

The cover features a vibrant illustration of a green submarine, numbered '21', navigating through a blue, ethereal space environment. The submarine is angled towards the viewer, with a white wake trailing behind it. In the background, a large, dark, rocky celestial body looms on the left, and a bright, glowing ring of light surrounds a distant star. A sleek, silver spacecraft is seen in the upper left, leaving a white trail. The overall scene is dynamic and futuristic, set against a backdrop of deep blue and purple hues.

**if**

**WORLDS OF  
SCIENCE FICTION**

FEBRUARY 35 CENTS



A New Space Thriller  
**AVOIDANCE  
SITUATION**

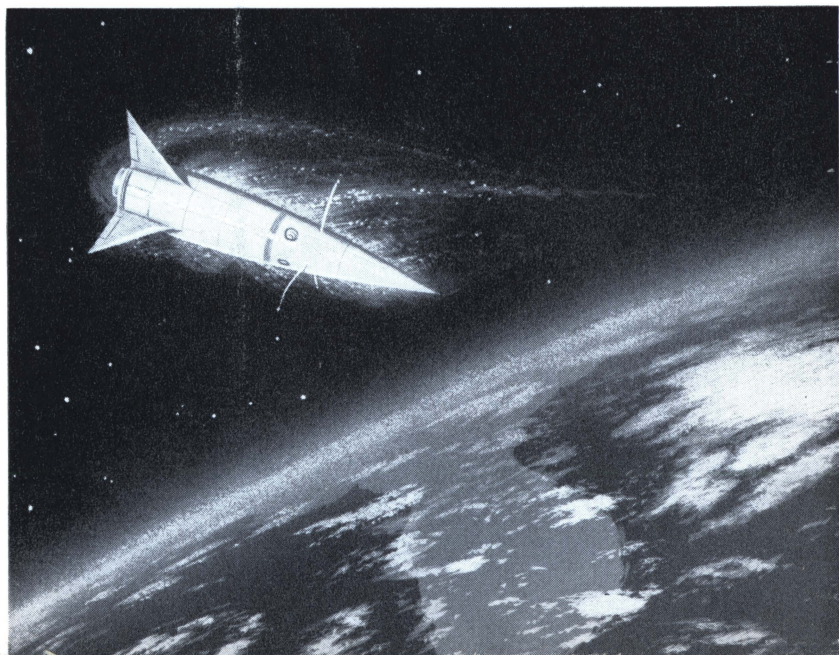
by James McConnell

POUL ANDERSON • JAMES BISH • JOHN JAKES • JACK LEWIS  
EDWARD W. LUDWIG • GEORGE H. SMITH • MIRIAM ALLEN DE FORD





LAUNCHING AND DEATH OF THE SATELLITE—America's miniature satellite is shown here in two phases of its brief existence: the initial phase, its launching (left) as part of a three-stage rocket, and (below) its final moment as it flips over just before disintegrating from intense heat of friction with denser atmosphere. See page 38 for more detailed description. (Drawings by Mel Hunter)



# WORLDS of SCIENCE FICTION

FEBRUARY 1956

All Stories New and Complete

Editor: JAMES L. QUINN

Assist. Editors: EVE WULFF, ROBERT W. GREENE

Art Editor: MEL HUNTER

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"Atomic Submarine Lurking Under Reef in Southern California Waters" by Mel Hunter

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# THE ODD genre

**HE NEVER SLEPT!** That was the title of a story by John Russell Fearn published 20 years ago and remembered by me to this day. I may also remember it as my motto for the Clevention: during 120 terrific hours of conventioning, I slept approximately 12! Last day and nite of all I went clean 'round the clock.

The incentive for this anti-Morpheus marathon? Who could sleep with the opportunity at hand to get the first-hand information on ASP (Artificial Satellite Program) straight from the maestro's mouth? —to hear Willy Ley in person, letting his distinguished hair down with the s.f. aficionados. Who could sleep with the clown princes of the imagi-nation. Bob Bloch, Bob Tucker and Isaac Asimov, constantly tickling the funnybone? Who wanted shuteye with the projectoscope programs showing famous collectors' choicest items (First Editions, foreign editions, unpublished magazines, rare art work, doppelgangers, etc.) on a large screen, accompanied by

miked descriptions by Sam Moskowitz, Dr. C. L. Barrett, and Weaver Wright, curator of Mis-katonic University? Who wouldn't be ashamed to sleep in the presence of the British beauty, Pamela Bulmer, and what a shame it would have been to've slept and missed any of the whimsical humor of husband Ken, fan and author from England who was International Guest of Honour of the occasion.

Run this list of favorite authors over your tongue: *Damon Knight, Fritz Leiber, Mark Clifton, Judith Merril, Randall Garrett, Leigh Brackett, Edmond Hamilton, Rog Phillips, Russ Winterbotham, Edward E. Smith, E. Everett Evans, Lloyd Eshbach, Betsy Curtis, Thelma Hamm, James E. Gunn, Jim Harmon, Bob Silverberg, Wallace West, Frank Riley, Bob Bloch*, and many others. Nearly every "pro" present was a guest of the University of Chicago Science-Fiction Club at an afternoon autograph party, and the ink flowed like wine, with many a fan bringing home a fine memento of the occasion in the form of a personally inscribed book.

At one time at 2 a.m. conventioners were in the midst of enjoying a revival of the classic fantasy film, *Lost Horizon*. The first nite of all, conventioners were immediately put in a jovial mood by being shown the scientificomedy riot starring Alec Guinness, *The Man in the White Suit*. A feature of this Convention that I found especially pleasing was the showing of motion picture records of a num-



ber of past Conventions, in a program assembled by cameraman Bill Grant of Canada. (Was that sans-moustached, harlequin-glassed, *twenty pounds slimmer* guy I caught a glimmer of in the 1948 Toronto films really me?) And there was Walt Willis, world's favorite fan, at the banquet in Chicago in '52; and Hugo Gernsback, the Father of Science Fiction; and AE van Vogt, "the man in the *bright suit*"; and Charles Beaumont and John Campbell and Margaret St Clair and Philip José Farmer and more interesting people than you'd care to shake a slipstick at. And for me, a first glimpse at the goings-on of the first Convention I ever missed, the Nolacon: New Orleans' convention of 1951, the year my Dad died when I was enroute.

**AMONG THE BEASTS** of science fiction (and all its wolves are not of the wehr variety) walks great beauty. San Francisco gave us The Goddess Known as Jessyca: supple, silver reed of womanhood, bending in the wind of the sighs of her would-be wooers, her stricken swains. Jessyca the remote, the unapproachable, the dweller on the pink cloud. Jessyca—unbelievably, a *fan*—the unforgettable.

That was 1954.

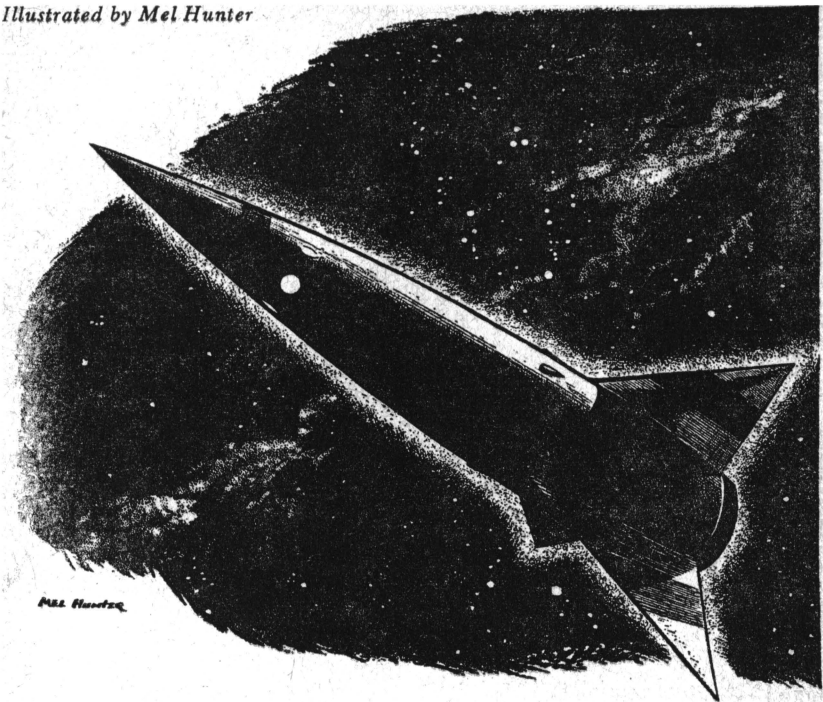
Time rockets on.

1955: and from the mists of obscurity, from northeast of nowhere, drifting into the ken of fen and pro's alike from some unlikely miniscule pin-mark on the map of the United States, came (remember the name, and ask for an in-

roduction at the next convention) . . . *Ruth Landis!* She came, she saw, she conquered. Queen for a Day? Nay, Queen for the Convention. She moved always in the highest echelons. (It could probably be said she sat in the laps of the Gods!) All paid court to her; and if there were giants in the "good old days" of stf, before it put on a bow-tie and went sci-fi on us, there never were such living dolls reading our favorite literature. Twenty years ago we male fans would have welcomed a cross-eyed gal with buck teeth (and not even balked at the cost of her teeth) just to know the companionship of a *female fan*. Today, in La Landis, we discover a Grace Kelly who's been reading s.f. for 10 years! Will wonders never cease! (We hope not.) For the good of all fankind (and the professionals who made her their ubiquitous mascot) may her tribe increase.

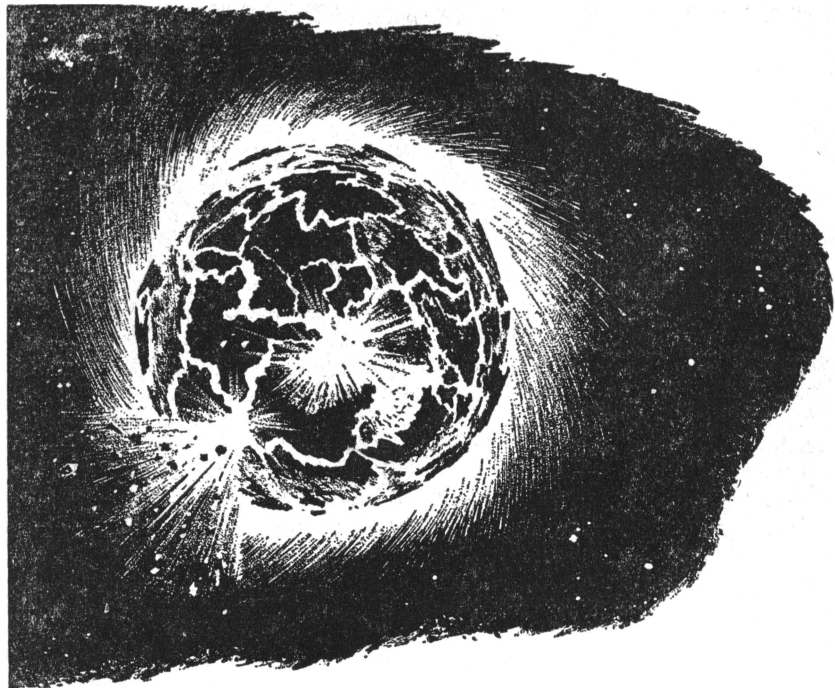
**RIDING BACK** from Cleveland to Chicago I had the good fortune to have as a companion James E. Gunn, one of the newer voices in science fiction who's going places. Jim gave one of the most solid, most perceptive speeches at the Convention—"The Function of Science Fiction". I asked him if, in his s.f. writings, he felt he had anything special to say or was pointing any way in particular, and got an answer that I liked: he said he was trying to write stories with an optimistic note and a belief in human beings. When Jim and I parted company, It was with the feeling on my part that if we had  
(Continued on page 116)

*Illustrated by Mel Hunter*



# AVOIDANCE

*What can a man do when he alone  
must decide the fate of Earth and all  
its people—and when the choices  
offered him are slavery and death . . .*



# SITUATION

BY JAMES MC CONNELL

**C**APTAIN ALLEN HAWKINS stood quietly in the observation room of the *Sunward* looking out at subspace. He was a medium-sized man with a trim squareness to him that suggested he had been in the military most of his life. He had a good deal of gold on his sleeve and a good deal of sliver in his hair, and he had discovered in his many years in the Space Navy that the two usually went hand in hand. In the background he could hear



the noise and ordered confusion of the ship's bridge. But at the moment he paid it little attention, concentrating instead on the observation window.

It was not the first time that he had stood thus, gazing at whatever lay beyond the shell of the ship. Almost every time he had put the *Sunward* through the dark shadow of subspace, he had deserted the bridge for at least a few moments to come and stare out the window.

"God," he said out loud, repressing a shiver that wanted to crawl down his spine.

"Perhaps 'God forsaken' would be a better description," came a voice from behind him.

The voice belonged to Dr. J. L. Broussard, the *Sunward's* senior psychologist. And although the two men were on more than casually friendly terms, Hawkins didn't turn to greet him. The fascination of the observation port seemed to obviate the normal requirements of courtesy. "At times like this I think you're right. 'God forsaken.' That's just what it is," Hawkins said. "Completely black, completely empty. You know, it frightens me every time we make the jump through it."

A voice from the bridge called out, "Twelve minutes until zero. No noticeable deviations, Captain."

"Very well," Hawkins said loudly enough to be heard on the bridge.

"Perhaps it frightens all of us just a little," said Broussard. He leaned his oversized body against the observation room wall. His big, mild face had a relaxed look to it.

"I wonder why it affects us that way," he added almost as if it were a casual afterthought, but his eyes had a too-shrewd look to them.

"You're the psychologist. You tell me why," Hawkins said. He paused for just a moment, expecting Broussard to reply. But after a few seconds when the man gave him no conversational support, Hawkins continued. "For my part, I guess it frightens me because—well, because a man seems to get lost out there. In normal space there are always stars around, no matter how distant they may be, and you feel that you've got direction and location. In subspace, all you've got is nothing—and one hell of a lot of that." He pushed his cap back until it perched comfortably on the rear of his head. "It's incredible when you stop to think about it. An area—an opening as big as the whole of our universe, big enough to pack every galaxy we've ever seen in it and still have lots of room left over. All that space—and not a single atom of matter in it anywhere." Captain Hawkins shook his grayed head in wonder. "At least," he went on. "Not a single atom in it until we came barging in to use it as a short cut across our own universe."

The man on the bridge called out, "Ten minutes until zero. No noticeable deviations, Captain."

"Very well," Hawkins answered.

Broussard shifted his considerable weight into a more comfortable position. "You feel rather strongly about this, don't you?"

"That I do," said Hawkins. As much as he enjoyed an occasional

conversation with the psychologist, Broussard's questions often got on his nerves.

"Don't you think it's better we discovered subspace than if we were still back trying to beat the speed of light in our own universe?" Broussard asked him.

"Oh, stop looking for a dangling neurosis somewhere, Broussard," Hawkins said, managing a smile. "You know quite well that I've got absolutely nothing at all against the use of subspace for 'rapid transportation,' so to speak. It's just that I'm the sort of man who likes to know where he's going *all* the time. And out here, in this stuff, you lose your sense of direction. There's no up, no down, no in between. It took spacemen a long time to get accustomed to the wild freedom they found out in the middle of normal space. But at least there you could always head for a star if you got lost. Out here . . ." He gestured futilely towards the blackness staring in at them from the window. They stood silently contemplating it for several moments.

"Eight minutes until zero. No noticeable deviations, Captain," came the voice from the bridge again.

"Very well," Captain Hawkins replied, breaking the brief silence between the two men. Then he went on, "Broussard, have you ever been out there in that stuff? Oh, I don't mean like now, in a ship or a rescue craft. I mean in a spacesuit, all by yourself."

The psychologist shook his head. "No, I never have." He paused for just a second, then added, "What's

it really like?"

There were times, Hawkins thought, when even the phrasing of a simple question on Broussard's part carried a slight sting. But like the brief pain that accompanies the probing point of a hypodermic needle, the tiny barbs contained in the man's questions were soon forgotten. Hawkins smiled. "It's my own private guess of what hell will turn out to be. 'God forsaken,' did we say? That's just about it. We stopped to repair a ship once, and some of us had to go outside to work on it. I guess I was out there for less than three hours—no more than that. And yet I was almost a madman by the time they hauled me back inside. I can't explain why." His voice trailed off into nothingness. "I guess it was just the blackness that did it."

"Six minutes until zero. No noticeable deviations, Captain."

"Very well." For the first time Hawkins turned to face the psychologist. "During my training at the Academy they locked me up in a closet once, just as a joke. I was without light for hours, but it was nothing like that out there. You should know, Broussard. Why does it look so much blacker in that window now than any other black I've ever seen?"

Broussard looked the man over carefully before answering, wondering just exactly what sort of reply might be called for. "I think the reason is that you've got close to optimum conditions for it here in the observatory," he said momentarily. "You always get the blackest shade of black inside a ring of

white light. Look at the window." Hawkins turned to do as directed. "There you've got a white frame surrounding the complete absence of light. That's just about as good as you can get. No wonder it looks so black to you."

Hawkins shook his head, not so much in disbelief as in wonder.

"As a matter of fact," the psychologist continued almost in a hurry. "If you stayed out in sub-space all by yourself, with no ship near you and no light of your own, after a while it wouldn't seem black to you at all. You'd get cortical adaptation, and things would just look gray. And not too long after that, you'd stop 'seeing' entirely, as we think of seeing. Or, as a friend of mine once said, under those conditions you'd 'see' as much with your elbows as you would with your eyes. Funny, isn't it? We usually think of black as being the absence of light. And yet, in order to 'see' black, we've got to have at least a little light around every once in a while."

The watchman on the bridge droned out the time again. "Four minutes until zero. No noticeable deviations, Captain."

Allen Hawkins gave a large sigh, then readjusted the cap on his head. He had the feeling that Broussard's little lecture on science, while factually accurate, was delivered more to obscure the facts than to illuminate. "I'd better get to the bridge now, Broussard. Not that they really need me, but . . ." He left the sentence dangling, then turned and walked briskly out of the observation room.

ONCE IN the control room, he gave the dials and the illuminated screens a rapid, practiced glance and then sat down in his chair to one side of the operations panel. There was actually no known danger to this shifting back and forth from one space to another. No ship had ever encountered any difficulties whatsoever in doing so; there had never been an accident of any kind during transition. The whole thing was as completely automatic as man could make it, and apparently entirely safe. But still Hawkins had never made the shift one way or another without feeling a telltale tightening of muscles deep inside him, and without wondering just what would happen if they got *stuck* in all that darkness.

"One minute, Captain," the watch officer reminded him. Hawkins nodded in reply, his face illuminated by the flashing lights on the control panel in front of him. He watched their changing signals calmly with knowing eyes.

"Thirty seconds . . . all drives off," sang out a voice. The hands on the clock crept slowly around the dial.

"Zero . . ."

There was no sound, no feeling, no jerk nor jar, no noise to mark the transition—nothing at all different from the moment before except a slight increase in the total light flux in the room.

*Stars.*

Captain Allen Hawkins smiled softly to himself. Stars . . . something to cling to, he whispered under his breath.



"Bridge from Navigation," came a voice close to his ear.

"Go ahead, Navigation," he said after pressing the communications button.

"Looks like we hit it right on the nose, Captain," the Navigator told him. "Can't tell just yet, of course, until I feed the positions of the nearest stars into Betsy and she decides where we are. But it looks good from here, and if I'm right, the one we're hunting for is about eight o'clock high from the nose of the ship as she sits now. I'll plot a course there right now. Do you want to wait until Betsy decides that's the one, or shall we take a chance and head for it first?"

The Navigator always asked the question, but he knew what the answer would be. "We'll start just as soon as you can give us the course," Hawkins replied.

"Aye, aye, Captain," the Navigator replied.

Hawkins turned to the officer on duty. "Mr. Smith, you will remain as you are until you receive the course from the Navigator. Once you have it, you will get underway immediately."

"Aye, aye, Captain," Smith replied.

"I'll be in my cabin if you want me," Hawkins said as he left the bridge. He was rather tired and he meant to go straight to bed, but somehow he found himself stopping by the observation room en route. Broussard was still there, looking out of the window at the stars.

"Lovely, aren't they, Broussard?" Hawkins said.

"So you feel the stars are love-

ly?" the psychologist answered slowly.

"Yes, I do. They give us light, and hope for the future, and more than that, a frame of reference when we fly through the dark reaches of our universe. They're more than beautiful—they're necessary." As he turned to leave, Hawkins chuckled to himself. Just let the head-shrinker try to read a neurosis into that!

It took them three weeks from the day they arrived back in normal space to make sure that they had found a sun with planets, and another three weeks from then to make landfall on the second of the four satellites this particular solar system had to offer. Almost from the very beginning they were elated with their luck, for the planet seemed to be a first class find. The *Sunward* and her crew had been exploring this section of space for more than six years, and out of the thirty-eight systems they had investigated, this was the first that offered any promise of eventual human habitation.

Man had been in space less than one hundred years. At first he had thrown himself towards the stars with crude rocket-driven craft. A few years later he had invented a type of atomic drive which allowed him to approach the speed of light. But it was the discovery of the sub-space technique of travel which had theoretically given him the whole universe to live in. There were drawbacks, however, and they were important ones. To tear himself from the matrix of normal space he

still needed huge machines, and probably always would. This meant the building of exceedingly large space vessels, like the *Sunward*, which could contain not only the equipment necessary to propel him into the blackness of subspace, but which also could be equipped with the mammoth control mechanisms necessary to regulate the change-over. The switch to subspace could never be made near the surface of a planet, for the field forces generated during the change had far-flung effects and were quite capable, even under tightest control, of tearing loose a huge chunk of a planet and dropping it into subspace with the ship. Big ships meant big money, and even now there were fewer than a thousand of the large exploration craft in operation. Each ship could average fewer than ten new worlds a year. So while man had taken a lease on the universe, it seemed that at his present rate of exploration a great many centuries would pass before he finished the charting of even the stars in his own back yard.

But if at times he became discouraged at the immensity of the task, there were always moments of great joy which helped to spur a man on.

The men of the *Sunward* named the new star Clarion, and the habitable planet they called Trellis. It was the second of three large and one very small planets which circled Clarion. The *Sunward* spent more than two weeks circling over Trellis, making maps and checking the atmosphere. Then the council of scientists on board picked a land-

ing site and Captain Hawkins brought the ship down on the spot they had chosen. Exactly twenty-seven days from the hour they landed, the council voted unanimously that Trellis was safe for human habitation, and Allen Hawkins gave the orders to have the hatches opened to the Trellian air.

The Captain, as was customary, was the first man to set foot on the soil. He led the brief ceremonies that claimed the world as Earth's own and then planted the Terran flag. He also took the customary measure of declaring it a ship's holiday, and even threw out the first baseball when the inevitable game started up later in the afternoon. But he didn't stay to watch, preferring to stroll around the landscape by himself for a little while.

He had been walking for a little more than an hour, traveling in a wide circle around the ship, when he came upon Dr. Broussard, sitting quietly under a shady tree, a book in one hand and a container of beer in the other. The beer looked good and cold, and the shade looked comfortable. "Mind if I join you?" Hawkins asked, and since he was Captain of the ship, scarcely waited for an invitation before he sat down and opened himself a beer. It tasted as good as it had looked, and Hawkins soon found himself in an expansive mood. "Tell me, Broussard," he said good-naturedly. "How come you aren't out snooping around, making sure that the crew's libidos aren't acting up or something."

Cocking an ear towards the distant ball field, rife with the excited

noise that always accompanies such a game, Broussard replied, "It sounds to me as if the crew is getting about as much libidinal discharge as I could hope for under the circumstances. That being the case, I saw no reason why the ship's alienist shouldn't have a little time off."

Hawkins leaned back comfortably against the tree. "Alienist. That's a pretty strange word these days, Broussard. Used to be what they called psychiatrists in England back in the old days, right?" Hawkins was of vaguely English descent and felt it behooved him to know such things.

"That's right. They revived the term briefly a hundred years ago when we first got out into space, because they thought that psychologists might be needed for the first contacts with alien cultures." A slight frown came over the man's face. "The word's fallen into disuse again of late, however," he continued.

Captain Hawkins grunted in assent. "No aliens, eh?"

"That's right. No aliens. Thousands of new worlds, thousands upon thousands of new species, but not one of them intelligent enough to hold a candle to our earthside chimpanzee. But still they go on outfitting each of the exploration vessels with psychologists, and outfitting all of the psychologists for the double task of soothing the crew's *psyches* and making contact with mythical intelligent races that so far we've only dreamed about." Broussard emptied his container of beer and with a single vicious

movement threw it as far away from him as he could. "I must say, however, that of late they've been spending more time training us to be mind doctors than to be official greeters to unknown cultures."

Suddenly Broussard straightened up. "But why should you twit me about deserting my work today. I saw you throw out the first baseball. How come you didn't stay for the game? Surely that falls under the province of a Captain's job."

Allen Hawkins smiled. "I learned long ago, Broussard, that there are times when the presence of the Commanding Officer has an undesired influence on the spirits of the crew. After all, as Captain of the *Sunward*, I can't very well take part in the game itself. Who'd dare to strike me out when I came to bat?" He stopped to think about that for a moment. "Or, maybe I should have said, I don't *think* anybody would dare to strike me out."

"Ah, yes, the Father Figure," Broussard said laughing.

"That's right. So I can't play. Nor can I umpire, for half the fun of baseball is arguing with the umpire and I couldn't allow any of that. And if I just watched without playing the game itself, a lot of the crew might think that I felt myself too high and mighty to take part in their proletarian type of recreation. So I'm damned if I do and damned if I don't. So what did I do . . .?"

"You left the field," Broussard answered, lighting up a cigarette after offering the other man one.

"That's right, I left the baseball field and went walking."

"That's not quite what I meant



when I said 'you left the field,'” Broussard went on. “It’s a psychological term, first used by Lewin many centuries ago. Any time a man is in a conflict situation, faced with two or more alternatives that he finds it difficult to choose among, he may solve his problem by choosing none of them.”

Hawkins stretched his legs out restfully on the grass in front of him. As he thought about it, there had been few times in the past when he had given the psychologist his head and let the man talk. Probably, Hawkins thought to himself, Broussard spends most of his time listening to the petty confessions of all of us and never gets the opportunity to unload a bit himself. He caught himself wondering just who on Earth confesses the Pope . . .

And so he uttered the magical words, “I don’t think I quite understand . . .”

Broussard scarcely needed the encouragement to continue. “Lewin liked to think of psychological situations as approximating physical situations. He spoke in terms of valences and attractions, of vectors and forces operating through psychological distances. For example, let’s consider the case of a child put into a long hallway. At one end of the hall is a large, fierce dog. At the other end is an ugly man with a big switch. We tell the child that he has to go to one end of the hall or the other. This becomes an ‘avoidance-avoidance’ situation in the Lewinian terminology. Both the man with the switch and the fierce dog carry negative valences—that

means that the child actually doesn’t want to approach either of them—and the closer the child comes to one of them, the more powerfully it repels him. Just as with magnets—the closer you bring one negative charge to another negative charge, the more powerful is the force of repulsion.”

Captain Hawkins smiled. It wasn’t going to be as bad as he had feared. “What does all this have to do with baseball?”

“We’ll get back to home plate in just a moment. But first, let’s continue with the child. We put him in the hallway, tell him to go to one end or the other, and then we just sit back and watch. At first he stands about as close to the center of the hall as he can, assuming that the two negative valences are about of equal strength. He’s undecided—can’t make up his mind which is worse, the man or the dog. So we prompt him to action—shock him or tell him that he has to keep moving. Then he begins to move back and forth, vacillating between the two undesirable objects. So we apply more and more pressure to try to force him to a decision. But the closer he moves to the dog, for example, the more distasteful *it* becomes, and the less dangerous does the *man* seem to be. So the child turns around and starts towards the man. But here the situation is repeated. It’s a beautiful example of a conflict situation.”

Giving vent to a well-disciplined snort, Captain Hawkins said, “And eventually the child either gets well switched or badly bitten, eh?”

“No, that’s where you’re wrong.”

Eventually the child tries to escape from the hallway altogether. Sometimes he'll try to climb the walls, or break down a door, or anything like that which will release him from what has become an impossible psychological environment."

"So," said Hawkins. "I think you left me stranded on first base."

Broussard laughed. "Pardon the sermon, Captain. What I was trying to point out was that the baseball game represented just about the same sort of thing to you as the hallway did to the child. Any time a human being is faced with two impossible decisions like that, he usually ends up by 'leaving the field' of conflict altogether. Nowadays we can even predict the exact field forces necessary to bring on this type of behavior."

"And what do you predict I'm going to do right now?" Hawkins asked with a bit of a laugh in his voice.

"That's an easy one. I predict you're going to ask for another beer—and that I'll give it to you. No conflict there." He opened a container that chilled itself automatically as he handed it to his superior officer.

Hawkins blew the foam from it and then took a long, satisfying swallow. "There are times when I'm glad I'm just an uncomplicated space officer," he said presently.

Broussard grinned. "Sorry if I seemed to be giving you a lecture, Captain. I'm afraid you would have enjoyed a good, healthy discussion of Freud much more. My own particular problem is that I'm much more interested in thinking

about the remote possibilities of man's encountering new types of intelligences than I am in playing father confessor to a bunch of space rats. Back on Earth the social psychologists felt that Lewin's work offered a fruitful means of analyzing the motivational components in any alien society we might encounter. I guess my trotting out the vector charts was just a neat example of wishful thinking."

Captain Allen Hawkins didn't bother to answer the remark for some time. He was too busy watching something move slowly towards them across the grassy plain. Finally he half-whispered to his companion, "Don't put those charts away too soon, Broussard. You finally may have a chance to use them."

**B**ELLS CLANGED loudly. Red and yellow lights flashed insistently in front of the man, demanding his attention. The clattering noise of a computer working at high speed added to the unholy din of the small spaceship's control room.

Surveyor Lan Sur ran his deft fingers rapidly over the studs on the control panel in front of him. He scarcely looked at the controls as he manipulated them, concentrating instead on the screens before him—screens which showed the attack patterns of the seven large warships that surrounded him.

One of the attacking enemy ships loomed incredibly large directly ahead of him. Lan Sur's fingers hesitated, and then, at precisely the proper second, pressed the firing

studs. The scout ship seemed to dance lightly upward as it passed high above the larger, slower enemy craft. Lan Sur whirled his ship around just in time to witness the total disintegration of the enemy.

"One down," he thought, but took no particular pride in his accomplishment. There were still six left.

The enemy regrouped, spreading out into a cone-like formation. He knew the trick well, and aimed his ship to make its next pass high above the open mouth of this formation. But the enemy opened up from the top of the cone as fast as Lan Sur tried to avoid it. He fired a warning salvo and tucked his defensive screens in tight around him. But the uppermost enemy ship incredibly picked up more speed, sliding off into an extremely intricate maneuver. Lan Sur knew that if it could hold to this path, it would pass several miles above him, neatly sandwiching him between the enemy vessels below. He could have turned aside at once, but that would have been an admission of possible defeat, and he could never admit defeat. If he could beat the other ship to the topping maneuver, he would destroy not only it, but the ships at the small end of the cone as well when he came crashing down on them from above. For just a moment he felt certain that he could succeed.

The scout ship vibrated tensely as it hurled itself forward. The red lights on the control panel doubled in number, then tripled. The computer roared instructions so rapidly that he could hardly keep up with

them. The warning bells went mad with ringing.

"I think I can make it," he told himself. But he refused to become excited. He had come this close to victory before, and had still failed. Now he saw he was gaining on the enemy ship, but it was a thin margin of safety indeed. The computer screamed with danger signals as the huge craft came closer and closer.

Lan Sur leaned forward slightly in his seat, a little strain showing on his usually relaxed face. To his surprise, he found himself saying aloud, "Yes, I think I can."

But he did not. Suddenly the enemy craft shot by above him and belched forth a thick burst of light. The huge black warships immediately beneath him echoed the call, catching his smaller, fleeter ship in a double barrage.

