and the ceiling thirty feet above. Their lights picked out object after object below – a huge group of sculptured figures in the middle; some kind of a motor vehicle jacked up on trestles for repairs; things that looked like machine guns and autocannon; long tables, tops littered with a dust-covered miscellany; machinery; boxes and crates and containers.

They made their way down and walked among the clutter, missing a hundred things for every one they saw, until

they found an escalator to the basement. There were three basements, one under another, until at last they stood at the bottom of the last escalator, on a bare concrete floor, swinging the portable floodlight over stacks of boxes and barrels and drums, and heaps of powdery dust. The boxes were plastic – nobody had ever found anything made of wood in the city – and the barrels and drums were of metal or glass or some glasslike substance. They were outwardly intact. The powdery heaps might have been anything organic, or anything containing fluid. Down here, where wind and dust could not reach, evaporation had been the only force of destruction after the minute life that caused putrefaction had vanished.

They found refrigeration rooms, too, and using Martha's ice ax and the pistol-like vibratool Sachiko carried on her belt, they pounded and pried one open, to find desiccated piles of what had been vegetables, and leathery chunks of meat. Samples of that stuff, rocketed up to the ship, would give a reliable estimate, by radiocarbon dating, of how long ago this building had been occupied. The refrigeration unit, radically different from anything their own culture had produced, had been electrically powered. Sachiko and Penrose, poking into it, found the switches still on; the machine had only ceased to function when the power source, whatever that had been, had failed.

The middle basement had also been used, at least toward the end, for storage; it was cut in half by a partition pierced by but one door. They took half an hour to force this, and were on the point of sending above for heavy equipment when it yielded enough for them to squeeze through. Fitzgerald, in the lead with the light,

stopped short, looked around, and then gave a groan that came through his helmet speaker like a foghorn.

"Oh, no! *No!*"

"What's the matter, Ivan?" Sachiko entering behind him, asked anxiously.

He stepped aside. "Look at it, Sachi! Are we going to have to do all that?"

Martha crowded through behind her friend and looked around, then stood motionless, dizzy with excitement. Books. Case on case of books, half an acre of cases, fifteen feet to the ceiling. Fitzgerald, and Penrose, who had pushed in behind her, were talking in rapid excitement; she only heard the sound of their voices, not their words. This must be the main stacks of the university library — the entire literature of the vanished race of Mars. In the center, down an aisle between the cases, she could see the hollow square of the librarian's desk, and stairs and a dumbwaiter to the floor above.

She realized that she was walking forward, with the others, toward this. Sachiko was saying: "I'm the lightest; let me go first." She must be talking about the spidery metal stairs.

"I'd say they were safe," Penrose answered. "The trouble we've had with doors around here shows that the metal hasn't deteriorated."

In the end, the Japanese girl led the way, more catlike than ever in her caution. The stairs were quite sound, in spite of their fragile appearance, and they all followed her. The floor above was a duplicate of the room they had entered, and seemed to contain about as many books. Rather than waste time forcing the door here, they re-

turned to the middle basement and came up by the escalator down which they had originally descended.

The upper basement contained kitchens – electric stoves, some with pots and pans still on them – and a big room that must have been, originally, the students' dining room, though when last used it had been a workshop. As they expected, the library reading room was on the street-level floor, directly above the stacks. It seemed to have been converted into a sort of common living room for the building's last occupants. An adjoining auditorium had been made into a chemical works; there were vats and distillation apparatus, and a metal fractionating tower that extended through a hole knocked in the ceiling seventy feet above. A good deal of plastic furniture of the sort they had been finding everywhere in the city was stacked about, some of it broken up, apparently for reprocessing. The other rooms on the street floor seemed also to have been devoted to manufacturing and repair work; a considerable industry, along a number of lines, must have been carried on here for a long time after the university had ceased to function as such.

On the second floor they found a museum; many of the exhibits remained, tantalizingly half visible in grimed glass cases. There had been administrative offices there, too. The doors of most of them were closed, and they did not waste time trying to force them, but those that were open had been turned into living quarters. They made notes, and rough floor plans, to guide them in future more-thorough examination; it was almost noon before they had worked their way back to the seventh floor.

Selim von Ohlmhorst was in a room on the north side of the building, sketching the position of things before ex-

amining them and collecting them for removal. He had the floor checkerboarded with a grid of chalked lines, each numbered.

"We have everything on this floor photographed," he said. "I have three gangs – all the floodlights I have – sketching and making measurements. At the rate we're going, with time out for lunch, we'll be finished by the middle of the afternoon."

"You've been working fast. Evidently you aren't being high church about a 'qualified archaeologist' entering rooms first," Penrose commented.

"Ach, childishness!" the old man exclaimed impatiently. "These officers of yours aren't fools. All of them have been to intelligence school and criminal investigation school. Some of the most careful amateur archaeologists I ever knew were retired soldiers or policemen. But there isn't much work to be done. Most of the rooms are either empty or like this one – a few bits of furniture and broken trash and scraps of paper. Did you find anything down on the lower floors?"

"Well, yes," Penrose said, a hint of mirth in his voice. "What would you say, Martha?"

She started to tell Selim. The others, unable to restrain their excitement, broke in with interruptions. Von Ohlmhorst was staring in incredulous amazement.

"But this floor was looted almost clean, and the buildings we've entered before were all looted from the street level up," he said, at length.

"The people who looted this one lived here," Penrose replied. "They had electric power to the last; we found refrigerators full of food, and stoves with the dinner still on them. They must have used the elevators to haul things

down from the upper floor. The whole first floor was converted into workshops and laboratories. I think that this place must have been something like a monastery in the Dark Ages in Europe, or what such a monastery would have been like if the Dark Ages had followed the fall of highly developed scientific civilization. For one thing, we found a lot of machine guns and light autocannon on the street level, and all the doors were barricaded. The people here were trying to keep a civilization running after the rest of the planet had gone back to barbarism; I suppose they'd have to fight off raids by the barbarians now and then."

"You're not going to insist on making this building into expedition quarters, I hope, Colonel?" von Ohlmhorst asked anxiously.

"Oh, no! This place is an archaeological treasure house. More than that; from what I saw, our technicians can learn a lot here. But you'd better get this floor cleaned up as soon as you can, though. I'll have the subsurface part, from the sixth floor down, air-sealed. Then we'll put in oxygen generators and power units, and get a couple of elevators into service. For the floors above, we can use temporary air sealing floor by floor, and portable equipment; when we have things atmosphered and lighted and heated, you and Martha, and Tony Lattimer can go to work systematically and in comfort, and I'll give you all the help I can spare from the other work. This is one of the biggest things we've found yet."

Tony Lattimer and his companions came down to the seventh floor a little later.

"I don't get this, at all," he began, as soon as he joined them. "This building wasn't stripped the way the others

were. Always, the procedure seems to have been to strip from the bottom up, but they seem to have stripped the top floors first, here. All but the very top. I found out what that conical thing is, by the way. It's a wind-rotor, and under it there's an electric generator. This building generated its own power."

"What sort of condition are the generators in?" Penrose asked.

"Well, everything's full of dust that blew in under the rotor, of course, but it looks to be in pretty good shape. Hey, I'll bet that's it! They had power, so they used the elevators to haul stuff down. That's just what they did. Some of the floors above here don't seem to have been touched, though." He paused momentarily; back of his oxy-mask, he seemed to be grinning. "I don't know that I ought to mention this in front of Martha, but two floors above we hit a room – it must have been the reference library for one of the departments – that had close to five hundred books in it."

The noise that interrupted him, like the squawking of a Brobdingnagian parrot, was only Ivan Fitzgerald laughing through his helmet speaker.

