Possible Worlds of SCIENCE FICTION

Over 20 spine-tingling stories—none published in book form before—dealing with worlds other than our own. Among the authors are:

Robert Heinlein
Hal Clement
Isaac Asimov
Murray Leinster
Arthur C. Clarke
A. E. Van Vogt
Ray Bradbury
Theodore Sturgeon
Margaret St. Clair
Clifford Simak

etc., etc.

Edited by Groff Conklin

Editor of "The Best of Science Fiction," etc.

Here are twenty-two glimpses of life on other planets——life so incredible but yet so possible that you begin to believe!

True, the stories are fiction. But even serious scientists now think that life on other planets is not only possible but inevitable, in one form or another.

What forms may that life take? Part One of this book concerns Solar System life forms. Will they be sheer electronic shapes, as in Frank Belknap Long's description of Mercury, "Cones?" Or machine remnants of a long-dead people, as in "Enchanted Village," A. E. Van Vogt's tale of what the first explorer to reach Mars found?

Part Two goes out into the Galaxy, far beyond the Solar System, to find ——things that go click in the night, as in Arthur C. Clarke's "A Walk in the Dark"; enormous, playful monsters as in Samuel Merwin, Jr.'s, "Exit Line"; and ourselves, or a reasonable facsimile thereof, as in James Schmitz's "Second Night of Summer."

There are no limits to *Possible Worlds of Science Fiction*. These stories bring you the pleasures of armchair adventuring at their best and most exciting!

None of these stories has been published in book form before.

$2.95

Possible Worlds OF SCIENCE FICTION

Edited by GROFF CONKLIN

Editor of "The Best of Science Fiction," etc.

The VANGUARD Press, Inc.

New York

Published simultaneously in Canada by the
Copp Clark Company, Ltd., Toronto

Manufactured in the United States of America
by H. Wolff, New York, N. Y.

COPYRIGHT ACKNOWLEDGMENTS

CONTENTS

Introduction vii

PART ONE: The Solar System 1

Raymond Z. Gallun: Operation Pumice 2
Robert A. Heinlein: The Black Pits of Luna 15
A. E. Van Vogt: Enchanted Village 29
Malcolm Jameson: Lilies of Life 44
Ray Bradbury: Asleep in Armageddon 65
Isaac Asimov: Not Finall 79
Frank Belknap Long: Cones 96
D. L. James: Moon of Delirium 113
Theodore Sturgeon: Completely Automatic 130
Nelson S. Bond: The Day We Celebrate 148
Margaret St. Clair: The Pillows 165
Hal Clement: Proof 177

PART TWO: The Galaxy 193

Murray Leinster: Propagandist 194
H. B. Fyfe: In Value Deceived 213
Jack Vance: Hard-Luck Diggings 225
John Berryman: Space Rating 238
Katherine MacLean: Contagion 257
Clifford D. Simak: Limiting Factor 286
Samuel Merwin, Jr.: Exit Line 302
James H. Schmitz: Second Night of Summer 309
Arthur C. Clarke: A Walk in the Dark 337
Poul Anderson: The Helping Hand 347

INTRODUCTION

UNTIL very recently, the idea of voyaging across the spaces that separate us from the Moon and the planets of our Solar System has been a sheer dream, a jumping-off place for amateur philosophers, a hide-out for fantasists. No one ever really thought it scientifically possible that man might escape from his fishlike state at the bottom of his sea of air and voyage through the star-spangled near-vacuum in which our Sun and its family of planets are suspended.

But then, until less than half a century ago, no one really believed that man could ever get his feet off the ground at all. Yet within a quarter of a century after the first heavier-than-air flight, airplane travel was common, safe, and matter-of-fact. Similarly, though at a much less swift rate, the idea of flight into space has been marching from the realm of impossible fantasy toward that of actual achievement. *Space travel is a definite probability,* and in the near future, too. As Willy Ley, famed rocketry expert, has said, "It now looks as if that great old dream is not a dream after all. It looks as if it were something that can be done."

It has not been done yet, true enough. But the only bars to the first Moon rocket, which will herald the advent of interplanetary travel, are technical and economic, not scientific. All the basic scientific problems have been solved, and we can safely say that rockets to the Moon should be a reality within the next decade or so. We are indeed so close to solving the myriad straight engineering problems—physical, chemical, physiological, psychological—that lie between us and the new frontiers of space that the largest single bar to the first successful space rocket may be said to be financial. Space rocketry is almost fantastically expensive. Until conditions are such that a united government-private-enterprise effort can be turned to this problem from the problems of rocketry as weapons, it is unlikely that even unmanned Moon rockets will be undertaken. However, as soon as world conditions permit, such a rocket unquestionably will become a high-priority project in both military and civilian scientific circles.

While interplanetary travel is thus an almost immediate possibility, interstellar travel remains highly unlikely for decades or even centuries to come. The project is simply too stupendous. Nevertheless, the requirements for interstellar ships are known to be at least mathematically feasible and physically conceivable. Given highly advanced atomic fuels,

gigantic strides in metallurgy and other techniques, and a combined economic support which would make the financing of our first atomic-bomb research look like the purchase of a toy at the neighboring dime store, it is not wholly ridiculous to imagine the successful launching of an interstellar ship, either from the Moon or from a man-made planetoid outside the Earth's surface, within the next century.

The problem of what we will find when we finally set out to explore our Solar System and, later, our Galaxy, is one for which there are no satisfactory answers at all. Negative approaches are the easiest, of course, and those biologists who have turned their attention to this highly suppositive field of conjecture have in general vetoed the idea of life elsewhere in the Solar System and, by extrapolation, in the whole Galaxy of which our Sun is a minute element.

Biologists in general seem to assume that the only possible form of life is one based on an oxygen-water ecology and on a temperature range within which water is, most of the time, a liquid. With such narrowly blindered views, the biological fraternity has an easy answer to the question of the possible existence of life on other planets. Barely possible on Mars and Venus; impossible elsewhere, they say.

Drawing parallels from the existence on earth of certain exceptionally high- and low-temperature life forms, these biologists admit that there is no reason why such specially adapted forms could not live on our immediately neighboring planets. Scarcely developed to the point of intelligence, these specialized "animals" would probably be little more than bacteria, or mosses, or aquatic plants, and possibly some novel types of arthropods or fish or reptiles, dry-land types on Mars and probably gill-breathing on Venus. Beyond this the academic biologist will not go. Life on Mercury? Too hot! Jupiter, Saturn, Neptune, the asteroids? Too cold, by far.

But writers of science fiction, many of them with just as sound and extensive training in biology as the professors themselves, can see no reason for staying within these narrow limitations of the known. Scientifically, they say, there is literally no reason why the possibilities of life in the Universe must be limited to those found on one planet of a dull little third-rate star on the outermost, neglected fringes of the great Galaxy. While the existence of other forms of life cannot be proved today, in the absence of interplanetary or interstellar communications, their impossibility cannot in any way be proved by known science. The stereotypes of biology which hold true under the conditions of Earth

cannot disprove the possibility of utterly foreign forms of life under widely differing planetary ecologies. Why must these stereotypes be valid on planets with sulphur-gas atmospheres (about 900° Fahrenheit) or on those where the term "atmosphere," as we understand it, may have no application to speak of—as, for example, a fantastically cold planet where gill breathers might use liquid oxygen for their metabolism (roughly −400° Fahrenheit)?

The one thing we can assume on the basis of scientific logic is that *any* form of life imaginable may exist somewhere in the Galaxy, providing we use the word life not in our commonly accepted sense, in which all that is living is composed of protoplasm requiring planetary conditions similar to those existing on Earth. In a much broader frame, perhaps we can say that anything is alive that can reproduce itself either directly (like men or amoebae) or symbiotically (like Schistosoma hematobium or various viruses), or that is by its nature immortal (as would be any life formed directly from energy).

We can also assume the extra-solar existence of that most unlikely life form of all—our own. There is no reason why a few extra-solar planets (out of the hundreds of millions which *may* exist) should not provide an ecology similar to that of Earth's, and why parallel forms of evolution on these planets should not result, now and again, in essentially human (or "humanoid," as the science-fiction writers like to call it) forms of life. A great many science-fiction writers have chosen to envisage such humanoid societies and have very often assumed them to be far in advance of our own civilization. The most common form which these extra-solar "human" societies take is, consequently, that of the Galactic Empire.