And it was all over.

The red lights on the control panel blinked out quickly, one by one. The warning bells ceased their claxons, the computer settled down to a quiet hum. The screens went blank. A thin piece of tape spewed forth from the computer. It read, "This scout ship utterly annihilated. End of problem."

Lan Sur looked the tape over sourly. "Damn," he said, leaning back in his seat. He tore the tape into little pieces and deposited them angrily in the reclaim box. Reluctantly he pressed the "Analysis" button on the computer. The machine would issue him a complete dissection of the whole mock war game, pointing out with deadly accuracy the mistakes he had made.



"Damn," he said again, thinking over the past battle. He got up from the control panel and walked over to his relaxation chair. Sitting down, he took a small bit of food from a container and began chewing on it viciously.

It wasn't really so bad that he lost the engagement, he told himself. The pre-battle odds were greatly against him. And as often as he had tried it, he had never been able to take on seven enemy ships and still survive. Sometimes it seemed an almost impossible task to him. However, he had a deep desire to solve the problem, because the computer told him it might be solvable if he took the proper course of action. Evidently, it would take a lot more work, a great deal more study on his part before he found the solution.

"But time is something I have plenty of," he said aloud, stretching out comfortably in the chair. For several hours he puzzled over the thing, taking time out to digest the taped analysis of his mistakes, and then attacked the problem afresh. Eventually, out of sheer exhaustion, he slipped off into a deep, restful sleep, quite confident that the next time he tried the seven-ship problem, or at most the time following that. . .

Lan Sur awoke to quietness. He stretched his lean, lithe legs, slowly, returning to normal awareness as he did so. Once he was completely awake, he sat down in front of the control panel again. A single amber light beamed from the board. While he had been asleep, the scout ship

had come out of its C<sup>2</sup> drive and had slowed to a stop. They had reached their immediate destination, and since he was asleep, the computer had simply turned on the protective screens around the ship and had begun a survey of the sun system they had arrived at.

He pressed a button on the computer and then leaned back to digest the information that the machine began feeding him at once. The sun was of the A/34.79Lu type, just as had been forecast before his voyage. It had three large inner planets and a tiny fourth much too far away from the solar furnace and much too small to be of any practical value. Lan Sur read the report carefully, noting with pleasure certain of the facts presented him. He was in the midst of an interesting section concerning the chemical composition of the atmosphere on the second of the planets when a small bell on the computer rang and the machine became silent for just a second or two, then began pouring out material at a furious rate.

Lan Sur, who had been yards of tape behind in his reading, dropped the atmosphere discussion and began to read the new information being spewed forth. A frown crossed his face as he read the first few words, "Alien contact established. . ." He hoped this new development would not take him away from his games for too long a time.

The computer had detected the emanation of modulated energy waves coming from the second planet. Immediately it had withdrawn

its wide-flung detector beams and had concentrated fully upon the source of the waves. Lan Sur reset the computer so that only a very small part of the huge machine would carry on the routine work of new investigation, while the greater part would be put to work in an attempt to decode what was obviously a language being broadcast in some obsolete manner. He noted with pride that the aliens, whoever they might be, had not at the moment reached the point of development where C<sup>2</sup> communication was available to them, but were still limited to the raw speed of light for the transmission of messages, and hence, he felt sure, for the transmission of space ships too. This meant, he knew, that he had probably stumbled onto a race of beings still new to the reaches of space who would be helpless in the face of even his own lightly armed scout ship. However, according to patrol instructions, he activated a switch that relayed all pertinent information by means of a sealed C<sup>2</sup> beam back to the nearest Dakn Patrol base, and put in a formal call for the presence of Patrol battleships. One way or another, they would be needed. . .

It took the computer less than a day and a half, as Lan Sur figured time, to break the language of the aliens discovered on the second planet. The Surveyor spent this time working feverishly on a new idea he had for the solution of the seven-ship problem, and was quite upset when the computer finished its problem of decoding the new

tongue before Lan Sur had worked out all the details of his latest attack on the mock war games. Reluctantly he put himself into a light trance, during which the machine taught him the new language. He did not actually learn to think in the new tongue, for that would have imposed limiting strictures on his mental processes. Rather, his mind was turned into a kind of translating factory. He had the freedom to think in the terms and in the concepts that he was accustomed to, and his mind simply expressed these thoughts as best it could in the newly-learned way of speaking. The computer had also arrived at an incredibly clear knowledge of the socio-politico-psychological structure of the new civilization, but aside from a brief glance at some of the more intriguing points, Lan Sur ignored this information and simply relayed it along to the Galactic base where social scientists could pore over it in their own bemused leisure. For his tasks Lan Sur hardly felt that he needed it.

Once Lan Sur had memorized the language, he put his scout ship under a screen of complete invisibility and landed it some few miles away from the space ship the aliens were using as their permanent base. He let the computer drink up what additional information it required to make sure both that the planetary conditions were suitable to his own particular chemical make-up, and that the aliens were indeed as impotent as his previous estimates had seemed to indicate. Once the computer gave him its blessing, he

walked out into the bright planetary sunlight.

**P**SYCHOLOGIST J. L. Broussard sat up puzzled. "What do you mean, don't put away my Lewinian vector charts too soon? I may have a chance to use them on *whom?*"

Captain Allen Hawkins simply stared straight ahead of him, his lips forming unanswerable questions. Broussard took his cue from the man's head and stared too. And then he understood.

The alien, for from its dress alone it obviously *was* an alien, was still quite a distance away from them. It came walking towards them with a kind of protective sparkle about it—and even from that distance they could sense a feeling of power about the man.

"Man?" Broussard caught himself thinking. Yes, it did seem very much like a man—not only like a human, but like a masculine human. But immediately Broussard told himself that this might not be the case. True, humanoid it was, but because it displayed a certain lack of the more obvious female sexual characteristics it did not follow that it was *male*. "Why, they could even have *ten* different sexes for all we know," Broussard thought to himself.

"I think it's coming towards *us*," Hawkins said quietly.

Broussard watched the alien move a few more yards and then agreed.

Hawkins activated a small radio that he carried in one of his shirt

pockets. "Hello, Communications," he spoke rapidly into the microphone. "This is Hawkins. Put me through to the Bridge at once. And make sure you record every word that I say."

The words "Aye, aye, Captain," were forthcoming immediately from the tiny loudspeaker. The Captain rated a special communications channel that was guarded by the radio shack at all times, and it came as no surprise to Hawkins that the reply was prompt. He had expected it to be.

"Bridge here, go ahead."

"This is Captain Hawkins, Bridge. Who's the Duty Officer?" Hawkins knew who the man was, but asked to give the man a chance to realize fully that the Captain was aware with whom he was speaking.

"Lieutenant Medboe, 'Captain, ready for instructions."

Hawkins thought for just a moment and then answered. "Mr. Medboe, the information that I am about to pass along to you is not to leave the Bridge under any circumstances. As soon as I finish, you will contact the radio shack and make certain that what I have said, if it has been monitored, is not passed along from that particular point either. Do you understand me?"

Medboe's voice sounded a little puzzled, "Of course, Captain. Your instructions will be followed to the letter."

"Now then," Hawkins continued. "You might as well know at once that I think we've made contact with an alien race. I don't know what this means to you personally,

but to the human race it means a great deal and we can under no circumstances risk the occurrence of any incident. You will therefore send someone to find Commander Petri and inform him that as Executive Officer, he will be in charge of the ship until I return to it. And while you are doing that, you will summon all the men to return to the ship at once. You may not give them the real reason—tell them that there is a bad storm coming and that I have ordered them all inside. It is imperative that none of them realizes the true reason. Do you understand?”

Medboe's voice sounded almost hurt. "Aye, aye, Captain," he said.

"Good. Once everyone is back inside the ship, have Petri summon all officers not on watch and all scientists to the large meeting hall. They will be given a chance to observe and listen to the contact as it is made. Which reminds me—have the communications department set up a long range television camera on me at once, and pipe the image down into the hall. You will have them record both sight and sound for later use. You will also inform Petri that a state of emergency exists as of this moment by my personal order, and that if necessary he is to blast off from the planet without making any attempt either to protect or rescue me. And once it has been established that we are in fact dealing with an alien culture, Navy Headquarters must be informed immediately via subspace radio." Hawkins wanted to make sure that in the event the entire ship was captured, Earth would

know that an alien contact had been made and could take steps to protect itself. He only wished, now that he thought of it, that he could have taken more adequate steps to protect the men and the ship. But for the moment the *Sunward* and her crew would have to remain where they were and as they were. And if the alien had not attacked them up to that point, perhaps no attack would be made at all.

Hawkins wanted to tell Medboe a thousand other things—simple, obvious things that surely both Medboe and Petri would be cognizant of. But, as always, the man who had to delegate responsibility simply had to depend on the perspicacity of the men to whom he gave the power.

"Any questions?" Hawkins asked after a brief pause.

"I don't believe so, Captain," Medboe answered. Hawkins could tell from the sound of the man's voice that he had hundreds of things he would have liked to ask, but none of them were of the type that he could have expected his superior officer to answer.

"Good," Hawkins replied formally. "One more thing. You will under no circumstances attempt to contact me on this radio set—there's no need in letting the alien know any more about us or our abilities than we absolutely have to."

"Right, Captain," came the obedient answer.

Hawkins turned the switch to the "Sustained Talk" position and informed the Officer of the Deck of his actions. Then he turned to

Broussard. "Anything you have to add to all that?" he asked.

The psychologist indicated a negative by a shake of his head.

"Very well, Mr. Medboe. You may carry out your orders," Hawkins said with a sigh. Then he turned to Broussard again. "Well, Louie. I guess it's up to you from here on out. You're the alienist." And with that, Hawkins reluctantly relinquished completely his normal command of the situation.

During the time that Captain Hawkins had been giving his orders, Broussard had been deep in thought, paying only scant attention to the instructions that the other man had passed along. The psychologist's mind had been racing over the possibilities of this first contact, and more than once during the brief period of time, it had dwelt on his own particular fears that he would not be up to the encounter.

"I think you had better give the radio to me," Broussard said. "I'll probably be closer to the alien during the first stages of contact at least, and certainly I should be doing most of the talking."

The statement made sense to Hawkins, and he passed the device over without comment. Broussard tucked it away in one of his pockets.

"I don't think we should bother walking towards him," Broussard said a moment later, answering an unspoken question. "He's obviously coming toward us and it would seem better if we weren't too eager." Broussard felt no need to

describe the alien over the radio since by this time the communications division back on board the *Sunward* would have set up their long range television cameras. Captain Hawkins shifted about on his feet a bit like a boxer doing warm-up footwork prior to a battle.

"I wonder where he's put his space ship," Broussard said.

Hawkins looked puzzled. "How do you know he's got one?" he asked.

"Well, it's just a hunch. But unless I miss my guess, that shining air the—the—" Broussard groped for the right noun, then fell back again on a sheer perceptual analysis. "The shining air the *man* coming towards us has is a defensive screen of some sort. And we've certainly found no evidence on Trellis of any civilization at all, much less one so advanced that it could dream up gadgets like that. I figure he must be from somewhere else. Maybe he's just a visitor here too, like us." Hawkins inwardly admitted the logic of the reasoning.

As the alien came closer, they could both see why they had instinctively felt from the first that it was of the male gender. The creature's hair was cut a little longer than men wore theirs back on Earth, but this was almost the only difference. The alien was a bit taller than either of them, but not beyond the limits producible by the human race. His shoulders were the widest part of his body, and formed the broad top of the inverted triangular shape that most human men admired. His clothes

were of some peculiar, clinging material, but the bottom half of his body was fitted out in a close approximation of Earthside trousers. The man was handsome even by their own standards of masculine beauty.

"Well," said Hawkins. "This is it. Man is no longer 'alone.'"

Broussard realized suddenly that the other man was just as nervous as he himself was. "No, man is no longer alone," Broussard replied. And then he added, "But neither is *he*."

The alien was less than one hundred yards away when Broussard said quietly, "I don't think we'd better talk any more. Let's just stand here and wait for him to make the first move."

Lan Sur walked towards the two aliens at a comfortable rate of speed. When he was still some distance off the computer back on his scout ship informed him of the first of the messages going back and forth from one of the men to the ship, and then of the gradual withdrawal of the rest of the ship's crew to the sanctuary of the *Sunward*. It was with no surprise at all that he listened to the computer, as it did a remote physical and chemical analysis of the aliens. Eons ago the Dakn people had come to the conclusion, first in theory and then in fact, that intelligent life capable of reaching the stars had to fall within the humanoid pattern. The aliens confronting him were well within the theoretical tolerance limits on every count. But still it amused him to see the slight obesi-

ty of one of the men and the thick body hair of the other. These were two minor points of difference between the races.

At exactly the right psychological distance from the two aliens, Lan Sur stopped. He was quite close enough to be heard and understood, but not so close that his physical presence suggested too much of a threat. He waited just long enough before speaking.

"It is customary in your culture to begin with introductions," he said in a strong voice. "I am Lan Sur, possessed of the rank of Senior Surveyor in the Galactic Patrol of the Dakn Empire. I welcome you officially to the communion of the stars."

Lan Sur could almost feel the sinking sensation inside the larger of the two aliens when he began to speak to them in their own tongue. It amused him to think that these two had probably expected to begin by drawing pictures in the dirt. Well, they would learn.

"You should know at once that the Dakn Empire comprises some 700 quadrillion people of the same general humanoid characteristics as obtain in your race. We populate planets on some hundred thousand suns, most of which lie much further toward the opposite end of the galaxy than does the system in which we find ourselves at the moment. We have explored great reaches of the universe, but this is the first time we have penetrated as far into this particular district as this star you call Clarion. That explains why our races have never before come into contact."



The two aliens leaned forward a little on their feet, as caught up in his words as children might be when told a new and fascinating story.

"The Dakn Empire is the only other political system that exists in this entire galaxy, as far as we know." Lan Sur paused for a moment, to let the significance of his words sink in. "There have been others, of course, but they soon passed under our control. Just as your civilization will now pass under our control."

He read the sudden, stark fear that appeared in their eyes correctly without needing the affirming echo from the computer.

"The Dakn Empire has learned that whenever it discovers a new civilization, it must absorb this new culture immediately. There is no other choice. And your race must follow the pattern of the thousands we have encountered in the past. There is no choice. As of this moment, you and your people are, from our point of view, just as much a part of our Empire as our own home planets. This does not appeal to you, I know. But there is no other way."

The computer informed him that the *Sunward* had brought all of its gun turrets to bear on him, but Lan Sur ignored the fact as being irrelevant.

He continued. "No, you do not have a choice about becoming a part of our system. But you do have a choice about the method by which this action will be taken." The involuntary sigh that one of the aliens gave briefly amused him.

The alien would find that the sigh of relief was a short one. "The choice is this—either you will join with us peacefully, in which case the whole period of transition will take less than one of your years. Or . . ." He let the word dangle momentarily before his booming voice continued. "Or, if you choose to oppose us, the transition time will take even less than that. We will simply destroy you and all of your worlds.

"You have no alternatives."

The alien's voice grew louder. "You will want to know what absorption into our system will mean to you. By now you will surely have realized how far superior we are to you in every way, and I include specifically the factor of intelligence in this statement. My analysis of your potential intellectual and rational powers shows me that you are not capable of contesting on an equal basis with any of the other races that comprise our Empire. You are the lowest of the low, and as such, your race will be put into a slave category. We always have room for more slaves."

The two aliens in front of him seemed in a state of shock. Lan Sur felt he might as well finish the thing off and get it over with.

"If you choose to come with us peacefully, what will happen is this: We will take over all of your worlds at once, evacuating your people from them in less than a month. Your race will be spread out over our Empire, sent to the places where they are needed the most.

"Of course you will not be al-

lowed to retain either your own personalities or your memories. As slaves you would scarcely need them. So they will be stripped from you en route to your new homes, and suitable new slave personalities will be implanted in your minds. You find this thought distasteful I know, but it is the only logical action we can take. You will be born again, so to speak, knowing our language, feeling at home in our way of life and not retaining even a shred of your old patterns of culture. This is the simplest, most efficient way in which your race can become a part of our much larger scheme of things.

"If you do *not* choose to come peacefully . . ." again Lan Sur stopped for dramatic effect, "the warships I have already summoned, coming at the square of the speed of light, will search out every planet, every world in this whole sector, and will utterly annihilate every solar system you have contaminated. We have, in the past, met obstinate races who tried to resist our rule. The results were rather spectacular from an astronomical point of view. Perhaps your scientists have wondered what caused the nova of stars, or even the explosions of whole regions of space. Now you have the answer. We would hate to destroy your race, but if you resist us, we have no choice."

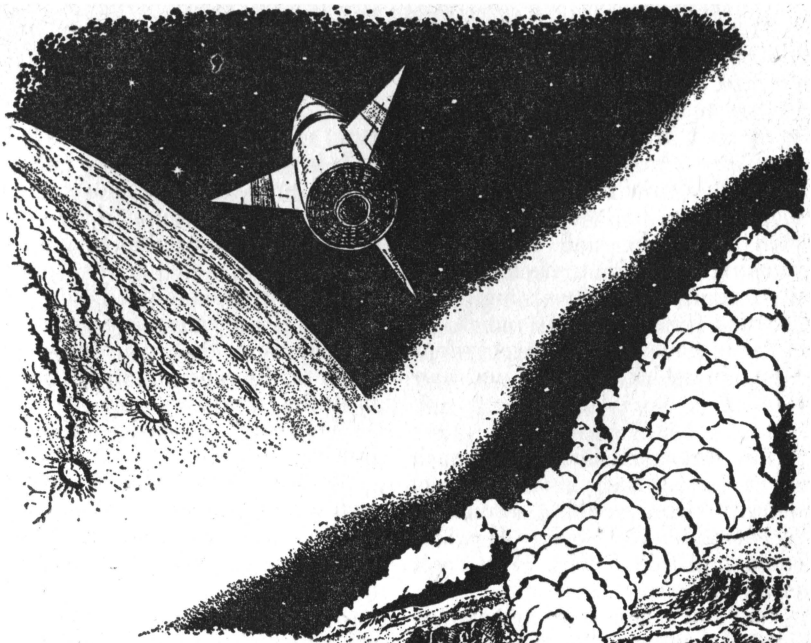
A strange, intense smile came over Lan Sur's face. "Our history relates of one race that tried to avoid its destiny. These peoples scattered to the four winds in millions of ships in their attempt to

hide from us." Fire lighted the alien's eyes. "It took more than a thousand of your years to track them all down, and we covered more than half the galaxy in doing so. It was a glorious thing. Now they are dead. All of them."

Slowly the smile died away. Lan Sur looked back at the two Earthlings before him. "You will see the necessity for all of this when you have exhausted your emotional reactions to this information and are capable of thinking logically again. In the long run it matters little to any of us which action we are forced to take. But because I realize that a race as untutored as yours is, cannot be expected to control its emotions in such a situation, I will not demand an immediate answer from you. I will give you more than ample time in which to think the problem through.

"You have exactly twenty-four hours in which to make up your minds."

**I**N HIS younger days at the Academy, Captain Allen Hawkins had been a boxer, and a good one. Most of his fights he had won easily and decisively. The few that he lost had been close matches and split decisions. Then had come the day when he had persuaded himself to fight outside his own weight and experience classifications, and he had matched himself against a classmate much larger than himself. Hawkins still remembered that fight at times. After the first round he had been completely dazed, scarcely conscious of his surround-



ings. Again and again he found himself lying stretched out on the canvas and had to force himself back to his feet to re-enter the fray. The fight terminated rather suddenly in the third round when Hawkins went down to the canvas for a full count.

All of this had happened years before, but the emotions that gripped the man now, as he stood facing the incredible alien from the center of the galaxy—these emotions reminded him of that fight. He felt now as he had felt when he regained consciousness in the dressing room—a little out of his senses, the wind still knocked out of him, and emotionally completely stunned.



The fact that Lan Sur had spoken perfect English had been the first blow. Every sentence that the alien had spoken was like a sharp jab, a sudden punch to a vital area. As in his boxing days, after a few brief moments of listening, Hawkins had stopped thinking with his brain—and had begun thinking with his stomach. But he was completely open and unguarded for the Sunday punch.

“You have exactly twenty-four hours in which to make up your minds.”

The three men stood facing each other for at least a full minute, none of them speaking. Broussard recovered his voice before Hawkins could and said feebly, “You can’t mean it.”

Lan Sur’s face gave no expression of emotion. “I realized that you would be incapable of comprehending what I have said so soon after I had said it. This is why I am giving you a length of time in which to make your decision. But you might as well realize that this high emotional index rating of your race is one of the main reasons you rate so low. It is a trait that we will have to breed out of your race.”

Hawkins came to life suddenly, reacting violently, his emotional control shattered. He almost shouted at the alien, “If we’re in such bad shape, why can’t you just go off and leave us alone? You’ve got all the rest of the universe. Why can’t you just leave us alone in our little corner of it?”

“If you were not so emotionally aroused at the moment, you would

understand why we cannot ‘leave you alone,’ as you put it,” the alien told him calmly. “It is completely impossible for two differing cultures to exist in this galaxy, as large as it is. Eventually the two cultures would have to come into contact, and this would cause friction. We do not care for friction, and we always seek to avoid it. By forcing you to join us now—or by destroying you if you refuse—we make absolutely sure that your race will never be the cause of any friction to us in the future.”

“Friction?” asked Broussard slowly.

“If we allowed you to go your own way, your population would expand and you would be forced to take over more and more of this area of the universe. We have our own plans for this part of the galaxy which do not include fighting constant wars with you for the possession of each new planetary system that one of us sees fit to colonize.” The alien spoke to them as he might have spoken to children.

Hawkins refused to abandon the train of thought. “But we could promise to give up all our worlds except our own home planet. You could have all the rest.”

Lan Sur shook his head. “At the present moment, you will promise anything to rid yourself of the painful necessity of making the decision that I have demanded of you. You might even be quite willing to live up to your promise of retiring to your home planet, never to voyage forth again. But your children and their children would grow discon-

tent and restless. Eventually, either a hundred or a thousand or a hundred thousand years from now, you would come forth to challenge us again." Lan Sur's face grew a trifle grim. "And next time you would be better equipped and stronger. You would be able to put up a better fight than you can at the moment." Then he smiled. "Oh, of course, the Dakn Empire would win eventually. We always do. But we would be back at exactly the same point that we are at right now. We would be forced to absorb you into our Empire, or to destroy you utterly. And, in the meantime, we would, of necessity, be forced to keep a careful watch on everything you did."

He shook his head. "No, you must realize that we cannot tolerate anything but absolute surrender. You have my terms. You must make your decision. There is nothing more to say."

Hawkins felt the numbing hand of deep fear within him. Like a losing boxer, he fought for any advantage that he might be able to take. "But, good Lord, man" he said quickly. "You don't understand the situation at all. Twenty-four hours isn't nearly enough time to make a decision that will affect our entire population. We can't even inform our home base of what's going on in that length of time, much less get a message *back* from them. And this is the sort of thing that would have to be submitted to our population as a whole, for them to decide. We're just a very, very small part of our race. Why, we . . . we don't have the authority to

make a decision that would affect the people back home. You *must* give us more time."

"Your complete lack of insight amazes me, even though I expected it," the alien said. "Surely you must understand that the more time I give you, the more time you have to prepare your physical defenses. I am just as aware as you are that, lacking the C<sup>2</sup> communications methods, it is impossible for you to contact your home planet in the time that I have allowed you. But the war ships that I have already summoned will be here shortly, and even before they arrive, there is much that I must do to ready you and your people for the change if you decide to come with us. If you do not decide to come with us, then I must begin the search for your home planet, so that it may be destroyed. In either event, the sooner your choice is made, the better it is for me. Already I have allowed you more time than is actually necessary for you to overcome your emotion and to think the problem through logically."

"But I simply haven't got the *authority* to make such a choice!" Hawkins found himself shouting. "Can't you understand that?"

Lan Sur paused a moment to let the other man regain some of his composure. Then he said simply but firmly, "I am in control here now. I have the authority, and I delegate it to you. *You* must decide for everyone."

Broussard's reactions were perhaps a little less emotionally tinged than might have been thought from

his facial reactions. He had held back what he felt to be a highly pertinent question until he felt that the alien was preparing to conclude the interview. He asked it now. "You seem to know a great many things about us, Lan Sur. And we seem to know very little about you. In a sense, this is strong evidence of your race's superiority. And yet you cannot really expect us to capitulate our entire culture to yours without giving us very conclusive proof that you are able to carry out your threats. After all, we are a large ship full of fighting men, and you seem to be one man all by yourself. What is to keep us from . . ." Deliberately the psychologist left the question hang uncompleted.

Lan Sur smiled. "At least you respond in a semi-logical fashion. The point is well taken, and if you had not brought it up now, I would have had to do so myself at a later time. I am therefore prepared to demonstrate to you the strength of our technology. You two will return to your ship, and I will remain here. You will then, for the next two hours, have the opportunity to attack me by any means you see fit. I will simply defend myself, without endangering you or your ship in any fashion. When you have discovered that even as undefended as I appear to be at the moment, all of your weapons are powerless to harm me, perhaps you will understand that I can carry out my threats if I so choose to."

The alien gestured with his hand. "And now, you must return to your ship. During the two hours at which I place myself at your mercy,

you may naturally maneuver your vessel as you desire. But at the end of the two hours, you must have returned to your landing place here—or to whatever other spot on this planet that I may choose to indicate to you by radio. Any attempt on your part to escape either now, or during the period following, or any attack you attempt on me except during these first two hours, or any effort to summon additional help, will mean the instant destruction of your ship—and of your race. I hope that you will both understand what I have said and will believe that I have the power to achieve my ends."

Surveyor Lan Sur crossed his arms. "This interview is at an end."

After a few seconds of stunned silence, the two men turned and walked the long and lonesome way back to the *Sunward*.

All of the scientists aboard the *Sunward* and most of the ship's officers were assembled in the central meeting hall when Broussard and Hawkins arrived. Hawkins walked directly to the central podium and turned to face the group.

"Gentlemen," he began slowly, his features a mask of repressed emotion. "I know that I do not have to give you any fuller explanations than you have already received. We have been given a challenge that seems to be insoluble. But we must face the situation, as the alien Lan Sur has suggested, with a minimum of emotionality and with a maximum of good, hard logic. I would welcome any comments, suggestions you might have



to offer.”

There was a general shuffling of feet and clearing of throats among the crowd. It seemed to Hawkins as if each member present was waiting for someone else to speak first. Finally the Communications Officer broke the silence.

“Captain, it has occurred to me that if the alien’s powers are as great as he claims, he may well be able to monitor every word any of us speaks, even here. I think we must take that into consideration.”

The crowd murmured an assent, feeling, Hawkins was sure, that it gave them an excellent excuse for not being able to propose any solution to the problem. “I think you are quite right,” Hawkins answered. “However, I feel that for the moment we must operate as if he couldn’t monitor us. In the meantime, the communications department must take what precautions it can to assure us that our future conversations are held in complete privacy.” A touch of bitter defeat crept into his voice. “And I would imagine that even if he is listening right now, he’ll gain precious little in the way of useful information.”

The group shuffled its feet again, embarrassed at its own impotence. “Are there any further comments?” Hawkins asked. There seemed to be none, until the Gunnery Officer spoke up.

“Captain,” he said, a slight smile on his broad face. “I’d sort of like to see just how much punishment the bastard can take.”

Hawkins laughed, breaking the tension. “I think we all agree with

you. Suppose we put off any further discussion until after we’ve put the alien through his paces. It will give us an opportunity to test his strength—and to test our own.

“Many of you—” Hawkins indicated with a wave of his hand the officers in the room “—are familiar with the offensive strength of this vessel. She is one of the most powerfully armed ships that Earth has. What I intend to do, then, is this: We’ll give our friend out there just as much hell as the *Sunward* can dish out. But while we’re doing it, I want photographs of every attack we make, fast photos that will give us, perhaps, an inkling of how he overcomes all of our weapons, if he does. I think this is extremely important.” He looked the crowd over. “We’ll begin the attack just as soon as all of you have indicated to me that your departments are ready. That is all, gentlemen.”

Half an hour later the *Sunward* rose from her landing site and floated gently into the atmosphere. She came to a halt about ten thousand feet up and drifted into an optimum firing position. Every gun and camera the ship possessed was trained on the now scarcely visible figure of the alien almost two miles beneath her. Hawkins was on the battle bridge, his experienced hand controlling the ship firmly, belying the nervousness he felt.

“Gunnery all ready, Sir!” came the report.

“Fire!” shouted Hawkins a little louder than he meant to. He strained forward in his seat to watch the scene on the screen in

front of him.

The heat guns opened up first. In less than a second the area of maximum temperature was less than two feet away from the alien's body. A space of ground 300 yards in diameter suddenly went up in smoke at the intensity of the rays. Slim shreds of fire licked at the edge of the ring, and in the center all was fierce flame and smoke as the heat actually melted the earth. For a full five minutes the guns remained firing at maximum intensity. No organic substance known to man could withstand such violence.

"Cease firing," Hawkins called. He leaned back slowly in his chair. It would take a few minutes for the smoke to clear, but he knew in his heart what they would see once it had. And even before the wind had blown enough of the smoke away to make things visible, they saw the figure of the alien come walking briskly out of the hellish ring of destruction and wave his arm to them.

"God," said Hawkins quietly. After a moment he threw open a communications switch that connected him to the Gunnery Officer. "Well, what's next?" he asked quietly.

Next came a huge ball of electricity that spat sparks as it hurtled through space and shattered itself into a million bolts of lightning at the very feet of the alien. The resulting burst of light was painful to the eyes, but when vision cleared, they saw the alien again, still standing erect and still waving.

They tried launching a dozen space torpedoes at once, filled with

the highest chemical explosives known to man. They crashed in criss-cross fashion about the alien, ripping the very air asunder with their fantastic devastation. They left a crater almost a mile wide, and standing in the middle of it, still untouched, the enemy. Then the ship bombarded the small figure below with every wavelength known to man, still without effect.

Finally the Gunnery Officer called Hawkins on the intercom. "I'm sorry, Captain, but we did our best. I guess there's only one thing left to do."

"I guess you're right," Hawkins admitted reluctantly. And turning to his helmsman he said, "Take her up."

The *Sunward* was almost fifty miles from the alien when she unleashed her final weapon. She had dropped tattle-tale robots behind to feed her information both before and after the blast. And then she aimed the mightiest atomic weapon man had created straight at Lan Sur.

The very planet shook at its detonation, so powerful was the bomb. The fire and clouds rose miles into the sky, and the *Sunward's* delicate instruments indicated the presence of a radiation so intense that it was certain an area hundreds of miles in size was completely destroyed. It took several minutes before enough of the aftermath of the explosion had cleared away for them to find him, but they located the alien sitting calmly in a crater at the very center of the affected area, obviously still unharmed.

Hawkins contemplated the situation for several minutes, and then wearily stretched out his hand and turned on the radio. After a moment he said simply, "All right, Lan Sur, you win. Where do you want us to land?"

Lan Sur answered immediately. "You will place your vessel in an area almost directly beneath your present position which I have caused to be marked in red. Any attempt to move the vessel without my permission will result in your immediate destruction. If, during the waiting time, you have any further questions to ask of me, I will be available. However, if you have not come to any conclusion by the end of that time, I shall be forced to destroy you without further hesitation. You have exactly twenty-two hours and nine minutes left."

When the ship had landed, Hawkins returned to the conference room. Most of the executive personnel were there, although some of the scientists were absent, ostensibly still analyzing the results of the futile attack on the alien. Hawkins strode briskly to the podium and faced the group.

"Gentlemen," he said, "you saw what happened. Perhaps some of you refused to believe that the alien could enforce his demands on us—and I'm sure that all of us hoped that this would be the case. But now we must accept the fact that the choice we were told to make will *have* to be made, unless we can come up with some means of destroying this creature or of escaping his wrath.