Lunch at the huts was a hasty meal, with a gabble of full-mouthed and excited talking. Hubert Penrose and his chief subordinates snatched their food in a huddled consultation at one end of the table; in the afternoon, work was suspended on everything else, and the fifty-odd men and women of the expedition concentrated their efforts on the university. By the middle of the afternoon, the seventh floor had been completely examined, photographed and sketched, and the murals in the square central hall covered with protective tarpaulins, and Laurent Gicquel

and his air-sealing crew had moved in and were at work. It had been decided to seal the central hall at the entrances. It took the French-Canadian engineer most of the afternoon to find all the ventilation ducts and plug them. An elevator shaft on the north side was found reaching clear to the twenty-fifth floor; this would give access to the top of the building; another shaft, from the center, would take care of the floors below. Nobody seemed willing to trust the ancient elevators, themselves; it was the next evening before a couple of cars and the necessary machinery could be fabricated in the machine shops aboard the ship and sent down by landing rocket. By that time, the air sealing was finished, the nuclear-electric energy converters were in place, and the oxygen generators set up.

Martha was in the lower basement, an hour or so before lunch the day after, when a couple of Space Force officers came out of the elevator, bringing extra lights with them. She was still using oxygen equipment; it was a moment before she realized that the newcomers had no masks, and that one of them was smoking. She took off her own helmet speaker, throat mike and mask and unslung her tank pack, breathing cautiously. The air was chilly, and musty acrid with the odor of antiquity – the first Martian odor she had smelled – but when she lit a cigarette, the lighter flamed clear and steady and the tobacco caught and burned evenly.

The archaeologists, many of the other civilian scientists, a few of the Space Force officers and the two news correspondents, Sid Chamberlain and Gloria Standish, moved in that evening, setting up cots in vacant rooms. They installed electric stoves and a refrigerator in the old library

reading room, and put in a bar and lunch counter. For a few days, the place was full of noise and activity; then, gradually, the Space Force people and all but a few of the civilians returned to their business of air sealing the more habitable of the buildings already explored, and fitting them up in readiness for the arrival, in a year and a half, of the five hundred members of the main expedition. There was work to be done enlarging the landing field for the ship's rocket craft, and building new chemical-fuel tanks.

There was the work of getting the city's ancient reservoirs cleared of silt before the next spring thaw brought more water down the underground aqueducts everybody called canals in mistranslation of Schiaparelli's Italian word, though this was proving considerably easier than anticipated. The ancient Canal Builders must have anticipated a time when their descendants would no longer be capable of maintenance work, and had prepared against it. By the next day, the university had been made completely habitable, the actual work there was being done by Selim, Tony Lattimer and herself, with half a dozen Space Force officers, mostly girls, and four or five civilians, helping.

They worked up from the bottom, dividing the floor surfaces into numbered squares, measuring and listing and sketching and photographing. They packaged samples of organic matter and sent them up to the ship for carbon 14 dating and analysis; they opened cans and jars and bottles, and found that everything fluid in them had evaporated, through the porosity of glass and metal and plastic if there were no other way. Wherever they looked, they found evidence of activity suddenly suspended and never

resumed. A vise with a bar of metal in it, half cut through and the hacksaw beside it. Pots and pans with hardened remains of food in them; a leathery cut of meat on a table, with the knife ready at hand. Toilet articles on washstands; unmade beds, the bedding ready to crumble at a touch but still retaining the impress of the sleeper's body; papers and writing materials on desks, as though the writer had gotten up, meaning to return and finish in a fifty-thousand-year-ago moment.

It worried her. Irrationally, she began to feel that the Martians had never left this place; that they were still around her, watching disapprovingly every time she picked up something they had laid down. They haunted her dreams, now, instead of their enigmatic writing. At first, everybody who had moved into the university had taken a separate room, happy to escape the crowding and lack of privacy of the huts. After a few nights, she was glad when Gloria Standish moved in with her, and accepted the newswoman's excuse that she felt lonely without somebody to talk to before falling asleep. Sachiko Koremitsu joined them the next evening, and before going to bed, the girl officer cleaned and oiled her pistol, remarking that she was afraid some rust may have gotten into it.

The others felt it, too. Selim von Ohlmhorst developed the habit of turning quickly and looking behind him, as though trying to surprise somebody or something that was stalking him. Tony Lattimer, having a drink at the bar that had been improvised from the librarian's desk in the reading room, set down his glass and swore.

"You know what this place is? It's an archaeological *Marie Celeste!*" he declared. "It was occupied right up to

the end – we've all seen the shifts these people used to keep a civilization going here – but what was the end? What happened to them? Where did they go?"

"You didn't expect them to be waiting out front, with a red carpet and a big banner – WELCOME,TERRANS – did you, Tony?" Gloria Standish asked.

"No, of course not; they've all been dead for fifty thousand years. But if they were the last of the Martians, why haven't we found their bones at least? Who buried them after they were dead?" He looked at the glass, a bubble-thin goblet, found, with hundreds of others like it, in a closet above, as though debating with himself whether to have another drink. Then he voted in the affirmative and reached for the cocktail pitcher. "And every door on the old ground level is either barred or barricaded from the inside. How did they get out? And why did they leave?"

The next day, at lunch, Sachiko Koremitsu had the answer to the second question. Four or five electrical engineers had come down by rocket from the ship, and she had been spending the morning with them, in oxy-masks, at the top of the building.

"Tony, I thought you said those generators were in good shape," she began, catching sight of Lattimer. "They aren't. They're in the most unholy mess I ever saw. What happened, up there, was that the supports of the wind-rotor gave way, and the weight snapped the main shaft, and smashed everything under it."

"Well, after fifty thousand years, you can expect something like that," Lattimer retorted. "When an archaeologist says something's in good shape, he doesn't necessarily mean it'll start as soon as you shove a switch in."

"You didn't notice that it happened when the power

was on, did you," one of the engineers asked, nettled at Lattimer's tone. "Well, it was. Everything's burned out or shorted or fused together; I saw one bus bar eight inches across melted clean in two. It's a pity we didn't find things in good shape, even archaeologically speaking. I saw a lot of interesting things, things in advance of what we're using now. But it'll take a couple of years to get everything sorted out and figure what it looked like originally."

"Did it look as though anybody'd made any attempt to fix it?" Martha asked.

Sachiko shook her head. "They must have taken one look at it and given up. I don't believe there would have been any possible way to repair anything."

"Well, that explains why they left. They needed electricity for lighting, and heating, and all their industrial equipment was electrical. They had a good life, here, with power; without it, this place wouldn't have been habitable."

"Then why did they barricade everything from the inside, and how did they get out?" Lattimer wanted to know.

"To keep other people from breaking in and looting. Last man out probably barred the last door and slid down a rope from upstairs," von Ohlmhorst suggested. "This Houdini trick doesn't worry me too much. We'll find out eventually."

"Yes, about the time Martha starts reading Martian," Lattimer scoffed.

"That may be just when we'll find out," von Ohlmhorst replied seriously. "It wouldn't surprise me if they left something in writing when they evacuated this place."

"Are you really beginning to treat this pipe dream of

hers as a serious possibility, Selim?" Lattimer demanded. "I know, it would be a wonderful thing, but wonderful things don't happen just because they're wonderful. Only because they're possible, and this isn't. Let me quote that distinguished Hittitologist, Johannes Friedrich: 'Nothing can be translated out of nothing.' Or that later but not less distinguished Hittitologist, Selim von Ohlmhorst: 'Where are you going to get your bilingual?' "

"Friedrich lived to see the Hittite language deciphered and read," von Ohlmhorst reminded him.

"Yes, when they found Hittite-Assyrian bilinguals." Lattimer measured a spoonful of coffee powder into his cup and added hot water. "Martha, you ought to know, better than anybody, how little chance you have. You've been working for years in the Indus valley; how many words of Harappa have you or anybody else ever been able to read?"

"We never found a university, with a half-million-volume library, at Harappa or Mohenjo-Daro."

"And, the first day we entered this building we established meanings for several words," Selim von Ohlmhorst added.

"And you've never found another meaningful word since," Lattimer added. "And you're only sure of general meaning, not specific meaning of word elements, and you have a dozen different interpretations for each word."

"We made a start," von Ohlmhorst maintained. "We have Grotefend's word for 'king.' But I'm going to be able to read some of those books, over there, if it takes me the rest of my life here. It probably will, anyhow."

"You mean you've changed your mind about going

home on the *Cyrano?*" Martha asked. "You'll stay on here?"

The old man nodded. "I can't leave this. There's too much to discover. The old dog will have to learn a lot of new tricks, but this is where my work will be, from now on."