This idea, of Earth's backwardness, is based on the assumption that, since our Sun is actually a "fringe" star, lying far out from the center of the Galaxy in a kind of neglected backwash or eddy of cosmic matter, it is also remote from the main currents of Galactic culture, and we humans are nothing but an undiscovered tribe of savages in a poorly explored part of the Universe. Closer in to the Galactic center, these writers assume, there are many humanoid civilizations (and also many nonhuman but intelligent societies as well) that have developed not only interstellar but inter-Galactic travel, as well as all sorts of other scientific delicacies. These Galactic Empires are only now, as radiations from atomic bombs register on their supersensitive instruments, becoming aware of us. For the most part, these stories are located on

Earth and fall into a different category from that covered in this book: the "earth-invasion" type of story. A collection of earth-invasion stories would make a most excellent anthology—and, indeed, may do so in the near future if the present editor has his way. But no stories assuming a non-Earthian Galactic Empire are included in this book, because they do not fit the pattern.

On the other hand, a "Terra" (science fiction for "Earth") of the future can be imagined which is itself the center of a Galactic Empire composed of both human and nonhuman intelligences. This type of story is obviously suitable for inclusion in this anthology. Two of them are; and the last story in the book, which is one of them, carries out the idea of a Terran-based Galactic Empire, with a certain stinging logic which is very applicable to events on Earth today.

As to whether or not there actually are many (or any) planetary systems among the stars of our Galaxy, astronomical evidence is almost entirely lacking. Some theories of cosmological origins make the Solar System a practically unique accident. Others make planetary systems a natural outcome of the formation of the suns themselves. Neither type of theory has any basis in experimental fact, so that we are free to assume that planets are as common in our Galaxy as are litters of pups wherever there are dogs. Such an assumption has naturally been made by the writers contributing to Part II of this collection.

Only one thing needs to be said about the actual stories included in this book. I have made it a point to omit any of the more typical examples of BEMs. BEMs are what science fictioneers call the more horrendous (and juvenile) forms of extra-Earthian life with which the writers of standard space operas used to delight in peopling their alien worlds. (The initials, incidentally, stand for Bug-Eyed Monsters.) I have included no gigantic squids (unless you want to call Sam Merwin's weird form of life a squid), no telepathic ants the size of small horses, no scaly worm-dragons of sinister intelligence, no Essences of Evil such as used to serve some of the pulpeteers as plot mechanisms in lieu of original ideas or realistic conflicts. There is no reason to assume that some sort of BEMs do *not* exist somewhere in the Galaxy, I admit. But I have preferred to leave their existence unreported in this book. They just do not make very good reading!

With this, let me introduce you to the Possible Worlds of Science Fiction—or, even more tantalizingly, the Possible Worlds of Science. Not one of the stories in this book is based on fact; contrariwise, not one of them, in the opinion of the editor, is scientifically impossible. Today, however, neither of these facts is particularly important. What is important is that the stories are all, I think, fun to read. They all give your imaginations a good run for the money.

Slip into your spacesuit, then; strap yourself down in your antigravity seat; take your anti-space sickness pills, and hold tight! You're off for a thrilling voyage of exploration of the unknown Universe!

GROFF CONKLIN

PART ONE

THE SOLAR SYSTEM

HERE are narratives ranging from the highly probable to the rather unlikely concerning the planets, satellites, and asteroids of the little, balanced system of matter-globes that wheel around our Sun. In every instance the writers have fitted their ideas of possible life and possible environment on the various members of the Solar System into the fairly rigid pattern of known data about them—temperature, gravities, densities, atmospheres or the lack of them, and so on. That is to say that none of these stories is based on data known to be wrong—as far as the data are known. What makes them exciting are the authors' various and sundry extrapolations into the unknown which give their stories their substance. Until we actually land on the planets and moons, and find out from firsthand experience exactly what the facts of the matter are, we will not be able to contradict even the most wild of these imaginings, no matter how unlikely we may think them.

Raymond Z. Gallun

OPERATION PUMICE

Before we can discover what it really is like on the Moon and the planets, we have to learn how to get to them. In all probability the first spaceship will not land on extraterrestrial soil, for it will not be large enough to carry the extra fuel necessary to lift it even off the Moon. It will be merely an exploring rocket, testing space and the conditions of space as they affect human beings.

The story of the first manned rocket around the Moon is here told with realism and a down-to-earth human touch. It is in the nature of an introduction to the possible worlds of our universe—the story of the first step off the ground which must precede all other steps.

HE GOT all the way through the guard lines, and that must have taken some fancy figuring, or else it was just kid luck. It happened to be Mel Robbins who discovered him, early in the morning, when it was still cool and not quite broad daylight. Robbins was one of the two inside men of Operation Pumice.

Mel had come out of the mess-trailer and was having his digestion cigarette, when he spotted the youngster sprawled on his stomach on the New Mexico desert. Mel walked toward him without hurry, the way you might do when you see something so out of place that it leaves you incredulous. Ten paces away, Mel stopped and studied his find for all of two minutes. The boy never moved nor even seemed to know that anybody was so near.

He was spindly, fifteen or sixteen. Ten days ago he must have been very pale—maybe was the bookish kind—because now he was unbelievably sunburned. Shreds of dry skin stuck out from his blistered lips; his thin nose and high cheekbones were scabbed. The back of his neck, above his dirty T shirt, was so crusted that it was like lizard hide. All this indicated vast and unaccustomed tribulation.

But on his face there was a look of ridiculous rapture, as if he saw the millennium coming true; as if being here was worth a hundred times what it had cost, or fifty times what flesh could endure.

Mel Robbins had memories from his own early youth that led him to understand such feelings. His grin was sympathetic as he followed the

line of the boy's vision-haunted gaze to the thing that loomed there in the dun-colored landscape.

It might have been taken for a vertical oil tank, a hundred feet high, capsule-shaped, silvery and seamless, and braced by slanting, winglike buttresses. But the dark vents arranged in a ring at its base suggested tumults of flaming energy. In its domed top were small, round windows. Above them, lettered in enamel that would not burn in the heat of atmospheric friction, was the melodramatic marking, MR-1.

Mel Robbins knew every part and mechanism in that twenty-million-dollar mass of coordinated equipment—even every brace, pared out for maximum strength with minimum weight. He knew the MR-1 by the mathematics of ballistics, physics, and chemistry, by the data from the unmanned probe-rockets that had gone far into space, by long experience flying the fastest planes in the world, by the many times he'd been whirled in a centrifuge, making tests, and by his years of dreaming that such a craft as this was possible. He lacked only the final adventure of flight, and that he would have tomorrow, before noon.

Knowledge, building slowly, had dulled some of the glamour and washed out the mystery.

But now Robbins borrowed a thrill from the kid's eyes, or called it back from memory. For a second he saw MR-1 almost freshly—enigmatic, with hints of other worlds in it. Around it was the camp, the army tents, the portable liquid hydrogen and oxygen plants on their immense trailers, the barbed-wire barriers . . .

He chuckled, and the boy gave a start.

"Hi, fella," Mel said. "Didn't you meet any guys with rifles while you were coming the last couple of miles?"

Scared to sullenness, the kid scrambled to his feet.

Asking the questions was a job for the security officer, but Robbins figured that Eagle Brow would make an enormity of the boy's intrusion. What was going on here had a military importance tangled with its broader scope. It was best to break the kid in gently for trouble. Besides, Mel Robbins was curious.

"Looks as though you had quite a journey," he said. "And people don't get fried by the sun, riding buses or trains. Where did you come from, and how?"

"Long Island City," the waif grumbled. He made a gesture with a grimy thumb. Hitchhiking.

"Your folks know about it?" Mel asked.

"I sent postcards."

"What's your name?"

"Art Pelsudski."

"What's the trip for?" Mel figured that he knew the answer. He just wanted to hear the kid's way of saying it.

"I had to see Moon Rocket One."

The words fitted perfectly Mel Robbins's picture of how it had been. When you were fifteen or sixteen, a dream could be a shining demon, a driving jet of intense interest. You had a couple of dollars and the dope you could get out of books. No skill—and without it you were nothing. That was your poverty. You had only that wealth of glittering wonder. It was not worn thin by too much time spent close to the thing you wanted to do. When you thought of advancing science being perverted toward a final destruction, even that was glamorous; there was no stark shadow of worry nor a recurrent idea that your efforts were better left unmade.

This Art Pelsudski—Robbins wondered how he had managed to remember such a name for even ten seconds—had run out on his family and school, had thumbed and blundered his way almost across the whole United States, just to see the first real spaceship.

Robbins figured that, in his own day, he would have done it himself, if there had been an MR-1 then. In fact, for those times, he had done almost the equivalent. Too young for the Second World War, he had hung around an airfield in Kansas. Starry-eyed and humble, he had badgered a fighter pilot into giving him his mascot—a black doll made of large wooden beads held together with cord. He still had the doll.

As he remembered, Robbins's thin, dark face softened even more. The kid saw and seemed reassured.