"I want you to know that although it might well be within my province as Captain of the *Sunward* to decide which of the alternatives we will take, I will not do so. What is decided here will affect all of Earth's peoples everywhere. Neither one man nor one small group can make this choice. Therefore, exactly one hour before the deadline, we will hold a plebiscite. Every person aboard the *Sunward* will have exactly one vote, and the majority decision will hold. I will refrain from voting and will decide the issue in the event of a tie.

In the meantime, I want you to think. To think not only of a means of escape from our dilemma, if this be possible, but also how you will vote. If any of you have any ideas, or if you simply wish to talk about something, you will find me available at any hour.

"I do not know how each of you will react to this situation. Perhaps the alien is right. Perhaps man is far too emotional an animal to merit more than slave status in the councils of the stars. But I hope that our actions will prove otherwise—and that this, man's darkest hour, will also become his finest."

Hawkins turned from the group and walked quietly from the room. He knew that his speech had been anything but an example of clear logic devoid of emotional context, and he had no idea why he had let himself be so carried away. But with the inborn and well-trained sense he had of men and situations, he knew that he could not have spoken otherwise.

The men on board the *Sunward* faced the crisis in various fashions. A few of the scientists worked with erratic bursts of speed to finish up their analyses of the data they had gathered during the bombardment of the alien. Some of the crew wrote letters home. The communications department was swamped with personal messages to be relayed back to Earth. The Chaplain gave up his attempt at private counseling and held hourly open services. The routine jobs were still performed, albeit in a perfunctory manner. But mostly the men just gathered around in small groups and talked, usually in low voices. A few of the luckier ones got drunk.

Captain Hawkins remained in his room, completely isolated from the rest of the ship, for almost four hours. During that time he simply sat in his easy chair and thought. At the beginning of the fifth hour he broke a precedent and opened a bottle of whiskey. At the beginning of the sixth hour he broke still another precedent and sent for Broussard. Hawkins was neither too drunk nor too sober when the psychologist arrived. He told the scientist to sit down and offered him a drink.

"I know it's unethical for me to take you away from the men when they need your help more than ever before," Hawkins began slowly, choosing to stare moodily at the table instead of directly at the man he was talking to. "But for once I am exercising a Captain's prerogatives.

"You must have realized some of the problems that face anyone

in a position of command. Usually we have to operate on pretty rigid rules, but things always go better if it seems as though we aren't quite as rigid as we really must be. The men under you always feel better if they think they have some free choice about things. In any military set-up you can't allow much of this free will at all. The best commander is the one who decides what it is his men must do in a given situation, and then finds some way of making the men want to do it." Again he paused, then looked up, facing Broussard squarely.

"I have decided what the result of the balloting must be—and I want you, as a psychologist, to help me make sure that I get that result without anyone else being aware that we've rigged things." He got up from the table and began nervously pacing the floor.

After a few moments he stopped and turned to face the psychologist, both his fists clenched tightly on the back of his easy chair. He said nothing.

After several moments of silence, Broussard cleared his throat and asked, "And which choice have you decided it must be?"

Hawkins collapsed into the chair. Finally his mouth opened, his lips trembled, and he said, "Slavery, of course. It's the only choice.

"You're the psychologist, perhaps you can understand the fierce pride I'd take in knowing that the men would have the . . . the *guts* to want to end it all instead of bowing down to that bastard out there who holds us in the very palm of his

hands." Hawkins paused in this outburst, blinked his eyes briefly, and then continued.

"But that's just the emotion showing through. From the logical point of view, our race must continue. If we choose slavery we'll live and breathe and die just as we always have. We'll do all of these things on alien planets, having forgotten the Earth we sprang from and all our past history, as sorry as some of that has been. We'll have forgotten who *we* are. We will have lost ourselves."

He banged a fist down on the table. "But we *will* exist! The protection of the race comes first, and we've got to make sure that it is protected, that the *Sunward* makes the logical decision. I'll steer things as best I can, but I'll need help."

He turned to Broussard. "I'm not a psychologist. I won't tell you how to go about it. I don't care what you do. All I want are the results."

For a space of several seconds the two men sat without speaking. Then Hawkins said, "And I guess that unless you have something to add, that's all for now. Let me know what you're doing, if you have time to tell me. But more important than that, let me know if you think you're going to fail. We may have to rig the ballots if you do."

Broussard gave a deep sigh and rose to leave. He could understand the torment the Captain was going through, but there was little that he could do for the man at the moment. He was almost at the door when Hawkins stopped him.

"Broussard!" Hawkins shouted.

"What in God's name makes a man's personality so dear to him? Why has it always been just about the last thing that a man will give up? You're the psychologist. You must know the answer. Even a man with a diseased mind who knows that he's sick and wants help badly will fight back tooth and nail when you try to change even one small part of his personality make-up. Didn't you once tell me that? Didn't you?"

The Captain's voice grew louder and louder. "That's why therapy is so hard, isn't it? That's why constructive education is so difficult, isn't it? That's why politicians who appeal to existing fears and hates and loves get elected instead of those men who try to shift public opinion for the better.

"Oh, why in God's name are we so proud of this tiny, puny, weak, insignificant, miserable thing inside each of us we call the real *me!*" He picked up the whiskey bottle and hurled it with full force against the wall. It shattered in a thousand pieces. The dark liquor inside ran down the wall leaving long thin fingers of stain behind it.

Captain Hawkins' personal steward came rushing into the room at the sound of the crash, and looked, horrified, at the mess on the wall.

"Oh, get out! Get out, both of you, and leave me alone!" Hawkins shouted.

After they were gone, Hawkins threw himself on his bunk and buried his face in his pillow. The mood of fierce hot anger passed rapidly, leaving only the warm sting

of shame. Although he had made the decision to capitulate to the alien, at least at an intellectual level, he could not really bring himself to believe that there was no means of escape. His head ached from his emotional outburst and every effort toward constructive thinking seemed to end in a blind alley. He had been tossing restlessly for perhaps two hours when the Communications Officer brought him a message from Earth that had just been received. Hawkins reached for the message blank eagerly at first, his befuddled mind thinking for just an instant that here were instructions from home telling him how to meet the crisis, telling him of a means of escape, or just taking the awful responsibility of the decision from him. But then he remembered that communications, even when they passed through subspace, took several days to get from Earth to here. Earth was still unaware of the crisis on Trelis, and this message that had just been received had begun its journey long before they were made so painfully aware of the existence of the alien.

The radiogram was of a semi-routine nature, but one that, in normal circumstances, would have demanded an immediate answer. "Shall we bother replying to it?" the Communications Officer asked.

"Of course not," Hawkins said angrily. "It wouldn't be necessary, even if we dared break radio silence to reply."

The Communications Officer's eyes opened wide in a startled fashion. "Radio silence?" he said fee-

bly. "But, Captain, we've . . . we've . . ."

Hawkins sat bolt upright in his bunk. "Good Lord, man, do you mean to say that you've been sending messages to Earth right along?"

The Communications Officer nodded. "We started relaying from the moment you contacted the alien. We've sent out all the talks, speeches, reports, everything. Just as you ordered." The man was cringing in fright.

"But didn't you hear the alien tell us to make no attempt to contact our home base or he'd destroy us at once?" Hawkins demanded.

The other officer felt like crawling out of the room without bothering to open the door. "I'm sorry, Captain," he managed to stutter. "But I must have missed that . . . that part of what he said. I . . . I was called out of the office during part of the contact when something went wrong with one of our main transmitters." The man had turned a very pale shade of white. "But I'll stop transmission at once," he said, turning nervously towards the door.

Hawkins looked at his watch. "If he hasn't blasted us for it by now, I don't guess he ever will. But all the same, you'd better stop sending immediately." As the Communications Officer left the room, Hawkins cursed mildly under his breath. After all of his plans and sweat and pains, it would take something like this to bring the whole house of cards crashing about him, some little insignificant something that he had overlooked. "For want of a nail . . ." he said aloud, reminding himself of the age-old parable.



"But if he meant what he said about not notifying Earth, why hasn't he already destroyed us?" Hawkins asked himself. Perhaps Lan Sur wasn't as cruelly logical and unfeeling as they had thought. And unfeeling the thought from his mind, knowing that it would lead him to too much false hope if he pursued it further. It would be too easy to hope that simply because Lan Sur had not acted upon one of his threats, he might not act on the rest of them.

As he thought, Hawkins found himself pacing the floor of his room anxiously—first to one wall, then a stop, an about face, and back to the opposite side of the room. He stopped his walking and slumped down into his chair.

"Back and forth," he said out loud. "From one side to another. I'm just like the child in Broussard's story. Only instead of a man with a stick at one end of the hall and a dog at the other, I've got Lan Sur at both ends. Death, or a kind of slavery which is just about as bad. A real 'avoidance situation' if ever one existed." He laughed bitterly. "The closer I come to one choice, the worse it seems and the better the other choice appears."

He shrugged his shoulders sadly. "But eventually I'll have to realize that there's no escape. Unfortunately, unlike the child in Broussard's example, I can't . . ."

Hawkins stopped suddenly as something occurred to him. "Good God," he said after a moment. He sat upright in the chair. "It couldn't be. It just *couldn't*," he told himself. "And yet, I bet, I bet

it is!"

He got up from the chair and walked quickly to the wall communicator. "Hello, Bridge?" he demanded. "Inform all officers not on watch and all the scientific personnel that I want to see them in the council chamber in thirty minutes. Exactly thirty minutes, do you understand?"

There was a broad smile on his face as he marched out of his stateroom to talk with some of the officers and scientists before the meeting.

After all of the men had crowded into the meeting hall, they closed and locked the doors. The group kept up a low but excited chatter while they waited for Captain Hawkins to begin.

"Gentlemen," he said finally, calling the meeting to order. "I am informed by the electronics specialists aboard that they have made this meeting room as 'spy-proof' as is humanly possible, but I think we've learned not to trust the power of human technology too much these past few hours. Therefore, I'm going to tell you just as little of my plans as I possibly can, on the theory that the best-kept secret is the one that the fewest people know about."

The crowd seemed anxious, and a little apprehensive, but still hopeful.

"Within the past hour, I have made what I think are several remarkable discoveries. I shall not tell you what they are, but I think I have discovered a way out of the dilemma that we are facing."

The crowd breathed a unanimous sigh of relief. Smiles broke out on several faces.

"I cannot tell you just at the moment what this mode of escape is. But I have discussed it with a few of you—the fewest number possible—and all of them agree that there is an excellent chance that it will work. If it does, we of Earth will still face a great many problems. But we shall, at least, be free, and that is the important thing. If we fail . . ." Hawkins let his voice trail off for a moment. "If we fail, we can expect instant destruction not only for us, but for all of mankind."

He waited for the meaning to sink in, his face set in a firm frown. And then, purposefully, he let his facial muscles relax into a broad smile. "But I do not think that we will fail. I think we will win. And I have come to ask your permission to risk all our lives on the venture. I cannot give you any more information I can only ask for your confidence—and for your votes of approval." He looked around the room deliberately, pausing for just the right length of time. And then he said, "Will all of you who have sufficient faith in me and my judgment please rise in assent?"

Broussard had given him the trick of mass decision—had told him that if you make people commit themselves openly, the decision has a better chance of unanimity. Hawkins smiled to see how well the device worked. Every man in the room was on his feet, most of them cheering.

He waited for the shouting to die

down and then said simply, "Thank you. And now to battle stations."

**CAPTAIN ALLEN HAWKINS** sat in his control seat on the *Sunward's* bridge, staring at the button that turned on his radio set. "The purpose of a position of responsibility is to make decisions," he told himself.

A green light burst into life on the control panel, indicating that all of the preparations he had asked for were in readiness. Such signals would be his only means of communications during the entire maneuver, for he had given orders that no one was to utter one word aloud during the entire operation. He was taking no chances.

Hawkins grinned. "And the devil take the hindmost," he told himself.

Pressing down on the radio button, he said aloud, "This is Captain Allen Hawkins of the *Sunward* calling Surveyor Lan Sur of the Dakn Empire."

Almost at once he heard a voice answering, "You may go ahead."

"I think we have finally reached our decision," Hawkins said soberly. "But before we announce it, we have one request to make, and I do not think you will find it an unreasonable one. As you yourself pointed out, ours is an incredibly emotional race. Had we not been so, we could have given you our answer much sooner."

The alien's voice came booming into the control room. "I will listen to your request, but you surely realize that none of the terms that I have given you can be changed."

"Yes, we realize that, and our request is along slightly different lines," said Hawkins. "As I said, we are an emotion-ridden race. But you must have realized that we aboard the *Sunward* are probably much more stable than are the majority of our peoples back on our home planets. It is always so with explorers and scientists. Therefore, we were able to reach a logical decision, and we will be able to hold to it.

"Unfortunately, we anticipate a little more trouble than this with 'the folks back home,' if you understand that term. And to make things much easier, not only for us, but also for you, we have a request to make."

"I understand the semantic import of the term and will give you my decision on the request if you will but come to the point," came the alien's voice. "We are wasting valuable time, and I have other things to do."

Hawkins was beginning to sweat a little. He was purposefully needling the alien, and he had no idea of how far he dared to go.

"Well, we of the *Sunward* are convinced that you can carry out your threats if we attempt any rebellion. We have seen you stand untouched by all the power this ship could muster. But defense against our meager weapons is one thing. The ability to destroy a star is another . . .

"The folks back home would accept our decision without hesitation, and would never dream of giving you or your people any trouble, if we could show them authen-

tic pictures of how powerful you are offensively. We request, therefore, that you unleash your weapons and turn this entire solar system into a nova while we photograph the procedure."

Lan Sur's answering voice sounded frighteningly loud to Hawkins. "What you request is impossible for several reasons. First, the Dakn Empire has no desire to destroy potentially valuable property simply to demonstrate its powers. Second, the procedure would occupy too much time, for while my small ship could outrace the enveloping flames of the nova, your larger ship, unequipped as it is with the C<sup>2</sup> drive, would be caught in the destruction and you would perish. I recognize that from the emotionality index of your race, such a demonstration would probably aid in the peaceful absorption of your culture into ours, but it is impossible."

Hawkins allowed himself the luxury of a quick smile. His analysis of the situation had been absolutely correct. "Well, look," he said in reply. "According to our survey, the outer planet in this system is pretty small and of little use to anybody. Could you possibly destroy it instead?" He paused for just the smallest fraction of a second, but then hurried on before the alien could reply. "Of course, if you can't do it without destroying all the rest of the planets too, why, we'll understand. But it would help . . ."

The alien's voice boomed back, interrupting the man. "You obviously still underestimate the technological level of the Dakn Em-

pire." The alien paused, as if checking something. "According to my analysis of this system, the fourth and outer planet is of no value whatsoever to my people. Therefore, I accede to your request. The planet will be destroyed at once."

"Hey, wait a minute," Hawkins cried in a startled tone of voice.

"You need not worry," came the alien's flat response. "I fully realize that your visual recording equipment cannot function at such a distance. Therefore, you will raise ship at once and locate yourself to take advantage of the best recording angles."

Hawkins had to hold himself in his chair to keep from dancing a jig. He had set a trap for the alien, and somehow, some incredible how, it had worked. At least he dared hope that it had . . .

The *Sunward* came to a full stop just inside the orbit of the third planet. The alien ship danced on ahead of them towards the tiny outer world. "You can come closer than that," Lan Sur informed Hawkins, noting that the *Sunward* had stopped sooner than expected.

"No, thank you," Hawkins replied. "We can get excellent pictures from this distance, and you must remember that we haven't the protective devices that you have."

Hawkins noted that Lan Sur's voice carried with it an almost petulant, disdainful note. "There is a great deal of difference between the destruction of one small planet and the creation of a nova. However, if you feel safer there, you

may remain where you are." A few moments later, the alien added, "Are your recording devices in readiness?"

Hawkins indicated to the alien that they were.

"Then watch," Lan Sur said.

It took perhaps three minutes for the first burst of light to reach their position. The tiny planet, scarcely 500 miles in diameter, began to glow slightly, then suddenly came alive with fire. Bursts of flame danced up hundreds of miles above its surface, then fell back, exhausted, into the boiling cauldron the planet had become. For almost ten minutes the small world seethed in agonized torment, and then, all at once, it seemed to shake apart at the seams. There was no sound, but those watching on board the *Sunward* mentally supplied the missing component to the greatest explosion they had ever witnessed. The cameras recorded the scene noiselessly.

A few minutes later, after most of the fragments of the once-world had disintegrated in flaming splendor, Lan Sur's voice broke the silence. "I used only one of many possible means of destruction. However, it promised to be, under the circumstances, the most spectacular. And so you have seen the offensive might of the Dakn Empire. Are you ready to give me your decision?"

The control board in front of Hawkins displayed all green signals. "Yes," he said. "I think we're finally ready. Here is our answer to the choice you gave us." His finger pressed firmly on a single red key.

**T**HE *Sunward* had been hurling itself back towards Earth for almost an hour when Broussard discovered Captain Hawkins, standing by himself in the observation room, staring out into the black of subspace.

"Well," the psychologist said. "I don't suppose it looks quite so bleak to you now as it did on the trip out."

Hawkins turned and smiled at the man. "No, I don't guess it does. Funny what the presence of one small pinpoint of light does to the blackness of a field, eh?"

Broussard nodded in assent. "I wonder what our alien friend thought when suddenly Clarion, Trellis, the two other planets, and us too, just up and disappeared and left him behind?"

Hawkins laughed. "You're the alienist. You tell me."

"I'd rather ask you something. How did you know it would work?"

"You might say I became an expert in psychology over night," Hawkins replied. "Oh, not the scientific kind that you practice—but the every day kind that most people mean when they use the word. I discovered, for example, that because of a misunderstanding on the part of the communications people, we continued to send messages home after the alien had specifically warned us not to do so. At first I thought he might be ignoring this infraction of his rules, but then I began to wonder if it didn't mean that he just wasn't aware of what we were doing. I remembered that he talked a great

deal about a  $C^2$  drive system which he claimed was so much better than the type we used. But when I asked the Navigator to do a little figuring, I discovered that by using subspace, we can actually get places much faster than his race does.

"It all added up to the fact that his race had never stumbled onto the use of subspace. I know that sounds incredible, but when I checked with one of the top physicists, I found out that we happened onto it by sheer accident—and an impossibly stupid one at that—and not through any high-level theorizing. The theory came later, after the process had been demonstrated in a laboratory.

"For a while I still couldn't believe it. But when we discovered that his space ship was a very small one—too small to utilize the subspace drive—I knew my guess had been correct. So I tricked him into letting us get into position where we could activate the drive—and had the engineers increase the effective radius so that we could pull Clarion and her three planets into subspace with us." Hawkins paused for a few seconds as he turned back to the observation window. "We'll need every sun and every planet we can lay our hands on."

Broussard leaned comfortably back against the door. "I think you were wise to take the pictures of the destruction of that fourth planet. We may need them to convince 'the folks back home' that this was the only solution to the problem."

Hawkins agreed with him. "They won't like giving up all the universe

they've come to be used to, just to run away and hide in subspace. And you know, I think the poets and the sailors and the young people in love will hate us most of all."

"How do you mean?" asked Broussard.

"No more heaven full of stars to write poems about, to sail true courses by, and to sing love songs under. I guess a lot of us will be lonely for all the stars."

"Do you think they'll ever find us?" Broussard asked, changing the subject. "From the look on Lan Sur's face when he told about that other world, I suspect they'll move heaven and earth to find out where we've run to."

"Find us? The Dakn Empire? I just don't know. We've got a thousand ships equipped with the subspace drive. That's a thousand or so solar systems we can pull through into subspace before they

can catch up with us—I hope. But we'll have to be careful. If one of our ships is ever caught, and they discover the drive, we're all done for. I doubt that they'll show us much mercy.

"A thousand suns—and only a handful of usable worlds in the whole lot of them. Not much for a race that's grown as fast as ours has. And to some of us, I guess, subspace will never be quite the same as the one we grew up in—and came to know and love." Hawkins shook his head sadly.

"But if they find us?" Broussard insisted.

"Well, at least we'll have had time to prepare. Perhaps a year, perhaps ten, perhaps a thousand. But we beat them this time, and maybe we can do it again."

For a long time he continued to stare quietly into the blackness. "I just don't know . . ." ● ● ●

## THE LAUNCHING AND DEATH OF THE SATELLITE

THE TEMPORARY SATELLITE, announced by the U.S. as our contribution to the International Geophysical Year, will probably be launched as the third stage of a three-stage rocket. The first drawing (top) shows the rocket beginning its vertical climb, trailing characteristic shock diamonds in its fiery tail. First stage will fall away fifty to sixty miles up; second stage drops away at 100 miles. Third stage will cease firing when it reaches orbit, 200 miles up and parallel with Earth's surface, at 17,400 m.p.h.

Flaming death comes to small satellite (days or weeks later) when gradual drag of thin atmosphere diminishes original speed to point where gravity pulls it down into denser air. Tremendous remaining speed will cause satellite to overheat from friction and vaporize in seconds. To people on Earth it will appear as great flash and meteoric trail. Second drawing (bottom) shows satellite flipping over just before it disintegrates over Florida. During its life, instruments in satellite have constantly sent back vital information to scientists on Earth. (See inside front cover for drawings.)

*Clearly, re-educating Man's brain wouldn't fit him for survival*

*on the plague-ridden surface. Re-educating his body was*

*the answer; but the process was so very long . . .*

# TO PAY THE PIPER

BY JAMES BLISH

*Illustrated by Paul Orban*

**T**HE MAN in the white jacket stopped at the door marked "Re-Education Project—Col. H. H. Mudgett, Commanding Officer" and waited while the scanner looked him over. He had been through that door a thousand times, but the scanner made as elaborate a job of it as if it had never seen him before.

It always did, for there was always in fact a chance that it *had* never seen him before, whatever

the fallible human beings to whom it reported might think. It went over him from grey, crew-cut poll to reagent-proof shoes, checking his small wiry body and lean profile against its stored silhouettes, tasting and smelling him as dubiously as if he were an orange held in storage two days too long.

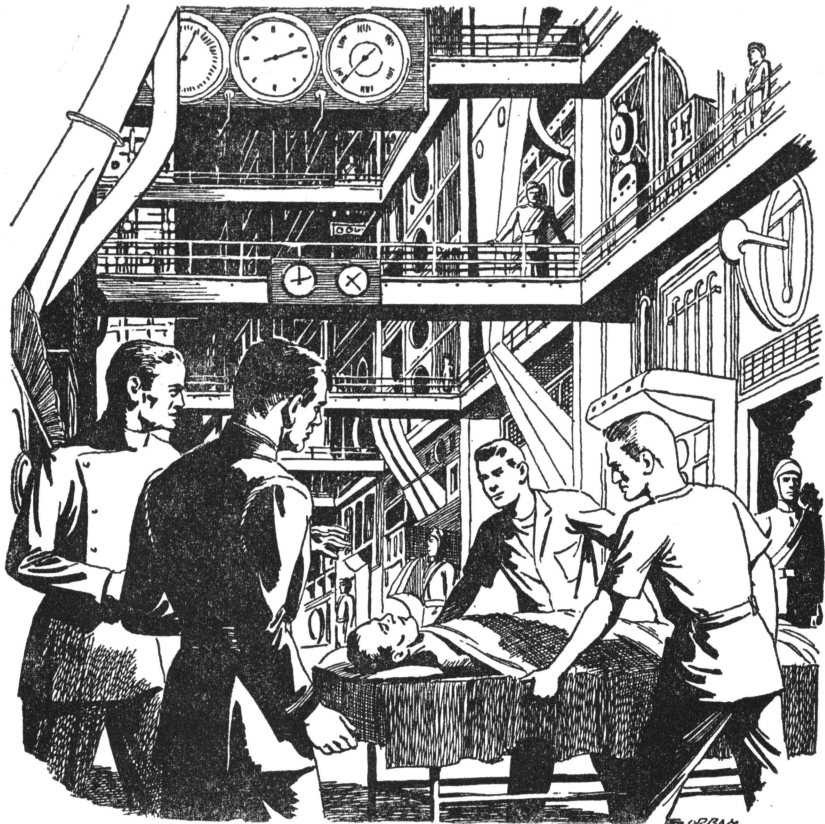
"Name?" it said at last.

"Carson, Samuel, 32-454-0698."

"Business?"

"Medical director, Re-Ed One."





While Carson waited, a distant, heavy concussion came rolling down upon him through the mile of solid granite above his head. At the same moment, the letters on the door—and everything else inside his cone of vision—blurred distressingly, and a stab of pure pain went lancing through his head. It was the supersonic component of the explosion, and it was harmless—except that it always both hurt and scared him.

The light on the door-scanner,

which had been glowing yellow up to now, flicked back to red again and the machine began the whole routine all over; the sound-bomb had reset it. Carson patiently endured its inspection, gave his name, serial number and mission once more, and this time got the green. He went in, unfolding as he walked the flimsy square of cheap paper he had been carrying all along.

Mudgett looked up from his desk and said at once: "What now?"

The physician tossed the square

of paper down under Mudgett's eyes. "Summary of the press reaction to Hamelin's speech last night," he said. "The total effect is going against us, Colonel. Unless we can change Hamelin's mind, this outcry to re-educate civilians ahead of soldiers is going to lose the war for us. The urge to live on the surface again has been mounting for ten years; now it's got a target to focus on. Us."

Mudgett chewed on a pencil while he read the summary; a blocky, bulky man, as short as Carson and with hair as grey and close-cropped. A year ago, Carson would have told him that nobody in Re-Ed could afford to put stray objects in his mouth even once, let alone as a habit; now Carson just waited. There wasn't a man—or a woman or a child—of America's surviving thirty-five million "sane" people who didn't have some such tic. Not now, not after twenty-five years of underground life.

"He knows it's impossible, doesn't he?" Mudgett demanded abruptly.

"Of course he doesn't," Carson said impatiently. "He doesn't know any more about the real nature of the project than the people do. He thinks the 'educating' we do is in some sort of survival technique—That's what the papers think, too, as you can plainly see by the way they loaded that editorial."

"Um. If we'd taken direct control of the papers in the first place—"

Carson said nothing. Military control of every facet of civilian life was a fact, and Mudgett knew

it. He also knew that an appearance of freedom to think is a necessity for the human mind—and that the appearance could not be maintained without a few shreds of the actuality.

"Suppose we do this," Mudgett said at last. "Hamelin's position in the State Department makes it impossible for us to muzzle him. But it ought to be possible to explain to him that no unprotected human being can live on the surface, no matter how many Merit Badges he has for woodcraft and first aid. Maybe we could even take him on a little trip topside; I'll wager he's never seen it."

"And what if he dies up there?" Carson said stonily. "We lose three-fifths of every topside party as it is—and Hamelin's an inexperienced—"

"Might be the best thing, mightn't it?"

"No," Carson said. "It would look like we'd planned it that way. The papers would have the populace boiling by the next morning."

Mudgett groaned and nibbled another double row of indentations around the barrel of the pencil. "There must be something," he said.

"There is."

"Well?"

"Bring the man here and show him just what we *are* doing. Re-educate *him*, if necessary. Once we told the newspapers that he'd taken the course . . . well, who knows, they just might resent it. Abusing his clearance privileges and so on."

"We'd be violating our basic

policy," Mudgett said slowly. "Give the Earth back to the men who fight for it." Still, the idea has some merits . . ."

"Hamelin is out in the ante-chamber right now," Carson said. "Shall I bring him in?"

The radioactivity never did rise much beyond a mildly hazardous level, and that was only transient, during the second week of the war—the week called the Death of Cities. The small shards of sanity retained by the high commands on both sides dictated avoiding weapons with a built-in backfire: no cobalt bombs were dropped, no territories permanently poisoned. Generals still remembered that unoccupied territory, no matter how devastated, is still unconquered territory.

But no such considerations stood in the way of biological warfare. It was controllable: you never released against the enemy any disease you didn't yourself know how to control. There would be some slips, of course, but the margin for error—

There were some slips. But for the most part, biological warfare worked fine. The great fevers washed like tides around and around the globe, one after another. In such cities as had escaped the bombings, the rumble of truck convoys carrying the puffed heaped corpses to the mass graves became the only sound except for sporadic small-arms fire; and then that too ceased, and the trucks stood rusting in rows.

Nor were human beings the sole

victims. Cattle fevers were sent out. Wheat rusts, rice molds, corn blights, hog choleras, poultry enteritises fountained into the indifferent air from the hidden laboratories, or were loosed far aloft, in the jet-stream, by rocketing fleets. Gelatin capsules pullulating with gill-rots fell like hail into the great fishing grounds of Newfoundland, Oregon, Japan, Sweden, Portugal. Hundreds of species of animals were drafted as secondary hosts for human diseases, were injected and released to carry the blessings of the laboratories to their mates and litters. It was discovered that minute amounts of the tetracycline series of antibiotics, which had long been used as feed supplements to bring farm animals to full market weight early, could also be used to raise the most whopping *Anopheles* and *Aedes* mosquitoes anybody ever saw, capable of flying long distances against the wind and of carrying a peculiarly interesting new strains of the malarial parasite and the yellow fever virus . . .

By the time it had ended, everyone who remained alive was a mile under ground.

For good.

"I still fail to understand why," Hamelin said, "if, as you claim, you have methods of re-educating soldiers for surface life, you can't do so for civilians as well. Or instead."

The under-secretary, a tall, spare man, bald on top, and with a heavily creased forehead, spoke with the odd neutral accent—untinged by regionalism—of the

trained diplomat, despite the fact that there had been no such thing as a foreign service for nearly half a century.

"We're going to try to explain that to you," Carson said. "But we thought that, first of all, we'd try to explain once more why we think it would be bad policy—as well as physically out of the question.

"Sure, everybody wants to go topside as soon as it's possible. Even people who are reconciled to these endless caverns and corridors hope for something better for their children—a glimpse of sunlight, a little rain, the fall of a leaf. That's more important now to all of us than the war, which we don't believe in any longer. That doesn't even make any military sense, since we haven't the numerical strength to occupy the enemy's territory any more, and they haven't the strength to occupy ours. We understand all that. But we also know that the enemy is intent on prosecuting the war to the end. Extermination is what they say they want, on their propagandist broadcasts, and your own Department reports that they seem to mean what they say. So we can't give up fighting them; that would be simple suicide. Are you still with me?"

"Yes, but I don't see—"

"Give me a moment more. If we have to continue to fight, we know this much: that the first of the two sides to get men on the surface again—so as to be able to *attack* important targets, not just keep them isolated in seas of plagues—will be the side that will bring this war to an end. They know that,

too. We have good reason to believe that they have a re-education project, and that it's about as far advanced as ours is."

"Look at it this way," Col. Mudgett burst in unexpectedly. "What we have now is a stalemate. A saboteur occasionally locates one of the underground cities and lets the pestilences into it. Sometimes on our side, sometimes on theirs. But that only happens sporadically, and it's just more of this mutual extermination business—to which we're committed, willy-nilly, for as long as they are. If we can get troops onto the surface first, we'll be able to scout out their important installations in short order, and issue them a surrender ultimatum with teeth in it. They'll take it. The only other course is the sort of slow, mutual suicide we've got now."

Hamelin put the tips of his fingers together. "You gentlemen lecture me about policy as if I had never heard the word before. I'm familiar with your arguments for sending soldiers first. You assume that you're familiar with all of mine for starting with civilians, but you're wrong, because some of them haven't been brought up at all outside the Department. I'm going to tell you some of them, and I think they'll merit your close attention."

Carson shrugged. "I'd like nothing better than to be convinced, Mr. Secretary. Go ahead."

"You of all people should know, Dr. Carson, how close our underground society is to a psychotic break. To take a single instance, the number of juvenile gangs roam-

ing these corridors of ours has increased 400% since the rumors about the Re-Education Project began to spread. Or another: the number of individual crimes without motive—crimes committed, just to distract the committer from the grinding monotony of the life we all lead—has now passed the total of all other crimes put together.

“And as for actual insanity—of our thirty-five million people still unhospitalized, there are four million cases of *which we know*, each one of which should be committed right now for early paranoid schizophrenia—except that were we to commit them, our essential industries would suffer a manpower loss more devastating than anything the enemy has inflicted upon us. Every one of those four million persons is a major hazard to his neighbors and to his job, but how can we do without them? And what can we do about the unrecognized, sub-clinical cases, which probably total twice as many? How long can we continue operating without a collapse under such conditions?”