Lattimer was shocked. "You're nuts!" he cried. "You mean you're going to throw away everything you've accomplished in Hittitology and start all over again here on Mars? Martha, if you've talked him into this crazy decision, you're a criminal!"

"Nobody talked me into anything," von Ohlmhorst said roughly. "And as for throwing away what I've accomplished in Hittitology, I don't know what the devil you're talking about. Everything I know about the Hittite Empire is published and available to anybody. Hittitology's like Egyptology; it's stopped being research and archaeology and become scholarship and history. And I'm not a scholar or a historian; I'm a pick-and-shovel field archaeologist – a highly skilled and specialized grave robber and junk picker – and there's more pick-and-shovel work on this planet than I could do in a hundred lifetimes. This is something new; I was a fool to think I could turn my back on it and go back to scribbling footnotes about Hittite kings."

"You could have anything you wanted, in Hittitology. There are a dozen universities that'd sooner have you than a winning football team. But no! You have to be the top man in Martiology, too. You can't leave that for anybody else – " Lattimer shoved his chair back and got to his feet, leaving the table with an oath that was almost a sob of exasperation.

Maybe his feelings were too much for him. Maybe he realized, as Martha did, what he had betrayed. She sat, avoiding the eyes of the others, looking at the ceiling, as embarrassed as though Lattimer had flung something dirty on the table in front of them. Tony Lattimer had, desperately, wanted Selim to go home on the *Cyrano*. Martiology was a new field; if Selim entered it, he would bring with him the reputation he had already built in Hittitology, automatically stepping into the leading role that Lattimer had coveted for himself. Ivan Fitzgerald's words echoed back to her: "When you want to be a big shot, you can't bear the possibility of anybody else being a bigger big shot." His derision of her own efforts became comprehensible, too. It wasn't that he was convinced that she would never learn to read the Martian language. He had been afraid that she would.

Ivan Fitzgerald finally isolated the germ that had caused the Finchley girl's undiagnosed illness. Shortly afterward, the malady turned into a mild fever, from which she recovered. Nobody else seemed to have caught it. Fitzgerald was still trying to find out how the germ had been transmitted.

They found a globe of Mars, made when the city had been a seaport. They located the city, and learned that its name had been Kukan — or something with a similar vowel-consonant ratio. Immediately, Sid Chamberlain and Gloria Standish began giving their telecasts a Kukan dateline, and Hubert Penrose used the name in his official reports. They also found a Martian calendar; the year had been divided into ten more or less equal months, and one of them had been *doma.* Another month was *nor,* and that

was a part of the name of the scientific journal Martha had found.

Bill Chandler, the zoologist, had been going deeper and deeper into the old sea bottom of Syrtis. Four hundred miles from Kukan, and at an altitude fifteen thousand feet lower, he shot a bird. At least, it was a something with wings and what were almost but not quite feathers, though it was more reptilian than avian in general characteristics. He and Ivan Fitzgerald skinned and mounted it, and then dissected the carcass almost tissue by tissue. About seven eighths of its body capacity was lungs; it certainly breathed air containing at least half enough oxygen to support human life, or five times as much as the air around Kukan.

That took the center of interest away from archaeology, and started a new burst of activity. All the expedition's aircraft – four jetticopters and three wingless airdyne reconnaissance fighters – were thrown into intensified exploration of the lower sea bottoms, and the bio-science boys and girls were wild with excitement and making new discoveries on each flight.

The university was left to Selim and Martha and Tony Lattimer, the latter keeping to himself while she and the old Turco-German worked together. The civilian specialists in other fields, and the Space Force people who had been holding tapelines and making sketches and snapping cameras, were all flying to lower Syrtis to find out how much oxygen there was and what kind of life it supported.

Sometimes Sachiko dropped in; most of the time she was busy helping Ivan Fitzgerald dissect specimens. They had four or five species of what might loosely be called birds, and something that could easily be classed as a rep-

tile, and a carnivorous mammal the size of a cat with bird-like claws, and a herbivore almost identical with the pig-like thing in the big *darfhulva* mural, and another like a gazelle with a single horn in the middle of its forehead.

The high point came when one party, at thirty thousand feet below the level of Kukan, found breathable air. One of them had a mild attack of *sorroche* and had to be flown back for treatment in a hurry, but the others showed no ill effects.

The daily newscasts from Terra showed a corresponding shift in interest at home. The discovery of the university had focused attention on the dead past of Mars; now the public was interested in Mars as a possible home for humanity. It was Tony Lattimer who brought archaeology back into the activities of the expedition and the news at home.

Martha and Selim were working in the museum on the second floor, scrubbing the grime from the glass cases, noting contents, and grease-penciling numbers; Lattimer and a couple of Space Force officers were going through what had been the administrative offices on the other side. It was one of these, a young second lieutenant, who came hurrying in from the mezzanine, almost bursting with excitement.

"Hey, Martha! Dr. von Ohlmhorst!" he was shouting. "Where are you? Tony's found the Martians!"

Selim dropped his rag back in the bucket; Martha laid her clipboard on top of the case beside her.

"Where?" they asked together.

"Over on the north side." The lieutenant took hold of himself and spoke more deliberately. "Little room, back of one of the old faculty offices – conference room. It was

locked from the inside, and we had to burn it down with a torch. That's where they are. Eighteen of them, around a long table – "

Gloria Standish, who had dropped in for lunch, was on the mezzanine, fairly screaming into a radiophone extension:

". . . dozen and a half of them! Well, of course, they're dead. What a question! They look like skeletons covered with leather. No, I do not know what they died of. Well, forget it; I don't care if Bill Chandler's found a three-headed hippopotamus. Sid, don't you get it? We've found the *Martians!*"

She slammed the phone back on its hook, rushing away ahead of them.

Martha remembered the closed door; on the first survey, they hadn't attempted opening it. Now it was burned away at both sides and lay still hot along the edges, on the floor of the big office room in front. A floodlight was on in the room inside, and Lattimer was going around looking at things while a Space Force officer stood by the door. The center of the room was filled by a long table; in armchairs around it sat the eighteen men and women who had occupied the room for the last fifty millennia. There were bottles and glasses on the table in front of them, and, had she seen them in a dimmer light, she would have thought that they were merely dozing over their drinks. One had a knee hooked over his chair-arm and was curled in fetuslike sleep. Another had fallen forward onto the table, arms extended, the emerald set of a ring twinkling dully on one finger. Skeletons covered with leather, Gloria Standish had called them, and so they were – faces like

skulls, arms and legs like sticks, the flesh shrunken onto the bones under it.

"Isn't this something!" Lattimer was exulting. "Mass suicide, that's what it was. Notice in the corners?"

Braziers, made of perforated two-gallon-odd metal cans, the white walls smudged with smoke above them. Von Ohlmhorst had noticed them at once, and was poking into one of them with his flashlight.

"Yes; charcoal. I noticed a quantity of it around a couple of hand forges in the shop on the first floor. That's why you had so much trouble breaking in; they'd sealed the room on the inside." He straightened and went around the room until he found a ventilator, and peered into it. "Stuffed with rags. They must have been all that were left here. Their power was gone, and they were old and tired, and all around them their world was dying. So they just came in here and lit the charcoal, and sat drinking together till they fell asleep. Well, we know what became of them, now, anyhow."

Sid and Gloria made the most of it. The Terran public wanted to hear about Martians, and if live Martians couldn't be found, a room full of dead ones was the next best thing. Maybe an even better thing; it has been only sixty-odd years since the Orson Welles invasion scare. Tony Lattimer, the discoverer, was beginning to cash in on his attentions to Gloria and his ingratiation with Sid; he was always either making voice and image talks for telecast or listening to the news from the home planet. Without question, he had become, overnight, the most widely known archaeologist in history.

"Not that I'm interested in all this, for myself," he disclaimed, after listening to the telecast from Terra two

days after his discovery. "But this is going to be a big thing for Martian archaeology. Bring it to the public attention; dramatize it. Selim, can you remember when Lord Carnarvon and Howard Carter found the tomb of Tutankhamen?"