"Say—you're Colonel Mel Robbins!" he burst out suddenly. "The man who's going up in MR-1 to try to circle the Moon! I've saved a lot of your pictures from the papers. Doctor Ernest Carnot must be here, too. Could I see him, maybe?"

"He's coming this way from the mess-trailer," Mel said. "All you have to do is look."

Young Pelsudski got one glimpse of the plain, middle-aged man with the bent nose. Then a pair of MPs spotted the kid and took him by the arms. Mel saw the mask of fright and sullenness drop over that scabbed face again.

"How did he get inside the wire?" Carnot asked mildly.

"Search me," Mel answered. "With half a chance, he would have tried to stow away. Too bad he can't—with all that enthusiasm!"

Mel Robbins had too many practical preoccupations to spend any more time thinking about the youngster just then.

"Hansen's gang will be charging the cameras and checking instruments today," Carnot said. "While we give all the fuel pumps a final going over."

So Carnot and Robbins climbed and crawled through pipelike servicing tunnels aboard MR-1, which was not a single rocket but five separate ones, sleeved into one another. The smallest, at the spaceship's domed top, where the tiny passenger compartment was, fitted into the second smallest, and so on, up to the largest rocket, which would provide the take-off thrust—the first step in building tremendous speed.

For Robbins and Carnot, their present work was routine and completely familiar, yet with a subdued anticipation behind it. Tomorrow held the answers to many questions. Carnot, the ship's designer, whose life was too valuable to risk, might not find them out as well as Robbins; but there was chance of an accident's happening so swiftly that Robbins would never know of anything happening at all.

They had lunch in the mess-trailer with a trim, dark-haired girl, the newspaperwoman Robbins had married. She had been in Los Angeles for a day, conferring with radio people, and had just flown her private plane back to camp. Mel Robbins hardly listened to the business subjects she now talked about, but he listened to her voice. He loved his Norma, and she loved him; but they were different in many ways, and sometimes they even lost the thread of each other's personalities.

"Terra Firma has enough wonder left in it for me, Mel," Norma used to say. "But you are the first man I ever knew who reached for the Moon and planets and really thought he could have them. Maybe you can, at that. . . ."

Now they had one more night together and one more breakfast in the house-trailer where they were living, in camp.

During the bustle and tension of early morning, Robbins saw the kid again. He was sitting under an awning, with a guard near him. The bandages now over his sunburn helped make him look ridiculous and dejected; but when Robbins grinned at him and said, "What's the name? I forgot," he showed joy.

"Art Pelsudski," he answered. "Say—let me wish you luck, Colonel Robbins! Just think—in four days you'll be looking down on the other side of the Moon, that nobody's ever seen! The old theory may be right. Maybe the Moon has been drawn out of shape by the pull of Earth's gravity in one direction—it may bulge on the hemisphere which always faces Earth, and be hollow on the other. Maybe some air is cupped there. There might be lakes and trees and cities in a tremendous valley. Nobody knows . . . "

"Nobody does," Robbins agreed.

The theory was ancient, weak, and too romantic and pat in the way that its supposed marvels hid behind the unknown. It was the look in the kid's eyes that interested Mel most. In it was the worship of great things of metal and power, and the driving love of unreached distance and mystery.

After that brief meeting, Pelsudski vanished from Robbins's thoughts once more. The fueling of MR-1, the last preparations, and the thread of personal fear in him held his attention.

The flight was set for almost midday, when the Moon was nearly new and to Sunward. Solar gravity would help a little to draw the spaceship along its course.

Once, at the last moment, when he was trying to think of something jaunty to say to his wife, Mel did remember the boy.

"Norm," he said, "you don't look much like the girls on the covers of science-fiction magazines. But a young friend of mine might be watching us. He's a purist. To him all science glitters. His heroes are big and strong, his heroines beautiful and soft. So let's make this kiss his way. He hitchhiked out from Long Island City."

Robbins's words had turned out to be more serious than he had intended. Norma didn't seem to take them as a joke, either.

"Good enough, you bum," she said, her voice unsteady. "Maybe I'm juvenile, too. . . . Well, so long, darlin', until eight or nine days go by. . . ."

Waving backhand, he climbed the ladder toward the entrance port of MR-1. For a second he lived for Art Pelsudski, or maybe more for his enthralled, Earthbound self of fifteen years ago. Or was that the same? The news people who were present didn't matter. Perhaps he should be wearing his lightweight vacuum armor over his slacks and

sweat shirt for more drama—okay, call it corn. But this trip, in the sealed passenger compartment, he wouldn't be needing the armor.

The fierce desert sunshine was cut off when he climbed through the port. It was cooler here. For a moment, now, with his nerves wearied from tensions and dulled to enthusiasms, he hated the great, rimed tanks of liquid hydrogen and oxygen that he was climbing past in the semidarkness. He was thinking:

"If politicians didn't put so many restrictions on research, we wouldn't be doing this with chemical fuels. We'd already have an atomic motor, simpler and safer . . ."

Mel knew that in part he was just grumbling, against that other—that recurrent—fear. Now a guided missile could come not only from the other side of the Earth; it could also be launched from deep in space. That idea grated against other hopes. But a scientist did not quit working, any more than he willed his pulse to stop.

Mel Robbins found Carnot in the domed and padded passenger compartment. The thick quartz glass of the windows was leaded and darkened against the cosmic rays and ultraviolet of the void. The older man grinned mildly in the dim light.

"My last look-around," he said. Probably he didn't like being left behind, and maybe there was in him something of the same mood that Robbins had. "We're selling the eternal enigma, I suppose—first. Then, whatever comes out. Oh—you'll make this trip all right, Mel."

Mel heard the receding click of Carnot's feet on the ladder as he sealed himself inside the compartment, dogging down the airtight hatch. Then he took the small microphone-speaker unit that was corded to the wall.

"This is Robbins," he said into the mike. "I'm strapping myself to the floor padding now. Prone, a man can stand about nine gravities of acceleration. It won't be that bad. Now all I do is wait. You don't trust the firing and direction of a spaceship to a pilot. Clocks time everything."

His words were being rebroadcast by a hundred stations. He didn't mention that he felt as if he were near an atom bomb about to explode.

"Hear that rising hum?" he said. "The main stabilizing gyroscope is starting. That slobbering noise is the rotary fuel pump of the largest rocket, going into action."

Then came the roar of hidden flame and creaks and crackles in the

structure of MR-1, loaded with hundreds of tons of ticklish fuel. Such sounds described themselves. He didn't have to.

"I can feel a little wobble," he said, close to the mike. "That means the ship is fire-borne—off the ground. The thrust feels gentle, at first. . . ."

The sense of weight grew with awful steadiness, pushed his jowls toward his ears, made his heart labor and the flesh of his cheeks feel tight.

He spoke at broken intervals: ". . . end of first minute . . . Fifteen miles altitude. . . Acceleration is about half a mile per second, every minute—not too hard to take. We'll use a little over seven miles per second, maximum velocity. That means a total firing time, for all the rockets, of only fifteen minutes. Then MR-1 just coasts on. Speed can't hurt anyone—only too fast a change in speed. The Earth goes around the Sun at eighteen miles a second, and we can't even feel the motion. . . ."

He talked on, mixing the announcement of events with bits of lecturing, as he was supposed to do:

". . . vision dims under high acceleration, but I can see that there's more light in the compartment, now. The ship has climbed out of the atmosphere. There's no air to cut down the sun's brightness. . . . Hear that clatter? Largest rocket, empty, released to fall. Watch your heads! The sounds of the smaller rockets, vibrating through the ship, will be shriller. . . ."

Once he said, "Are you listening, Norma? Hi, Carnot!" Then he joshed a little: "Say—this is kind of dull: Everything happens just as we expected. . . ."

The rockets burned themselves out in succession and dropped away, and Mel announced the end of each.

"So!" he said at last. "The tubes of the smallest rocket, in which I'm riding, have cut themselves off, though there is still dry-powder fuel in reserve. The sudden silence hits you. All you can hear is the hum of automatic cameras, and cosmic-ray instruments, and the click of hot metal contracting. Space, outside, is pretty cold. . . . But there's a scorched smell here. The sudden lack of thrust makes your stomach feel funny. . . . I'm already quite a way from Earth. This initial speed can gobble up even astronomical distance in a hurry."

Mel Robbins was silent for a minute. Then he spoke again:

"I've removed a section of floor padding that covers a window. There are no rockets below to block the view, now. The Earth is a grayish-green mound, with nothing clear in it. The white areas must be clouds, though they don't look like clouds. I can see the atmosphere as a sort of bluish fringe. Beyond it the sky is black, the stars sharp as needles. It's a beautiful view. . . ."