Carson mopped his brow. “I didn’t suspect that it had gone that far.”

“It has gone that far,” Hamelin said icily, “and it is accelerating. Your own project has helped to accelerate it. Col. Mudgett here mentioned the opening of isolated cities to the pestilences. Shall I tell you how Louisville fell?”

“A spy again, I suppose,” Mudgett said.

“No, Colonel. Not a spy. A band of—of vigilantes, of mutineers. I’m

familiar with your slogan, ‘The Earth to those who fight for it.’ Do you know the counter-slogan that’s circulating among the people?”

They waited. Hamelin smiled and said: “Let’s die on the surface.”

“They overwhelmed the military detachment there, put the city administration to death, and blew open the shaft to the surface. About a thousand people actually made it to the top. Within twenty-four hours the city was dead—as the ringleaders had been warned would be the outcome. The warning didn’t deter them. Nor did it protect the prudent citizens who had no part in the affair.”

Hamelin leaned forward suddenly. “People won’t wait to be told when it’s their turn to be re-educated. They’ll be tired of waiting, tired to the point of insanity of living at the bottom of a hole. They’ll just go.

“And that, gentlemen, will leave the world to the enemy . . . or, more likely, the rats. They alone are immune to everything by now.”

There was a long silence. At last Carson said mildly: “Why aren’t *we* immune to everything by now?”

“Eh? Why—the new generations. They’ve never been exposed.”

“We still have a reservoir of older people who lived through the war: people who had one or several of the new diseases that swept the world, some as many as five, and yet recovered. They still have their immunities; we know; we’ve tested them. We know from sampling that no new disease has been introduced by either side in over

ten years now. Against all the known ones, we have immunization techniques, anti-sera, antibiotics, and so on. I suppose you get your shots every six months like all the rest of us; we should all be very hard to infect now, and such infections as do take should run mild courses." Carson held the under-secretary's eyes grimly. "Now, answer me this question: why is it that, despite all these protections, *every single person* in an opened city dies?"

"I don't know," Hamelin said, staring at each of them in turn. "By your showing, some of them should recover."

"They should," Carson said. "But nobody does. Why? Because the very nature of disease has changed since we all went underground. There are now abroad in the world a number of mutated bacterial strains which can bypass the immunity mechanisms of the human body altogether. What this means in simple terms is that, should such a germ get into your body, your body wouldn't recognize it as an invader. It would manufacture no antibodies against the germ. Consequently, the germ could multiply without any check, and—you would die. So would we all."

"I see," Hamelin said. He seemed to have recovered his composure extraordinarily rapidly. "I am no scientist, gentlemen, but what you tell me makes our position sound perfectly hopeless. Yet obviously you have some answer."

Carson nodded. "We do. But it's important for you to understand the situation, otherwise the answer

will mean nothing to you. So: is it perfectly clear to you now, from what we've said so far, that no amount of re-educating a man's brain, be he soldier *or* civilian, will allow him to survive on the surface?"

"Quite clear," Hamelin said, apparently ungrudgingly. Carson's hopes rose by a fraction of a millimeter. "But if you don't re-educate his brain, what can you re-educate? His reflexes, perhaps?"

"No," Carson said. "His lymph nodes, and his spleen."

A scornful grin began to appear on Hamelin's thin lips. "You need better public relations counsel than you've been getting," he said. "If what you say is true—as of course I assume it is—then the term 're-educate' is not only inappropriate, it's downright misleading. If you had chosen a less suggestive and more accurate label in the beginning, I wouldn't have been able to cause you half the trouble I have."

"I agree that we were badly advised there," Carson said. "But not entirely for those reasons. Of course the name is misleading; that's both a characteristic and a function of the names of top secret projects. But in this instance, the name 'Re-Education', bad as it now appears, subjected the men who chose it to a fatal temptation. You see, though it is misleading, it is also entirely accurate."

"Word-games," Hamelin said.

"Not at all," Mudgett interposed. "We were going to spare you the theoretical reasoning behind our project, Mr. Secretary, but now you'll just have to sit still for it. The

fact is that the body's ability to distinguish between its own cells and those of some foreign tissue—a skin graft, say, or a bacterial invasion of the blood—isn't an inherited ability. It's a learned reaction. Furthermore, if you'll think about it a moment, you'll see that it has to be. Body cells die, too, and have to be disposed of; what would happen if removing those dead cells provoked an antibody reaction, as the destruction of foreign cells does? We'd die of anaphylactic shock while we were still infants.

"For that reason, the body has to learn how to scavenge selectively. In human beings, that lesson isn't learned completely until about a month after birth. During the intervening time, the newborn infant is protected by antibodies that it gets from the colostrum, the 'first milk' it gets from the breast during the three or four days immediately after birth. It can't generate its own; it isn't allowed to, so to speak, until it's learned the trick of cleaning up body residues *without* triggering the antibody mechanisms. Any dead cells marked 'personal' have to be dealt with some other way."

"That seems clear enough," Hamelin said. "But I don't see its relevance."

"Well, we're in a position now where that differentiation between the self and everything outside the body doesn't do us any good any more. These mutated bacteria have been 'selfed' by the mutation. In other words, some of their protein molecules, probably desoxyribonucleic acid molecules, carry configurations or 'recognition-units' iden-

tical with those of our body cells, so that the body can't tell one from another."

"But what has all this to do with re-education?"

"Just this," Carson said. "What we do here is to impose upon the cells of the body—all of them—a new set of recognition-units for the guidance of the lymph nodes and the spleen, which are the organs that produce antibodies. The new units are highly complex, and the chances of their being duplicated by bacterial evolution, even under forced draught, are too small to worry about. That's what Re-Education is. In a few moments, if you like, we'll show you just how it's done."

Hamelin ground out his fifth cigarette in Mudgett's ashtray and placed the tips of his fingers together thoughtfully. Carson wondered just how much of the concept of recognition-marking the under-secretary had absorbed. It had to be admitted that he was astonishingly quick to take hold of abstract ideas, but the self-marker theory of immunity was—like everything else in immunology—almost impossible to explain to laymen, no matter how intelligent.

"This process," Hamelin said hesitantly. "It takes a long time?"

"About six hours per subject, and we can handle only one man at a time. That means that we can count on putting no more than seven thousand troops into the field by the turn of the century. Every one will have to be a highly trained specialist, if we're to bring the war to a quick conclusion."

"Which means no civilians," Hamelin said. "I see. I'm not entirely convinced, but—by all means let's see how it's done."

ONCE INSIDE, the under-secretary tried his best to look everywhere at once. The room cut into the rock was roughly two hundred feet high. Most of it was occupied by the bulk of the Re-Education Monitor, a mechanism as tall as a fifteen-storey building, and about a city block square. Guards watched it on all sides, and the face of the machine swarmed with technicians.

"Incredible," Hamelin murmured. "That enormous object can process only one man at a time?"

"That's right," Mudgett said. "Luckily it doesn't have to treat all the body cells directly. It works through the blood, re-selfing the cells by means of small changes in the serum chemistry."

"What kind of changes?"

"Well," Carson said, choosing each word carefully, "that's more or less a graveyard secret, Mr. Secretary. We can tell you this much: the machine uses a vast array of crystalline, complex sugars which *behave* rather like the blood group-and-type proteins. They're fed into the serum in minute amounts, under feedback control of second-by-second analysis of the blood. The computations involved in deciding upon the amount and the precise nature of each introduced chemical are highly complex. Hence the size of the machine. It is, in its major effect, an artificial kidney."

"I've seen artificial kidneys in the hospitals," Hamelin said, frowning. "They're rather compact affairs."

"Because all they do is remove waste products from the patient's blood, and restore the fluid and electrolyte balance. Those are very minor renal functions in the higher mammals. The organ's main duty is chemical control of immunity. If Burnet and Fenner had known that back in 1949, when the selfing theory was being formulated, we'd have had Re-Education long before now."

"Most of the machine's size is due to the computation section," Mudgett emphasized. "In the body, the brain-stem does those computations, as part of maintaining homeostasis. But we can't reach the brain-stem from outside; it's not under conscious control. Once the body is re-selfed, it will re-train the thalamus where we can't." Suddenly, two swinging doors at the base of the machine were pushed apart and a mobile operating table came through, guided by two attendants. There was a form on it, covered to the chin with a sheet. The face above the sheet was immobile and almost as white.

Hamelin watched the table go out of the huge cavern with visibly mixed emotions. He said: "This process—it's painful?"

"No, not exactly," Carson said. The motive behind the question interested him hugely, but he didn't dare show it. "But any fooling around with the immunity mechanisms can give rise to symptoms—fever, general malaise, and so on.



We try to protect our subjects by giving them a light shock anesthesia first."

"Shock?" Hamelin repeated. "You mean electroshock? I don't see how—"

"Call it stress anesthesia instead. We give the man a steroid drug that counterfeits the anesthesia the body itself produces in moments of great stress—on the battlefield, say, or just after a serious injury. It's fast, and free of after-effects. There's no secret about that, by the way; the drug involved is 21-hydroxypregnane-3,20 dione sodium succinate, and it dates all the way back to 1955."

"Oh," the under-secretary said. The ringing sound of the chemical name had had, as Carson had hoped, a ritually soothing effect.

"Gentlemen," Hamelin said hesitantly. "Gentlemen, I have a— a rather unusual request. And, I am afraid, a rather selfish one." A brief, nervous laugh. "Selfish in both senses, if you will pardon me the pun. You need feel no hesitation in refusing me, but . . ."

Abruptly he appeared to find it impossible to go on. Carson mentally crossed his fingers and plunged in.

"You would like to undergo the process yourself?" he said.

"Well, yes. Yes, that's exactly it. Does that seem inconsistent? I should know, should I not, what it is that I'm advocating for my following? Know it intimately, from personal experience, not just theory? Of course I realize that it would conflict with your policy, but I assure you I wouldn't turn

it to any political advantage—none whatsoever. And perhaps it wouldn't be too great a lapse of policy to process just one civilian among your seven thousand soldiers."

Subverted, by God! Carson looked at Mudgett with a firmly straight face. It wouldn't do to accept too quickly.

But Hamelin was rushing on, almost chattering now. "I can understand your hesitation. You must feel that I'm trying to gain some advantage, or even to get to the surface ahead of my fellow-men. If it will set your minds at rest, I would be glad to enlist in your advance army. Before five years are up, I could surely learn some technical skill which would make me useful to the expedition. If you would prepare papers to that effect, I'd be happy to sign them."

"That's hardly necessary," Mudgett said. "After you're Re-Educated, we can simply announce the fact, and say that you've agreed to join the advance party when the time comes."

"Ah," Hamelin said. "I see the difficulty. No, that would make my position quite impossible. If there is no other way—"

"Excuse us a moment," Carson said. Hamelin bowed, and the doctor pulled Mudgett off out of earshot.

"Don't overplay it," he murmured. "You're tipping our hand with that talk about a press release, Colonel. He's offering us a bribe—but he's plenty smart enough to see that the price you're suggesting is that of his whole political career,

He won't pay that much."

"What then?" Mudgett whispered hoarsely.

"Get somebody to prepare the kind of informal contract he suggested. Offer to put it under security seal so we won't be able to show it to the press at all. He'll know well enough that such a seal can be broken if our policy ever comes before a presidential review—and that will restrain him from forcing such a review. Let's not demand too much. Once he's been re-educated, he'll have to live the rest of the five years with the knowledge that he *can* live topside any time he wants to try it—and he hasn't had the discipline our men have had. It's my bet that he'll goof off before the five years are up—and good riddance."

They went back to Hamelin, who was watching the machine and humming in a painfully abstracted manner.

"I've convinced the Colonel," Carson said, "that your services in the army might well be very valuable when the time comes, Mr. Secretary. If you'll sign up, we'll put the papers under security seal for your own protection, and then I think we can fit you into our treatment program today."

"I'm grateful to you, Dr. Carson," Hamelin said. "Very grateful, indeed."

Five minutes after his injection, Hamelin was as peaceful as a flounder and was rolled through the swinging doors. An hour's discussion of the probable outcome, carried on in the privacy of Mud-

gett's office, bore very little additional fruit, however.

"It's our only course," Carson said. "It's what we hoped to gain from his visit, duly modified by circumstances. It all comes down to this: Hamelin's compromised himself, and he knows it."

"But," Mudgett said, "suppose he was right? What about all that talk of his about mass insanity?"

"I'm sure it's true," Carson said, his voice trembling slightly despite his best efforts at control. "It's going to be rougher than ever down here for the next five years, Colonel. Our only consolation is that the enemy must have exactly the same problem; and if we can beat them to the surface—"

"*Hsst!*" Mudgett said. Carson had already broken off his sentence. He wondered why the scanner gave a man such a hard time outside that door, and then admitted him without any warning to the people on the other side. Couldn't the damned thing be trained to knock?

The newcomer was a page from the haematology section. "Here's the preliminary rundown on your 'Student X', Dr. Carson," he said.

The page saluted Mudgett and went out. Carson began to read. After a moment, he also began to sweat.

"Colonel, look at this. I was wrong after all. Disastrously wrong. I haven't seen a blood-type distribution pattern like Hamelin's since I was a medical student, and even back then it was only a demonstration, not a real live patient. Look at it from the genetic point of view—the migration factors."

He passed the protocol across the desk. Mudgett was not by background a scientist, but he was an enormously able administrator, of the breed that makes it its business to know the technicalities on which any project ultimately rests. He was not much more than halfway through the tally before his eyebrows were gaining altitude like shock-waves.

"Carson, we can't let that man into the machine! He's—"

"He's already in it, Colonel, you know that. And if we interrupt the process before it runs to term, we'll kill him."

"Let's kill him, then," Mudgett said harshly. "Say he died while being processed. Do the country a favor."

"That would produce a hell of a stink. Besides, we have no proof."

Mudgett flourished the protocol excitedly.

"That's not proof to anyone but a haematologist."

"But Carson, the man's a saboteur!" Mudgett shouted. "Nobody but an Asiatic could have a typing pattern like this! And he's no melting-pot product, either—he's a classical mixture, very probably a Georgian. And every move he's made since we first heard of him has been aimed directly at us—aimed directly at tricking us into getting him into the machine!"

"I think so too," Carson said grimly. "I just hope the enemy hasn't many more agents as brilliant."

"One's enough," Mudgett said. "He's sure to be loaded to the last cc of his blood with catalyst poi-

sons. Once the machine starts processing his serum, we're done for—it'll take us years to re-program the computer, if it can be done at all. It's *got* to be stopped!"

"Stopped?" Carson said, astonished. "But it's already stopped. That's not what worries me. The machine stopped it fifty minutes ago."

"It can't have! How could it? It has no relevant data!"

"Sure it has." Carson leaned forward, took the cruelly chewed pencil away from Mudgett, and made a neat check beside one of the entries on the protocol. Mudgett stared at the checked item.

"Platelets Rh VI? he mumbled. "But what's that got to do with . . . Oh. Oh, I see. That platelet type doesn't exist at all in our population now, does it? Never seen it before myself, at least."

"No," Carson said, grinning wolfishly. "It never was common in the West, and the pogrom of 1981 wiped it out. That's something the enemy couldn't know. But the machine knows it. As soon as it gives him the standard anti-IV desensitization shot, his platelets will begin to dissolve—and he'll be rejected for incipient thrombocytopenia." He laughed. "For his own protection! But—"

"But he's getting nitrous oxide in the machine, and he'll be held six hours under anesthesia anyhow—also for his own protection," Mudgett broke in. He was grinning back at Carson like an idiot. "When he comes out from under, he'll assume that he's been re-educated, and he'll beat it back to the enemy to

report that he's poisoned our machine, so that they can be sure they'll beat us to the surface. And he'll go the fastest way: *overland*."

"He will," Carson agreed. "Of course he'll go overland, and of course he'll die. But where does that leave us? We won't be able to conceal that he was treated here, if there's any sort of an inquiry at all. And his death will make everything we do here look like a fraud. Instead of paying our Pied Piper—and great jumping Jehosophat, look at his name! They were rubbing our noses in it all the time! Nevertheless, we didn't pay the piper; we killed him. And 'platelets Rh VI' won't be an adequate excuse for the press, or for Hamelin's following."

"It doesn't worry me," Mudgett rumbled. "Who'll know? He won't die in our labs. He'll leave here hale and hearty. He won't die until he makes a break for the surface. After that we can compose a fine obituary for the press. Heroic government official, on the highest policy level—couldn't wait to lead his followers to the surface—died of being too much in a hurry—Re-

Ed Project sorrowfully reminds everyone that no technique is fool-proof—"

Mudgett paused long enough to light a cigarette, which was a most singular action for a man who never smoked. "As a matter of fact, Carson," he said, it's a natural."

Carson considered it. It seemed to hold up. And 'Hamelin' would have a death certificate as complex as he deserved—not officially, of course, but in the minds of everyone who knew the facts. His death, when it came, would be due directly to the thrombocytopenia which had caused the Re-Ed machine to reject him—and thrombocytopenia is a disease of infants. *Unless ye become as little children . . .*

That was a fitting reason for rejection from the new kingdom of Earth: anemia of the newborn.

His pent breath went out of him in a long sigh. He hadn't been aware that he'd been holding it. "It's true," he said softly. "That's the time to pay the piper."

"When?" Mudgett said.

"When?" Carson said, surprised. "Why, *before* he takes the children away." ● ● ●

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Only if we face and know the truth about the world, whether the world of physics and chemistry, or of geology and biology, or of mind and behavior, shall we be able to see what is our own true place in the world.

—Julian Huxley

A new moral outlook is called for in which the submission to the powers of nature is replaced by respect for what is best in man. It is where this respect is lacking that scientific technique is dangerous.—Bertrand Russell

*Man is a kind of turtle. Wherever  
he goes, he will always carry a  
shell holding warmth and air—and  
with them his human failings . . .*

# CATALYSIS

BY POUL ANDERSON

**W**HEN YOU looked outside, it was into darkness.

Going out yourself, you could let your eyes accommodate. At high noon, the sun was a sharp spark in a dusky heaven, and its light amounted to about one-ninth of one percent of what Earth gets. The great fields of ice and frozen gases reflected enough to help vision, but upthrust crags and cliffs of naked rock were like blackened teeth.

Seventy hours later, when Triton was on the other side of the primary that it always faced, there was a midnight thick enough



*Illustrated by Paul Orban*

to choke you. The stars flashed and glittered, a steely twinkle through a gaunt atmosphere mostly hydrogen—strange, to see the old lost constellations of Earth, here on the edge of the deep. Neptune was at the full, a giant sprawling across eight degrees of sky, bluish gray and smoky banded, but it caught so little sunlight that men groped in blindness. They set up floodlights, or had lamps glaring from their tracs, to work at all.

But nearly everything went on

indoors. Tunnels connected the various buildings on the Hill, instruments were of necessity designed to operate in the open without needing human care, men rarely had occasion to go out any more. Which was just as well, for it takes considerable power and insulation to keep a man alive when the temperature hovers around 60 degrees Kelvin.

And so you stood at a meter-thick port of insulglas, and looked out, and saw only night.

Thomas Gilchrist turned away from the view with a shudder. He had always hated cold, and it was as if the bitterness beyond the lab-dome had seeped in to touch him. The cluttered gleam of instruments in the room, desk piled high with papers and microspools, the subdued chatter of a computer chewing a problem, were comforting.

He remembered his purpose and went with a long low-gravity stride to check the mineralogical unit. It was busily breaking down materials fetched in by the robosamplers, stones never found on Earth—because Earth is not the Mercury-sized satellite of an outer planet, nor has it seen some mysterious catastrophe in an unknown time back near the beginning of things. Recording meters wavered needles across their dials, data tapes clicked out, he would soon have the basic information. Then he would try to figure out how the mineral could have been formed, and give his hypothesis to the computer for mathematical analysis of possibility, and start on some other sample.

For a while Gilchrist stood watching the machine. A cigaret smoldered forgotten between his fingers. He was a short, pudgy young man, with unkempt hair above homely features. Pale-blue eyes blinked nearsightedly behind contact lenses, his myopia was not enough to justify surgery. Tunic and slacks were rumpled beneath the gray smock.

*Behold the bold pioneer!* he thought. His self-deprecating sarcasm was mildly nonsane, he knew, but he couldn't stop—it was like

biting an aching tooth. Only a dentist could fix the tooth in an hour, while a scarred soul took years to heal. It was like his eyes, the trouble wasn't bad enough to require long expensive repair, so he limped through life.

Rafael Alemán came in, small and dark and cheerful. "'Allo," he said. "How goes it?" He was one of the Hill's organic chemists, as Gilchrist was the chief physical chemist, but his researches into low-temperature properties were turning out so disappointingly that he had plenty of time to annoy others. Nevertheless, Gilchrist liked him, as he liked most people.

"So-so. It takes time."

"Time we have enough of, *mi amigo*," said Alemán. "Two years we've been here, and three years more it will be before the ship comes to relieve us." He grimaced. "Ah, when I am back to Durango Unit, how fast my savings will disappear!"

"You didn't have to join the Corps, and you didn't have to volunteer for Triton Station," Gilchrist pointed out.

The little man shrugged, spreading slender hands. "Confidential, I will tell you. I had heard such colorful tales of outpost life. But the only result is that I am now a married man—not that I have anything but praise for my dear Meihua, but it is not the abandonment one had hoped for."

Gilchrist chuckled. Outer-planet stations did have a slightly lurid reputation, and no doubt it had been justified several years ago.

After all—The voyage was so

long and costly that it could not be made often. You established a self-sufficient colony of scientists and left it there to carry on its researches for years at a time. But self-sufficiency includes psychic elements, recreation, alcohol, entertainment, the opposite sex. A returning party always took several children home.

Scientists tended to be more objective about morals, or at least more tolerant of the other fellow's, than most; so when a hundred or so people were completely isolated, and ordinary amusements had palled, it followed that there would be a good deal of what some would call sin.

"Not Triton," said Gilchrist. "You forget that there's been another cultural shift in the past generation—more emphasis on the stable family. And I imagine the Old Man picked his gang with an eye to such attitudes. Result—the would-be rounders find themselves so small a minority that it has a dampening effect."

"Sí. I know. But you 'ave never told me your real reason for coming here, Thomas."

Gilchrist felt his face grow warm. "Research," he answered shortly. "There are a lot of interesting problems connected with Neptune."

Alemán cocked a mildly skeptical eyebrow but said nothing. Gilchrist wondered how much he guessed.

That was the trouble with being shy. In your youth, you acquired bookish tastes; only a similarly oriented wife would do for you, so you didn't meet many women and

didn't know how to behave with them anyhow. Gilchrist, who was honest with himself, admitted he'd had wistful thoughts about encountering the right girl here, under informal conditions where—

He had. And he was still helpless.

Suddenly he grinned. "I'll tell you what," he said. "I also came because I don't like cold weather."

"Came to *Neptune*?"

"Sure. On Earth, you can stand even a winter day, so you have to. Here, since the local climate would kill you in a second or two, you're always well protected from it." Gilchrist waved at the viewport. "Only I wish they didn't have that bloody window in my lab. Every time I look out, it reminds me that just beyond the wall nitrogen is a solid."

"*Yo comprendo*," said Alemán. "The power of suggestion. Even now, at your words, I feel a chill."

Gilchrist started with surprise. "You know, somehow I have the same— Just a minute." He went over to a workbench. His inframicroscope had an air thermometer attached to make temperature corrections.

"What the devil," he muttered. "It is cooled off. Only 18 degrees in here. It's supposed to be 21."

"Some fluctuation, in temperature as in ozone content and humidity," reminded Alemán. "That is required for optimum health."

"Not this time of day, it shouldn't be varying." Gilchrist was reminded of his cigaret as it nearly burned his fingers. He stubbed it out and took another and inhaled to light it.



"I'm going to raise Jahangir and complain," he said. "This could play merry hell with exact measurements."

Alemán trotted after him as he went to the door. It was manually operated, and the intercoms were at particular points instead of every room. You had to forego a number of Earthside comforts here.

There was a murmuring around him as he hurried down the corridor. Some doors stood open, showing the various chemical and biological sections. The physicists had their own dome, on the other side of the Hill, and even so were apt to curse the stray fields generated here. If they had come this far to get away from solar radiations, it was only reasonable, as anyone but a chemist could see, that—

The screen stood at the end of hall, next to the tunnel stairs. Gilchrist checked himself and stood with a swift wild pulse in his throat. Catherine Bardas was using it.

He had often thought that the modern fashion of outbreeding yielded humans more handsome than any pure racial type could be. When a girl was half Greek and half Amerind, and a gifted biosynthesizer on top of it, a man like him could only stare.

Mohammed Jahangir's brown, bearded face registered more annoyance than admiration as he spoke out of the screen. "Yes. Dr. Bardas," he said with strained courtesy. "I know. My office is being swamped with complaints."

"Well, what's the trouble?" asked the girl. Her voice was low

and gentle, even at this moment.

"I'm not sure," said the engineer. "The domes' temperature is dropping, that's all. We haven't located the trouble yet, but it can't be serious."

"All I'm asking," said Catherine Bardas patiently, "is how much longer this will go on and how much lower it's going to get. I'm trying to synthesize a cell, and it takes precisely controlled conditions. If the air temperature drops another five degrees, my thermostat won't be able to compensate."

"Oh, well . . . I'm sure you can count on repair being complete before that happens."

"All right," said Catherine sweetly. "If not, though, I'll personally bung you out the main airlock *sans* spacesuit."

Jahangir laughed and cut off. The light of fluorotubes slid blue-black off the girl's shoulder-length hair as she turned around. Her face was smooth and dark, with high cheekbones and a lovely molding of lips and nose and chin.

"Oh—hello, Tom," she smiled. "All through here."

"Th-th-th—Never mind," he fumbled. "I was only g-going to ask about it myself."

"Well—" She yawned and stretched with breathtaking effect. "I suppose I'd better get back and—"

"Ah, why so, señorita?" replied Alemán. "If the work does not need your personal attention just now, come join me in a leetle drink. It is near dinnertime anyhow."

"All right," she said. "How about

you, Tom?"

He merely nodded, for fear of stuttering, and accompanied them down the stairs and into the tunnel. Half of him raged at his own timidity—why hadn't he made that suggestion?

The passages connecting the domes were all alike, straight featureless holes lined with plastic. Behind lay insulation and the pipes of the common heating system, then more insulation, finally the Hill itself. That was mostly porous iron, surprisingly pure though it held small amounts of potassium and aluminum oxides. The entire place was a spongy ferrous outcropping. But then, Triton was full of geological freaks.

"How goes your work?" asked Alemán sociably.

"Oh, pretty well," said Catherine. "I suppose you know we've synthesized virus which can live outside. Now we're trying to build bacteria to do the same."

On a professional level, Gilchrist was not a bad conversationalist. His trouble was that not everyone likes to talk shop all the time. "Is there any purpose in that, other than pure research to see if you can do it?" he inquired. "I can't imagine any attempt ever being made to colonize this moon."

"Well, you never know," she answered. "If there's ever any reason for it, oxide-reducing germs will be needed."

"As well as a nuclear heating system for the whole world, and—What do your life forms use for energy, though? Hardly enough sunlight, I should think."

"Oh, but there is, for the right biochemistry with the right catalysts—analogue to our own enzymes. It makes a pretty feeble type of life, of course, but I hope to get bacteria which can live off the local ores and frozen gases by exothermic reactions. Don't forget, when it's really cold a thermal engine can have a very high efficiency; and all living organisms are thermal engines of a sort."

They took the stairs leading up into the main dome: apartments, refectories, social centers, and offices. Another stair led downward to the central heating plant in the body of the Hill. Gilchrist saw an engineer going that way with a metering kit and a worried look.

The bar was crowded, this was cocktail hour for the swing shift and—popular opinion to the contrary—a scientist likes his meals regular and only lives off sandwiches brought to the lab when he must. They found a table and sat down. Nobody had installed dial units, so junior technicians earned extra money as waiters. One of them took their orders and chits.

The ventilators struggled gallantly with the smoke. It hazed the murals with which some homesick soul had tried to remember the green Earth. A couple of astronomers at the next table were noisily disputing theories.

"—Dammit, Pluto's got to be an escaped satellite of Neptune. Look at their orbits . . . and Pluto is where Neptune should be according to Bode's Law."

"I know. I've heard that song before. I suppose you favor the In-

vador theory?"

"What else will account for the facts? A big planet comes wandering in, yanks Neptune sunward and frees Pluto; but Neptune captures a satellite of the Invader. Triton's got to be a captured body, with this screwy retrograde orbit. And Nereid—"

"Have you ever analyzed the mechanics of that implausible proposition? Look here—" A pencil came out and began scribbling on the long-suffering table top.

Catherine chuckled. "I wonder if we'll ever find out," she murmured.

Gilchrist rubbed chilled fingers together. Blast it, the air was still cooling off! "It'd be interesting to land a ship on Nep himself and check the geology," he said. "A catastrophe like that would leave traces."

"When they can build a ship capable of landing on a major planet without being squeezed flat by the air pressure, that'll be the day. I think we'll have to settle for telescopes and spectroscopes for a long, long time to come—"

The girl's voice trailed off, and her dark fine head poised. The loudspeaker was like thunder.

**"DR. VESEY! DR. VESEY!  
PLEASE CONTACT ENGI-  
NEERING OFFICE! DR.  
VESEY, PLEASE CONTACT  
DR. JAHANGIR! OVER."**

For a moment, there was silence in the bar.

"I wonder what the trouble is," said Alemán.

"Something to do with the heating plant, I suppose—" Again Cath-

erine's tones died, and they stared at each other.

The station was a magnificent machine; it represented an engineering achievement which would have been impossible even fifty years ago. It kept a hundred human creatures warm and moist, it replenished their air and synthesized their food and raised a wall of light against darkness. But it had not the equipment to call across nearly four and a half billion kilometers of vacuum. It had no ship of its own, and the great Corps vessel would not be back for three years.

It was a long way to Earth.

Dinner was a silent affair that period. There were a few low-voiced exchanges, but they only seemed to deepen the waiting stillness.

And the cold grew apace. You could see your breath, and your thin garments were of little help.

The meal was over, and the groups of friends were beginning to drift out of the refectory, when the intercoms woke up again. This chamber had a vision screen. Not an eye stirred from Director Samuel Vesey as he looked out of it.

His lips were firm and his voice steady, but there was a gleam of sweat on the ebony skin—despite the cold. He stared directly before him and spoke:

"Attention, all personnel. Emergency situation. Your attention, please."

After a moment, he seemed to relax formality and spoke as if face to face. "You've all noticed

our trouble. Something has gone wrong with the heating plant, and Dr. Jahangir's crew haven't located the trouble so far.

"Now there's no reason for panic. The extrapolated curve of temperature decline indicates that, at worst, it'll level off at about zero Centigrade. That won't be fun, but we can stand it till the difficulty has been found. Everyone is advised to dress as warmly as possible. Food and air plant crews are going on emergency status. All projects requiring energy sources are cancelled till further notice.

"According to the meters, there's nothing wrong with the pile. It's still putting out as much heat as it always has. But somehow, that heat isn't getting to us as it should. The engineers are checking the pipes now.

"I'll have a stat of the findings made up and issued. Suggestions are welcome, but please take them to my office—the engineers have their own work to do. Above all, don't panic! This is a nuisance, I know, but there's no reason to be afraid.

"All personnel not needed at once, stand by. The following specialists please report to me—"

He read off the list, all physicists, and closed his talk with a forced grin and thumbs up.

As if it had broken a dam, the message released a babble of words. Gilchrist saw Catherine striding out of the room and hastened after her.

"Where are you going?" he asked.

"Where do you think?" she replied. "To put on six layers of

clothes."

He nodded. "Best thing. I'll come along, if I may—my room's near yours."

A woman, still in her smock, was trying to comfort a child that shivered and cried. A Malayan geologist stood with teeth clattering in his jaws. An engineer snarled when someone tried to question him and ran on down the corridor.

"What do you think?" asked Gilchrist inanely.