"In 1922? I was two years old, then," von Ohlmhorst chuckled. "I really don't know how much that publicity ever did for Egyptology. Oh, the museums did devote more space to Egyptian exhibits, and after a museum department head gets a few extra showcases, you know how hard it is to make him give them up. And, for a while, it was easier to get financial support for new excavations. But I don't know how much good all this public excitement really does in the long run."

"Well, I think one of us should go back on the *Cyrano*, when the *Schiaparelli* orbits in," Lattimer said. "I'd hoped it would be you; your voice would carry the most weight. But I think it's important that one of us go back, to present the story of our work, and what we have accomplished and what we hope to accomplish, to the public and to the universities and the learned societies, and to the Federation Government. There will be a great deal of work that will have to be done. We must not allow the other scientific fields and the so-called practical interests to monopolize public and academic support. So, I believe I shall go back at least for a while, and see what I can do – "

Lectures. The organization of a Society of Martian Archaeology, with Anthony Lattimer, Ph.D., the logical candidate for the chair. Degrees, honors; the deference of the learned, and the adulation of the lay public. Positions,

with impressive titles and salaries. Sweet are the uses of publicity.

Martha crushed out her cigarette and got to her feet. "Well, I still have the final lists of what we found in *halvhulva* – biology – department to check over. I'm starting on *sornhulva* tomorrow, and I want that stuff in shape for expert evaluation."

That was the sort of thing Tony Lattimer wanted to get away from, the detail work and the drudgery. Let the infantry do the slogging through the mud; the brass hats got the medals.

She was halfway through the fifth floor, a week later, and was having midday lunch in the reading room on the first floor when Hubert Penrose came over and sat down beside her, asking her what she was doing. She told him.

"I wonder if you could find me a couple of men, for an hour or so," she added. "I'm stopped by a couple of jammed doors at the central hall. Lecture room and library, if the layout of the floor's anything like the ones below it."

"Yes. I'm a pretty fair door buster, myself." He looked around the room. "There's Jeff Miles; he isn't doing much of anything. And we'll put Sid Chamberlain to work, for a change, too. The four of us ought to get your doors open." He called to Chamberlain, who was carrying his tray over to the dishwasher. "Oh, Sid; you doing anything for the next hour or so?"

"I was going up to the fourth floor to see what Tony's doing."

"Forget it. Tony's bagged his season limit of Martians, I'm going to help Martha bust in a couple of doors; we'll probably find a whole cemetery full of Martians."

Chamberlain shrugged. "Why not. A jammed door can have anything back of it, and I know what Tony's doing—just routine stuff."

Jeff Miles, the Space Force captain, came over, accompanied by one of the lab crew from the ship who had come down on the rocket the day before.

"This ought to be up your alley, Mort," he was saying to his companion. "Chemistry and physics department. Want to come along?"

The lab man, Mort Tranter, was willing. Seeing the sights was what he'd come down from the ship for. She finished her coffee and cigarette and they went out into the hall together, gathered equipment and rode the elevator to the fifth floor.

The lecture-hall door was the nearest; they attacked it first. With proper equipment and help, it was no problem and in ten minutes they had it open wide enough to squeeze through with the floodlights. The room inside was quite empty, and like most of the rooms behind closed doors, comparatively free from dust. The students, it appeared had sat with their backs to the door, facing a low platform, but their seats and the lecturer's table and equipment had been removed. The two side walls bore inscriptions: on the right, a pattern of concentric circles which she recognized as a diagram of atomic structure, and on the left a complicated table of numbers and words, in two columns. Tranter was pointing at the diagram on the right.

"They got as far as the Bohr atom, anyhow," he said. "Well, not quite. They knew about electron shells, but they had the nucleus pictured as a solid mass. No indication of proton and neutron structure. I'll bet, when you

come to translate their scientific books, you'll find that they taught that the atom was the ultimate and indivisible particle. That explains why you people never found any evidence that the Martians used nuclear energy."

"That's a uranium atom," Captain Miles mentioned.

"It is?" Sid Chamberlain asked, excitedly. "Then they did know about atomic energy. Just because we haven't found any pictures of A-bomb mushrooms doesn't mean – "

She turned to look at the other wall. Sid's signal reactions were getting away from him again; uranium meant nuclear power to him, and the two words were interchangeable. As she studied the arrangement of the numbers and words, she could hear Tranter saying:

"Nuts, Sid. We knew about uranium a long time before anybody found out what could be done with it. Uranium was discovered on Terra in 1789, by Klaproth."

There was something familiar about the table on the left wall. She tried to remember what she had been taught in school about physics, and what she had picked up by accident afterward. The second column was a continuation of the first: there were forty-six items in each, each item numbered consecutively –

"Probably used uranium because it's the largest of the natural atoms," Penrose was saying. "The fact that there's nothing beyond it there shows that they hadn't created any of the transuranics. A student could go to that thing and point out the outer electron of any of the ninety-two elements."

Ninety-two! That was it; there were ninety-two items in the table on the left wall! Hydrogen was number one, she knew; one, *sarfaldsorn*. Helium was two; that was *tirfald-*

sorn. She couldn't remember which element came next, but in Martian it was *sarfalddavas. Sorn* must mean "matter," or "substance," then. And *davas;* she was trying to think of what it could be. She turned quickly to the others, catching hold of Hubert Penrose's arm with one hand and waving her clipboard with the other.

"Look at this thing, over here," she was clamoring excitedly. "Tell me what you think it is. Could it be a table of the elements?"

They all turned to look. Mort Tranter stared at it for a moment.

"Could be. If I only knew what those squiggles meant – "

That was right; he'd spent his time aboard the ship.

"If you could read the numbers, would that help?" she asked, beginning to set down the Arabic digits and their Martian equivalents. "It's the decimal system, the same as we use."

"Sure. If that's a table of elements, all I'd need would be the numbers. Thanks," he added as she tore off the sheet and gave it to him.

Penrose knew the numbers, and was ahead of him. "Ninety-two items, numbered consecutively. The first number would be the atomic number. Then a single word, the name of the element. Then the atomic weight – "

She began reading off the names of the elements. "I know hydrogen and helium; what's *tirfalddavas,* the third one?"

"Lithium," Tranter said. "The atomic weights aren't run out past the decimal point. Hydrogen's one-plus, if that double-hook dingus is a plus sign; helium's four-plus, that's right. And lithium's given as seven, that isn't right.

It's six-point-nine-four-oh. Or is that thing a Martian minus sign?"

"Of course! Look! A plus sign is a hook, to hang things together, a minus sign is a knife, to cut something off from something – see, the little loop is the handle and the long pointed loop is the blade. Stylized, of course, but that's what it is. And the fourth element, *kiradavas;* what's that?"

"Beryllium. Atomic weight given as nine-and-a-hook; actually it's nine-point-oh-two."

Sid Chamberlain had been disgruntled because he couldn't get a story about the Martians having developed atomic energy. It took him a few minutes to understand the newest development, but finally it dawned on him.

"Hey! You're reading that!" he cried. "You're reading Martian!"

"That's right," Penrose told him. "Just reading it right off. I don't get the two items after atomic weight, though. They look like months of the Martian calendar. What ought they to be, Mort?"

Tranter hesitated. "Well, the next information after the atomic weight ought to be the period and group numbers. But those are words."

"What would the numbers be for the first one, hydrogen?"

"Period one, group one. One electron shell, one electron in the outer shell," Tranter told her. "Helium's period one, too, but it has the outer – only – electron shell full, so it's in the group of inert elements."

"*Trav, trav. Trav's* the first month of the year. And helium's *trav, yenth; yenth* is the eighth month."

"The inert elements could be called group eight, yes.

And the third element, lithium, is period two, group one. That check?"

"It certainly does. *Sanv, trav; sanv*'s the second month. What's the first element in period three?"

"Sodium, number eleven."

"That's right; it's *krav, trav*. Why, the names of the months are simply numbers, one to ten, spelled out."