Robbins didn't express his private thoughts—that looking back at Earth from space was a symbolic moment to him, once dreamed up, and then built for. Well, he *was* happy about it. "Fella," he thought silently, addressing his past self, "you waited a long time." So Robbins was looking back in another sense, too.

He was aware that his meeting with a boy named Pelsudski had something to do with the way his mind was rambling, just as did the knowledge that progress was trying to find its way through a period in history when growth could be real, or could mean The End.

Vagaries went through his head, stray thoughts to be chuckled at or taken half seriously. If he had been able to look at the Earth from space, long ago, it would have been sheer glory. Now it was something less. Some of the charm rubbed off just by your becoming a man. Was that justice to a young visionary? His perfect height was never quite reached, even in realization.

Mel even felt a bit sheepish over his success. In a way he'd been two people, and wasn't this moment more the creation of his boyhood? If he had always been the plodder he was now, he wouldn't be out here. But the boy changed, and so was cheated. Why couldn't success come when the appreciation of it could be highest? The timing was wrong, somewhere.

Robbins shrugged and returned his attention to the mike.

"Gravity is dropping off fast, with increasing distance from the Earth," he said. "I feel light—it's like falling. I think I'm going to be slightly ill. . . ."

By snapping a small switch on the microphone-speaker unit in his hand, Robbins could have let Norma or Carnot talk to him. But he didn't want either their too serious, or perhaps playful, sympathy. In avoiding it, he showed a certain playfulness himself.

Prone once more, he just kept on talking about anything that came to mind, repeating what had been in the papers and on the radio:

". . . MR-1 should go up, Moonward, at slowing speed against Earth gravity, for nine-tenths of the two hundred and forty thousand

miles distance; then it will be in the sphere of the lunar pull. It is aimed not to hit the Moon but to swing naturally in a half orbit around it, like a rock on a string of gravitation, or like a comet looping around the Sun. After that, it will start tumbling back toward Earth. . . ."

Mel talked on until the spacesickness really got him. He had strapped himself down again; but he felt as if he had lost his stomach. He never remembered just when it was that he shut off the mike. In his misery, he managed at last to sleep fitfully, and for once he had nightmares. He hurtled and fell. Or he struggled across sun-blasted deserts, thumbing to leering motorists who never stopped.

At intervals of wakefulness he radioed: "All okay." After some hours it became true. Spacesickness could pass, like seasickness.

The first words he got from Norma were, "What are you doin', Mel?" with a warm laugh.

In their apartment in L.A., she used to call to him from the kitchen with that same phrase. He knew that now she meant to remind him of the memory.

Her voice was coming up to him on an aimed radio beam, and nobody else could hear it. But the beam stabbing down from MR-1 wasn't so narrow; besides, everything he said was for broadcast. Well, why should he care about the lack of privacy? Things had gone very well. The worst dangers were over. He felt relaxed and gay.

"I'm doing the tricks from the imaginative fiction about space, hon," he chuckled, when he had switched to transmission. "Shaking water out of a bottle—it does form into chains of globes that drift through the air with almost no weight at all. I can float up to the ceiling without any trouble. . . .I love you, honey. . . .Wish you liked to see things like the Sun with its corona visible. . . ."

Norma laughed again. Her voice turned very gentle. "Happy, Mel?" she asked. "You've got what you want?" There was fondness in her tone, mothering, and mild feminine cynicism, mixed with satisfaction. Part of her seemed forever out of his reach. But he felt fond, too.

"Sure," he said.

Time passed. Robbins talked on the radio—to everybody, to Norma, to Carnot. He slept. He ate chocolate and food concentrates. He inspected the air purifiers and the cameras and instruments, which could be reached by unlatching sections of padding from the walls and floor.

The Moon grew to a pock-marked crescent, hideous with nearness.

The turnabout came at last. Lazily MR-1's heavier base rolled around till it faced the smaller world. It was in the gentle grip of lunar gravitation. For a while it swung like a slow pendulum.

Mel talked to his microphone:

"I can now see part of the hemisphere that is always hidden from view on Earth. So far it shows the same kind of craters as the visible hemisphere and the same kind of *mares*—'seas.' Though they aren't seas, but airless deserts of lava, sprinkled, it is supposed, with volcanic pumice. The same kind of stuff that people used to scour kettles with. . . ."

Robbins spieled into the mike until the vast bulk of the satellite began to eclipse the Earth. MR-1 was now curving behind Luna. Radio communication would be eclipsed, too.

He changed to reception.

"Can you hear me, Mel?" Norma's voice was already thready and full of weird echoes. Her tone was a little taut.

He moved the switch again and said, "Yes, still . . . So long for a couple of hours, Norm . . ."

Reception gave only a thin crackle after that. Robbins was alone, as nobody had ever been before—a quarter of a million miles from all of his kind.

Jagged crater walls were very near—only a couple of thousand miles distant—and in full light of the Sun. Mel peered at them from the floor window. MR-1 still kept its heavier base Moonward, though now there seemed no sense of weight at all—the centrifugal force of the ship's curving path counterbalanced gravitation.

Some of the craters were like Tycho, on the familiar hemisphere—white, with streaks of white, powdered rock radiating in starred pattern around them. Maybe these craters were not volcanoes, but the bruises of gigantic meteors, made when the Moon was already old, in a crust that had partially cooled.

The cameras and instruments were mainly automatic; still, for a while, Robbins was very busy, making sure that everything functioned as it should. But his mind worked separately. He was at his goal, the farthest point of his journey, meeting the unknown. He had completed a step in science, proven a radically new human power. There was a thrill in the accomplishment—a subdued, icy one. Everything in his life seemed to focus itself toward this time. In this solitude he could not have kept his thoughts from rambling. Perhaps no one could.

He pictured what the Moon must have been like, a billion and a half years ago, with hot, volcanic gases trailing off into space. Lunar gravity had never been strong enough to retain an extensive atmosphere.

Mechanisms whirred. Radar beams were probing down, reflecting a record, perhaps, of mineral deposits—radioactive elements were hoped for. Maybe the Moon had them; maybe not.

Long ago Robbins had imagined lunar colonization—men in strange armor building airtight shelters, observatories where telescopes would never be murked by an atmosphere, ramps from which spaceships could leap toward distant planets, with an attraction of only one-sixth that of Earth to retard them.

He knew his eyes must have glowed with that vision, then. Now it was not as wonderful as it had been, though much of it could still turn out the same. It would be parallel to other advancement—in medicine, in living, and, one still hoped, in social science. You couldn't stop the tide—you wouldn't want to—but if war came in this era of untried power, a whole planet might be torn to pieces.

Mel Robbins could see most of the mysterious hemisphere now, and his attention was drawn inevitably back to a minor memory. In the sunshine the lunar scene was as stark as dry bone.

"There's no valley with air and trees and cities in it, Art Pelsudski," he said aloud.

Somehow this fact hit Robbins—dropped his spirits a notch farther. It seemed like a defeat for the kid, for himself of years ago, and for all the naïve souls who dreamed idealistically.

He knew that the quiet of humming mechanisms, and of space, and of absolute solitude, with the skeletal Moonscape so near, had depressed him. But he knew, too, that his pessimism was no deeper in quality now than it had been for a long time, in the back of his mind. It was reasonable; you couldn't wish away the facts that built it. It had an overpoweringly real basis. How could you ever fight the mistrust of millions of people for millions of other people of another nation? The answer was simply: "Sooner or later." Robbins's sniff and shrug and one-sided smile had the humor of fatalism in them.

For a minute, because this thinking seemed to have reached a conclusion, he considered other things. There were four days of his journey yet to pass. He'd probably make it all right, now. Soon he'd be talking again by radio with Norma, from the other flank of the Moon.

Then the long fall Earthward, speed mounting. Near the Earth, dry-powder fuels, blasting from the jets, would check MR-1's velocity a little. Two hundred miles above the Atlantic an immense metal-fabric parachute would open in the thinnest fringes of the atmosphere, checking it more. MR-1 was light enough to float. He'd be back with Norma, Carnot, and their friends. History for what it was still worth, would call him the "Columbus of Space."

It was a nice, melodramatic title. It made him chuckle. The final effort to gain it had been easy. He'd simply ridden an automatic machine. If there had ever been any hero in him, it was long ago, when nobody knew him. Dream and fulfillment were mistimed, like a lot of things in the world.

Again his ruminations followed an inevitable route. He remembered a kid, burned by the sun, in dirty clothes, sprawled in the desert, with a ridiculous look of rapture on his face. Scared and inexperienced, he'd begged rides across almost three thousand miles. That was guts to admire. Grabbed by the cops, he still was happy in being near MR-1. He didn't realize the troubles that hung over him.