"I don't have any thoughts about the heating plant," said Catherine. Her voice held a thin edge. "I'm too busy worrying about food and air."

Gilchrist's tongue was thick and dry in his mouth. The biochemistry of food creation and oxygen renewal died when it got even chilly.

Finished dressing, they looked at each other in helplessness. Now what?

The temperature approached its minimum in a nosedive. There had always been a delicate equilibrium; it couldn't be otherwise, when the interior of the domes was kept at nearly 240 degrees above the surrounding world. The nuclear pile devoted most of its output to maintaining that balance, with only a fraction going to the electric generators.

Gilchrist thrust hands which were mottled blue with cold into his pockets. Breath smoked white before him. Already a thin layer of hoarfrost was on ceiling and furniture.

"How long can we stand this?" he asked.

"I don't know," said Catherine. "Not too long, I should think, since nobody has adequate clothes. The children should . . . suffer . . . pretty quickly. Too much drain on body energy." She clamped her lips together. "Use your mental training. You can ignore this till it begins actually breaking down your physique."

Gilchrist made an effort, but couldn't do it. He could stop shivering, but the chill dank on his skin, and the cold sucked in by his nose, were still there in his consciousness, like a nightmare riding him.

"They'll be dehumidifying the air," said Catherine. "That'll help some." She began walking down the hall. "I want to see what they're doing about the food and oxy sections."

A small mob had had the same idea. It swirled and mumbled in the hall outside the service rooms. A pair of hard-looking young engineers armed with monkey wrenches stood guard.

Catherine wormed her way through the crowd and smiled at them. Their exasperation dissolved, and one of them, a thickset red-head by the name of O'Mallory, actually grinned. Gilchrist, standing moodily behind the girl, could hardly blame him.

"How's it going in there?" she asked.

"Well, now, I suppose the Old Man is being sort of slow about his bulletins," said O'Mallory. "It's under control here."

"But what are they doing?"

"Rigging electric heaters, of

course. It'll take all the juice we have to maintain these rooms at the right temperature, so I'm afraid they'll be cutting off light and power to the rest of the Hill."

She frowned. "It's the only thing, I suppose. But what about the people?"

"They'll have to jam together in the refectories and clubrooms. That'll help keep 'em warm."

"Any idea what the trouble is?"

O'Mallory scowled. "We'll get it fixed," he said.

"That means you don't know." She spoke it calmly.

"The pile's all right," he said.

"We telemetered it. I'd'a done that myself, but you know how it is—" He puffed himself up a trifle. "They need a couple husky chaps to keep the crowd orderly. Anyhow, the pile's still putting out just as it should, still at 500 degrees like it ought to be. In fact, it's even a bit warmer than that; why, I don't know."

Gilchrist cleared his throat. "Then-then the trouble is with the . . . heating pipes," he faltered.

"How did you ever guess?" asked O'Mallory with elaborate sarcasm.

"Lay off him," said Catherine. "We're all having a tough time."

Gilchrist bit his lip. It wasn't enough to be a tongue-tied idiot, he seemed to need a woman's protection.

"Trouble is, of course," said O'Mallory, "the pipes are buried in insulation, behind good solid plastic. They'll be hard to get at."

"Whoever designed this farce ought to have to live in it," said his

companion savagely.

"The same design's worked on Titan with no trouble at all," declared O'Mallory.

Catherine's face took on a grimness. "There never was much point in making these outer-planet domes capable of quick repair," she said. "If something goes wrong, the personnel are likely to be dead before they can fix it."

"Now, now, that's no way to talk," smiled O'Mallory. "Look, I get off duty at 0800. Care to have a drink with me then?"

Catherine smiled back. "If the bar's operating, sure."

Gilchrist wandered numbly after her as she left.

The cold gnawed at him. He rubbed his ears, unsure about frost-bite. Odd how fast you got tired—It was hard to think.

"I'd better get back to my lab and put things away before they turn off the electricity to it," he said.

"Good idea. Might as well tidy up in my own place." Something flickered darkly in the girl's eyes. "It'll take our minds off—"

Off gloom, and cold, and the domes turned to blocks of ice, and a final night gaping before all men. Off the chasm of loneliness between the Hill and the Earth.

They were back in the chemical section when Alemán came out of his lab. The little man's olive skin had turned a dirty gray.

"What is it?" Gilchrist stopped, and something knotted hard in his guts.

"*Madre de Dios*—" Alemán licked sandy lips. "We are fin-

ished."

"It's not that bad," said Catherine.

"You do not understand!" he shrieked. "Come here!"

They followed him into his laboratory. He mumbled words about having checked a hunch, but it was his hands they watched. Those picked up a Geiger counter and brought it over to a wall and traced the path of a buried heating pipe.

The clicking roared out.

"Beta emission," said Gilchrist. His mouth felt cottony.

"How intense?" whispered Catherine.

Gilchrist set up an integrating counter and let it run for a while. "Low," he said. "But the dosage is cumulative. A week of this, and we'll begin to show the effects. A month, and we're dead."

"There's always some small beta emission from the pipes," said the girl. "A little tritium gets formed down in the pile room. It's . . . never been enough to matter."

"Somehow, the pile's beginning to make more H-3, then." Gilchrist sat down on a bench and stared blankly at the floor.

"The laws of nature—" Alemán had calmed down a bit, but his eyes were rimmed with white.

"Yes?" asked Catherine when he stopped. She spoke mostly to fend off the silence.

"I 'ave sometimes thought . . . what we know in science is so leetle. It may be the whole universe, it has been in a . . . a most improbable state for the past few billion years." Alemán met her

gaze as if pleading to be called a liar. "It may be that what we thought to be the laws of nature, those were only a leetle statistical fluctuation."

"And now we're going back onto the probability curve?" muttered Gilchrist. He shook himself. "No, damn it. I won't accept that till I must. There's got to be some rational explanation."

"Leakage in the pipes?" ventured Catherine.

"We'd know that. Nor does it account for the radiation. No, it's —" His voice twisted up on him, and he groped out a cigaret. "It's something natural."

"What is natural?" said Alemán. "How do we know, leetle creeping things as we are, living only by the grace of God? We 'ave come one long way from home." His vision strayed to the viewport with a kind of horror.

*Yes, thought Gilchrist in the chilled darkness of his mind, yes, we have come far. Four and a half billion kilometers further out from the sun. The planet-sized moon of a world which could swallow ours whole without noticing. A thin hydrogen atmosphere, glaciers of nitrogen which turn to rivers when it warms up, ammonia snow, and a temperature not far above absolute zero. What do we know? What is this arrogance of ours which insists that the truth on Earth is also the truth on the rim of space?*

No!

He stood up, shuddering with cold, and said slowly: "We'd better go see Dr. Vesey. He has to know, and maybe they haven't

thought to check the radiation. And then—"

Catherine stood waiting.

"Then we have to think our way out of this mess," he finished lamely. "Let's, uh, start from the beginning. Think back how th-th-the heating plant works."

Down in the bowels of the Hill was a great man-made cave. It had been carved out of the native iron, with rough pillars left to support the roof; walls and ceiling were lined with impermeable metal, but the floor was in its native state—who cared if there was seepage downward?

The pile sat there, heart and life of the station.

It was not a big one, just sufficient to maintain man on Triton. Part of its energy was diverted to the mercury-vapor turbines which furnished electricity. The rest went to heat the domes above.

Now travel across trans-Jovian spaces is long and costly; even the smallest saving means much. Very heavy insulation against the haze of neutrons which the pile emitted could scarcely be hauled from Earth, nor had there been any reason to spend time and labor manufacturing it on Triton.

Instead, pumps sucked in the hydrogen air and compressed it to about 600 atmospheres. There is no better shield against high-energy neutrons; they bounce off the light molecules and slow down to a speed which makes them perfectly harmless laggards which don't travel far before decaying into hydrogen themselves. This, as well as the di-

rect radiation of the pile, turned the room hot—some 500 degrees.

So what was more natural than that the same hydrogen should be circulated through pipes of chrome-vanadium steel, which is relatively impenetrable even at such temperatures, and heat the domes?

There was, of course, considerable loss of energy as the compressed gas seeped through the Hill and back into the satellite's atmosphere. But the pumps maintained the pressure. It was not the most efficient system which could have been devised; it would have been ludicrous on Earth. But on Triton, terminal of nowhere, men had necessarily sacrificed some engineering excellence to the stiff requirements of transportation and labor.

And after all, it had worked without a hitch for many years on Saturn's largest moon. It had worked for two years on Neptune's—

**S**AMUEL VESEY drummed on his desk with nervous fingers. His dark countenance was already haggard, the eyes sunken and feverish.

"Yes," he said. "Yes, it was news to me."

Jahangir put down the counter. The office was very quiet for a while.

"Don't spread the word," said Vesey. "We'll confine it to the engineers. Conditions are bad enough without a riot breaking loose. We can take several days of this radiation without harm, but you know

how some people are about it."

"You've not been very candid so far," snapped Catherine. "Just exactly what have you learned?"

Jahangir shrugged. There was a white frost rimming his beard. "There've been no bulletins because there's no news," he replied. "We checked the pile. It's still putting out as it should. The neutron flux density is the same as ever. It's the gas there and in our pipes which has gotten cold and . . . radioactive."

"Have you looked directly in the pile room—actually entered?" demanded Alemán.

Jahangir lifted his shoulders again. "My dear old chap," he murmured. "At a temperature of 500 and a pressure of 600?" After a moment, he frowned. "I do have some men modifying a trac so it could be driven in there for a short time. But I don't expect to find anything. It's mostly to keep them busy."

"How about the pipes, then?" asked Gilchrist.

"Internal gas pressure and velocity of circulation is just about what it always has been. According to the meters, anyway, which I don't think are lying. I don't want to block off a section and rip it out except as a last resort. It would just be wasted effort, I'm sure." Jahangir shook his turbanned head. "No, this is some phenomenon which we'll have to think our way through, not bull through."

Vesey nodded curtly. "I suggest you three go back to the common rooms," he said. "We'll be shunting all the power to food and oxy-



soon. If you have any further suggestions, pass them on . . . otherwise, sit tight."

It was dismissal.

The rooms stank.

Some ninety human beings were jammed together in three long chambers and an adjacent kitchen. The ventilators could not quite handle that load.

They stood huddled together, children to the inside, while those on the rim of the pack hugged their shoulders and clenched teeth between blue lips. Little was said. So far there was calm of a sort—enough personnel had had intensive mind training to be a steadying influence; but it was a thin membrane stretched near breaking.

As he came in, Gilchrist thought of a scene from Dante's hell. Somewhere in that dense mass, a child was sobbing. The lights were dim—he wondered why—and distorted faces were whittled out of thick shadow.

"G-g-get inside . . . in front of me," he said to Catherine.

"I'll be all right," answered the girl. "It's a fact that women can stand cold better than men."

Alemán chuckled thinly. "But our Thomas is well padded against it," he said.

Gilchrist winced. He himself made jokes about his figure, but it was a cover-up. Then he wondered why he should care; they'd all be dead anyway, before long.

A colleague, Danton, turned empty eyes on them as they joined the rest. "Any word?" he asked.

"They're working on it," said

Catherine shortly.

"God! Won't they hurry up? I've got a wife and kid. And we can't even sleep, it's so cold."

Yes, thought Gilchrist, that would be another angle. Weariness to eat away strength and hope . . . radiation would work fast on people in a depressed state.

"They could at least give us a heater in here!" exclaimed Danton. His tone was raw. Shadows muffled his face and body.

"All the juice we can spare is going to the food and air plants. No use being warm if you starve or suffocate," said Catherine.

"I know, I know. But— Well, why aren't we getting more light? There ought to be enough current to heat the plants and still furnish a decent glow in here."

"Something else—" Gilchrist hesitated. "Something else is operating, then, and sucking a lot of power. I don't know what."

"They say the pile itself is as hot as ever. Why can't we run a pipe directly from it?"

"And get a mess of fast neutrons?" Catherine's voice died. After all . . . they were being irradiated as they stood here and trembled.

"We've got batteries!" It was almost a snarl from Danton's throat. "Batteries enough to keep us going comfortably for days. Why not use them?"

"And suppose the trouble hasn't been fixed by the time they're drained?" challenged Gilchrist.

"Don't say that!"

"Take it easy," advised another man.

Danton bit his lip and faced away, mumbling to himself.

A baby began to cry. There seemed no way of quieting it.

"Turn that bloody brat off!" The tone came saw-toothed from somewhere in the pack.

"Shut up!" A woman's voice, close to hysteria.

Gilchrist realized that his teeth were rattling. He forced them to stop. The air was foul in his nostrils.

He thought of beaches under a flooding sun, of summer meadows and a long sweaty walk down dusty roads, he thought of birds and blue sky. But it was no good. None of it was real.

The reality was here, just beyond the walls, where Neptune hung ashen above glittering snow that was not snow, where a thin poisonous wind whimpered between barren snags, where the dark and the cold flowed triumphantly close. The reality would be a block of solid gas, a hundred human corpses locked in it like flies in amber, it would be death and the end of all things.

He spoke slowly, through numbed lips: "Why has man always supposed that God cared?"

"We don't know if He does or not," said Catherine. "But man cares, isn't that enough?"

"Not when the next nearest man is so far away," said Alemán, trying to smile. "I will believe in God; man is too small."

Danton turned around again. "Then why won't He help us now?" he cried. "Why won't He at least save the children?"

"I said God cared," answered Alemán quietly, "not that He will do our work for us."

"Stow the theology, you two," said Catherine. "We're going to pieces in here. Can't somebody start a song?"

Alemán nodded. "Who has a guitar?" When there was no response, he began singing a capella:

*"La cucaracha, la cucaracha,  
Ya no quiere caminar—"*

Voices joined in, self-consciously. They found themselves too few, and the song died.

Catherine rubbed her fingers together. "Even my pockets are cold now," she said wryly.

Gilchrist surprised himself; he took her hands in his. "That may help," he said.

"Why, thank you, Sir Galahad," she laughed. "You— Oh. Hey, there!"

O'Mallory, off guard detail now that everyone was assembled here, came over. He looked even bulkier than before in half a dozen layers of clothing. Gilchrist, who had been prepared to stand impotently in the background while the engineer distributed blarney, was almost relieved to see the fear on him. *He* knew!

"Any word?" asked Catherine.

"Not yet," he muttered.

"Why 'ave we so leetle light?" inquired Alemán. "What is it that draws the current so much? Surely not the heaters."

"No. It's the pump. The air-intake pump down in the pile room." O'Mallory's voice grew higher. "It's working overtime, sucking in more hydrogen. Don't ask me why! I

don't know! Nobody does!"

"Wait," said Catherine eagerly. "If the room's losing its warm gas, and having to replace it from the cold stuff outside, would that account for the trouble we're having?"

"No," said O'Mallory dully. "We can't figure out where the hydrogen's disappearing to, and anyway it shouldn't make that much difference. The energy output down there's about what it's supposed to be, you know."

Gilchrist stood trying to think. His brain felt gelid.

But damn it, damn it, damn it, there must be a rational answer. He couldn't believe they had blundered into an ugly unknown facet of the cosmos. Natural law was the same, here or in the farthest galaxy—it had to be.

Item, he thought wearily. The pile was operating as usual, except that somehow hydrogen was being lost abnormally fast and therefore the pump had to bring in more from Triton's air. But—

—Item. That couldn't be due to a leak in the heating pipes, because they were still at their ordinary pressure.

—Item. The gas in the pipes included some radioactive isotope. Nevertheless—

—Item. It could not be hydrogen-3, because the pile was working normally and its neutron leakage just wasn't enough to produce that much. Therefore, some other element was involved.

Carbon? There was a little methane vapor in Triton's atmosphere. But not enough. Anyway,

carbon-13 was a stable isotope, and the pile-room conditions wouldn't produce carbon-14. Unless—

*Wait a minute!* Something flickered on the edge of awareness.

Danton had buttonholed O'Mallory. "We were talking about using the battery banks," he said.

The engineer shrugged. "And what happens after they're used up? No, we're keeping them as a last resort." His grin was hideous. "We could get six or seven comfortable days out of them."

"Then let's have them! If you thumb-fingered idiots haven't fixed the system by then, you deserve to die."

"And you'll die right along with us, laddybuck." O'Mallory bristled. "Don't think the black gang's loafing. We're taking the cold and the radiation as much as you are—"

*"Radiation?"*

Faces turned around. Gilchrist saw eyes gleam white. The word rose in a roar, and a woman screamed.

"Shut up!" bawled O'Mallory frantically. "Shut up!"

Danton shouted and swung at him. The engineer shook his head and hit back. As Danton lurched, a man rabbit-punched O'Mallory from behind.

Gilchrist yanked Catherine away. The mob spilled over, a sudden storm. He heard a table splinter.

Someone leaped at him. He had been an educated man, a most scientific and urbane man, but he had just been told that hard radiation was pouring through his body and he ran about and howled. Gilchrist had a glimpse of an unshaven face

drawn into a long thin box with terror, then he hit. The man came on, ignoring blows, his own fists windmilling. Gilchrist lowered his head and tried clumsily to take the fury on his arms. Catherine, he thought dizzily, Catherine was at least behind him.

The man yelled. He sat down hard and gripped his stomach, retching. Alemán laughed shortly. "A good kick is advisable in such unsporting circumstances, *mi amigo*."

"Come on," gasped Catherine. "We've got to get help."

They fled down a tunnel of blackness. The riot noise faded behind, and there was only the hollow slapping of their feet.

Lights burned ahead, Vesey's office. A pair of engineer guards tried to halt them. Gilchrist choked out an explanation.

Vesey emerged and swore luridly, out of hurt and bewilderment at his own people. "And we haven't a tear gas bomb or a needler in the place!" He brooded a moment, then whirled on Jahangir, who had come out behind him. "Get a tank of compressed ammonia gas from the chem section and give 'em a few squirts if they're still kicking up when you arrive. That ought to quiet them without doing any permanent damage."

The chief nodded and bounded off with his subordinates. In this gravity, one man could carry a good-sized tank.

Vesey beat a fist into his palm. There was agony on his face.

Catherine laid a hand on his arm. "You've no choice," she said

gently. "Ammonia is rough stuff, out it would be worse if children started getting trampled."

Gilchrist, leaning against the wall, straightened. It was as if a bolt had snapped home within him. His shout hurt their eardrums.

"Ammonia!"

"Yes," said Vesey dully. "What about it?" Breath smoked from his mouth, and his skin was rough with gooseflesh.

"I—I—I— It's your . . . y-y-your answer!"

**T**HEY HAD set up a heater in his laboratory so he could work, but the test was quickly made. Gilchrist turned from his apparatus and nodded, grinning with victory. "That settles the matter. This sample from the pile room proves it. The air down there is about half ammonia."

Vesey looked red-eyed at him. There hadn't been much harm done in the riot, but there had been a bad few minutes. "How's it work?" he asked. "I'm no chemist."

Alemán opened his mouth, then bowed grandly. "You tell him, Thomas. It is your moment."

Gilchrist took out a cigaret. He would have liked to make a cavalier performance of it, with Catherine watching, but his chilled fingers were clumsy and he dropped the little cylinder. She laughed and picked it up for him.

"Simple," he said. With technicalities to discuss, he could speak well enough, even when his eyes kept straying to the girl. "What we have down there is a Haber process

chamber. It's a method for manufacturing ammonia out of nitrogen and hydrogen—obsolete now, but still of interest to physical chemists like myself.

"I haven't tested this sample for nitrogen yet, but there's got to be some, because ammonia is  $\text{NH}_3$ . Obviously, there's a vein of solid nitrogen down under the Hill. As the heat from the pile room penetrated downward, this slowly warmed up. Some of it turned gaseous, generating terrific pressure; and finally that pressure forced the gas up into the pile room.

"Now, when you have a nitrogen-hydrogen mixture at 500 degrees and 600 atmospheres, in the presence of a suitable catalyst, you get about a 45 percent yield of ammonia—"

"You looked that up," said Catherine accusingly.

He chuckled. "My dear girl," he said, "there are two ways to know a thing: you can know it, or you can know where to look it up. I prefer the latter." After a moment: "Naturally, this combination decreases the total volume of gas; so the pump has to pull in more hydrogen from outside to satisfy its barostat, and more nitrogen is welling from below all the time. We've been operating quite an efficient little ammonia factory down there, though it should reach equilibrium as to pressure and yield pretty soon.

"The Haber process catalyst, incidentally, is spongy iron with certain promoters—potassium and aluminum oxides are excellent ones. In other words, it so happened that the Hill is a natural Haber catalyst,

which is why we've had this trouble."

"And I suppose the reaction is endothermic and absorbs heat?" asked Catherine.

"No . . . as a matter of fact, it's exothermic, which is why the pile is actually a little hotter than usual, and that in spite of having to warm up all that outside air. But ammonia does have a considerably higher specific heat than hydrogen. So, while the gas in our pipes has the same caloric content, it has a lower temperature."

"Ummm—" Vesey rubbed his chin. "And the radiation?"

"Nitrogen plus neutrons gives carbon-14, a beta emitter."

"All right," said Catherine. "Now tell us how to repair the situation."

Her tone was light—after all, the answer was obvious—but it didn't escape Gilchrist that she *had* asked him to speak. Or was he thinking wishfully?

"We turn off the pile, empty the pipes, and go into the room in spacesuits," he said. "Probably the simplest thing would be to drill an outlet for the nitrogen vein and drop a thermite bomb down there . . . that should flush it out in a hurry. Or maybe we can lay an impermeable floor. In any event, it shouldn't take more than a few days, which the batteries will see us through. Then we can go back to operation as usual."

Vesey nodded. "I'll put Jahangir on it right away." He stood up and extended his hand. "As for you, Dr. Gilchrist, you've saved all our lives and—"

"Shucks." His cheeks felt hot. "It was my own neck too."

Before his self-confidence could evaporate, he turned to Catherine. "Since we can't get back to work for a few days, how about going down to the bar for a drink? I believe it'll soon be functioning again.

And, uh, there'll doubtless be a dance to celebrate later—"

"I didn't know you could dance," she said.

"I can't," he blurted.

They went out together. It is not merely inorganic reactions which require a catalyst. ● ● ●

## WORTH CITING

MAN MAY HAVE already created new plant species out of the old, using as a tool for creation his most destructive force, the atom. Plant types that fit the definition "new species" have been created by a group of Swedish scientists, and more food for a hungry world is the first bright prospect from this atom-created beneficial mutation. The Swedish group reported that these "new species" have been made by atomic bombardment of plants in an experimental garden. Irradiation from atomic particles changed the hereditary make-up of the plants so much that their offspring showed all the essential characteristics of a separate species. Experiments have already shown that in barley and other test plants such induced mutations can increase the yield per acre of a variety, or leave the yield unchanged while improving specially desired characteristics. In addition to increased yields, beneficial changes concerning stiffness of straw, response to fertilization, earliness of fruiting, protein or oil content, fiber strength and grain size were all obtained.

Features marking the plants as "new species" are inability to cross fertilize with their parent stock, drastic changes in shape and structure, altered response to environment, and differences in genetic structure that can be detected under a microscope. In the past, breeders had to wait for mutations to occur naturally. With irradiation exposures, the rate can be raised several thousand times making it possible to experiment with a greater number of beneficial mutations in a much shorter time than ever before.

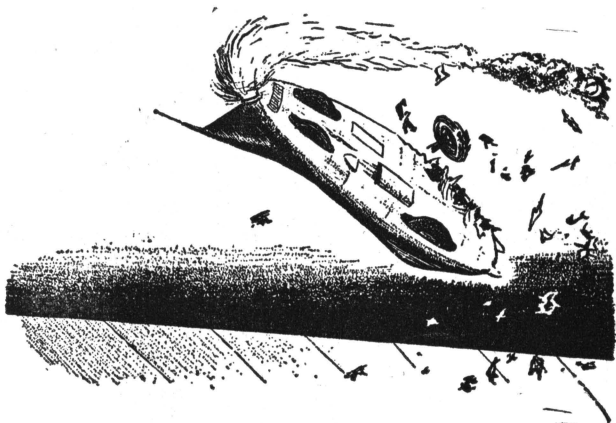
Our citation this month goes to the Swedish scientists; the "inventors" of this new species which will aid immeasurably in the world-wide effort to feed the hungry mouths of tomorrow.

# THE DRIVERS

*Jetways were excellent substitutes for war,*

*perfect outlets for all forms of neuroses.*

*And the unfit were weeded out by death . . .*



BY EDWARD W. LUDWIG

**U**P THE concrete steps. Slowly, one, two, three, four.  
Down the naked, ice-white corridor. The echo of  
his footfalls like drumbeats, ominous, threatening.

Around him, bodies, faces, moving dimly behind the  
veil of his fear.

At last, above an oaken door, the black-lettered sign:

DEPARTMENT OF LAND-JET VEHICLES  
DIVISION OF LICENSES

He took a deep breath. He withdrew his handkerchief and wiped perspiration from his forehead, his upper lip, the palms of his hands.

His mind caressed the hope: *Maybe I've failed the tests. Maybe they won't give me a license.*

He opened the door and stepped inside.

The metallic voice of a robot-receptionist hummed at him:

"Name?"

"T—Tom Rogers."

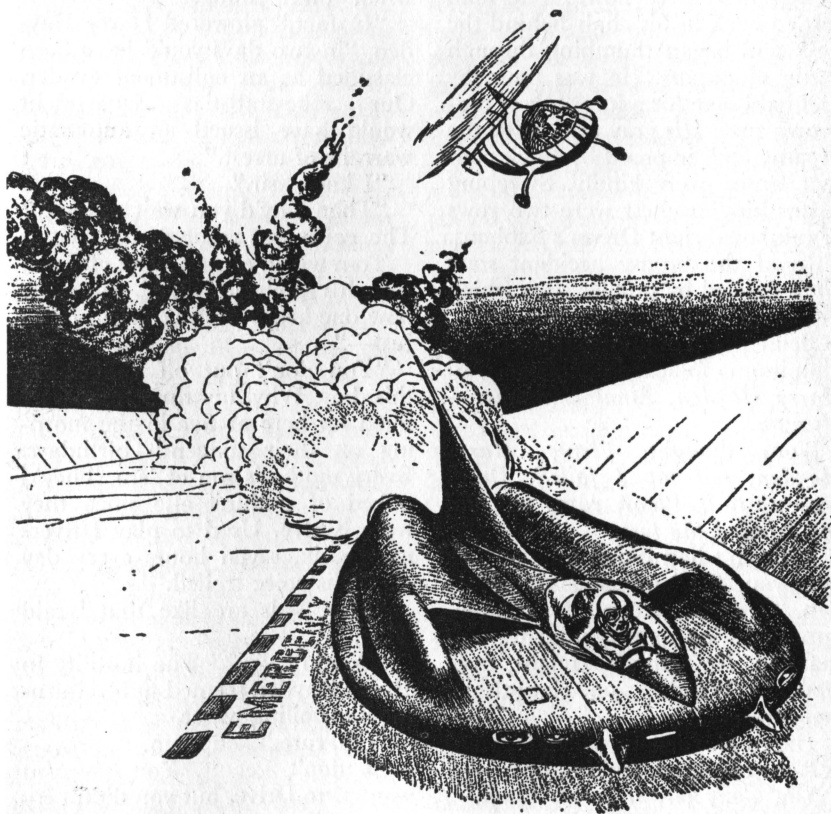
Click. "Have you an appointment?"

His gaze ran over the multitude of silver-boxed analyzers, computers, tabulators, over the white-clad technicians and attendants, over the endless streams of taped data fed from mouths in the dome-shaped ceiling.

"Have you an appointment?" repeated the robot.

"Oh. At 4:45 p. m."

Click. "Follow the red arrow in



Illustrated by Mel Hunter



Aisle Three, please.”

Tom Rogers moved down the aisle, eyes wide on the flashing, arrow-shaped lights just beneath the surface of the quartzite floor.

Abruptly, he found himself before a desk. Someone pushed him into a foam-rubber contour chair.

“Surprised, eh, boy?” boomed a deep voice. “No robots at this stage of the game. No sir. This requires the human touch. Get me?”

“Uh-huh.”

“Well, let’s see now.” The man settled back in his chair behind the desk and began thumbing through a file of papers. He was paunchy and bald save for a forepeak of red-brown fuzz. His gray eyes, with the dreamy look imposed by thick contact lenses, were kindly. Sweeping across his flat chest were two rows of rainbow-bright Driver’s Ribbons. Two of the bronze accident stars were flanked by smaller stars which indicated limb replacements.

Belatedly, Tom noticed the desk’s aluminum placard which read *Harry Hayden, Final Examiner—Human.*

Tom thought, *Please, Harry Hayden, tell me I failed. Don’t lead up to it. Please come out and say I failed the tests.*

“Haven’t had much time to look over your file,” mused Harry Hayden. “Thomas Darwell Rogers. Occupation: journalism student. Unmarried. No siblings. Height, five-eleven. Weight, one-sixty-three. Age, twenty.”

Harry Hayden frowned. “Twenty?” he repeated, looking up.

*Oh, God, here it comes again.*

“Yes, sir,” said Tom Rogers.

Harry Hayden’s face hardened. “You’ve tried to enlist before? You were turned down?”

“This is my first application.”

Sudden hostility swept aside Harry Hayden’s expression of kindness. He scowled at Tom’s file. “Born July 18, 2020. This is July 16, 2041. In two days you’ll be twenty-one. We don’t issue new licenses to people over twenty-one.”

“I—I know, sir. The psychiatrists believe you adjust better to Driving when you’re young.”

“In fact,” glowered Harry Hayden, “in two days you’d have been classified as an enlistment evader. Our robo-statistics department would have issued an automatic warrant of arrest.”

“I know, sir.”

“Then why’d you wait so long?” The voice was razor-sharp.

Tom wiped a fresh burst of sweat from his forehead. “Well, you know how one keeps putting things off. I just—”

“You don’t put off things like this, boy. Why, my three sons were lined up here at five in the morning on their sixteenth birthdays. Every mother’s son of ’em. They’d talked of nothing else since they were twelve. Used to play Drivers maybe six, seven hours every day . . .” His voice trailed.

“Most kids are like that,” said Tom.

“Weren’t *you*?” The hostility in Harry Hayden seemed to be churning like boiling water.

“Oh, sure,” lied Tom.

“I don’t get it. You say you wanted to Drive, but you didn’t try to enlist.”

Tom squirmed.

*You can't tell him you've been scared of jetmobiles ever since you saw that crash when you were three. You can't say that, at seven, you saw your grandfather die in a jetmobile and that after that you wouldn't even play with a jetmobile toy. You can't tell him those things because five years of psychiatric treatment didn't get the fear out of you. If the medics didn't understand, how could Harry Hayden?*

Tom licked his lips. *And you can't tell him how you used to lie in bed praying you'd die before you were sixteen—or how you've pleaded with Mom and Dad not to make you enlist till you were twenty. You can't—*

Inspiration struck him. He clenched his fists. "It—it was my mother, sir. You know how mothers are sometimes. Hate to see their kids grow up. Hate to see them put on a uniform and risk being killed."

Harry Hayden digested the explanation for a few seconds. It seemed to pacify him. "By golly, that's right. Esther took it hard when Mark died in a five-car bang-up out of San Francisco. And when Larry got his three summers ago in Europe. Esther's my wife—Mark was my youngest, Larry the oldest."

He shook his head. "But it isn't as bad as it used to be. Organ and limb grafts are pretty well perfected, and with electro-hypnosis operations are painless. The only fatalities now are when death is immediate, when it happens before the medics get to you. Why, no more than one out of ten Drivers died in the last four-year period."

A portion of his good nature returned. "Anyway, your personal life's none of my business. You understand the enlistment contract?"

Tom nodded. *Damn you, Harry Hayden, let me out of here. Tell me I failed, tell me I passed. But damn you, let me out.*

"Well?" said Harry Hayden, waiting.

"Oh. The enlistment contract. First enlistment is for four years. Renewal any time during the fourth year at the option of the enlistee. Minimum number of hours required per week: seven. Use of unauthorized armour or offensive weapons punishable by \$5,000.00 fine or five years in prison. All accidents and deaths not witnessed by a Jetway 'copter-jet must be reported at once by visi-phone to nearest Referee and Medical Depot. Oh yes, maximum speed: 900 miles per."