"*Doma*'s the fifth month. That was your first Martian word, Martha," Penrose told her. "The word for 'five.' And if *davas* is the word for 'metal,' and *sornhulva* is 'chemistry and/or physics,' I'll bet *tadavas sornhulva* is literally translated as 'of-metal matter-knowledge.' Metallurgy, in other words. I wonder what *mastharnorvod* means." It surprised her that, after so long and with so much happening in the meantime, he could remember that. "Something like 'journal,' or 'review,' or maybe 'quarterly.' "

"We'll work that out, too," she said confidently. After this, nothing seemed impossible. "Maybe we can find – " Then she stopped short. "You said 'quarterly.' I think it was 'monthly,' instead. It was dated for a specific month, the fifth one. And if *nor* is 'ten,' *mastharnorvod* could be 'year-tenth.' And I'll bet we'll find that *masthar* is the word for 'year.' " She looked at the table on the wall again. "Well, let's get all these words down, with translations for as many as we can."

"Let's take a break for a minute," Penrose suggested, getting out his cigarettes. "And then, let's do this in comfort. Jeff, suppose you and Sid go across the hall and see what you find in the other room in the way of a desk or something like that, and a few chairs. There'll be a lot of work to do on this."

Sid Chamberlain had been squirming as though he

were afflicted with ants, trying to contain himself. Now he let go with an excited jabber.

"This is really it! *The* it, not just it-of-the-week, like finding the reservoirs of those statues or this building, or even the animals and the dead Martians! Wait till Selim and Tony see this! Wait till Tony sees it; I want to see his face! And when I get this on telecast, all Terra's going to go nuts about it!" He turned to Captain Miles. "Jeff, suppose you take a look at that other door, while I find somebody to send to tell Selim and Tony. And Gloria; wait till she sees this – "

"Take it easy, Sid," Martha cautioned. "You'd better let me have a look at your script before you go too far overboard on the telecast. This is just a beginning; it'll take years and years before we're able to read any of those books downstairs."

"It'll go faster than you think, Martha," Hubert Penrose told her. "We'll all work on it, and we'll teleprint material to Terra, and people there will work on it. We'll send them everything we can – everything we work out, and copies of books, and copies of your word lists – "

And there would be other tables – astronomical tables, tables in physics and mechanics, for instance – in which words and numbers were equivalent. The library stacks, below, would be full of them. Transliterate them into Roman alphabet spellings and Arabic numerals, and somewhere, somebody would spot each numerical significance, as Hubert Penrose and Mort Tranter and she had done with the table of elements. And pick out all the chemistry textbooks in the library; new words would take on meaning from contexts in which the names of elements ap-

peared. She'd have to start studying chemistry and physics, herself –

Sachiko Koremitsu peeped in through the door, then stepped inside.

"Is there anything I can do – ?" she began. "What's happened? Something important?"

"Important?" Sid Chamberlain exploded. "Look at that, Sachi! We're reading it! Martha's found out how to read Martian!" He grabbed Captain Miles by the arm. "Come on, Jeff; let's go. I want to call the others – " He was still babbling as he hurried from the room.

Sachiko looked at the inscription. "Is it true?" she asked, and then, before Martha could more than begin to explain, flung her arms around her. "Oh, it really is! You are reading it! I'm so happy!"

She had to start explaining again when Selim von Ohlmhorst entered. This time she was able to finish.

"But Martha, can you be really sure? You know, by now, that learning to read this language is as important to me as it is to you, but how can you be sure that those words really mean things like hydrogen and helium and boron and oxygen? How do you know that their table of elements was anything like ours?"

Tranter and Penrose and Sachiko all looked at him in amazement.

"That isn't just the Martian table of elements; that's *the* table of elements. It's the only one there is," Mort Tranter almost exploded. "Look, hydrogen has one proton and one electron. If it had more of either, it wouldn't be hydrogen, it'd be something else. And the same with all the rest of the elements. And hydrogen on Mars is the same as hydro-

gen on Terra, or on Alpha Centauri, or in the next galaxy – "

"You just set up those numbers, in that order, and any first-year chemistry student could tell you what elements they represented," Penrose said. "Could if he expected to make a passing grade, that is."

The old man shook his head slowly, smiling. "I'm afraid I wouldn't make a passing grade. I didn't know, or at least didn't realize, that. One of the things I'm going to place an order for, to be brought on the *Schiaparelli,* will be a set of primers in chemistry and physics, of the sort intended for a bright child of ten or twelve. It seems that a Martiologist has to learn a lot of things the Hittites and the Assyrians never heard about."

Tony Lattimer, coming in, caught the last part of the explanation. He looked quickly at the walls and, having found out just what had happened, advanced and caught Martha by the hand.

"You really did it, Martha! You found your bilingual! I never believed that it would be possible; let me congratulate you!"

He probably expected that to erase all the jibes and sneers of the past. If he did, he could have it that way. His friendship would mean as little to her as his derision – except that his friends had to watch their backs and his knife. But he was going home on the *Cyrano,* to be a big shot. Or had this changed his mind for him again?

"This is something we can show the world, to justify any expenditure of time and money on Martian archaeological work. When I get back to Terra, I'll see that you're given full credit for this achievement – "

On Terra, her back and his knife would be out of her watchfulness.

"We won't need to wait that long," Hubert Penrose told him dryly. "I'm sending off an official report tomorrow; you can be sure Dr. Dane will be given full credit, not only for this but for her previous work, which made it possible to exploit this discovery."

"And you might add, work done in spite of the doubts and discouragements of her colleagues," Selim von Ohlmhorst said. "To which I am ashamed to have to confess my own share."

"You said we had to find a bilingual," she said. "You were right too."

"This is better than a bilingual, Martha," Hubert Penrose said. "Physical science expresses universal language. Heretofore archaeologists have dealt only with prescientific cultures."

Dream Street

Frank M. Robinson

Michael Donahue lay on the cinder embankment just outside the Proviso train yards, pressing himself into the shadows cast by the small clump of discouraged-looking, oil-stained weeds that grew on top, along the tracks. He sprawled spread-eagled against the slope of cinders, not moving and only breathing enough to catch the mingled odors on the chill night air — the oily, dirty smell of the cinders and the faint, stomach-wrenching scent of slow-frying ham and eggs from the shanty a scant hundred yards away.

They must really be talking about it back at the Home, he thought. Sandy and Mick and Butz and the others were probably undressing for bed now and wondering where he was, wondering if he'd ever make it as far as Roswell and the Roswell Rocket Port. . . .

He moved slightly in the shadows, turning his head to look up at the blazing stars. There was the moon, splotchy with the shadowed areas that were Mare Tranquillitatis and Mare Imbrium. And then there was the tiny red dot of Mars and the fire that was Venus. . . .

He changed his position a little, trying to ease his cramped muscles. A stone, loosened by his elbow, went clattering down the embankment. He tensed, but the noise was masked by the usual night sounds of small creatures in the brush along the tracks and by the clangor of the switch engines shuttling cars through the yards a block away.

A phone rang in the shanty. A moment later, men came

out with lanterns and started through the yards, searching the low-slung, talgo freight cars.

They were probably looking for him, he thought sickly, automatically flattening himself closer to the cinders. Mr. Gilman of the Home was plenty smart – maybe he had figured that a runaway wouldn't try to leave Chicago by bus or car, that it was too easy to get picked up that way. Maybe he had figured right off that a runaway would try the freight yards.

One of the yard workers was coming closer, swinging his lantern so it cut through the night in big arcs, lighting up the tracks and the cinder slope. Mike bit his lips and prayed and the man stopped. Far down the track another light was fingering its way over the ties. The Diesel grew bigger and rumbled slowly by, lightweight freight cars swaying behind it.

It was heading west, Mike observed, his heart suddenly beating faster, and it had a string of empties at the end. He leaped to his feet and started running beside it, not caring whether the man with the lantern saw him or not. The train was picking up speed now, the whistle an eerie blast in the night. The empties rattled by, doors halfway open. He cut in towards one. His fingers touched the frame and with a sudden burst of speed and a lunge he was half in and half out, his thin cotton pants whipping about his legs in the chill wind. He hung there a moment, then snatched a chestful of air and muscled himself inside.

He hunkered down by the open door, catching his breath and watching the suburbs roll by. Then they were out of the metropolitan area and peaceful farmlands and darkened woods stretched by the track, quiet and ghostly in the bright moonlight.