Maybe it was protective instinct for the young; maybe it was maudlin sentimentality connected with being out here beyond the Moon, maybe it was just pity—Robbins didn't care, then. That kid was somehow important to him, seeming to make him feel that way by just being what he was. Robbins knew that he had to do something for this Art Pelsudski—build him up, blind him a little to what was coming, let him feel that the universe was still okay.

It wouldn't be hard to do. Mel looked down at a lunar "sea"—a huge patch of desolation. *"Mare Pelsudski?"* No, that was too much to give, and too academic.

But another idea came easily. From a camera he removed a print—the first picture of the mysterious hemisphere. With a pen that didn't feed too well out here, he began to write across it. . .

The surprising thing for Robbins then was that right away he began to feel better. There was a warmth in him now for the kid and for what he was doing for the kid. It occurred to him that Pelsudski, being young, was a symbol of the future—a rather splendid one. The idea was enough to turn Robbins's mind around, making it argue in another direction.

The word "feelings" became a kind of pivot for his arguments. What

you could do about the future was related to what you felt about it. Feelings were the critical factor in this age of danger and triumphs, when the weakness was the human element. Some feelings were constructive; others were bitter and deadly. All of them could spread from one person to another—across a country, or even many countries —just as something good had spread to him from Pelsudski.

There had been, and certainly still were, many spreaders of feelings —self-interested dictators, honest statesmen, moralists. The well-intentioned ones had been trying to sell fairness, freedom from prejudice, equality, good sense, for a long time, while they attempted to steer the world through trouble. Plenty of them had made fools of themselves; but they had at least tried. Others had turned insincere. You might sometimes feel cynical about the whole repetitious business. But the important fact was that no final calamity had yet come; so maybe the good men had helped, and would go on helping until a solution was found.

Mel Robbins's hopes lifted. He might help, too. Suddenly his eyes twinkled. He was the guy who had crossed space, wasn't he? He was now the natural reigning hero, for all kids, everywhere.

Maybe he could make his voice reach even into the darker lands. In the world there must be millions of idealistic youngsters like Pelsudski, with the same and other interests. They were the core of the future. What the youngsters as a whole, everywhere, came to feel about the future ought to be the truth about it. Help them along, when they deserved it. Let them know that their universe was all right.

Robbins read what he had written across the photograph of the spaceward side of the Moon:

"To Art Pelsudski: When you are first to land an atomic ship on —say—Ganymede, largest satellite of the planet Jupiter, remember me, and keep thinking straight and fair. Regards from Mel Robbins. Written in space while rounding the Moon in MR-1. 1959."

Robbins grinned. His prediction could even be true. Pelsudski had the guts and the fury. Robbins felt fine. At least he had a philosophy and a beginning. The shadows in the years to come had receded a little. Pelsudski had given him something. Now he would give something back.

He knew that getting the picture with that message on it would change a troubled Earth to humble heaven for the boy.

Robert A. Heinlein

THE BLACK PITS OF LUNA

Eventually the Moon will be conquered—and conquered, perhaps, to a point where it will become nothing more than a busy manufacturing and power center. The story which follows tells of a Moon culture which, though still possessed of an occasional thrill and an occasional unknown danger, is still pretty humdrum . . . except *when seen through the romantic eyes of a teen-age boy just arrived for the first time from Earth. And since in this story we get a view of the Moon in just this fashion, it still retains all the excitement that in older days the story of a camping trip on a cattle ranch, told by just such a youngster, would have had.*

And this is one of the really astonishing merits of this tale—that the author can make you yourself feel blasé about the Moon. It is only with a start, after you have finished reading it, that you pull yourself together and say, "But this isn't possible*—yet!"*

THE morning after we got to the Moon we went over to Rutherford. Dad and Mr. Latham—Mr. Latham is the man from the Harriman Trust that Dad came to Luna City to see—Dad and Mr. Latham had to go anyhow, on business. I got Dad to promise I could go along because it looked like just about my only chance to get out on the surface of the Moon. Luna City is all right, I guess, but I defy you to tell a corridor in Luna City from the sublevels in New York—except that you're light on your feet, of course.

When Dad came into our hotel suite to say we were ready to leave, I was down on the floor, playing mumblety-peg with my kid brother. Mother was lying down and had asked me to keep the runt quiet. She had been dropsick all the way out from Earth and I guess she didn't feel very good. The runt had been fiddling with the lights, switching them from "dusk" to "desert suntan" and back again. I collared him and sat him down on the floor.

Of course, I don't play mumblety-peg any more, but, on the Moon, it's a right good game. The knife practically floats, and you can do all kinds of things with it. We made up a lot of new rules.

Dad said, "Switch in plans, my dear. We're leaving for Rutherford right away."

Mother said, "Oh, mercy me—I don't think I'm up to it. You and Dickie run along. Baby Darling and I will just spend a quiet day right here."

Baby Darling is the runt.

I could have told her it was the wrong approach. He nearly put my eye out with the knife and said, "Who? What? I'm going, too. Let's go!"

Mother said, "Oh, now, Baby Darling—don't cause Mother Dear any trouble. We'll go to the movies, just you and I."

The runt is seven years younger than I am, but don't call him "Baby Darling" if you want to get anything out of him. He started to bawl. "You said I could go!" he yelled.

"No. Baby Darling. I haven't mentioned it to you. I—"

"Daddy said I could go!"

"Richard, did you tell Baby he could go?"

"Why, no, my dear, not that I recall. Perhaps I—"

The kid cut in fast. "You said I could go anywhere Dickie went. You promised me you promised me you promised me." Sometimes you have to hand it to the runt; he had them jawing about who told him what in nothing flat. Anyhow, that is how, twenty minutes later, the four of us were up at the rocket port with Mr. Latham and climbing into the shuttle for Rutherford.

The trip only takes about ten minutes and you don't see much, just a glimpse of the Earth while the rocket is still near Luna City and then not even that, since the atom plants where we were going are all on the back side of the Moon, of course. There were maybe a dozen tourists along, and most of them were dropsick as soon as we went into free flight. So was Mother. Some people never will get used to rockets.

But Mother was all right as soon as we grounded and were inside again. Rutherford isn't like Luna City; instead of extending a tube out to the ship, they send a pressurized car out to latch onto the air-lock of the rocket, then you jeep back about a mile to the entrance to underground. I liked that, and so did the runt. Dad had to go off on business with Mr. Latham, leaving Mother and me and the runt to join up with the party of tourists for the trip through the laboratories.

It was all right, but nothing to get excited about. So far as I can see, one atomics plant looks about like another; Rutherford could just as well have been the main plant outside Chicago. I mean to say everything that is anything is out of sight, covered up, shielded. All you get to see are some dials and instrument boards and people watching them. Remote-control stuff, like Oak Ridge. The guide tells you about the experiments going on, and they show you some movies—that's all.

I liked our guide. He looked like Tom Jeremy in *The Space Troopers*. I asked him if he was a spaceman, and he looked at me kind of funny and said, no, that he was just a Colonial Services ranger. Then he asked me where I went to school and if I belonged to the Scouts. He said he was scoutmaster of Troop One, Rutherford City, Moonbat Patrol.

I found out there was just the one patrol—not many Scouts on the Moon, I suppose.

Dad and Mr. Latham joined us just as we finished the tour, while Mr. Perrin—that's our guide—was announcing the trip outside. "The conducted tour of Rutherford," he said, talking as if it were a transcription, "includes a trip by spacesuit out on the surface of the Moon, without extra charge, to see the Devil's Graveyard and the site of the Great Disaster of 1965. The trip is optional. There is nothing particularly dangerous about it, and we've never had anyone hurt, but the commission requires that you sign a separate release for your own safety if you choose to make this trip. The trip takes about one hour. Those preferring to remain behind will find movies and refreshments in the coffee shop."

Dad was rubbing his hands. "This is for me," he announced. "Mr. Latham, I'm glad we got back in time. I wouldn't have missed this for the world."

"You'll enjoy it," Mr. Latham agreed, "and so will you, Mrs. Logan. I'm tempted to come along myself."

"Why don't you?" Dad asked.

"No, I want to have the papers ready for you and the director to sign when you get back and before you leave for Luna City."

"Why knock yourself out?" Dad urged him. "If a man's word is no good, his signed contract is no better. You can mail the stuff to me at New York."

Mr. Latham shook his head. "No, really—I've been out on the sur-

face dozens of times. But I'll come along and help you into your spacesuits."

Mother said, oh dear, she didn't think she'd better go; she wasn't sure she could stand the thought of being shut up in a spacesuit and, besides, glaring sunlight always gave her a headache.