"Right! You got it, boy!" Harry Hayden paused, licking his lips. "Now, let's see. Guess I'd better ask another question or two. This is your final examination, you know. What do you remember about the history of Driving?"

Tom was tempted to say, "Go to Hell, you fat idiot," but he knew that whatever he did or said now was of no importance. The robot-training tests he'd undergone during the past three weeks, only, were of importance.

Dimly, he heard himself repeating the phrases beaten into his mind by school history-tapes:

"In the 20th Century a majority of the Earth's peoples were filled with hatreds and frustrations. Hu-

manity was cursed with a world war every generation or so. Between wars, young people had no outlets for their energy, and many of them formed bands of delinquents. Even older people developed an alarming number of psychoses and neuroses.

"The institution of Driving was established in 1998 after automobiles were declared obsolete because of their great number. The Jetways were retained for use of young people in search of thrills."

"Right!" Harry Hayden broke in. "Now, the kids get all the excitement they need, and there are no more delinquent bands and wars. When you've spent a hitch or two killing or almost being killed, you're mature. You're ready to settle down and live a quiet life—just like most of the old-time war veterans used to do. And you're trained to think and act fast, you've got good judgment. And the weak and unfit are weeded out. Right, boy?"

Tom nodded. A thought forced its way up from the layer of fear that covered his mind. "Right—as far as it goes."

"How's that?"

Tom's voice quavered, but he said, "I mean that's part of it. The rest is that most people are bored with themselves. They think that by traveling fast they can escape from themselves. After four or eight years of racing at 800 per, they find out they can't escape after all, so they become resigned. Or, sometimes if they're lucky enough to escape death, they begin to feel important after all. They aren't so

bored then because a part of their mind tells them they're mightier than death."

Harry Hayden whistled. "Hey, I never heard that before. Is that in the tapes now? Can't say I understand it too well, but it's a fine idea. Anyway, Driving's good. Cuts down on excess population, too—and with Peru putting in Jetways, it's world-wide. Yep, by golly. Yes, sir!"

He thrust a pen at Tom. "All right, boy. Just sign here."

Tom Rogers took the pen automatically. "You mean, I—"

"Yep, you came through your robot-training tests A-1. Oh, some of the psycho reports aren't too flattering. Lack of confidence, sense of inferiority, inability to adjust. But nothing serious. A few weeks of Driving'll fix you up. Yep, boy, you've passed. You're getting your license. Tomorrow morning you'll be on the Jetway. You'll be Driving, boy, Driving!"

*Oh Mother of God, Mother of God . . .*

"And now," said Harry Hayden, "you'll want to see your Hornet."

"Of course," murmured Tom Rogers, swaying.

The paunchy man rose and led Tom down an aluminite ramp and onto a small observation platform some ninety feet above the ground.

A dry summer wind licked at Tom's hair and stung his eyes. Nausea twisted at his innards. He felt as if he were perched on the edge of a slippery precipice.

"There," intoned Harry Hayden, "is the Jetway. Beautiful, eh?"

"Uh-huh."

Trembling, Tom forced his vision to the bright, smooth canyon beneath him. Its bottom was a shining white asphalt ribbon, a thousand feet wide, that cut arrow-straight through the city. Its walls were naked concrete banks a hundred feet high whose reinforced lips curved inward over the antiseptic whiteness.

Harry Hayden pointed a chubby finger downward. "And there *they* are—the Hornets. See 'em, boy? Right there in front of the assembly shop. Twelve of 'em. Brand new DeLuxe Super-Jet '41 Hornets. Yes, sir. Going to be twelve of you initiated tomorrow."

Tom scowled at the twelve jet-mobiles shaped like flattened tear-drops. No sunlight glittered on their dead-black bodies. They squatted silent and foreboding, oblivious to sunlight, black bullets poised to hurl their prospective occupants into fury and horror.

*Grandpa looked so very white in his coffin, so very dead—*

"What's the matter, boy? You sick?"

"N—no, of course not."

Harry Hayden laughed. "I get it. You thought you'd get to *really* see one. Get in it, I mean, try it out. It's too late in the day, boy. Shop's closing. You couldn't drive one anyway. Regulation is that new drivers start in the morning when they're fresh. But tomorrow morning one of those Hornets'll be assigned to you. Delivered to the terminal nearest your home. Live far from your terminal?"

"About four blocks."

"Half a minute on the mobile-walk. What college you go to?"

"Western U."

"Lord, that's 400 miles away. You been living there?"

"No. Commuting every day on the monorail."

"Hell, that's for old women. Must have taken you over an hour to get there. Now you'll make it in almost thirty minutes. Still, it's best to take it easy the first day. Don't get 'er over 600 per. But don't let 'er fall beneath that either. If you do, some old veteran'll know you're a greenhorn and try to knock you off."

Suddenly Harry Hayden stiffened.

"Here come a couple! Look at 'em, boy!"

The low rumbling came out of the west, as of angry bees.

Twin pinpoints of black appeared on the distant white ribbon. Louder and louder the rumbling. Larger and larger the dots. To Tom, the sterile Jetway was transformed into a home of horror, an amphitheatre of death.

Louder and larger—

*Brooommmmmmm.*

Gone.

"Hey, how'ja like that, boy? They're gonna crack the sonic barrier or my name's not Harry Hayden!"

Tom's white-knuckled hands grasped a railing for support. *Christ, I'm going to be sick. I'm going to vomit.*

"But wait'll five o'clock or nine in the morning. That's when you see the traffic. That's when you *really* do some Driving!"

Tom gulped. "Is—is there a rest room here?"

"What's that, boy?"

"A—a rest room."

"What's the matter, boy? You *do* look sick. Too much excitement, maybe?"

Tom motioned frantically.

Harry Hayden pointed, slow comprehension crawling over his puffy features. "Up the ramp, to your right."

Tom Rogers made it just in time . . .

Many voices:

"Happy Driving to You,  
Happy Driving to You,  
Happy Driving, Dear Taaa-  
ahmmm—" (pause)  
"Happy Driving to—" (flourish)  
"—You!"

\* An explosion of laughter. A descent of beaming faces, a thrusting forward of hands.

Mom reached him first. Her small face was pale under its thin coat of make-up. Her firm, rounded body was like a girl's in its dress of swishing Martian silk, yet her blue eyes were sad and her voice held a trembling fear:

"You passed, Tom?" Softly.

Tom's upper lip twitched. Was she afraid that he'd passed the tests—or that he hadn't! He wasn't sure.

Before he could answer, Dad broke in, hilariously. "Everybody passes these days excepts idiots and cripples!"

Tom tried to join the chorus of laughter.

Dad said, more softly, "You *did* pass, didn't you?"

"I passed," said Tom, forcing a smile. "But, Dad, I didn't want a surprise party. Really, I—"

"Nonsense." Dad straightened. "This is the happiest moment of our lives—or at least it *should* be."

Dad grinned. An understanding, intimate and gentle, flickered across his handsome, gray-thatched features. For an instant Tom felt that he was not alone.

Then the grin faded. Dad resumed his role of proud and blustering father. Light glittered on his three rows of Driver's Ribbons. The huge Blue Ribbon of Honor was in their center, like a blue flower in an evil garden of bronze accident stars, crimson fatality ribbons and silver death's-heads.

In a moment of desperation Tom turned to Mom. The sadness was still in her face, but it seemed overshadowed by pride. What was it she'd once said? "It's terrible, Tom, to think of your becoming a Driver, but it'd be a hundred times more terrible *not* to see you become one."

He knew now that he was alone, an exile, and Mom and Dad were strangers. After all, how could one person, entrenched in his own little world of calm security, truly know another's fear and loneliness?

"Just a little celebration," Dad was saying. "You wouldn't be a Driver unless we gave you a real send-off. All our friends are here, Tom. Uncle Mack and Aunt Edith and Bill Ackerman and Lou Dorrance—"

No, Dad, Tom thought. Not our friends. *Your* friends. Don't you re-

member that a man of twenty who isn't a Driver has no friends?

A lank, loose-jowled man jostled between them. Tom realized that Uncle Mack was babbling at him.

"Knew you'd make it, Tom. Never believed what some people said 'bout you being afraid. My boy, of course, enlisted when he was only seventeen. Over thirty now, but he still Drives now and then. Got a special license, you know. Only last week—"

Dad exclaimed, "A toast to our new Driver!"

Murmurs of delight. Clinkings of glasses. Gurglings of liquid.

Someone bounded a piano chord. Voices rose:

"A-Driving he will go,  
A-Driving he will go,  
To Hell and back in a coffin-  
sack  
A-Driving he will go."

Tom downed his glass of champagne. A pleasant warmth filled his belly. A satisfying numbness dulled the raw ache of fear.

He smiled bitterly.

There was kindness and gentleness within the human heart, he thought, but like tiny inextinguishable fires, there were ferocity and savageness, too. What else could one expect from a race only a few thousand years beyond the spear and stone axe?

Through his imagination passed a parade of sombre scenes:

The primitive man dancing about a Paleolithic fire, chanting an invocation to strange gods who might help in tomorrow's battle

with the hairy warriors from the South.

The barrel-chested Roman gladiator, with trident and net, striding into the great stone arena.

The silver-armored knight, gauntlet in gloved hand, riding into the pennant-bordered tournament ground.

The rock-shouldered fullback trotting beneath an avalanche of cheers into the 20th Century stadium.

Men needed a challenge to their wits, a test for their strength. The urge to combat and the lust for danger was as innate as the desire for life. Who was he to say that the law of Driving was unjust?

Nevertheless he shuddered.

And the singers continued:

"A thousand miles an hour,  
A thousand miles an hour,  
Angels cry and devils sigh  
At a thousand miles an  
hour . . ."

**T**HE JETMOBILE terminal was like a den of chained, growling black tigers. White-cloaked attendants scurried from stall to stall, deft hands flying over atomic-engine controls and flooding each vehicle with surging life.

Ashen-faced, shivering in the early-morning coolness, Tom Rogers handed an identification slip to an attendant.

"Okay, kid," the rat-faced man wheezed, "there she is—Stall 17. Brand new, first time out. Good luck."

Tom stared in horror at the

grumbling metal beast.

"But remember," the attendant said, "don't try to make a killing your first day. Most Drivers aren't out to get a Ribbon every day either. They just want to get to work or school, mostly, and have fun doing it."

*Have fun doing it*, thought Tom. *Good God.*

About him passed other black-uniformed Drivers. They paused at the heads of their stalls, donned crash-helmets and safety belts, adjusted goggles. They were like primitive warriors, like cocky Roman gladiators, like armored knights, like star fullbacks. They were formidable and professional.

Tom's imagination wandered.

*By Jupiter's beard, we'll vanquish Attila and his savages. We'll prove ourselves worthy of being men and Romans . . . The Red Knight? I vow, Mother, that his blood alone shall know the sting of the lance . . . Don't worry, Dad. Those damned Japs and Germans won't lay a hand on me . . . Watch me on TV, folks. Three touchdowns today—I promise!*

The attendant's voice snapped him back to reality. "What you waiting for, kid? Get in!"

Tom's heart pounded. He felt the hot pulse of blood in his temples.

The Hornet lay beneath him like an open, waiting coffin.

He swayed.

"Hi, Tom!" a boyish voice called. "Bet I beat ya!"

Tom blinked and beheld a small-boned, tousled-haired lad of seventeen striding past the stall. What

was his name? Miles. That was it. Larry Miles. A frosh at Western U.

A skinny, pimply-faced boy suddenly transformed into a black-garbed warrior. How could this be?

"Okay," Tom called, biting his lip.

He looked again at the Hornet. A giddiness returned to him.

You can say you're sick, he told himself. It's happened before: a hangover from the party. Sure. Tomorrow you'll feel better. If you could just have one more day, just one—

Other Hornets were easing out into the slip, sleek black cats embarking on an insane flight. One after another, grumbling, growling, spitting scarlet flame from their tail jets.

Perhaps if he waited a few minutes, the traffic would be thinner. He could have coffee, let the other nine-o'clock people go on ahead of him.

*No, dammit, get it over with. If you crash, you crash. If you die, you die. You and Grandpa and a million others.*

He gritted his teeth, fighting the omnipresent giddiness. He eased his body down into the Hornet's cockpit. He felt the surge of incredible energies beneath the steelite controls. Compared to this vehicle, the ancient training jets were as children's toys.

An attendant snapped down the plexite canopy. Ahead, a guide-master twirled a blue flag in a starting signal.

Tom flicked on a switch. His trembling hands tightened about the steering lever. The Hornet

lunged forward, quivering as it was seized by the Jetway's electromagnetic guide-field.

He drove . . .

One hundred miles an hour, two hundred, three hundred.

Down the great asphalt valley he drove. Perspiration formed inside his goggles, steaming the glass. He tore them off. The glaring whiteness hurt his eyes.

Swish, swish swish.

Jetmobiles roared past him. The rushing wind of their passage buffeted his own car. His hands were knuckled white around the steering lever.

He recalled the advice of Harry Hayden: Don't let 'er under 600 per. If you do, some old veteran'll know you're a greenhorn and try to knock you off.

Lord. Six hundred.

But strangely, a measure of desperate courage crept into his fear-clouded mind. If Larry Miles, a pimply-faced kid of seventeen, could do it, so could he. Certainly, he told himself.

His foot squeezed down on the accelerator. Atomic engines hummed smoothly.

To his right, he caught a kaleidoscopic glimpse of a white gyro-ambulance. A group of metal beasts lay huddled on the emergency strip like black ants feeding on a carcass.

*Like Grandfather, he thought. Like those two moments out of the dark past, moments of screaming flame and black death and a child's horror.*

Swish.

The scene was gone, transformed

into a cluster of black dots on his rear-vision radarscope.

His stomach heaved. For a moment he thought he was going to be sick again.

But stronger now than his horror was a growing hatred of that horror. His body tensed as if he were fighting a physical enemy. He fought his memories, tried to thrust them back into the oblivion of lost time, tried to leave them behind him just as his Hornet had left the cluster of metal beasts.

He took a deep breath. He was not going to be sick after all.

Five hundred now. Six hundred. He'd reached the speed without realizing it. Keep 'er steady. Stay on the right. If Larry Miles can do it, so can you.

*Swoommmm.*

God, where did *that* one come from?

Only ten minutes more. You'll be there. You'll make a right hand turn at the college. The automatic pilot'll take care of that. You won't have to get in the fast traffic lanes.

He wiped perspiration from his forehead. Not so bad, these Drivers. Like Harry Hayden said, the killers come out on Saturdays and Sundays. Now, most of us are just anxious to get to work and school.

Six hundred, seven hundred, seven-twenty—

Did he dare tackle the sonic barrier?

The white asphalt was like opaque mist. The universe seemed to consist only of the broad expanse of Jetway.

*Swoommmm.*

Someone passing even at this



speed! The crazy fool! And cutting in, the flame of his exhaust clouding Tom's windshield!

Tom's foot jerked off the accelerator. His Hornet slowed. The car ahead disappeared into the white distance like a black arrow.

Whew!

His legs were suddenly like ice water. He pulled over to the emergency strip. Down went the speedometer—five hundred, four, three, two, one, zero . . .

He saw the image of the approaching Hornet in his rear-vision radarscope. It was traveling fast and heading straight toward him. Heading on the emergency strip.

A side-swiper!

Tom's heart churned. There would be no physical contact between the two Hornets—but the torrent of air from the inch-close passage would be enough to hurl his car into the Jetway bank like a storm-blown leaf.

There was no time to build enough acceleration for escape. His only chance was to frighten the attacker away. He swung his Hornet right, slammed both his acceleration and braking jet controls to full force. The car shook under the sudden release of energy. White-hot flame roared from its two dozen jets. Tom's Hornet was enclosed by a sphere of flame.

But dwarfing the roar was the thunder of the attacking Hornet. A black meteor in Tom's radarscope, it zoomed upon him. Tom closed his eyes, braced himself for the impact.

There was no impact. There was only an explosion of sound and a

moderate buffeting of his car. It was as if many feet, not inches, had separated the two Hornets.

Tom opened his eyes and flicked off his jet controls.

Ahead, through the plexite canopy, he beheld the attacker.

It was far away now, like an insane, fiery black bird. Both its acceleration and braking jets flamed. It careened to the far side of the Jetway and zig-zagged up the curved embankment. Its body trembled as its momentum fought the Jetway's electromagnetic guide-field.

As if in an incredible carnival loop-the-loop, the Hornet topped the lip of the wall. It left the concrete, did a backward somersault, and gyrated through space like a flaming pinwheel.

It descended with an earth-shaking crash in the center of the gleaming Jetway.

*What happened?* Tom's dazed mind screamed. *In God's name, what happened?*

He saw the sleek white shape of a Referee's 'copter-jet floating to the pavement beside him. Soon he was being pulled out of his Hornet. Someone was pumping his hand and thumping his back.

"Magnificent," a voice was saying. "Simply magnificent!"

Night. Gay laughter and tinkling glasses. Above all, Dad's voice, strong and proud:

". . . and on his very first day, too. He saw the car in his rear radarscope, guessed what the devil was up to. Did he try to escape? No, he stayed right there. When

the car closed in for the kill, he spun around and turned on all his jets full-blast. The killer never had a chance to get close enough to do his side-swiping. The blast roasted him like a peanut."

Dad put his arm around Tom's shoulder. All eyes seemed upon Tom's bright new crimson fatality ribbon embossed not only with a silver death's-head, but also with a sea-blue Circle of Honor.

Tom thought:

*Behold the conquering hero. Attila is vanquished and Rome is saved. The Red Knight has been defeated, and the fair princess is mine. That Jap Zero didn't have a chance. A touchdown in the final five seconds of the fourth quarter—not bad, eh?*

Dad went on:

"That devil really *was* a killer. Fellow name of Wilson. Been Driving for six years. Had thirty-three accident ribbons with twenty-one fatalities—not one of them honorable. That Wilson drove for just one purpose: to kill. He met his match in our Tom Rogers."

Applause from Uncle Mack and Aunt Edith and Bill Ackerman and Lou Dorrance—and more important, from young Larry Miles and big Norm Powers and blonde Geraldine Oliver and cute little Sally Peters.

Tom smiled. Not only *your* friends tonight, Dad. Tonight it's *my* friends, too. *My* friends from Western U.

Fame was as unpredictable as the trembling of a leaf, Tom thought, as delicate as a pillar of glass. Yet the yoke of fame rested pleasantly on his shoulders. He had no inclination to dislodge it. And while a fear was still in him, it was now a fragile thing, an egg shell to be easily crushed.

Later Mom came to him. There was a proudness in her features, and yet a sadness and a fear, too. Her eyes held the thoughtful hesitancy of one for whom time and event have moved too swiftly for comprehension.

"Tomorrow's Saturday," she murmured. "There's no school, and no one'll expect you to Drive after what happened today. You'll be staying home for your birthday, won't you, Tom?"

Tom Rogers shook his head. "No," he said wistfully. "Sally Peters is giving a little party over in New Boston. It's the first time anyone like Sally ever asked me anywhere."

"I see," said Mom, as if she really didn't see at all. "You'll take the monorail?"

"No, Mom," Tom answered very softly. "I'm Driving." • • •

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The world has begun to fear that science has destroyed the ancient values and put nothing in their place. What has really happened, of course, is that science has shown in harsh relief the division between our values and our world.

—J. Bronowski

*Valaya was a primitive so-*  
*ciety, yet the natives had a*  
*way of communicating that*  
*had the experts stumped . . .*

***s h a n g o***

**T**HIS," SAID chief Van Isaac, "is our new trouble spot," The older man's rodlike finger probed decisively at a violet dot placed on a thin yellow line of a circle, third out from a sun. Other dots peppered the giant glazed star map, companions of which hung on the other three walls of the chamber. "Valaya is the name of the place," Van Isaac continued. "Perhaps you know something about it."

"Not much," said the other, a thirtyish, lean man by the name of Arnold Koven. "I mean, not a great deal besides what the telefilms have screamed for the past two weeks. Revolution, slaughter, tribe against tribe." Koven placed a cigarette between his lips, and his eyes smiled with gentle cynicism. "Valaya has a creole sound."

"You'll have no vacation, believe

**BY JOHN JAKES**

me," Van Isaac responded. "During the colonization, Valaya was peopled largely by residents of the Caribbean. The inhabitants have intermarried over the past sixty years, so there is a slight blue Martian strain. Valaya was seeded with sugar and tin to provide for economy, but left rather backward—by choice of the colonists." Koven

bled into focus.

"The raids are the combined effort of the people of the north continent, which is small. The attacks are focused across the channel to the larger south continent. Somehow, the people on North have been inveigled into believing they have a right to South. Our only bit of information is that



*Illustrated by Paul Orban*

moved his eyes from the star map to his superior.

"Have you localized the trouble?"

"Yes. These raids have moved from the small north continent—" Van Isaac touched one of a row of studs on the desk. An immense rear projection lantern view on the wall where the map had been, set-

a man named Bruschlöss—" Koven suddenly straightened in the theatrical gloom where his cigarette smoke floated torpidly. "Bruschlöss? The one you used to call The Hog?"

"The Hog, yes. He is a citizen of the Betelgeuse Bloc with right-of-entry to any of our planets. He claims to be solely interested in set-

ting up a trading company on Valaya, with headquarters at the village of Maru. But the attacks date from two weeks after he arrived. So," said Van Isaac, tone hardening, "I know he is undoubtedly behind all this, and I want him stopped."

"Any G. C. I. A. men around Maru?" Koven inquired.

"The local agent for the continent, named Spotwood. He says Bruschloss has conversed privately with the local ruler. Spotwood couldn't plant cameras or sound equipment at the conferences—our own blasted code forbids it. But the rub is that the ruler has in no way communicated with any of the other tribes on North. *In no way*," Van Isaac repeated, with a fist on the desk for emphasis. "They have drums. The drums say nothing Spotwood can't understand. All perfectly innocent. They have runners. No runners. No flare signals. No secret meetings. Spotwood has hired three or four dozen breeds to do his spying, but he has absolutely no idea of how the ruler manages to organize the other tribes into these precise, well-timed, well-generated raids across the strait."

"I'm to find out?" asked Koven.

"And stop the proceedings?"

"Exactly. Spotwood's good, but . . ."

At the spaceport, Koven pushed his way through the jabbering crowd, checked his baggage onto the Valaya flight, had coffee, and got something to read from a Vendobook. He chose a volume entitled *The Twilight of Meaning-*

*ism*, by Dr. Reywill of Memphis University. As the long iron dagger of the rocket cut burning through the blue curtain of the sky, he settled down in his compartment to read.

Dr. Reywill's work turned out to be an historical analysis of the forces which, toward the end of the twentieth century, catalyzed the arts into pure sensation, utterly devoid of meaning or communication. During the middle of that century, with poetry restricted to the hands of the few who wailed that their mechanized age did not understand them, poetry became exceedingly private in imagery and meaning. In a natural evolution, it completely lost all meaning and became a charming musical form several cuts above the primitive. When the masses found they could merely accept verse as a pleasantry whose sound intrigued them as a rattle intrigues a child, poetry, regained its audience. The same condition held true for music, the dance, painting and sculpture. To Koven, born when Meaningism was two hundred years dead, the notion that a poem could say something seemed quaint and even a trifle peculiar.

Twenty-eight hours later Koven landed in Maru, knowing a good deal more about the history of contemporary poetry, but knowing nothing which would help him unravel the puzzle of the raids.

"**N**O, VAN ISAAC wasn't kidding," Jimmy Spotwood said. "The colonization board worked

Valaya over from one end to the other. This is genuine, authentic and otherwise real tropicana."

Koven stood at the window of Spotwood's shack, which looked down a long street to the central clearing which formed the cross-roads of Maru. Bluish sky spread out overhead like sheets of hot metal, and the almost poisonously colorful foliage stuttered gently in a hot breeze. The nearly undressed inhabitants, skins belying only a touch of the bluish blood from Mars, idled along from hut to hut, talking or playing with the children. The only note of turmoil was sounded by the slapping skin drums from the far side of the village. Koven turned around to his host.

"Are they beating the drums for any purpose?" he wanted to know.

Spotwood took a drink from a sanitary plastic bubble. "Once a month everybody on North gets together for a shindig." He smirked with good-natured lasciviousness. "The whole rigamarole is years old. Guarantees that plenty of good strong babies will be born, and that the crops won't fail, or some such rot. O'course," Spotwood said laconically, "this monthly assembly would be the logical time to suspect, if they ever did anything but put on a sexual exhibition in that clearing down the road. Maybe," he added, "the head dancer's pelvis—a female, by the way—is tattooed with a message in some sort of invisible ink our poor old Earth eyes can't see. Her belly gyrations would guarantee high readership, if nothing else."

Koven smiled thinly, as a knock

rattled on the slatted door.

Spotwood's eyes slitted down and jumped briefly to Koven's, in a glance which the latter interpreted to read, *News isn't slow in Maru. I'll bet this is the prime mover.* Koven instinctively patted the flat pistol beneath his coat, his back to the door as Spotwood opened it.

"I understand we have a visitor in the village," came the sound of an unpleasant, wet and wheezing voice.

"You're right," said Spotwood. "Come on in, Bruschloss."

Molding his face into a careful expression of relaxed disinterest, Koven turned around to face The Hog.

Bruschloss extended a pink gobby hand. "Koven, did you say? I'm always delighted to see anyone here with Earth blood in his veins." He laughed self-consciously, and the rolling folds of his belly quivered. "Even though we are on opposite sides of the political fence we can still be friends, I hope. You arrived at a good time. Tonight's the celebration." He seemed to breathe more quickly at the thought; he savored the words like a man aroused by a fetish.

"Spotwood's been telling me," Koven said.

"Has he, eh? He enjoys them too, I'll wager." No reply from Spotwood, save the pop of another gin globe being opened.

"Have a drink, Bruschloss?" Spotwood asked.

"No, I don't think so. Liquor makes me very sleepy. I want to be alert for the ceremony tonight. I love to watch Chemin dance."

"Quite a woman," Spotwood agreed.

"Er . . . what is your line of business?" inquired Bruschloss of Koven, elevating the wrinkles on his steaming forehead into an expression of curiosity.

"I came to help Jimmy finish up in a hurry."

"Trying to discover whether you might seed Valaya for platinum?" asked Bruschloss with perfect innocence.

Spotwood snickered. "What's the matter with you, Bruschloss? Are you sure you haven't had a drink? You know it's petro I'm after."

"Of course! I am stupid, forgive me." A self-conscious pause ensued, while no one spoke. Then Bruschloss, as if snatching at any clue that might tell him more about the visitor to Maru, spied Koven's book, slung carelessly along with his other gear on the deal table. "A book!" exclaimed The Hog, rolling forward. "Mr. Koven, it delights me to find a literate man in this wilderness." He turned a few pages, leaving black sweaty thumb prints on the thin plastic leaves.

"The disappearance of meaning from poetry, eh?" he said, snapping the book closed. "I must read it some time, if you'll lend it."

Koven said he would, and Bruschloss made a quick exit. He seemed to do things in opposites. First he had been straining to remain and keep conversation alive. Last, he had been straining to leave as rapidly as possible. In spite of the man's slovenly appearance, Koven knew he had a dangerous enemy. Bruschloss would have had

to be an utter moron to believe that Koven had come to Maru simply to aid Spotwood. Spotwood himself, as if sensing Koven's appraisal of the man from the Betelgeuse Bloc, spoke:

"Watch him. He's got three uglies up at his place who do nothing all day but drink and play cards. They're here in case of trouble."

Koven smiled thinly. "I hope we can accommodate them."

Toward the end of the sixteen-hour-day, after Spotwood had prepared dinner from food cubes, Koven decided to take a stroll around the village. The citizens hardly gave him a glance, engrossed in eating within their houses. From glimpses Koven caught, they hardly looked like a warlike crew, and yet he had read the tales of atrocities committed across the strait on South, and he felt a crawly sensation on his spine. Tonight, perhaps, plans would be laid for the next attack, while he knew nothing about the process which would probably go on right around him. Certainly the people of Valaya weren't 'paths. He knew that much.

Koven crossed the central clearing and turned left toward the village fringe. He passed the final few dwellings and turned left again, up a slight wooded rise, back across which he could reach Spotwood's house. As he crossed the spine of the ridge, he thought he noticed a movement along to his right, and turned in that direction. He caught sight of an arm arching for-

ward, and a small circular object spiraling down toward his head through the spicy air. Instinctively trained, Koven pumped his legs and slid out forward along the ground, rolling, watching the object go spinning crazily by against the darkening heavens. He extended an arm, caught a tree and jerked himself around into the protection of its thick trunk as a flat explosion tore the air and smashed his eardrums. He closed his eyes tightly. The blazing white flash lasted only a second.

Struggling up, he had time only to see the scooped-out pit along the spine's crest, smoking like a raw wound, where the bomb had struck. Boots bit earth, coming in his direction at a dead run. Koven crouched in tree shadow, hoping that his adversary had not seen him scramble to safety in the illusive light on the hill. He snaked the flat pistol free of its casing just as the attacker broke through a clump of brush. Koven had a fleeting impression of massive size, a meaty face and short spiky dark hair. Then he was on his feet, charging against his enemy, who abruptly saw him and ground to a halt.

The attacker's mouth made a red startled O, and one heavy hand labored to bring up a heavy pistol. But Koven had already fired. The pale thin beam lanced out in complete silence. The enemy dropped his weapon but had no time to utter a sound. The skin of his head began to blacken and fall away in charring strips. Koven always felt relieved when a man shot like that fell, for he did not have to look at

the bubbling horror of burning flesh and gristle.

Swinging around, Koven scrutinized the village. No clamor, no outcry had been made. The central street overflowed now, for the short night had nearly begun, and torches began to flare, throwing up great roiling shadows on the trees as the crowd babbled and pressed down to the main clearing.

Why in the name of sense had the attack come now? at this precise moment? Spotwood had been in Maru for months, and had said nothing about any sort of attack on him. Certainly Brus Schloss suspected Spotwood. All men from Earth had to be suspect here, to a man from the Betelgeuse Bloc. Therefore something about himself which, offhand, he couldn't pinpoint, had driven The Hog far enough into fear to send this attacker.

This point Spotwood verified after Koven jogged back to the house at a run. Spotwood scratched his chin and whistled. "Why the blazes is he after you right away?" Spotwood asked.

"I'm wondering the same."

"He must think you've found out how he organizes the raids."

"That's the hell of it. I haven't."

From the central clearing came a staccato increase in the tempo of the drumming. Spotwood swiveled around, listening, while Koven continued to scowl dismally at the floor. Spotwood snagged a light coat from the corner and slipped into it. "They'll be starting in a minute. Come on." Once again he managed to grin. "You don't want



to miss Chemin. They call the dance a shango. I often wince when I think what a pastor would call it."

Koven followed Spotwood from the shanty, and they trudged down the blue-lit street toward the swaying mob in the clearing. Koven quickly outlined a few facts to his companion. They must pretend not to notice the surprise on the face of Bruschluss, which would certainly be present when Koven turned up alive. Moreover, Koven made it clear that they should not even look the least suspiciously in The Hog's direction.

"Tough order," Spotwood offered. "Bruschluss sees you alive, he knows you probably saw, and killed, the man who tried to get you. He figures you described the killer to me, and also figures I pegged him down for you as one of his assistants."

"Still, let's try to bluff it out."

They pressed through the edges of the crowd, ignored, for the watchers concentrated upon the figures diving and turning and stamping their feet on the earth in the center of the ring, clad in feathers and little else, skins shining and polished by sweat in the bubbling light of the ghastly blue flares. Spotwood shouldered off to stand a fair distance away, and Koven found a slight break in the crowd and crouched down on his haunches, stabbing a cigarette into his mouth. From the rear of the circle a young girl appeared, very beautiful, with a tuft of feathers at her hip, and her breasts oiled and glowing like metal cones. Koven

gathered this was Chemin, for the name passed on many tongues. A circle of male dancers closed around her.