"Kinda young to be on the lam, aren't you, kid?"

There was the sound of a match being struck in the darkness and the yellow light flickered and flared in the empty freight car. The man who held the match was big, with a bigness that was more muscle than fat. Whiskers sprouted in the creases of his face and under a once-mashed nose, while watery blue eyes hid under a tangled undergrowth of brows.

"I – I'm old enough," Mike said defensively.

The hamlike hand that held the match raised it a little so the feeble light fell across Mike's face and chest.

"Just makin' conversation, son. You're big for your age but I could guess it at a young fourteen and not be more'n a month off." There was a pause while the big man looked him over. "Somebody's probably offerin' good money for the whereabouts of a skinny, blond-haired kid like you. What's your name, Slim?"

Mike hesitated. "Bill."

The big man's eyes narrowed. "That ain't for real, is it? Well, it don't matter anyways. Goin' west?"

Mike felt a little uneasy. "Roswell."

The match went out. The big man didn't bother lighting another one.

"Star-struck, huh?"

Reluctantly. "I guess so." He didn't want to talk about it. Not even Mr. Gilman, who was a right guy every other way, knew how it felt to stare at the stars at night and feel hungry inside, a hunger that didn't go away no matter how many of the Home's pork chops and baked potatoes you ate.

The big man spat on the floor. "You oughta read the statistics, Slim. You're good for a couple of years and then

the piles blow up and there ain't enough of you or the ship to bury in a six-inch coffin. You get your name on a hunk of brass and that's it. And believe me, I oughta know."

"You been up, mister?"

The big man made a noise. "Yeah, I been up. I was on a freight run to Titan for a couple of years."

Titan! The freight car was suddenly the control cabin on an M-class rocket; the open door, the port looking out on the stars. His voice seemed to come from far away.

"What was it like?"

The big man snorted. "I'll tell you what it was like! There was nuthin' to do. You sit on your fanny and stare out the ports and play cards. And then you land at Ley Village and unload your supplies and get drunk and that's all you do because there's no women there and then you come back. And if you don't have ulcers and weak kidneys and radiation burns by this time, you're one in a million."

The freight car was just a freight car again.

"You're looking at it the wrong way, mister," Mike protested.

"I suppose you been up?"

"My dad took me to Crater City once." He'd never forget it, he thought slowly. The glassite domes over the small town and the mine diggings and the dazzling sunlight glinting off the harsh crater walls of Archimedes and Aristillus and the plains of pumice dust stretching beyond. . . . He felt in his pocket for the small good-luck charm made out of a hunk of genuine crater rock that his father had once given him. It was round and almost perfectly smooth now from the number of times he had fingered it.

The big man changed the subject. "It takes money to get to Roswell. Even riding the rods all the way."

"I got enough."

The big man's voice turned thoughtful. "I'm sorry to hear you say that, Slim. I kinda need money myself."

He moved quickly in the dark and Mike suddenly felt something sharp and pointed pressing against his throat.

"Just don't move, Slim, and everything will be okay." Mike sat stock-still, the inside of his mouth drying up while the palms of his hands turned wet. A practiced hand slipped into his right-hand pocket and drew out his wallet. The pressure on his throat relaxed. There was a faint rustle of paper and he knew the big man was feeling for the money.

They had been going up a slight grade and the car door had slid open, showing the black sky and the blazing stars beyond. The big man was to Mike's right but still in front of the door. And he was too busy taking the money out of the wallet to notice anything else. Mike suddenly kicked out with his feet and the big man *oofed* and folded up, a fleeting expression of surprise on his beefy face as he sat down on the air outside the door.

Mike was shaking and sick to his stomach. Talgo trains made a hundred or more on slight grades. The big man wasn't going to bother him or anybody else – again.

His heart gradually slowed and he realized how lucky he had been. He was safe and still headed for Roswell, even if he no longer had the fifty bucks he had saved from his Home allowance. It was going to be hard to get along without the money. But that wasn't the important thing.

The important thing was that he was on his first step to Venusport.

Or Mars Town.
Or even Crater City.

She was big and blond and bosomy with a too tight skirt slit up the side and a mouth that was a slash of scarlet. She slouched under the street lamp, watching green-overalled spacemen wander up the street, pausing as coins clinked against closed windows. The sign on the corner said Dream Street – a narrow street with too much neon and too little light, where rotting houses fronted directly on the sidewalks.

Mike watched her for a moment from the shadows across the street, then walked over.

"Could you tell me where Goddard Boulevard is, lady?"

He was still in shadow when he asked it and she automatically arched her back against the lamppost and let her face slip into a professional smile.

"You're not in a hurry to get there, are ya, hon?"

He stepped closer and her smile faded. A thin, blond-haired kid – tall for his age – in white cotton ducks and a short-sleeved shirt and the narrow, intent face that was as much of a trademark as the two bearded ginks on the coughdrop boxes.

The syrup vanished from her voice and left it harsh and gravelly.

"Whaddya wanna find Goddard Boulevard for? See the port?"

He managed an uneasy smile. "I'd like to."

"It's pretty hard to stow away, kid. And you'd never make it in that getup anyways."

"I – wasn't planning to stow away," he lied, reddening.

"It's written all over your face, kid – and you're going

at it all wrong. You think all you wanna do is slip down to the port and watch but once you get there you'll try something foolish and you'll be caught and sent back to your folks."

"They'll never catch me," he said stubbornly.

"I used to know a kid like you," she mused. "A long time ago. He tried all the dodges. And then one day he made it."

For a brief moment her face softened and lost its harsh lines.

"What happened then?" Mike asked curiously.

"He never came back." She paused. "If I was you, I'd get a job down there so you got a reason for being there. Just hang around and the cops'll pick you up. You kids are an old story to them."

He started to ask her a question but she wasn't listening. A man was standing a few feet away, having trouble lighting his cigarette. She put on her smile and raised her voice a little.

"Shag it, kid. Come back when you're older."

He walked down the street past the penny arcades and the shooting galleries and the taverns that smelled of stale beer. The street was thick with men wearing the insignia of tube men or pile technicians or the crossed jets of pilots.

". . . the whole planet's nothing but a goddamned swamp . . ."

". . . place called Rose's, just down the block . . ."

". . . for two months nothing but stars, nothing but the goddamned stars . . ."

". . . dry, the atmosphere sucks moisture right out of you . . ."

". . . so I says to the first mate, you can take your GD jet man and jam . . ."

They were from faraway places, Mike thought dreamily. They had seen the native section of Mars Town, teeming with greenies and leathery skinned colonists, they had seen the rings of Saturn, and stood on the mountains of the moon. And maybe some day soon he would be right there with them . . .

Dream Street abruptly turned into Oberth Avenue and a block more and he was standing under the chestnut trees that bordered the expressway of Goddard Boulevard. It was crowded with eager tourists and misty-eyed colonists-to-be, taking one last look at Earth.

Mike fought his way to the traffic-filled street and looked down it. It was right there at the end of the boulevard, a few miles away. A bubble of light made up of search beams and the thin red flares that marked takeoffs. The biggest rocket port in the world, fifty square miles of desert sand covered with concrete landing aprons and surrounded with grassy parks so you could bring your lunch and watch the passenger liners take off for Venus or Mars and the freighters head out for the research posts on Saturn's moons.

He glanced down at his shirt and pants, rumpled with having slept in them and spotted with grease from the freight car, and realized the lady he had talked to earlier that evening was probably right. He couldn't get within a mile of the port like he was. He'd have to go at it kind of slow, and in the meantime he'd have to find a job and a place to sleep.

And something to eat.

Mike stood in front of the window of Larry Doby's – a

restaurant on Dream Street – and watched the middle-aged owner working at the griddle right in back of the glass.

Larry Doby had thick, corded arms, the beginnings of a small paunch, and a friendly face with an expression of absorbed attention. He ran a greased rag over the griddle and then poured out some batter in three small circles. They sat there a minute, little bubbles formed on top, broke and dried, and then he flipped them high in the air. They came down with the crispy brown side on top. He scooped them up when they were done, set them on a plate with a pat of butter melting down the sides of the stack, then shoved the plate on the moving belt just behind the counter.