Dad said, "Don't be silly, my dear; it's the chance of a lifetime," and Mr. Latham told her that the helmets' filters kept the light from being glaring.

Mother always objects and then gives in. I suppose women just don't have any force of character. Like the night before—Earth night, I mean, Luna City time—she had bought a fancy Moonsuit to wear to dinner in the Earth-View Room at the hotel, then she got cold feet. She complained to Dad that she was too plump to dare to dress like that.

Well, she did show an awful lot of skin. Dad said, "Nonsense, my dear. You look ravishing." So she wore it and had a swell time, especially when a pilot tried to pick her up.

It was like that this time. She came along. We went into the outfitting room, and I looked around while Mr. Perrin was getting them all herded in and having the releases signed. There was the door to the airlock to the surface at the far end, with a bull's-eye window in it and another one like it in the door beyond. You could peek through and see the surface of the Moon beyond, looking hot and bright and sort of improbable, in spite of the amber glass in the windows. And there was a double row of spacesuits hanging up, looking like empty men. I snooped around until Mr. Perrin finally got around to our party.

"We can arrange to leave the youngster in the care of the hostess in the coffee shop," he was telling Mother. He reached down and tousled the runt's hair. The runt tried to bite him, and he snatched his hand away in a hurry.

"Thank you, Mr. Perkins," mother said; "I suppose that's best—though perhaps I had better stay behind with him."

" 'Perrin' is the name," Mr. Perrin said mildly. "It won't be necessary. The hostess will take good care of him."

Why do adults talk in front of kids as if they couldn't understand English? They should have just shoved him into the coffee shop. By now the runt knew he was being railroaded. He looked around belligerently. "I go too," he said loudly. "You promised me."

"Now, Baby Darling," Mother tried to stop him. "Mother Dear didn't tell you—" But she was just whistling to herself; the runt turned on the sound effects.

"You said I could go where Dickie went; you promised me when I was sick. You promised me you promised me—" and on and on, his voice getting higher and louder all the time.

Mr. Perrin looked embarrassed. Mother said, "Richard, you'll just have to deal with your child. After all, you were the one who promised him."

"Me, dear?" Dad looked surprised. "Anyway, I don't see anything so complicated about it. Suppose we did promise him that he could do what Dickie does—we'll simply take him along; that's all."

Mr. Perrin cleared his throat. "I'm afraid not. I can outfit your older son with a woman's suit; he's tall for his age. But we just don't make any provision for small children."

Well, we were all tangled up in a mess in no time at all. The runt can always get Mother to running in circles. Mother has the same effect on Dad. He gets red in the face and starts laying down the law to *me.* It's sort of a chain reaction, with me on the end and nobody to pass it along to. They came out with a very simple solution—I was to stay behind and take care of Baby Darling brat!

"But, Dad, you said—" I started in.

"Never mind!" he cut in. "I won't have this family disrupted in a public squabble. You heard what your mother said."

I was desperate. "Look, Dad," I said, keeping my voice low, "if I go back to Earth without once having put on a spacesuit and set foot on the surface, you'll just have to find another school to send me to. I won't go back to Lawrenceville; I'd be the joke of the whole place."

"We'll settle that when we get home."

"But, Dad, you promised me specifically—"

"That'll be enough out of you, young man. The matter is closed."

Mr. Latham had been standing near by, taking it in but keeping his mouth shut. At this point he cocked an eyebrow at Dad and said very quietly, "Well, R.J.—I thought your word was your bond?"

I wasn't supposed to hear it, and nobody else did—a good thing, too, for it doesn't do to let Dad know that you know that he's wrong; it just makes him worse. I changed the subject in a hurry. "Look, Dad, maybe we all can go out. How about that suit over there?" I pointed at a rack that was inside a railing with a locked gate on it. The rack

had a couple of dozen suits on it and at the far end, almost out of sight, was a small suit—the boots on it hardly came down to the waist of the suit next to it.

"Huh?" Dad brightened up. "Why, just the thing! Mr. Perrin! Oh, Mr. Perrin—here a minute! I thought you didn't have any small suits, but here's one that I think will fit."

Dad was fiddling at the latch of the railing gate. Mr. Perrin stopped him. "We can't use that suit, sir."

"Uh? Why not?"

"All the suits inside the railing are private property, not for rent."

"What? Nonsense—Rutherford is a public enterprise. I want that suit for my child."

"Well, you can't have it."

"I'll speak to the director."

"I'm afraid you'll have to. That suit was specially built for his daughter."

And that's just what they did. Mr. Latham got the director on the line, Dad talked to him, then the director talked to Mr. Perrin, then he talked to Dad again. The director didn't mind lending the suit, not to Dad, anyway, but he wouldn't order Mr. Perrin to take a below-age child outside.

Mr. Perrin was feeling stubborn, and I don't blame him, but Dad soothed his feathers down and presently we were all climbing into our suits and getting pressure checks and checking our oxygen supply and switching on our walkie-talkies. Mr. Perrin was calling the roll by radio and reminding us that we were all on the same circuit, so we had better let him do most of the talking, and not to make casual remarks or none of us would be able to hear. Then we were in the airlock and he was warning us to stick close together and not try to see how fast we could run or how high we could jump. My heart was knocking around in my chest.

The outer door of the lock opened and we filed out on the face of the Moon. It was just as wonderful as I dreamed it would be, I guess, but I was so excited that I hardly knew it at the time. The glare of the Sun was the brightest thing I ever saw and the shadows so inky black you could hardly see into them. You couldn't hear anything but voices over your radio, and you could reach down and switch off that.

The pumice was soft and kicked up around our feet like smoke,

ettling slowly, falling in slow motion. Nothing else moved. It was the *leadest* place you can imagine.

We stayed on a path, keeping close together for company, except wice when I had to take out after the runt when he found out he ould jump twenty feet. I wanted to smack him, but did you ever try o smack anybody wearing a spacesuit? It's no use.

Mr. Perrin told us to halt presently and started his talk. "You are ıow in the Devil's Graveyard. The twin spires behind you are five housand feet above the floor of the plain and have never been scaled. The spires, or monuments, have been named for apocryphal or mythological characters because of the fancied resemblance of this fantastic scene to a giant cemetery. Beelzebub, Thor, Siva, Cain, Set—" He pointed around us. "Lunologists are not agreed as to the origin of he strange shapes. Some claim to see indications of the action of air ınd water as well as volcanic action. If so, these spires must have been tanding for an unthinkably long period, for today, as you see, the Moon—" It was the same sort of stuff you can read any month in *Spaceways Magazine,* only we were seeing it, and that makes a difference, let me tell you.

The spires reminded me a bit of the rocks below the lodge in the Garden of the Gods in Colorado Springs when we went there last summer, only these spires were lots bigger and, instead of blue sky, there was just blackness and hard, sharp stars overhead. Spooky.

Another ranger had come with us, with a camera. Mr. Perrin tried o say something else, but the runt had started yapping away and I ıad to switch off his radio before anybody could hear anything. I kept t switched off until Mr. Perrin finished talking.

He wanted us to line up for a picture, with the spires and the black ky behind us for a background. "Push your faces forward in your helnets so that your features will show. Everybody look pretty. There!" ıe added as the other guy snapped the shot. "Prints will be ready when ou return, at ten dollars a copy."

I thought it over. I certainly needed one for my room at school and I wanted one to give to—anyhow, I needed another one. I had eighteen ıucks left from my birthday money; I could sweet-talk mother for the ıalance. So I ordered two of them.

We climbed a long rise and suddenly we were staring out across the rater, the disaster crater, all that was left of the first laboratory. It

stretched away from us, twenty miles across, with the floor covered with shiny, bubbly green glass instead of pumice. There was a monument. I read it:

HERE ABOUT YOU ARE THE
MORTAL REMAINS OF
KURT SCHAEFFER
MAURICE FEINSTEIN
THOMAS DOOLEY
HAZEL HAYAKAWA
G. WASHINGTON SLAPPEY
SAM HOUSTON ADAMS
WHO DIED FOR THE TRUTH
THAT MAKES MEN FREE
ON THE ELEVENTH DAY OF AUGUST 1965

I felt sort of funny and backed away and went to listen to Mr. Perrin. Dad and some of the other men were asking him questions. "They don't know exactly," he was saying. "Nothing was left. Now we telemeter all the data back to Luna City as it comes off the instruments, but that was before the line-of-sight relays were set up."

"What would have happened," some man asked, "if this blast had gone off on Earth?"

"I'd hate to try to tell you—but that's why they put the lab here, back of the Moon." He glanced at his watch. "Time to leave, everybody." They were milling around, heading back down toward the path, when Mother screamed.

"Baby! Where's Baby Darling?"