Koven kept his head straight front, but moved his eyes in their sockets, so that he could see Bruschluss, backed up by two men with thick shoulders standing directly behind. The trio blurred almost out of sight at the edge of Koven's line of vision. Bruschluss sat bent forward, his rolled belly heaving, and the sweaty, stubbled skin of his face looking rotted in the blue light. He followed each movement of the dancer Chemin with obscene concentration, but Koven, switching his eyes front, had the unpleasant feeling that the two burly companions were scrutinizing him.

Chemin's dance became less sexual for a few moments, became the sort of dance you might almost expect to see on a photovision variety hour; a dance without specific meaning.

Abruptly the palms of Koven's hands felt wet.

He lurched to his feet and searched the crowd for Spotwood. The crowd seemed intensely quiet during Chemin's performance. Each man had his eyes riveted to the flying hands and undulating body of the girl in the center. Koven inched his way free of the crowd, still keeping watch on the dance. He just broke from the edges as Chemin disappeared into the darkness from which she had come, and pairs of males and females, with sharp, biting cries, began again the ritual.

With a throbbing in his nerves

that always came when he was very close to something he worked for, Koven cut around a series of huts in time to see the girl Chemin disappear into one of them. Looking left and right, seeing no one except the crowd at the rear of the hut forming this edge of the ring, he eased out the pistol and stepped through the hangings.

Chemin sat with her head resting wearily on her arms, as if the dancing had drained her last reserve of energy. The light scuff of Koven's shoes on dirt caused her to whip her head up, and he realized again how attractive she was, in spite of the perspiration filming her body and the tired haggardness of her features.

"Don't make a single sound," he warned. "I'll fire."

Gradually the spasmodic quivering in her throat subsided. "You are the new man here with Spotwood," she said, frightened.

Koven nodded. "I came to find out how Bruschloss organized the attacks on South, through your ruler." The Hog's name washed the light of truth for a moment into her eyes, and Koven pressed on, sure. "We didn't know how the plans for attack were circulated on this continent. But you've been giving the plans, out there in the ring. That solo dance had a meaning."

"Fertility . . ." she began.

"Oh, no. Before and after it, yes. But the women paid no attention to your solo dance. The men did. They were attentive. They were waiting for and receiving orders, weren't they? Orders your ruler had to give through a dance, be-

cause Spotwood was here, and you couldn't dare give them in a way he might understand."

"You are wrong."

Koven stepped forward and pressed the pistol against Chemin's breast. In the badly-lit tent he could still see the flesh of that breast harden. "Am I wrong?"

A tiny tongue caressed her lips in anxiety. "What are you going to do with me?"

"Do you have more to tell them?"

"No, I . . ."

"Tell the truth." The pistol muzzle ground an ugly white pit in her flesh.

"Yes, I have more."

"When you dance, tell the people to kill Bruschloss and his two men, immediately. Orders from your ruler. Bruschloss is a traitor, tell them."

Aghast: "I could not . . ."

"Would you rather die?"

"The ruler will know . . ."

"You show me where he is sitting. I'll take care of him. If you should give the wrong message when you dance . . . if they should turn on me, I'll still manage to kill you before they get me. So it's entirely up to you whether you live or die." He recognized acceptance in her bowed neck. "I want you to show me how the dance works. Show me the motions, the gestures you use to explain plans for the attack."

Chemin gazed obliquely at him with tormented eyes. Then she crossed her wrists and moved her fingers in a fluttering motion. "This is the sign for a small peninsula

south of here, on the strait. This . . ." She pantomimed again. ". . . is the sign which means meeting place. This . . ." And so she rehearsed the various signals, and then the message Koven had issued, while he kept his pistol trained on her. He knew now what had alarmed Bruschluss, what had prompted the attack so suddenly.

**CHEMIN DANCED**, in the ring again. Koven stood almost directly behind the ruler, fitting a tiny cylindrical attachment to the muzzle of his pistol, to reduce the power for close range. Once more the men glued their eyes on the dancing figure. Seconds after the dance had begun, the ruler uttered a sharp gasp and lurched up from his woven chair as he read the new message. Koven's hand touched him and he stepped around the chair in the darkness. Koven slid the pistol forward and triggered it. Only a faint white glow showed flush against the belly of the ruler. With the smell of burned flesh eating in his nostrils, Koven lowered the ruler's body to the ground. The crowd to either side had surged forward slightly, beginning to talk curiously now, paying no attention to Koven. Across the ring, Bruschluss blinked and gestured sweatily, while his two assistants closed in tight against his shoulders. The drums slapped in a frenzy.

Koven saw a man break from the edge of the ring and lurch across toward Bruschluss. Chemin stopped her dance, collapsing to her knees. One of Bruschluss' men shot the

first attacker, but by then the crowd had broken, and men boiled forward, and Koven heard The Hog's scream as a sea of writhing backs and arms and legs closed over him. The sounds were gruesome.

Koven turned and raced up the long street to Spotwood's house. The seemingly careless agent reeled in moments later, to hear Koven finishing at the communicator set: ". . . that's right, two Control squads. And for God's sake make it within twenty minutes, before they decide to massacre us." He threw down a switch and swung around on the stool, grinning lopsidedly. Down the long avenue echoed screams, and an angry mob shouting.

"Bang! Like that!" Spotwood breathed. "What the hell happened?"

Koven sketched it quickly.

"You knew," Spotwood said in astonishment, pointing to the table, "because of that book you happened to read?"

Koven nodded. "The arts no longer convey meaning, but the ruler of Maru managed to put it back in. Something you didn't look for. Something I wouldn't have looked for . . . if I hadn't stopped at a Vendobook."

"You think they'll come after us?" Spotwood asked.

Koven glanced out the window. At the street's end, pieces of something meaty and red had been hoisted up by the crowd on long, sharp poles. They glistened in the flaring light.

"They may. They're in a wild

mood. Once Control takes over, though, the attacks will be a thing of the past. But until then . . ."

"Holy God," Spotwood breathed. He went toward a cupboard, stopped at the table and glanced down. Nearly in awe, he read aloud, "*The Twilight of Meaningism*. Mph." An emphatic shake of the head. Then he unlimbered a

pistol from the cupboard, and they sat down to wait.

Twenty-three minutes later 'copters were snarling across the night over the village, and beams cut swathes back and forth over a sea of tossing bluish faces. Spotwood stood up with a sigh, stretched and took down two gin bubbles, saying to Koven, "Have a drink." • • •

## WHAT IS YOUR SCIENCE I.Q.?

HERE'S SOME technical jargon every avid science fiction fan should know. How science wise are you? Score 10 points for each correct answer: 70 is good; 80 is very good; 90 or over makes you a real whizz. Answers on page 112.

1. What theory states that every even number can be written as the sum of two prime numbers?
2. For a circular orbit to be maintained around the Earth like that of the moon a velocity of — m.p.h. is the minimum necessary.
3. Which metal has the highest known melting point?
4. A parsec is a measure of interstellar space equal to a distance of — light years.
5. What is the only naked-eye object visible in the southern sky which isn't part of our own galaxy?
6. Prime numbers get — as we move into larger figures.
7. What is another name for a gnomonic projection?
8. The number 1 followed by a hundred zeros is known as a —.
9. Which planet has a density so low that it's actually less than that of water?
10. The basic distinction between animals and plants is that animals have no —.
11. Do non-metals show more extreme melting points than the two extremes in the metal family?
12. Cosmic ray intensity varies with the latitude because of Earth's —.

*The tiny, live, straw-colored circles were mysterious but definitely harmless. Yet they were directly responsible for riots, revolution and an atomic war . . .*

# THE margenes

**T**HERE IS a small striped smelt called the grunion which has odd egg-laying habits. At high tide, on the second, third, and fourth nights after the full of the moon from March to June, thousands of female grunions ride in on the waves to a beach in southern California near San Diego, dig tail-first into the soft sand, deposit their eggs, then ride back on the wash of the next wave. The whole operation lasts about six seconds.

On the nights when the grunion are running, hordes of people used

to come to the beach with baskets and other containers, and with torches to light the scene, and try to catch the elusive little fish in their hands.

They were doing that on an April night in 1960. In the midst of the excitement of the chase, only a few of them noticed that something else was riding the waves in with the grunions.

Among the few who stopped grunion-catching long enough to investigate were a girl named Marge Hickin and a boy named

BY MIRIAM ALLEN DE FORD

Gene Towanda. They were UCLA students, "going together", who had come down on Saturday from Los Angeles for the fun.

"What on earth do you think these can be, Gene?" Marge asked, holding out on her palms three or four of the little circular, wriggling objects, looking like small-size doughnuts, pale straw in color.

"Never saw anything like them," Gene admitted. "But then my major's psychology, not zoology. They don't seem to bite, anyway. Here let's collect some of them instead of the fish. That dingus of yours will hold water. We can take them to the Marine Biology lab tomorrow and find out what they are."

Marge Hickin and Gene Towanda had started a world-wide economic revolution.

None of the scientists at the university laboratory knew what the little live straw-colored circles were, either. In fact, after a preliminary study they wouldn't say positively whether the creatures were animal or vegetable; they displayed voluntary movement, but they seemed to have no respiratory or digestive organs. They were completely anomalous.

The grunion ran again that night, and Gene and Marge stayed down to help the laboratory assistants gather several hundred of the strange new objects for further study. They were so numerous that they were swamping the fish, and the crowds at the beach began to grumble that their sport was being spoiled.

Next night the grunion stopped running—but the little doughnuts

didn't. They never stopped. They came in by hundreds of thousands every night, and those which nobody gathered wriggled their way over the land until some of them even turned up on the highways (where a lot of them were smashed by automobiles), on the streets and sidewalks of La Jolla, and as far north as Oceanside and as far south as downtown San Diego itself.

The things were becoming a pest. There were indignant letters to the papers, and editorials were written calling on the authorities to do something. Just what to do, nobody knew; the only way to kill the circular little objects from the sea seemed to be to crush them—and they were too abundant for that to be very effective.

Meanwhile, the laboratory kept studying them.

Marge and Gene were interested enough to come down again the next week-end to find out what, if anything, had been discovered. Not much had: but one of the biochemists at the laboratory casually mentioned that chemically the straw-colored circles seemed to be almost pure protein, with some carbohydrates and fats, and that apparently they contained all the essential vitamins.

College student that he was, Gene Towanda immediately swallowed one of the wriggling things down whole, as a joke.

It tickled a little, but that wasn't what caused the delighted amazement on his face.

"Gosh!" he exclaimed. "It's delicious!"

He swallowed another handful.

That was the beginning of the great *margene* industry.

It was an astute reporter, getting a feature story on the sensational new food find, who gave the creatures their name, in honor of the boy and girl who had first brought the things to the attention of the scientists. He dubbed them *margenes*, and *margenes* they remained.

"Dr. O. Y. Willard, director of the laboratory," his story said in part, "thinks the *margenes* may be the answer to the increasing and alarming problem of malnutrition, especially in undeveloped countries.

"For decades now," he said, "scientists have been worried by the growing gap between world population and world food facilities. Over-farming, climatic changes caused by erosion and deforestation, the encroachment of building areas on agricultural land, and above all the unrestricted growth of population, greatest in the very places where food is becoming scarcest and most expensive, have produced a situation where, if no remedy is found, starvation or semi-starvation may be the fate of half the Earth's people. The ultimate result would be the slow degeneration and death of the entire human race.

"Many remedies have been suggested," Dr. Willard commented further. "They range from compulsory birth control to the production of synthetic food, hydroponics, and the harvesting of plankton from the oceans. Each of these presents almost insuperable difficulties.

"The one ideal solution would be the discovery of some universal food that would be nourishing, very cheap, plentiful, tasty, and that would not violate the taboos of any people anywhere in the world. In the *margenes* we may have discovered that food."

"We don't know where the *margenes* came from," the director went on to say, "and we don't even know yet what they are, biologically speaking. What we do know is that they provide more energy per gram than any other edible product known to man, that everyone who has eaten them is enthusiastic about their taste, that they can be processed and distributed easily and cheaply, and that they are acceptable even to those who have religious or other objections to certain other foods, such as beef among the Hindus or pork among the Jews and Mohammedans.

"Even vegetarians can eat them," Dr. Willard remarked, "since they are decidedly not animal in nature. Neither, I may add, are they vegetable. They are a hitherto utterly unknown synthesis of chemical elements in living form. Their origin remains undiscovered."

Naturally, there was no thought of feeding people on raw *margenes*. Only a few isolated places in either hemisphere would have found live food agreeable. Experiment showed that the most satisfactory way to prepare them was to boil them alive, like crabs or lobsters. They could then be ground and pressed into cakes, cut into convenient portions. One one-inch-square cube made a nourishing and delicious

meal for a sedentary adult, two for a man engaged in hard physical labor.

And they kept coming in from the Pacific Ocean nightly, by the million.

By this time none of them had to be swept off streets or highways. The beach where for nearly a century throngs had gathered for the sport of catching grunion was off bounds now; it was the property of California Margene, Inc., a private corporation heavily subsidized by the Federal Government as an infant industry. The grunions themselves had to find another place to lay their eggs, or die off—nobody cared which. The sand they had used for countless millennia as an incubator was hemmed in by factory buildings and trampled by margene-gatherers. The whole beautiful shore for miles around was devastated; the university had to move its marine biological laboratory elsewhere; La Jolla, once a delightful suburb and tourist attraction, had become a dirty, noisy honkytonk town where processing and cannery workers lived and spent their off-hours; the unique Torrey Pines had been chopped down because they interfered with the erection of a freight airport.

But half the world's people were living on margenes.

The sole possession of this wonderful foodstuff gave more power to the United States than had priority in the atomic bomb. Only behind the Iron Curtain did the product of California Margene, Inc. fail to penetrate. *Pravda* ran parallel articles on the same day, one

claiming that margenes—*brzdichnoya*—had first appeared long ago on a beach of the Caspian Sea and had for years formed most of the Russian diet; the other warning the deluded nations receiving free supplies as part of American foreign aid that the margenes had been injected with drugs aimed at making them weak and submissive to the exploitation of the capitalist-imperialists.

There was a dangerous moment at the beginning when the sudden sharp decline in stocks of all other food products threatened another 1929. But with federal aid a financial crash was averted and now a new high level of prosperity had been established. Technological unemployment was brief, and most of the displaced workers were soon retained for jobs in one of the many ramifications of the new margene industry.

Agriculture, of course, underwent a short deep depression, not only in America but all over the world; but it came to an end as food other than margenes quickly became a luxury product. Farmers were able to cut their production to a small fraction of the former yield, and to get rich on the dizzying prices offered for bread, apples, or potatoes. And this increased the prosperity of the baking and other related industries as well.

In fact, ordinary food costs (which meant margene costs) were so low that a number of the larger unions voluntarily asked for wage decreases in their next contracts. California Margene, Inc. was able to process, pack, and dis-



tribute margene cakes at an infinitesimal retail price, by reason of the magnitude of the output.

An era of political good feeling, fell upon the western world, reflected from the well-fed comfort of vast populations whose members never before in their lives had had quite enough to eat. The fear of famine seemed to be over forever, and with it the fear of the diseases and the social unrest that follow famine. Even the U.S.S.R. and its satellites, in a conciliatory move in the United Nations Assembly, suggested that the long cold war ought to be amenable to a reasonable solution through a series of amicable discussions. The western nations, assenting, guessed shrewdly that the Iron Curtain countries "wanted in" on the margenes.

Marge Hickin and Gene Towanda, who had started it all, left college for copywriting jobs with the agency handling the enormous margene publicity; they were married a few months later.

And the margenes continued to come in from the sea in countless millions. They were being harvested now from the Pacific itself, near the shoreline, before they reached the beach. Still no research could discover their original source.

Only a few scientists worried about what would happen if the margenes should disappear as suddenly as they had arrived. Attempts at breeding the creatures had failed completely. They did not undergo fission, they did not sporulate, they seemed to have no sex. No methods of reproduction known in the plant or animal kingdom seemed to apply

to them. Hundreds of them were kept alive for long periods—they lived with equal ease in either air or water, and they did not take nourishment, unless they absorbed it from their environment—but no sign of fertility ever appeared. Neither did they seem to die of natural causes. They just kept coming in . . .

On the night of May 7, 1969, not a single margene was visible in the ocean or on the beach.

They never came again.

What happened as a result is known to every student of history. The world-wide economic collapse, followed by the fall of the most stable governments, the huge riots that arose from the frantic attempts to get possession of the existing stocks of margene cakes or of the rare luxury items of other edibles, the announcement by the U.S.S.R. that it had known from the beginning the whole thing was a gigantic American hoax in the interests of the imperialistic bloodsuckers, the simultaneous atomic attacks by east and west, the Short War of 1970 that ruined most of what bombs had spared of the Earth, the slow struggle back of the remnant of civilization which is all of existence you and I have ever known—all these were a direct outgrowth of that first appearance of the margenes on the beach near San Diego on an April night in 1960.

Marge and Gene Towanda were divorced soon after they had both lost their jobs. She was killed in the hydrogen blast that wiped out San Diego; he fell in the War of 1970. "Margene" became a dirty

word in every language on Earth. What small amount of money and ability can be spared is, as everyone knows, devoted today to a desperate international effort to reach and colonize another habitable planet of the Solar System, if such there be.

As for the margenes, themselves, out of the untold millions that had come, only a few thousand were lucky enough to survive and find their way back to their overcrowded starting-point. In their strange way of communication—as incomprehensible to us as would be their means of nourishment and reproduction, or their constitution itself—they made known to their kin what had happened to them. There is no possibility, in spite of

the terrific over-population of their original home and of the others to which they are constantly migrating, that they will ever come here again.

There has been much speculation, particularly among writers of science fiction, on what would happen if aliens from other planets should invade Earth. Would they arrive as benefactors or as conquerors? Would we welcome them or would we overcome and capture them and put them in zoos and museums? Would we meet them in friendship or with hostility?

The margenes gave us the answer.

Beings from outer space came to Earth in 1960.

And we ate them.                   • • •

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## The Star-Studded April IF

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*Centifor was a paradise planet, another Garden of Eden. And*

*Leon Stubbs was the serpent of temptation . . .*

# **jekyll—hyde planet**



*Illustrated by Kelly Freas*

**T**HEY CAME in low, decelerating against dense air, while the passengers talked, and laughed, and pressed their faces against the observation ports.

In the ship's lounge, a squawk box crackled . . . "Twenty minutes," a mechanical voice said . . . "We land on Centauri IV in twenty minutes . . . Passengers for Orion, Antares, Cygni, and Polaris, have your transfers ready."

Everyone laughed. The speaker

clicked and went dead. And the boy who'd been gripping Claude Marshall's arm looked up.

"What's he mean, Pop? We don't *really* have to transfer, do we?"

Claude Marshall smiled. "No, Billy. This is as far as we're going—as far as anyone's going."

"But he said—"

"He was only joking, Billy. Maybe someday people will be going to those places, but not now." He glanced at his wife, sitting with her hands folded in her lap . . . "I'm glad it's over, Joan," he said. "It's been a long trip—a very long trip."

The woman nodded. She had dark hair, and blue eyes, and mi-

**BY JACK LEWIS**

nute lines of maturity around her eyes and mouth that seemed to soften, rather than age her. She looked almost too young to have mothered a nine-year-old boy—but of course that was one of the requirements.

"Is this where we're going to live?" the boy asked.

Claude looked out the port. "Yes, Billy. This is where we're going to live."

"Why?"

"I've already told you why. Don't you remember when I showed you the pictures, and asked you how you'd like to live where you'd have lots of room to play, and wouldn't have to worry about the bombs or anything?"

"Sure, Pop," the boy said. "I remember. But tell me about it again?"

Claude looked at his wife; watched her nod, and answer his smile. "All right," he said. He raised his arm over the foam-cushion seat-back till it rested on the boy's shoulder.

"You see, Billy, things back on Earth are pretty bad—have been for over a hundred years now. There's too many cities, too many wars, and too many people—it's mostly too many people. They don't have room to move around any more the way they used to . . .

"To make it worse there are always some people who figure that someone else has a little more room than they have, so they try to take it away from them by starting a war. Not that war ever solves anything. It's just that some people think it will."

"That's why we left, huh, Pop?"

"Yes, Billy. That's why we left. The problem was to find some place new; some place where a man had room to move—room to breathe. For a long while it didn't look as if there was such a place—not in our solar system anyhow. But one day a few years before you were born, a fellow by the name of Vincent Taibi made a trip out here to Centauri . . . It was a long trip. Took him thirteen years to get out here and back. But the important thing is that he came back with some news . . . He came back and reported that there was an uninhabited planet out here, just about the size of the Earth, that was as fresh and new as it was the day God made it."

"That's when we got on this ship. Right, Pop?"

Claude frowned. "Well, not exactly. You see, Son, to begin with this is a long trip—so long, and so expensive, that no one except maybe a few millionaires would be able to afford it. Anyhow, the government wanted *young* people out here: people who could colonize the place . . . They ran a lot of tests, Son."

"Tests?"

Claude nodded and turned to his wife. "The tests," he said. "You remember the tests, Joan?"

"Yes, Claude. I remember. It's been six years, but I remember them as if they happened yesterday."

"I don't, Pop."

"That's 'cause you were too young, Son. You didn't have to take the tests . . . You were lucky."

"Claude! Billy's not interested in

that. Besides they were necessary."

"Necessary! All those psychiatrists? Oh come, Joan . . . I felt as if they were picking my brain with an ice pick!"

"But they had to be careful, Claude."

"Careful, yes . . . But eight months of tests—every day!"

"Claude!" The woman's tone was severe.

"Why did they have to be careful, Pop?" Billy asked.

"They wanted to be sure, Son. They didn't want anyone out here who was sick, or lazy, or who wanted to start a war. They figured if the right kind of people came out here, Centifor would stay as fresh and clean as it was the day that Captain Taibi first landed here."

The boy looked out the porthole. "We'll sure have lots of room here, won't we, Pop?"

"Yes, Son. We'll have lots of room. The government's given us title to a hundred acres of what's just about the best land in the Universe . . . I showed you the pictures of our land, didn't I?"

"Sure, Pop. Lots of times."

The woman laughed. "About a thousand times, I'd imagine . . . Those pictures have been looked at so much, they're frayed at the corners."

They landed on a concrete apron, nestled between ridges of rolling hills. The jets belched, hissed, went out, and from a ranch type structure at the edge of the area, a jeep, towing a portable ramp moved out to meet them.

There was a gentle bump.

Hatches hissed open. And then the passengers began to move down the ramp.

Among the last to emerge into the bright, warm sunshine, were Claude and Joan Marshall. Each clasping a hand of their son, they stood at the top of the ramp, breathing deep gulps of sweet-smelling air, and staring at the boundless horizon of the fresh, new world.

Clean and unspoiled it was, like an immense green carpet, dotted with clear, blue lakes, and billions of wildflowers that soaked nourishment out of topsoil twenty inches deep.

A paradise planet, free of bustling crowds and concrete cities. Untainted by littered alleyways, and dirty kiosks, and the abominable smells of cosmopolitan chaos . . . In place of these was a sun-soaked, fairy-like landscape capped by fleecy white clouds that hung motionless in a sky of robin's-egg blue.

Claude stabbed an index finger at the patchwork quilt of green and yellow.

"Look Joan . . . Our land! You can see it from here!"

"Where, Claude?"

"Out there . . . See? Way out. Beyond those lakes!"

"Oh, Claude. How can you be sure?"

"I remember it from the maps—and the pictures . . . Our land is just twenty-eight miles from this landing strip, and you cross three ridges of hills to get to it . . . See? One . . . two . . . three!"

"Is that where we're going to

live, Pop?"

"Yes, Son. That's where we're going to live. And there isn't a better piece of land anywhere . . . I know!"

At the gentle urging of the attendant, they moved off the ramp and melted into the group of passengers drifting toward the ranch-type building at the edge of the area. A sign over the building said: RECEPTION CENTER, and a man was standing in front of it. The man wasn't old by Earth standards, but leathery skin, and steel-grey patches of hair around his temples made him look very ancient alongside the composite youth of the newly-arrived settlers.

The older man waited till the group had formed a tight semi-circle around him. Then he smiled and held up both hands.

"Welcome to Centifor," he said. "My name is Leon Stubbs, and I am the Director of Colonization."

He waited till the undercurrent of muttering had died down, and went on: "I know how anxious you all are to settle on your own land, but because immediate transportation is unavailable, there will be a slight delay. During this time you will be quartered here at the reception center."

Claude Marshall leaned close to his wife's ear. "We're lucky, Joan," he whispered. "We don't have to worry about transportation. We can *walk to our land* if we have to."

Leon Stubbs said: "If any of you have any questions, feel free to speak up . . . That's why I'm here." He stopped, and pointed at a thin-faced youth with one arm raised

while a young, and obviously pregnant girl held onto the other.

"Yes, Sir."

"We've been wondering," the youth said. "Are our building materials ready yet?"

"Some of them are," the director said, "and some of them aren't. Production here isn't quite what it should be yet. When you've been here a while, you'll realize that because of our relatively small numbers, and comparative inexperience in economic matters, we're a tightly-knit group . . . We have to be.

"There is one thing however that works in our favor. There are no irrational or psychological deviants on Centifor. The tests took care of that. They were rough, I know. They were supposed to be rough. And now that you're here you'll all be facing another test . . . The test of practical application.

"Some of you are fortunate in the respect that you've been awarded land reasonably close to the spaceport area. Some of you are not so fortunate, and will have to travel several hundred miles. Perhaps those of you in this latter category will find some consolation in the fact that since you left Terra, the government has started a movement to populate the other side of the planet. As a matter of fact, all future applications will be assigned to that area."

Claude looked at his wife. And she looked back at him. They didn't speak. They didn't have to. It was common knowledge that Centifor was a planet of contrast. It was a Jekyll and Hyde planet . . . One side was a veritable Utopia. And

the other? Claude shuddered at the thought of hacking a living out of the razor-backed mountains and bare patches of rocky soil that were frozen stiff nine months out of every thirteen.

"If there are no other questions," the Director said. "We'll get on with the business of setting you up in temporary quarters."

Twelve hours later, Claude Marshall and his family stood on the ramp of the spaceport watching the blue-tinted sun edge itself over the rim of the planet.

The decision to pack a few immediate necessities and walk to the homestead instead of waiting for transportation had been arrived at the night before. It was ridiculous, Claude had argued, to waste time at the reception center, when the culmination of a ten year dream lay just twenty-eight miles away. Especially so, since the Director had informed them that the materials for their prefab home was already waiting for them on the land.

Nor were they alone in their eagerness to begin a new way of life. Other settlers—some of them burdened-down with supplies that almost equalled their own weight—had already started a trek over the virgin landscape. In twos and threes, they plodded into the gently-sloping valley. Some of them moved slowly, some eagerly. All of them looked like tiny ants on a giant pool table.

Marshall adjusted the knapsack across his shoulders with an air of finality. "Let's go, Joan," he said. "Stay close, Billy. We have a long

walk ahead of us."

They started into the valley.

Two hours later they stopped to rest. They stopped on a patch of rich, green turf in the shadow of a broad-leaf tree. The spaceport, flanked by its low-slung buildings was still visible, but from seven miles away the buildings looked incredibly tiny. Like miniatures out of a Christmas kit. But the thing that impressed them most was the quiet—a strange sort of quiet, free of the whir of copter blades, land-car horns, and other nerve-shattering noises. Instead, there was only the rustle of a mild breeze through the tree branches, and the sound of their own breathing.

Marshall lay on his back, his fingers laced behind his neck.

"I feel rested, Joan," he said. "We've just walked seven miles, but I feel rested."

"I know, Claude. I feel the same way. It must be the air. The air feels different."

"Wouldn't it be nice if it'd always stay this way. Fresh and unspoiled, I mean. I know it won't, but wouldn't it be nice if it did?"

"It will, Claude. It will for as long as we live anyhow, and for as long as Billy lives. That's what's important. We're very lucky, Claude."

"I can't help thinking of the people back on Earth. I feel sorry for them."

"They could do what we did. They could take the tests."

"I know. But even if they did, what would they have? Who'd want to homestead the *other* side of this planet? Who'd want to live



out there anyway?"

"I would, Pop," Billy said.

"No you wouldn't, Son. Don't you remember those black mountains we saw from the ship when we came in?"

"Sure, Pop."

"Well that's what the other side of the planet is like. Only you couldn't tell what it was really like because we were too high. You wouldn't like it if you had to live there. It's cold, and rocky, and there's only six hours of daylight out of every twenty-six."

"I wouldn't like it then," the boy said. "I don't like the dark."

Claude got up and looked at his wife. "Shall we move along," he said.

They pushed ahead. Eagerly, yet slowly enough to absorb the world's endless beauty; stopping at the crest of each new hill; kneeling at the shores of crystal lakes to quench their thirst; and scooping up handfuls of rich, black soil in spots where the turf had become dislodged.

The sun of Centauri was almost at zenith when they approached the crest of the ridge that bounded the Marshall homestead.

Claude's pace, which had been quickening steadily for the final mile, burst into a jagged trot for the final hundred uphill yards. At the top of the hill he stopped, staring into the lush, green valley, ignoring his family who'd been unable to keep pace with his eagerness.

The homestead was all that the color photos had advertised—and more. It was all there. The flat,

rich turf, the stream running through the center of the valley, and the grove of trees under which he'd build the prefab house.

He'd anticipated the moment so many times, it was hard to believe it had really arrived. But it was real—it was. Everything was exactly as he'd expected to find it . . . except for one thing.

Always in his imagination, the land had been waiting for him to claim it. Him alone—and his wife and son.

But they weren't alone . . . There were other people on the land. On his land!

And they were acting as if they lived there!

**T**HERE WERE three of them—a man, a woman, and a boy of about nineteen. The woman appeared to be cooking a meal over a wood fire, while the man and boy were arranging a foundation pattern with part of the stack of building materials which had been earmarked for the house.

For his house!

Joan and Billy drew up alongside him, and together they stared at the intruders.

"Who are they, Claude?" his wife said. "What does it mean?"

"I don't know, honey. Maybe they just stopped here to eat. That's what it must be."

"But the men. The way they're measuring . . . As if they're going to build."

"We'll straighten it out, Joan . . . Probably some mistake. I have our land title. That'll prove they've

made a mistake. Come on. We'll talk to them."

The intruders stopped what they were doing as they approached, and the man—a huge, block-shouldered fellow in a leather jacket—pushed out a hand.

The man said: "Hello. My name's Whiting—Bruce Whiting."

Claude took the hand. "Claude Marshall," he said. "And this is my wife and my son."

The man who called himself Whiting nodded, and looked over at his wife. "We're fixing dinner," he said. "Why don't you and your family join us before you push on?"

Claude watched the man's face while he spoke. It was an open face. Guileless. With ruddy skin and mild, grey eyes that twinkled a bit at the corners.

"We're not *pushing* on," he said evenly. "We're staying. This is *our* land."

Bruce Whiting smiled. "There must be some mistake. This land is ours. The boy and I are just fixing to start building."

Claude shook his head. "Not here you're not. Not on this land." He spoke quietly; trying to keep his voice pitched below the emotion that churned up inside him.

"What's wrong, Dad?" The man's son joined them . . . He was a big strapping lad, with sandy hair and very bright skin.

"These people are looking for their homestead," the man with the jacket said. "They think *this* is their site."

"You think wrong, Mister," the youth said. "We double checked this location three times before we

made camp . . . Right?" He turned to the older man for confirmation.

Whiting nodded. "The boy's right. This land is ours. We've got a deed to prove it."

"So have I," Claude said frowning. "It's right here in the luggage . . . Wait. I'll show you . . ." He bent over, unzipping the knapsack and rummaged around till he produced the manila envelope that held the title papers.

Bruce Whiting examined them carefully; first the neat rows of fine print, then the dozen glossy color-photos which had been taken on the property from strategic angles. He shook his head and turned to his son.

"Get *our* titles, Frank," he said.

The boy left, returning within seconds with a similar manila envelope. Bruce Whiting opened it and pushed a handful of papers at Claude.