Mike swallowed automatically and realized there was a dull pain in the pit of his stomach. He hadn't had much to eat since leaving the Home and now he was so hungry he was almost sick. His hands explored his pockets hopefully for stray coins. There were none. He felt for his good-luck piece, squeezed it affectionately, and went on in.

He took a seat at the end of the counter and pretended that he was reading the menu dial selector. You punched out your selection, a duplicate of it appeared on the board above the short-order cook working in the window, and he fixed it up and set it on the belt. You took it off when it got to your place. And if you didn't like the looks of it, you just didn't claim it – the belt took it back to the cook.

Mike watched the belt nervously, hoping that nobody was watching. The pickings on the belt were slim – apparently Larry's had only satisfied customers. Finally a sweet roll came down that nobody had claimed. Mike

palmed it under a paper napkin and started to walk out.

At the door, Larry set three pancakes on a plate with one hand and grabbed Mike by the shirt collar with the other. "Ruby!" A thin, pale-faced woman came out of the back room. "Take over, will you?"

He walked Mike over to a table at the side. "You don't eat unless you pay, sport. One roll is an eighth of a credit. How about it?"

Mike let the roll fall from his hand to the table top. "I don't have any money," he said sullenly.

Larry gave him a long, hard look that took in his rumpled shirt and dirt-smeared pants. "Sit down – and don't try to beat it."

Mike sagged into one of the chairs. This was it, he thought, almost too tired to care. By tomorrow he'd be on his way back to the Home and the gang would call him a stupe – and they'd be right. The closest he'd ever get to Mars would be looking at it through his homemade telescope.

A stack of cakes was shoved under his nose and he looked up to find the griddle man offering him a fork.

"Go ahead, eat 'em sport! You're hungry, ain'tcha?" He sat down in the other chair and watched Mike eat. "Where's your folks?"

Mike swallowed and wiped the syrup off his mouth with the back of his hand. "Don't have any – they're dead."

Larry leaned back in his chair and worked at his teeth with a toothpick, "I'll buy that, though you don't look like the type to be on your own."

"I get by."

Larry's face was blank. "Yeah, I bet you do." He studied Mike carefully. "I got a proposition, sport. I need help,

somebody to wait table. If I let the wife do it, too many guys make passes at her and there's trouble. You want a job, you can have it."

Mike made a production out of sopping up the syrup on his plate with a hunk of bread. It was nice of him, he thought slowly. But he'd been taking charity ever since his old man had died and he was sick of it.

"Thanks, but . . ."

Larry was belligerent. "But what? You want to hold me up for more dough? I don't pay much but I pay regular and on top of that, I'll let you sleep in back, okay?"

It didn't sound like charity, Mike admitted to himself, it looked like if he didn't take it, the griddle man would have to find somebody else. Something caught in his throat. "Gee, thanks a lot!" he blurted.

Larry got up to go, then sat down again, looking thoughtful. "Just one thing, sport. I've had kids work here before and they usually ended up trying to snag a berth on one of the rockets out at the port. The cops catch 'em and ship 'em back to their hometown and I usually never find out until a couple of days later. If you're gonna do something foolish, let me know beforehand, will you?" He paused, looking hard at Mike again. "And think it over before you take off. I came out here fifteeen years ago with big ideas, too. I guess you begin to grow up when you realize you ain't gonna set the world on fire." He wiped the table with his apron and picked up the dishes. "You can get all the adventure you want, just listening to the guys in here talk. Keep your ears open – maybe you'll hear things that'll make you change your mind."

"Yeah, I might," Mike said absently.

But he knew that nothing he heard would make him change his mind.

He liked working at Larry's restaurant. The pay was low but the meals were good and Ruby took care of his laundry so it averaged out pretty well. He could even set some money aside for the big plan.

But the best thing about working there was that he could listen to the talk that swirled along the counter and among the tables. Talk about places he had never seen, about places he had only read about. . . .

There was an old cook on the Earth-Moon run, practically an overnight hop, who had been working on the big ships ever since the early days when Crater City was nothing but a collection of pressurized steel bubbles huddling under the crater ledges of Archimedes. And there was Gim Wong, a tube man on the *Martian Prince,* a freighter on the regular run to the red planet. Gim was a walking history book, a man who knew more about the start of the colonization of the planets, Mike thought, than any other man living. . . .

Setting up colonies is easy now, but you should have seen it when they first started planting colonies on Mars. I remember bringing in the first load, and then the relief supplies a year later. Half the original colonists had frozen to death and the other half were fast on their way to starving. Seems their atomics man had died of the crawling sickness shortly after arrival and none of the rest knew how to run the power plant, couldn't even call for help. And then there was the time on Io when . . .

But the best one of all was Captain Lieberman of the Cameron-Smith lines. He was a thin, wiry little man with a pencil-thin waxed moustache and frigid blue eyes – real

class. He and his second in command, a first mate named Schacht, stopped in at Larry's after every trip for a bowl of chili and crackers made the way that only Larry could.

Mike brought them their orders, then found one reason or another to hang around their table, straining his ears for the cold recital of facts and figures between Lieberman and Schacht, facts and figures that were far more romantic to him than either man could have imagined.

One day Lieberman suddenly broke off in the middle of a discussion of the drawbacks of the concrete landing aprons on Mars and fixed Mike with a stony stare.

"You've got big ears, son."

Mike reddened and started to move away. "Sorry, sir."

"Come here," Lieberman said curtly.

Mike walked over, nervously wiping his hands on the cotton towel wrapped around his waist.

"You like to listen to us talk about space" — he waved his arms at the ceiling — "don't you?"

Mike flushed. "Yes, sir. I'd like to go out there some day."

"Why?"

There were a million reasons, Mike thought, but now that he had been pinned down there were none that actually held water, none that would make much sense to Lieberman.

"I . . . I just want to, that's all."

Lieberman looked thoughtful. "That's the best answer I've heard yet. None of the others are worth a damn. But it isn't everything you youngsters think it is. It's just hard work and boredom and if you've got any other ideas, forget them." His piercing eyes played coldly over Mike. "Maybe after you've seen a few ships hulled by meteors

and men die trying to breathe space, some of the glamor would wear off."

Mike backed off towards the kitchen, embarrassed. "I – I got a pretty good idea of what it's like, sir."

Lieberman snorted. "All you youngsters think you do."

Mike was almost back to the kitchen when he stopped dead. The tall, thin man at the table by the kitchen door. He'd recognize him anywhere. The deep eyes and the thinning gray hair and the set of the shoulders . . . and the man had seen him.

He walked over. "Hello, Mr. Gilman."

The voice was friendly enough. "Have a seat, Mike, I want to talk to you."

Mike folded quietly into the offered chair. "You want to take me back, don't you?"

"The Home isn't such a bad place, Mike. I don't see why you ran away."

Mike shrugged, his face blank. "You wouldn't understand, Mr. Gilman."

"I think I do." The voice turned persuasive. "What's wrong with doing it our way, Mike? You'll be sent to school, you'll be taught the things you should know, rather than by learning by experience. You'll get what you want and you'll be better prepared for it. A few more years and you'll be apprenticed out to one of the regular lines."

Mike struggled to see it but it wasn't any good. His voice sounded tortured. "A few more years isn't today, Mr. Gilman!"

The tall man looked at him thoughtfully. "You can't wait, can you?" He got up. "Let's go, Mike."

"I'll have to get my things," Mike mumbled.

Mr. Gilman looked at his watch. "Give you five minutes – hurry it up."

Mike went out to the kitchen. It was empty. Larry was working in the front window, drawing in the evening customers. He wadded up his towel and threw it in the dirty clothes bin, then took down an empty pepper can from the spice shelf, opened it, and shook out his savings.

He was sorry he couldn't say good-bye to Larry. He was sorry, too, that he had to run out on Mr. Gilman.

But this was the best way.

The gnarled little man wearing the green eyeshade said: "You got the money?"

Mike placed the bills on the battered table and pushed them down to him.

The man counted it carefully, then shoved it inside a tattered wallet. "How do you know I just won't take your money and tell you to get the hell out of here, son?"