I was startled, but I wasn't scared, not yet. The runt is always running around, first here and then there, but he doesn't go far away, because he always wants to have somebody to yap to.

My father had one arm around Mother; he signaled to me with the other. "Dick," he snapped, his voice sharp in my earphones, "what have you done with your brother?"

"Me?" I said. "Don't look at me—the last I saw, Mother had him by the hand, walking up the hill here."

"Don't stall around, Dick. Mother sat down to rest when we got here and sent him to you."

"Well, if she did, he never showed up." At that, Mother started to scream in earnest. Everybody had been listening, of course—they had

to; there was just the one radio circuit. Mr. Perrin stepped up and switched off Mother's talkie, making a sudden silence.

"Take care of your wife, Mr. Logan," he ordered, then added, "When did you see your child last?"

Dad couldn't help him any; when they tried switching Mother back into the hookup, they switched her right off again. She couldn't help, either, and she deafened us. Mr. Perrin addressed the rest of us. "Has anyone seen the small child we had with us? Don't answer unless you have something to contribute. Did anyone see him wander away?"

Nobody had. I figured he probably ducked out when everybody was looking at the crater and had their backs to him. I told Mr. Perrin so. "Seems likely," he agreed. "Attention, everybody! I'm going to search for the child. Stay right where you are. Don't move away from this spot. I won't be gone more than ten minutes."

"Why don't we all go?" somebody wanted to know.

"Because," said Mr. Perrin, "right now I've only got one lost. I don't want to make it a dozen." Then he left, taking big easy lopes that covered fifty feet at a step.

Dad started to take out after him, then thought better of it, for Mother suddenly keeled over, collapsing at the knees and floating gently to the ground. Everybody started talking at once. Some idiot wanted to take her helmet off, but Dad isn't crazy. I switched off my radio so I could hear myself think and started looking around, not leaving the crowd, but standing up on the lip of the crater and trying to see as much as I could.

I was looking back the way we had come; there was no sense in looking at the crater—if he had been in there he would have shown up like a fly on a plate.

Outside the crater was different; you could have hidden a regiment within a block of us, rocks standing up every which way, boulders big as houses with blowholes all through them, spires, gullies—it was a mess. I could see Mr. Perrin every now and then, casting around like a dog after a rabbit, and making plenty of time. He was practically flying. When he came to a big boulder he would jump right over it, leveling off face down at the top of his jump, so he could see better.

Then he was heading back toward us and I switched my radio back on. There was still a lot of talk. Somebody was saying, "We've got to find him before sundown," and somebody else answered, "Don't be silly; the Sun won't be down for a week. It's his air supply, I tell you.

These suits are only good for four hours." The first voice said, "Oh!" then added softly, "like a fish out of water—" It was then I got scared.

A woman's voice, sounding kind of choked, said, "The poor, poor darling! We've got to find him before he suffocates," and my father's voice cut in sharply, "Shut up talking that way!" I could hear somebody sobbing. It might have been Mother.

Mr. Perrin was almost up to us and he cut in, "Silence, everybody. I've got to call the base," and he added urgently, "Perrin, calling airlock control; Perrin, calling airlock control!"

A woman's voice answered, "Come in, Perrin." He told her what was wrong and added, "Send out Smythe to take this party back in; I'm staying. I want every ranger who's around, and get me volunteers from among any of the experienced Moon hands. Send out a radio direction finder by the first ones to leave."

We didn't wait long, for they came swarming toward us like grasshoppers. They must have been running forty or fifty miles an hour. It would have been something to see, if I hadn't been so sick at my stomach.

Dad put up an argument about going back, but Mr. Perrin shut him up. "If you hadn't been so confounded set on having your own way, we wouldn't be in a mess. If you had kept track of your kid, he wouldn't be lost. I've got kids of my own; I don't let 'em go out on the face of the Moon when they're too young to take care of themselves. You go on back—I can't be burdened by taking care of you, too."

I think Dad might even have gotten in a fight with him if Mother hadn't gotten faint again. We went on back with the party.

The next couple of hours were pretty awful. They let us sit just outside the control room where we could hear Mr. Perrin directing the search, over the loud-speaker. I thought at first that they would snag the runt as soon as they started using the radio directional finder—pick up his power hum, maybe, even if he didn't say anything—but no such luck: they didn't say anything with it. And the searchers didn't find anything, either.

A thing that made it worse was that Mother and Dad didn't even try to blame me. Mother was crying quietly and Dad was consoling her, when he looked over at me with an odd expression. I guess he didn't really see me at all, but I thought he was thinking that if I hadn't insisted on going out on the surface this wouldn't have happened. I

said, "Don't go looking at me, Dad. Nobody told me to keep an eye on him. I thought he was with Mother."

Dad just shook his head without answering. He was looking tired and sort of shrunk up. But Mother, instead of laying in to me and yelling, stopped her crying and managed to smile.

"Come here, Dickie," she said, and put her other arm around me. "Nobody blames you, Dickie. Whatever happens, you weren't at fault. Remember that, Dickie."

So I let her kiss me and then sat with them for a while, but I felt worse than before. I kept thinking about the runt, somewhere out there, and his oxygen running out. Maybe it wasn't my fault, but I could have prevented it and I knew it. I shouldn't have depended on Mother to look out for him; she's no good at that sort of thing. She's the kind of person that would mislay her head if it wasn't knotted on tight—the ornamental sort. Mother's good, you understand, but she's not practical.

She would take it pretty hard if the runt didn't come back. And so would Dad—and so would I. The runt is an awful nuisance, but it was going to seem strange not to have him around underfoot. I got to thinking about that remark, "Like a fish out of water." I accidentally busted an aquarium once; I remember yet how they looked. Not pretty. If the runt was going to die like that—

I shut myself up and decided I just had to figure out some way to help find him.

After a while I had myself convinced that I *could* find him if they would just let me help look. But they wouldn't, of course.

Dr. Evans, the director, showed up again—he'd met us when we first came in—and asked if there was anything he could do for us and how was Mrs. Logan feeling. "You know I wouldn't have had this happen for the world," he added. "We're doing all we can. I'm having some ore detectors shot over from Luna City. We might be able to spot the child by the metal in his suit."

Mother asked how about bloodhounds, and Dr. Evans didn't even laugh at her. Dad suggested helicopters, then corrected himself and made it rockets. Dr. Evans pointed out that it was almost impossible to examine the ground closely from a rocket.

I got him aside presently and braced him to let me join the hunt. He was polite but unimpressed, so I insisted. "What makes you think you can find him?" he asked me. "We've got the most experienced Moon men available out there now. I'm afraid, son, that you would get your-

self lost or hurt if you tried to keep up with them. In this country, if you once lose sight of landmarks, you can get hopelessly lost."

"But look, Doctor," I told him, "I know the runt—I mean my kid brother better than anyone else in the world. I won't get lost—I mean I will get lost, but just the way he did. You can send somebody to follow me."

He thought about it. "It's worth trying," he said suddenly. "I'll go with you. Let's suit up."

We made a fast trip out, taking thirty-foot strides—the best I could manage even with Dr. Evans hanging on to my belt to keep me from stumbling. Mr. Perrin was expecting us. He seemed dubious about my scheme. "Maybe the old 'lost mule' dodge will work," he admitted, "but I'll keep the regular search going just the same. Here, Shorty, take this flashlight. You'll need it in the shadows."

I stood on the edge of the crater and tried to imagine I was the runt, feeling bored and maybe a little bit griped at the lack of attention. What would I do next?

I went skipping down the slope, not going anywhere in particular, the way the runt would have done. Then I stopped and looked back, to see if Mother and Daddy and Dickie had noticed me. I was being followed, all right; Dr. Evans and Mr. Perrin were close behind me. I pretended that no one was looking and went on. I was pretty close to the first rock outcroppings by now, and I ducked behind the first one I came to. It wasn't high enough to hide me, but it would have covered the runt. It felt like what he would do; he loved to play hide-and-go-seek—it made him the center of attention.

I thought about it. When the runt played that game, his notion of hiding was always to crawl under something, a bed, or a sofa, or an automobile, or even under the sink. I looked around. There were a lot of good places; the rocks were filled with blowholes and overhangs. I started working them over. It seemed hopeless; there must have been a hundred such places right around close.

Mr. Perrin came up to me as I was crawling out of the fourth tight spot. "The men have shined flashlights around in every one of these places," he told me. "I don't think it's much use, Shorty."

"Okay," I said, but I kept at it. I knew I could get at spots a grown man couldn't reach; I just hoped the runt hadn't picked a spot I couldn't reach.