While his wife and son watched, Claude Marshall went through the papers methodically . . . They were all there. All the measurements; looking like duplicates, backed up by photos that had apparently been developed from the same negatives . . . He glanced at his wife.

"Something's wrong, Joan," he said. "Mr. Whiting has a claim on this land too. It's just like ours . . . Exactly!"

"But I don't understand, Claude."

"It's not too hard to understand, Mrs. Marshall," Whiting said. "It just means that someone in Washington loused up the detail. They're always making mistakes like that . . . I figure some clerk—"

"But what are we supposed to do?"

Bruce Whiting moved his shoulders. "I don't know, Mrs. Marshall. I just don't know . . . After all we were here *first*. Why don't you take it up with the Colonization Director? . . . Maybe there's another tract he could give you."

"I don't want another tract," Claude said flatly. "I want this one."

"So do I, Mr. Marshall."

"But the land's mine!"

"Is it? How about *my* title? It's just as valid as yours."

"That'll be for the law to decide," Claude said grimly. "And we'll fight you on it. By God, we'll fight you on it all the way from here to Washington and back!"

"That's up to you, of course. In the meantime, may I remind you that I hold possession?"

Claude Marshall bit his lip.

"Let's go Joan," he said.

"Where, Claude?"

"Back to the spaceport. We'll get a ruling on this."

"But it's getting dark. Can't we make camp someplace and go back tomorrow?"

"I'm hungry," Billy said.

"We can eat later, Son."

Bruce Whiting continued to regard them sullenly. Then abruptly, his face softened. "Wait," he said. "Don't go. Your wife's right, Mr. Marshall. You can't make the trip after dark. Why don't you and your family camp here for the night . . . Alice has supper nearly ready and there's more than enough to go around . . ."

"We have our own rations,"

Claude said.

Bruce Whiting spread out his hands. "Look, Mr. Marshall. I know how you feel. I know, because it's the same way *I* feel. I guess a man can't help the way he feels when something threatens the thing he's been dreaming about all his life. But it isn't my fault that this happened any more than it's your fault. Since the problem concerns both of us, I suggest we sit down and discuss it like intelligent human beings."

"Mr. Whiting's right," Joan said. "After all it isn't his fault—"

"Another thing," Bruce Whiting went on. "I'm expecting a half-trac out here tomorrow with some supplies. If you and your family wanted to, there's no reason why we couldn't all ride back with him . . . Maybe we could get this thing straightened out then and still be friends."

Claude flicked a look toward the far-off hills that were haloed by the last rays of a strange sun. Within moments it would be dark. And a few yards away a woman threw another log on the fire and the pungent aroma of boiling coffee drifted across his nostrils.

"I'm hungry," Billy repeated.

Claude held out his hand.

"I'm sorry," he said. "As you say: this isn't our fault. We're just caught in the middle."

The ate picnic-style, off plastic dishes, while Bruce Whiting kept up a continuous stream of conversation, aided from time to time by his comely wife.

The Whiting's story was a famil-

iar one. He'd been with an advertising agency when the colonization urge had struck him . . . That was ten years ago . . . He'd talked it over with his wife, and together they'd weighed the chances of surviving the rigid tests that eliminated 97% of the applicants.

The story had a pattern you could play by ear. Just another man, and another woman, and another boy now in his teens, who'd grown tired of the struggle for survival in a world that begrudged a man the space occupied by his own body.

And when the meal was over, Joan helped Alice Whiting with the dishes, while the men sat around the fire and smoked. It was dark out now—a strange kind of darkness, split only by billions of incredibly bright stars and the nearby glow of the crackling wood fire.

Bruce Whiting's cordiality was contagious too. Claude found himself talking now; describing his wants, his ideas, and his ideals. And when the women returned to the circle, the conversation turned to other subjects. They discussed clothes, their children, and the future of the planet.

Only one subject was carefully avoided.

And that was the one that was foremost in the minds of all of them.

They were still talking when the fire had settled into weary heaps of smouldering embers. Then the two families excused themselves and retired to the canvas lean-to's wondering what the next day would hold in store for them.

**T**HE BLUE sun of Centauri was almost at zenith the next day, when the half-trac arrived with the supplies.

The driver—an amiable man—listened patiently while Bruce and Claude related the mixup, and as had been expected, agreed to transport them back to the base.

The two families rode together in the open back of the vehicle as it jounced over the mildly sloping terrain. And yet the ride was not unpleasant. The immensity of the planet was breathtaking. It was exactly as the colorcasts had pictured it—only better, incredibly better. No TV travelogue could adequately describe the tang of the air, or the scent of the sweet-smelling grass.

God had indeed been generous with this portion of the planet.

It was hard to believe that the opposite side was a rocky wasteland that would probably fight colonization for another thousand years.

Almost before they knew it, they were at the spaceport. Sometime during the night, another ship had arrived. It stood majestically at the far end of the apron, towering over a knot of tiny figures grouped around the rudder stanchions.

The driver swooped past them and brought the half-trac to a halt in front of the reception center where they observed the Colonization Director watching them through the window of his office.

Inside, Leon Stubbs greeted them cordially and ushered them into an inner office containing a metal desk and a dozen file cabinets.

The Director listened patiently, shaking his head from time to time and muttering remarks about government inefficiency . . . When they'd finished, he ran his hand through his greying hair.

"This, of course, is an outrage, Gentlemen," he said. "But before I can do anything, I'll have to check both your claims." He indicated the file cabinets. "It may take a little time but I'll get at it right away. As a matter of fact I believe they're serving lunch at the mess hall now. Why don't you all have lunch and come back in about an hour. I'll know more about the situation then."

Leon Stubbs shuffled through some papers on the desk, indicating dismissal. The two men joined their families in the anteroom.

After an awkward silence, Bruce Whiting and his family excused themselves, leaving the Marshall's alone.

"What did he say, Claude? Tell me! What did he say?"

"He doesn't know yet, honey. He's checking the claims. We're supposed to come back in an hour."

"But it will be all right, won't it. It's got to be all right!"

"I don't know, Joan. So help me, I don't know . . . We can't both have the land. That's for sure. One of us will have to settle for someplace else."

"Suppose we *did* have to take another tract, Claude. Would you be disappointed—I mean, really disappointed . . . After all, isn't the important thing the fact that we're here?"

Claude managed a smile. "I

suppose so," he admitted. "It's just that it comes as sort of a letdown. For almost seven years now we've been looking at the pictures of *this* land. We knew where we'd build the house, what portion we'd farm . . . I know every tree, every square inch of it . . . And now—"

"But there's other land. We've only seen a small portion of the planet."

He shook his head.

"Not like this. This claim has everything. What's more, Whiting knows it. That's why he'll fight us on it all the way."

"They seem like nice people. Claude. Couldn't we talk to them . . . make some sort of deal?"

"A deal? What sort of deal?"

"A hundred acres is a lot of land—an awful lot of land . . . Maybe the Whitings would—"

"Uh uh. No good. I've already felt him out on that. I had the same idea last night, so I came right out and asked him if he'd settle for fifty acres apiece . . . He refused. Oh, he was nice enough about it. But he gave me to understand it was all or nothing with him."

"I'm hungry," Billy said.

Claude looked at his wife. "So am I. Let's go over to the mess hall. That's where the Whitings went, I think."

"Claude?"

"Yes, Joan."

"Let's not sit with them, if we meet them there."

"All right, honey. Let's not."

They were halfway to the door when Leon Stubbs came out of the inner office. He smiled.

"Mind stepping inside a moment?" he said.

When Claude hesitated, he added: "Perhaps Mrs. Marshall had better come in too."

They followed him inside where the Director indicated two chairs alongside the desk.

"I've been checking your claims," he said. "And since you were still here, I didn't think it advisable to prolong the suspense."

Claude glanced at his wife.

"You mean it's all right . . . the land is ours?"

The Director sat down and spread open a pair of folders on the desk. For a long while he stared at them—comparing them. He shook his head.

"I'm afraid not, Mr. Marshall. I'm afraid it isn't all right."

"But our claim. It's valid, isn't it?"

Leon Stubbs ran a hand through his greying hair. "I don't know," he said. "Naturally the fault for processing duplicate claims lies with the colonization bureau in Washington. Eventually, I suppose it will be up to them to decide on the disposition of this case . . . However, because of the time-lag in communications, I have full authority to pass down temporary decisions in matters of this type . . . And because Mr. Whiting's claim is dated several days ahead of yours, I must in all fairness award the land to him . . . You and your wife can appeal that decision of course."

"We'll appeal, Mr. Stubbs," Claude said angrily. "After all, this mess is the government's fault. Not

ours! It's up to them to straighten it out."

"That's up to you," Leon Stubbs said. "Although I'm sure you realize that in the meantime you'll have to make some temporary arrangements."

"Temporary arrangements?"

"Yes, Mr. Marshall. Even assuming the government decides in your favor—which I doubt—you'll have to live *somewhere* while the case is being processed . . . And that will take some time."

"How long?"

Leon Stubbs shuffled through the papers again.

"You know about the time-lag, don't you?"

"No. What about the time-lag?"

The Director met his stare. "I thought you knew. Actually the only communication we have with Terra short of space travel, is by short wave radio, and radio waves as you may know travel at approximately the speed of light. Since we are approximately 4.4 light-years away from Earth, a round trip message to Washington would take about nine years. This of course does not take into consideration the time needed to process your case."

Claude kept watching the Director's face while he spoke. He *looked* like an honest man. To all intents and purposes he was simply a public servant performing a distasteful duty. Yet there was something about his voice that had an all-too-familiar ring . . . Something that hinted he was leading up to an offer.

Claude cleared his throat. "All

right, Mr. Stubbs. So you've convinced me of the futility of appealing the claim. What now?"

Leon Stubbs bit off the end of a cigar and lit it before answering.

"I've arranged to give you and your family an alternate claim, Mr. Marshall. Of course it isn't quite as desirable as the original one. But under the circumstances—" He let the sentence trail off.

"I see," Claude said. "And where is this alternate claim?"

Stubbs examined the end of his cigar.

"It's on the other side of the planet, Mr. Marshall. I'm sorry, but that's the best I can do."

At his elbow, Claude caught the sharp intake of his wife's breath.

"It really isn't *too* bad," the Director went on. "Many of the reports about the cold-side have been exaggerated."

"I'm sure they have," Claude said bitterly. "I'm sure it's just the place to bring up a nine-year-old boy."

"Please Mr. Marshall. Don't be bitter. It isn't my fault."

Claude got up placing his palms on the edge of the metal desk. He leaned forward till his face was only inches away from the Director's cigar, and said: "Isn't it?"

The Director didn't answer. Instead he got up and walked over to the open window. For ten full seconds he stared out at the lush valley that flanked the spaceport. Then he turned.

"You want my advice, Mr. Marshall?"

Claude shrugged his shoulders.

"Go home," Leon Stubbs said.

"You can't bring up a boy on the cold-side. It just wouldn't work."

"But we just got here," Joan said. "We sold everything we had to come here!"

Stubbs nodded. "I know," he said. He indicated the folders. "It's all there in your records. Six years ago you left Terra with six-thousand credits. But surely with that kind of money you could get a fresh start almost anywhere."

"But we want to stay here, Mr. Stubbs."

Stubbs took a drag out of the cigar.

"I know," he said woodenly.

Claude remained silent, regarding the conversation carefully. A pattern was beginning to form now—a familiar pattern. He walked over to where the Director was standing.

"Perhaps you could make a suggestion, Mr. Stubbs. Surely there must be opportunities on *this* side of the planet for a man with six-thousand credits?"

"I'm not quite sure what you're getting at," Leon Stubbs said.

"I think you do, Mr. Stubbs," Claude retorted. "I think we're both getting at the same thing. Suppose we dispense with the subtleties and get down to cases."

The Director sat down at the desk pyramiding his fingertips.

"Very well, Mr. Marshall," he said. "I'll be blunt. It's occurred to me that if the date on your claim were changed, the land would naturally be yours. The difficulty of course lies in the fact that there are duplicate records on Terra and we'd have to take care of the man

who handles them. Otherwise the discrepancy would show up eventually. Actually, I want nothing for myself but these people in Washington—”

“Yeah, I know,” Claude interrupted. “It’s someone else who’s getting the money. It’s *always* someone else who’s getting the money.”

“It would take quite a bit, I’m afraid,” the Director said ignoring the sarcasm.

“How much?”

The Director stubbed out the end of his cigar. “About five thousand,” he said. “Yes. Five thousand ought to do it.”

Claude looked at his wife.

And she looked back at him.

Outside, Billy had tired of the seven-year-old magazine and was hammering on the door for admittance.

“Can we have a few minutes to think it over?” Claude said.

“Certainly,” Stubbs said amiably.

“And I want to make it quite clear, Mr. Marshall, that this money is not for me. There’s this fellow—”

“Yeah, I know. There’s this fellow in Washington. Come on Joan. Let’s step outside a moment.”

**T**EN MINUTES later, Leon Stubbs answered their knock and ushered them to the desk chairs. After they were seated, he said: “I take it you’ve talked it over.”

Claude nodded. “Yes, Mr. Stubbs. My wife and I talked it over and we came to a decision.”

“I’m glad,” the Director said. “And may I say I think you’re doing a wise thing. Centifor’s a beautiful place. Simply beautiful . . .”

“Yes it is,” Claude agreed. “It is beautiful. That’s why we’d like to see it stay that way.”

The Director raised an eyebrow.

“My wife and I talked it over,” Claude went on, “and we decided that taking someone else’s land whether it’s done by theft, force, or bribery is wrong. We thought of this place as something fresh and clean. We thought all those tests we took were designed to keep people like you out of here. Now it appears we were mistaken. We’ve talked it over, Mr. Stubbs, and we’ve decided to go back to Earth and expose you.”

“But you can’t,” the Director said. “You’ve—”

“Yes we can,” Claude said. “The ships go back practically empty. A return berth will be no trouble at all. We’re returning on the first ship out.”

“Perhaps we could make a better deal,” Stubbs said. “Perhaps five thousand is too much. Perhaps—”

“No. No deals! Let’s go Joan.”

They went outside, into the fresh warm sunshine, staring at the torpedo shaped spaceship standing in the clearance area half-a-mile away.

They’d just started toward it, when a jeep squealed up alongside them. Bruce Whiting was at the wheel.

“Hi,” he said. “Hop in. I’ll give you a lift.”

“Thanks,” Claude said without



bitterness. He helped his wife and son into the rear seat and climbed in beside the driver.

"I suppose congratulations are in order," he said as the other man threw the vehicle into gear. "Stubbs tells me the land is yours now."

The driver nodded, inching down on the accelerator. The vehicle leaped forward. At seventy miles an hour, they swooped past the spaceship and the knot of people standing in the shadow of the rudder stanchions.

"Hey. Slow up!" Claude yelled. "We're getting off here. We're booking return passage on that ship!"

Whiting didn't answer.

The low slung buildings of the clearance area leaped up at them and passed into the background. They were heading into open country now.

"Whiting! Turn around. We're staying here in the clearance area!"

Whiting's foot slacked off the accelerator. The speedometer dropped to fifty. But the vehicle kept moving into open country. The man at the wheel flicked a look at Claude and smiled.

"Congratulations, Mr. Mar-

shall," he said. "You've passed the final test."

"Test? I don't understand."

"Let me explain then," Bruce Whiting said. "In the first place my name isn't Whiting . . . It's Reed—Paul Reed. I work for the government. This final test—the one you just went through—was designed to weed out any undesirables who might have slipped through our screening processes back on Earth.

"You mean this whole build up was just a test?"

The other man nodded. "We give it to every new arrival here. Now that you've passed, I'm driving you out to your homestead site."

Claude looked back at the newly-arrived spaceship and the tiny figures who were huddled at its base.

"All those people," he said. "You mean they still have to go through what we did?"

The driver shook his head.

"No. Those people are going back to Earth. You see, Mr. Marshall, those are the people who offered Leon Stubbs the bribe."

• • •

### WHAT IS YOUR SCIENCE I.Q.?

**ANSWERS:** 1—Goldbach's Theory. 2—18,000 miles per hour. 3—Tungsten. 4—3.26. 5—Magellanic Clouds. 6—Rarer. 7—Great Circle Chart. 8—Googol. 9—Saturn. 10—Chlorophyll. 11—Yes. 12—Magnetic field.



**In the near future** teeth and bone structure may be replaced with real bones. A team of scientists has succeeded in taking the minerals out of animal bones, making them soft and spongelike. Then they have been able to reharder or recalcify them by treating them with certain chemicals and placing them in a solution similar to body fluids. This finding presents the possibility that dentists may be able to rake this soft "demineralized" bone, treat it chemically, and then insert it as a natural filling in a drilled tooth cavity where it would harden and become part of the tooth. In addition, teeth may be prevented from falling out by building the bone up around them. Orthopedic surgeons may also be able to use this process to speed the healing of fractures or to replace bones lost by accident or disease.

**A picture of Medicine** at the end of the century, recently presented before the American Medical Association, reveals, some remarkable improvements. It predicts the eradication of all human infectious diseases, including tuberculosis, rheumatic heart disease, diphtheria,

pneumonia and even the common cold and other respiratory ills. Cancer will be treated successfully by turning viruses against it. Eye surgeons will have restored vision where successful treatment today can only be called "wishful thinking". Starvation will no longer exist because of the successful synthesis of foodstuffs. Deaf mutes will speak by use of portable electronic devices. Vital organs such as the heart, kidney, pancreas and lungs will be transplanted from person to person. Insulin will be taken in tablet form. There will have been effective treatments, against high blood pressure, arteriosclerosis, degenerative heart disease, leukemia and pernicious anemia. Hormone medication will keep women young, beautiful and shapely indefinitely.

**Need for a** signalling system much faster than today's dial system has spurred the development of a new device so fast that it may well do away with the dial. Developed by Bell laboratories, the device is called a polytonic coder and is based on a new mathematical concept of electronic coding. A test model will send 100 digits a second over almost all telephone connections. To make use of this new super speed, the present dialing system would have to be replaced by a push-button system. With such a phone, you would punch out the number you want on buttons while the receiver is still on the hook. When the receiver is lifted the called number's phone will start ringing. If the line is busy

you needn't dial again; the button setting will remain until you change it.

**Smokers may soon** be bombarded with advertising about "the cigarette with the built-in ashtray". A new glass-fiber paper developed by the National Bureau of Standards does the trick. It will not burn, but holds the ashes in place until the cigarette is smoked down to the point where it is thrown away. Made from glass fibers 1/50,000 of an inch thick, the new paper is also one of the best smoke filters. It allows only one smoke particle in 100,000 to pass through. Made by forcing molten glass through tiny holes and then stretching the fibers in hot air, the new paper is eight times as strong as previous papers and has a smooth silky texture.

**With thirty dollars** worth of equipment you will be able to turn your car of the future into a rolling Geiger counter. The equipment consists of a Geiger-Mueller tube and a few associated components. Radiation is indicated by either telltale clicks on the speaker of the car radio or by the movement of a needle on a dashboard-mounted meter. In addition to normal use, the speaker could also be used to receive instructions from civil defense authorities in time of atomic warfare, while the meter would warn of radiation. Designed to detect radiation within a fifty-foot radius, the unit would not only serve to warn occupants of danger but would make the car available for monitoring during emergency.

**Fishermen will soon be taking** along electric light bulbs for bait. Norwegian technicians have devised a metal container with four windows through which an electric light shines. When the apparatus is lowered into the water, the light attracts the fish to swim close to it. The lower part of the container, lying in darkness, is equipped with hooks. When the gear is jerked upwards the dazzled fish are theoretically hooked. In trawling several of the light ray sinkers are placed on a special hoop set at the mouth of a trawl net. The fish attracted to the light, gather in front of the net, thus considerably increasing the catch. The gear has showed some extremely promising results in tests made by the Fish and Wildlife Service in the Pacific Ocean and in salmon fisheries.

**Farms of the future** may be dotted with artificial ponds instead of grainfields. Experiments have shown that the common pond weed is equal or superior to alfalfa meal in a pig-fattening diet. The moss-like weed which can be found in even a goldfish bowl yields from 12 to 14 tons of green weight per acre in a test pond in Kansas. It also replaces itself within three months. The dehydrated meal resembles alfalfa meal but is darker and less dusty. Besides feeding cattle from the pond weed, the artificial ponds also serve as a boon to irrigation problems and as an extra source of proteins in the form of fish.

**Electrical batteries** a decade hence will be powered with by-product

atomic radiation converted directly into electricity. Radioisotopes from the debris of United States atomic power reactors might furnish the radiation that could be converted into electrical energy equivalent to 2,000,000 watts from the annual production of batteries. The possible substitution of atomic batteries for the conventional chemical ones is foreseen by scientists at the R.C.A. corporation. The most desirable radioactive wastes for the purpose include strontium 90 and yttrium 90, and tritium or triple-weight hydrogen. These are cheap enough for such use and also have a long enough life.

**Other predictions** for the atomic age made at a recent conference concerning waste debris from the reactors included: Preservation of foodstuffs by cold sterilization; sterilization of medical supplies such as antibiotics drugs and bandages, to make them safer after they are packed for shipment; prevention of trichinosis by irradiating hog carcasses; and making bones, heart tissues and other materials from "banks" used in human replacement surgery safe for use by irradiating them with gamma rays from cobalt 60. The cold sterilization of food promises to usher in as radical a revolution in food preservation as the invention of canning produced for heat sterilization. And the success of bone grafts with gamma radiated material has already proved the value of the technique in surgery.

**A new look in flying suits will soon**

be apparent and both passengers and pilots may well be wearing them for high altitude flying. Called a "T" suit, the garment fits rather like an old-fashioned corset and needs almost as much assistance to tighten the many laces properly. Once snugly wrapped in, a pilot is protected from failure of his pressurized cabin, even at altitudes of up to 65,000 feet, where his body would literally burst from the low pressure. The suit actually holds the wearer together in emergency decompressions. If the plastic cockpit windshield shatters during high-altitude flight, the suit and the pilot's helmet would automatically fill with compressed oxygen. This enables the pilot to dive the plane for lower altitude.



## AT LAST!

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more human beings in the world like James E. Gunn it would indeed be a better one. In the meantime, our tame author had been browsing thru a copy of Ron Smith's excellent fanzine, *Inside*, which he'd purchased at the Con, and he was puzzled by some of the slang (or slan) terms used by the fans. I explained the origin and meaning of a number of the strange words to him, and in particular the earliest abbreviation of them all, "stf", with which I have become so intimately identified that many people, not possessing a copy of *The Encyclopedia*, probably think I originated it. I explained to Jim how Hugo Gernsback himself first created the portmanteau word, *science-fiction*, at least 30 years ago if not longer, and that it had enjoyed a vogue for many years, gradually giving way to plain *science fiction* (with or without a hyphen) and a variety of abbreviations thereof: S.F., SF, s.f., sf, sci-fic, and latterly, as a parallel to hi-fi, *sci-fi*. I got interested, and when I got home I consulted my magazine files of the early 30's, to see if I could track down the first appearance in print of the abbreviation "stf".

For the records: my first stf correspondent, Linus Hogenmiller, sometime c. 1931, created the abbreviation. I was the first to use it in print, and later give it the pronunciation "stef" instead of "esti-ef"; but Linus, come out, come out, wherever you are, and get your *egoboo!* (Egoboo: boosting of the ego. A term favored by Charles

Burbee.)

Incidental intelligence: in searching for the first appearance in print of the abbreviation "stf", I ran across a letter by myself published when I was 14, wherein (Apr. '31 *Astounding*) I was astounded to find myself using the term "Mr. Science Fiction". Only then, a vogue of the day to be phonetic, I spelled it "Mr. Syence Ficshun".

**SMALL DEPT** of Truth Being Stranger Than Science Fiction: a serious report has come from the Union of South Africa that a science fiction novel written by a 17 year old girl has been banned there, and that a fine of \$2800 attaches to possession of a copy and any owner risks imprisonment for up to five years! This is the honest-to-God, gospel truth, but I am at a loss to offer any explanation for it. Have I a South African reader who might enlighten us all? I can only tell you that the work was first published 137 years ago. It made a name for Mary Wollstonecraft Shelley, and a career for Boris Karloff. You can pick up a pocket-book edition at most any second-hand magazine shop for a dime. Take one with you to South Africa and its value will increase 28,000 times! \$2800 is only about \$45 rent a month for a furnished cell, and presumably the meals are free: so if you want to relax with a good book and get away from it all, *Sud-Afrika* beckons. Just bring your own **FRANKENSTEIN!** —fja

# hue AND cry

Dear Editor:

The letter from G.W. Walton in the October issue of IF was sufficiently irritating to compel me to take up the cudgel so generously proffered. I have no quarrel with his right to believe what he chooses, but I do feel justified in disagreeing with him emphatically. His attempts to establish his views as absolute logic, and as such irrefutable, do not succeed. They achieve only a thinly veiled attempt to rationalize his own uncontrolled speculation.

Time travel exists only in imagination. I consider it quite presumptuous of any one person to set up rules and limitations, expecting writers and editors to concur. Mathematical fantasy . . . uncontrolled speculation . . . who cares? Any approach to an idea is acceptable provided it implements a good

story. How can a writer be condemned for the free use of imagination when no fiction at all is possible without it? G.W.'s statement about telepathy is not acceptable by his own standards either. Following all the information available you find that no conclusive evidence is available at present. If there were no possibility other than the one claimed by him, further research would be pointless. If all progress were hampered by such a narrow view, humans might never have learned to write . . .

I have been taught that one of the prime requisites of a scientific mind is a certain clear logical approach to any situation. Will you please explain, G.W., what sort of thinking leads you to demand that only proven fact be permitted in the most imaginative fiction available? It is your privilege to believe what you choose, my only interest is in keeping one of my favorite editors out of your opinionated clutches. I value his efforts to present a magazine that offers the best in science fiction, and for my money IF is everything it should be. I hope he'll buy any time travel or telepathy themed tales that have the necessary ingredients.

—G. A. Kepner  
Long Beach, California

Sir:

I'd like to make what one might term a half argument. I'm inclined to agree with Walton about time travel. It is an abstract, and useful only as subject matter for science-fiction stories. I must, however, disagree with his statements on telepa-

thy. To call it absurd is an absurdity in itself. The potentials of the mind are great and the thing that has prevented proper application of the potential lies in the matter of training. It is a fairly well accepted fact that the mind has never been fully developed in even the greatest men. I believe that when we have learned to properly train ourselves, mental abilities not yet dreamed of will be evident.

A word about your magazine. I fully enjoyed the October issue, particularly *The Almost Men* and *The Proxies*. However such stuff as *Meeting of the Board* is not what I would call science-fiction.

—Richard Madden  
Limestone, Maine

Dear Sirs:

Just finished the October ish and loved it—per usual. Then I turned to the letter column. Ouch! May I answer G.W. Walton and his blast against telepathy and time travel?

First off, I question his definition of telepathy as a transmission of emotions only. Joseph Jastrow, A.B., A.M., Ph.D. and LL.D., whose section on telepathy is the officially accepted standard in the National Encyclopedia, defines it as "the ability to transfer and receive sensations and ideas, mainly in visual terms . . ." And what is speech excepting sounds to transmit visual and emotional impressions?

Secondly, his usage of the word "impossible". Were you aware, G.W., that advanced mathematicians and students of aeronautics can "prove" by all the "laws" of aeronautics that it's impossible for

the sea-gull to fly? The only things that are impossible are those which we cannot at the time conceive of as logically possible. Think back one hundred years to the multitude of things that were deemed "impossible" but which are standard today. We have faith and a thinking mind. For this combination nothing is impossible.

—G. McMillan  
Redwood City, California

Dear Mr. Quinn:

Sad indeed to find that IF is again bi-monthly. I think the cause might be charged to its high quality; people are not apt to buy a magazine that makes them think.

Some suggestions to Mr. Walton are in order. The man seems to put his faith in the material universe. He is trying to display a scientific spirit. But I was of the opinion that the scientist, until he could definitely substantiate any one of several opposed theories, considered all the possibilities, probabilities and even the impossibilities. How impossible a spherical world is to our five senses! The fact is that there are many opposed theories of time travel and telepathy, none of which can be completely proven.

Mr. Walton points out that the best telepathy can do is send and receive emotions. Frankly I can hardly conceive of emotion in its pure state, therefore it seems improbable that I could transmit a pure emotion of which I cannot perceive. If Mr. Walton can entertain the abstract, I accuse him of thinking in non-human terms.

Concerning time travel, I will

agree that as far as it has been portrayed it is apparently impossible. The only way I can imagine it is a non-effecting-observer type into the past which would make dry reading, unless we were to find that history is grossly incorrect.

I suggest he read authors Rhine, Hayakawa, and Korzibisky. Other than that I offer no authority except that, as a human being, I consider it my right to think. And I think that Mr. Walton's stand on the subject should not be debated but rather that we should consider his entire "science" too aristotelian.

—Larry Martin  
Waco, Texas

Dear JLQ:

Mr. Walton makes several insupportable statements which he evidently wishes us to accept as dogma. He says that it is inconceivable that a small part of the universe such as a man could be shifted on the time scale because it involves too many paradoxes. Infinity too is inconceivable and involves a greater number of paradoxes. Also the infinite numerical series, while never demonstrated, is impossible to deny.

There are a great number of conceptions in the universe which our minds are incapable of grasping just yet; but we cannot deny them. I'm not being mystical; but merely admitting that we have not yet reached the peak of our mental development. I hope there is no peak.

As to telepathy, he says that it is impossible for an abstraction to "produce" (a semantic error, re-

member conservation of matter and energy) matter or energy. In this I agree, but I wish I knew what he meant by "abstraction". The brain operates on the same laws of matter and energy as the telephone switchboard. I can see no difference except in complexity between broadcast of emotions and of thoughts or pictures. Dr. Rhine has succeeded in finding people who, in tests which consist of guessing symbols on cards which another person is looking at and thinking about, have achieved more correct answers than can be accounted for by the laws of chance. This is not the broadcast of emotions but of thoughts, or more probably pictures.

The October issue was very good, especially *Prisoners of Earth* and *The Almost Men* in that order of preference. I'm glad you have started a letter column, it gives your readers a chance to express their interests and opinions.

—Bill Doying  
Chevy Chase, Maryland

Dear Sir:

Mr. Walton's opinions are based upon the premise that it would require an enormous flow of energy to move through time. I find the time machine that I have carried around on my shoulders for some "time" now functions with the small amount of energy contained in three meals per day. It seems to require no more energy for me to go back twenty years in "time" than it requires to go back twenty minutes. The movement seems instantaneous and without effort. It is my considered opinion that the



more stories and articles that are written about time travel, the sooner the public will become aware of the fact that their *OWN MINDS* are the only time machines they will ever know.

When that which we label *TIME* is analyzed, it seems to be an illusion that is brought on by the relational movements of the stars, suns, planets, etc. in the galaxy. If there is disagreement with this, then I should like to ask the question: What happens to *TIME* when we are in an unconscious state?

*The Almost Men* was a marvelous piece of work. It required a knowledge of physiology, anatomy down to the energy level as well as a knowledge of the functioning of the mind, for Cox to write such a

story. Hail to the story; and hail to the editor who is wise enough to choose it from among the many submitted. Let us have more!

—Dar Nelson  
Vista, California

*Mr. Walton's letter has provoked more heated comment than any we ever printed—with more to come!*

Dear Mr. Quinn:

For shame on your quiz writer! He has robbed the otherwise inconspicuous constellation Lyra of its most noble inhabitant, the brilliant Vega. If some relatively unimportant star had been misplaced we might overlook it, but Vega! Until the error is corrected in print your magazine has joined the publications of the astrologers in the corner we reserve for astronomy's enemies and detractors.

—Stephen Maran

Director, Junior Astronomy Club

*We really muffed it . . . and we apologize. Vega is not in Bootes, but in Lyra.*

Sirs:

S.F. is often concerned with the man-machine conflict. Either the machines revolt or man does. Who decides what's a machine? Is a stick used as a lever a machine? Is a calculator? How about a slide rule? Or a log table? If not, why? Or can this whole problem be dealt with by semantics?

—Mark Langston  
South Bend, Indiana

*Okay, folks, what constitutes a machine?*

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