"I heard you were a pretty square guy," Mike said simply.

The man laughed. "I should be ashamed of myself when a kid tells me that. Now exactly what is it you want?"

Mike moistened his dry lips with his tongue. "I want . . . an identity. You know, cards and papers for a background, to show I have parents and live in town here."

"What do you want it for?"

Mike hesitated. He felt that he had confided in too many people and that any of them could cross him up by telling. "You don't need to know, do you?"

The man took out his wallet, spilled the money on the

table, and shoved it back toward Mike. "Here's your money. Beat it."

"I want to get a job," Mike said quickly. "Down at the port."

The man took the money back. "You should have told me at the beginning," he said quietly. "How do you expect me to do my job if I don't know what the hell you want? Who do you want a job with?"

"Atlas Provisions."

The man nodded. "Good outfit. They're not too particular." He brought up a jar of India ink from the drawer, then hesitated. "It ain't for me to advise you, son, but are you sure you know what you're doing? Space isn't everything it's cracked up to be, you know. You might get a couple of days out and decide you don't like it – but then you'd be stuck."

Everybody was trying to discourage him, Mike thought stubbornly. But he was going to get to the stars. He was going to go if he had to walk every mile of the way and if it took years.

"I've thought about it for a long time. I'm sure."

The man sighed and took a few blank cards and some stationery out of the drawer, then fished around in a small cabinet for an assortment of fine lettering pens. "You'll need a work permit and a letter from your folks and maybe some recommendations and a few other items to back them up. Come back in an hour and you'll be all set."

The sun was a blinding white off the concrete aprons and the little brass plaques set in them. Mike shielded his eyes and shifted slightly on the back of the forklift truck that was hauling the train of pallets of concentrated food

and provisions and winding its way among the different aprons. He twisted around. A mile back he could see the green parks and the bunting and waving flags from tall flagpoles that jutted up over the trees.

The truck chugged around another apron and passed the *Empress of Mars,* a huge freighter impossibly balanced on her rear jets. Mike gasped in awe at the twenty-story-high ship, and let his interest wander to another, even larger ship.

His eyes lowered to the concrete. It was about here, where the old *Ashenden*'s berth had been. His eyes searched the ground, found a little brass plaque that he had been shown a picture of once – a long time ago – and then the truck passed it and it was lost in the distance, a small speck of yellow metal glaring in the sunlight. They were passing other ships now, the *Asteroid Queen,* the *Saturnia,* and the new *Lusitania* – the last a passenger liner with a double row of quartz view-ports around her midsection.

Elmer Carter – Mike's boss – stopped the truck beneath the support fins of the *Star Quest* and stood up and stretched. He was a fat man with thin arms and even thinner legs; Mike thought he looked like a golf ball on stilts.

The loading crew showed up a minute later and started to manhandle the crates and boxes to a sling, let down from the waist of the ship.

"Okay, Mike, you got the credit sheets?"

Mike felt in the pocket of his Atlas uniform and brought out the sheets. Elmer started to check them and the first sling-load went on board. "You keep count too, Mike – we don't want to miss anything."

It was a hot day and by the time they were done, sweat had stained Elmer's shirt and was rolling down his fat cheeks. He sighed and put away his slips: the last sling-load was aboard and the loading crew had gone off to another job. He started the forklift truck when suddenly Mike said: "Hey, it looks like they forgot something!"

Elmer looked startled. "No kidding!" He got out and waddled to the third pallet back. A small crate had fallen in between the third and fourth pallet-trucks. He picked up the small crate gingerly. "We shoulda caught this, Mike. It's B1 concentrates."

Mike bit his lips. "It's my fault. I'm new on the job and . . ."

Elmer shook his head. "It ain't your fault," he said generously. "Those dumbheads of loaders overlooked it." He looked worried. "They need these, Mike – it'll be my job if they don't get them. And blast-off's only fifteen minutes away."

It was a hot day and Elmer was already sopping wet and bone-tired. He looked up the ladder that crawled up the hull to the port that opened in the waist. It was five stories up, that port. A long haul. A mighty long haul.

Mike watched the look of dismay spread over Elmer's face. It was hot and the port was quiet except for the cries of the loading crew two ships down. Things were on a tight schedule, Mike knew – they wouldn't have time to call the crews back. He tried to make his voice sound casual. "I can take it up and be back in five minutes."

Relief flooded Elmer's face, relief mixed with apprehension over what the company would do if they found out. Letting kids go in the rockets wasn't company policy. He

shoved the box in Mike's arms. "Okay, kid, but shake it up. No sight-seeing."

Mike tucked the box in his shirt and started up the ladder. The crew was on board and probably strapped down by now, he thought. They were all set to go. His heart started to pound. The *Star Quest* was slated for a lift to Mars and that was a good two month trip. By the end of it, if he worked hard, he could be a third-class apprentice. Spacemen – good spacemen – were scarce and it didn't make a heck of a lot of difference how old you were. The government griped but nobody made much fuss.

He was five stories up now and he turned for one last look at the port of Roswell. Elmer was a tiny figure below him, and the pallets looked like they were made out of matchsticks. There were other ships around him, standing up like needles, and then – farther off – the parks and the wide streak of Goddard Boulevard. He could even see the section that was Dream Street. For a minute he thought he could make out Larry's restaurant, then realized he was too far away.

He looked down at Elmer again, hesitating a moment. It would probably mean Elmer's job. He turned back to the port. His heart was pounding and there was a roaring in his ears. He ran a moist thumb over his good-luck piece and went in the air lock.

"Look, Mr. Gilman, I didn't know who the hell the kid was! He's assigned to work with me and I don't ask questions – nobody's paying me for asking questions! The loaders leave this crate behind and I know it'll mean my job if I don't get it aboard and the kid volunteers to take it up. Do I know he's going to stow away? Look at me,

I'm an old man – I can't go climbing five stories of ladder!"

Gilman nodded tiredly. "Okay, Carter, forget it. I'll fix it up with Atlas so you don't get fired."

Carter left and Gilman turned back to the rocket port. Far out on the huge expanse of concrete there was a scorched spot where the *Star Quest* had been a few moments before. He looked at it thoughtfully.

Larry Doby shook his head.

"I thought I had him pretty well talked out of it at the restaurant, Mr. Gilman. Maybe if I had notified you sooner, you could have stopped him."

"I didn't want to stop him," Gilman said dryly. "Every ship that leaves this port has provisions for one or two stowaways. A hundred stowaways leave Roswell every month – kids who want to see the stars. We make it difficult for stowaways, scare away those who just want a thrill, but we don't try to stop them, Doby."

Larry looked puzzled. "I don't get you."

"All right," Gilman said slowly, "take Mike. He'll be a good spaceman. His father used to be on the Earth-Moon run – got killed when the pile of the *Ashenden* blew up in '97. That's why Mike was in the Home for the Children of Space. He knows a lot of the ropes already, he picked up a lot from his father. In a way, you might say that Mike was bred for space." He paused. "And he's got something pretty valuable, something that will make him one of the best of the lot – and Lord only knows we need them."

"What's that?"

"A long time ago, kids used to run away to sea. There was – well, something that called them. They wanted to

go. That's why Mike will be so good on the rockets. He isn't in it for the money, the dangers don't mean anything to him. He's got something you have to have for the job – he *wants* to go."

"I don't know," Larry said thoughtfully. "A lot of kids want to run away for the glamor, you know – visiting strange lands, that sort of thing. What happens when Mike finds out there isn't any glamor, that the exotic foreign places just ain't?"

"The glamor of anything is in the mind of the beholder," Gilman said slowly.

The sun had started to drop in the sky and a chill wind blew out of the east. Larry shivered.

"Seems to me like the kid has the short end of the stick. The government gets men for the spaceships but what do they get in turn? What's Mike gonna get out of this?"

Gilman turned a little into the fading sun and Larry caught the telltale flecks of flesh-colored tattooing that hid the radiation burns and the ultraviolet scars on Gilman's face.

"What will he get out of this?" Gilman asked slowly, bleakly. His voice filled with frustrated puzzlement at a man who didn't understand, who would never understand. "He'll get the stars, *Carter*, the stars. . . ."

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