It went on and on and I was getting cold and stiff and terribly tired. The direct sunlight is hot on the Moon, but the second you get in the shade, it's cold. Down inside those rocks it never got warm at all. The suits they gave us tourists are well enough insulated, but the extra insulation is in the gloves and the boots and the seats of the pants—and I had been spending most of my time down on my stomach, wiggling into tight places.

I was so numb I could hardly move and my whole front felt icy. Besides, it gave me one more thing to worry about—how about the runt? Was he cold, too?

If it hadn't been for thinking how those fish looked and how, maybe, the runt would be frozen stiff before I could get to him, I would have quit. I was about beat. Besides, it's rather scary down inside those holes —you don't know what you'll come to next.

Dr. Evans took me by the arm as I came out of one of them, and touched his helmet to mine, so that I got his voice directly. "Might as well give up, son. You're knocking yourself out and you haven't covered an acre."—I pulled away from him.

The next place was a little overhang, not a foot off the ground. I flashed a light into it. It was empty and didn't seem to go anywhere. Then I saw there was a turn in it. I got down flat and wiggled in. The turn opened out a little and dropped off. I didn't think it was worth while to go any deeper, as the runt wouldn't have crawled very far in the dark, but I scrunched ahead a little farther and flashed the light down.

I saw a foot sticking out.

That's about all there is to it. I nearly bashed in my helmet getting out of there, but I was dragging the runt after me. He was limp as a cat and his face was funny. Mr. Perrin and Dr. Evans were all over me as I came out, pounding me on the back and shouting.

"Is he *dead,* Mr. Perrin?" I asked, when I could get my breath. "He looks awful bad."

Mr. Perrin looked him over. "No . . . I can see a pulse in his throat. Shock and exposure, but this suit was specially built—we'll get him back fast." He picked the runt up in his arms, and I took out after him.

Ten minutes later the runt was wrapped in blankets and drinking hot cocoa. I had some, too. Everybody was talking at once and Mother was crying again, but she looked normal and Dad had filled out.

He tried to write out a check for Mr. Perrin, but he brushed it off.

"I don't need any reward; your boy found him. You can do me just one favor—"

"Yes?" Dad was all honey.

"Stay off the Moon. You don't belong here; you're not the pioneer type."

Dad took it. "I've already promised my wife that," he said without batting an eye. "You needn't worry."

I followed Mr. Perrin as he left and said to him privately. "Mr. Perrin—I just wanted to tell you that I'll be back, if you don't mind."

He shook hands with me and said, "I know you will, Shorty."

A. E. Van Vogt

ENCHANTED VILLAGE

It is usually assumed that Mars will be the first actual planet to be reached after we succeed in leaving our own world. Consequently it has for many years fascinated science-fiction writers, particularly since there is some evidence that vegetable life may still exist there. As for intelligent beings, the most popular (and also the most probable) assumption is that nothing will be left of such beings except ruins of their cities, or (at most) only a few degenerate representatives of an ancient civilization. This theory is based on the idea that millions of years ago Mars was warmer than it now is and had more atmosphere, and a civilization along with it. Most of the atmosphere—and the warmth—are believed to have "leaked off" into space over the millenia, because Mars's lesser gravity would be less able to retain the lighter gases than would Earth's. In the following story we visit one of the strangest remnants of a civilization ever imagined for a desiccated and dying Mars.

"EXPLORERS of a new frontier" they had been called before they left for Mars.

For a while after the ship crashed into a Martian desert, killing all on board except—miraculously—this one man, Bill Jenner spat the words occasionally into the constant, sand-laden wind. He despised himself for the pride he had felt when he first heard them.

His fury faded with each mile that he walked, and his black grief for his friends became a gray ache. Slowly he realized that he had made a ruinous misjudgment.

He had underestimated the speed at which the rocketship had been traveling. He'd guessed that he would have to walk three hundred miles to reach the shallow, polar sea he and the others had observed as they glided in from outer space. Actually, the ship must have flashed an immensely greater distance before it hurtled down out of control.

The days stretched behind him, seemingly as numberless as the hot, red, alien sand that scorched through his tattered clothes. This huge scarecrow of a man kept moving across the endless, arid waste—he would not give up.

By the time he came to the mountain, his food had long been gone. Of his four water bags, only one remained, and that was so close to being empty that he merely wet his cracked lips and swollen tongue whenever his thirst became unbearable.

Jenner climbed high before he realized that it was not just another dune that had barred his way. He paused, and as he gazed up at the mountain that towered above him, he cringed a little. For an instant he felt the hopelessness of this mad race he was making to nowhere—but he reached the top. He saw that below him was a depression surrounded by hills as high as or higher than the one on which he stood. Nestled in the valley they made was a village.

He could see trees and the marble floor of a courtyard. A score of buildings were clustered around what seemed to be a central square. They were mostly low-constructed, but there were four towers pointing gracefully into the sky. They shone in the sunlight with a marble luster.

Faintly, there came to Jenner's ears a thin, high-pitched whistling sound. It rose, fell, faded completely, then came up again clearly and unpleasantly. Even as Jenner ran toward it, the noise grated on his ears, eerie and unnatural.

He kept slipping on smooth rock, and bruised himself when he fell. He rolled halfway down into the valley. The buildings remained new and bright when seen from nearby. Their walls flashed with reflections. On every side was vegetation—reddish-green shrubbery, yellow-green trees laden with purple and red fruit.

With ravenous intent, Jenner headed for the nearest fruit tree. Close up, the tree looked dry and brittle. The large red fruit he tore from the lowest branch, however, was plump and juicy.

As he lifted it to his mouth, he remembered that he had been warned during his training period to taste nothing on Mars until it had been chemically examined. But that was meaningless advice to a man whose only chemical equipment was in his own body.

Nevertheless, the possibility of danger made him cautious. He took his first bit gingerly. It was bitter to his tongue, and he spat it out hastily. Some of the juice which remained in his mouth seared his gums. He felt the fire of it, and he reeled from nausea. His muscles began to jerk, and he lay down on the marble to keep himself from falling. After what seemed like hours to Jenner, the awful trembling finally went

out of his body and he could see again. He looked up despisingly at the tree.

The pain finally left him, and slowly he relaxed. A soft breeze rustled the dry leaves. Nearby trees took up that gentle clamor, and it struck Jenner that the wind here in the valley was only a whisper of what it had been on the flat desert beyond the mountain.

There was no other sound now. Jenner abruptly remembered the high-pitched, ever-changing whistle he had heard. He lay very still, listening intently, but there was only the rustling of the leaves. The noisy shrilling had stopped. He wondered if it had been an alarm, to warn the villagers of his approach.

Anxiously he climbed to his feet and fumbled for his gun. A sense of disaster shocked through him. It wasn't there. His mind was a blank, and then he vaguely recalled that he had first missed the weapon more than a week before. He looked around him uneasily, but there was not a sign of creature life. He braced himself. He couldn't leave, as there was nowhere to go. If necessary, he would fight to the death to remain in the village.

Carefully Jenner took a sip from his water bag, moistening his cracked lips and his swollen tongue. Then he replaced the cap and started through a double line of trees toward the nearest building. He made a wide circle to observe it from several vantage points. On one side a low, broad archway opened into the interior. Through it, he could dimly make out the polished gleam of a marble floor.

Jenner explored the buildings from the outside, always keeping a respectful distance between him and any of the entrances. He saw no sign of animal life. He reached the far side of the marble platform on which the village was built, and turned back decisively. It was time to explore interiors.

He chose one of the four tower buildings. As he came within a dozen feet of it, he saw that he would have to stoop low to get inside.

Momentarily, the implications of that stopped him. These buildings had been constructed for a life form that must be very different from human beings.

He went forward again, bent down, and entered reluctantly, every muscle tensed.

He found himself in a room without furniture. However, there were

several low marble fences projecting from one marble wall. They formed what looked like a group of four wide, low stalls. Each stall had an open trough carved out of the floor.

The second chamber was fitted with four inclined planes of marble, each of which slanted up to a dais. Altogether there were four rooms on the lower floor. From one of them a circular ramp mounted up, apparently to a tower room.

Jenner didn't investigate the upstairs. The earlier fear that he would find alien life was yielding to the deadly conviction that he wouldn't. No life meant no food or chance of getting any. In frantic haste he hurried from building to building, peering into the silent rooms, pausing now and then to shout hoarsely.

Finally there was no doubt. He was alone in a deserted village on a lifeless planet, without food, without water—except for the pitiful supply in his bag—and without hope.

He was in the fourth and smallest room of one of the tower buildings when he realized that he had come to the end of his search. The room had a single stall jutting out from one wall. Jenner lay down wearily in it. He must have fallen asleep instantly.

When he awoke he became aware of two things, one right after the other. The first realization occurred before he opened his eyes—the whistling sound was back; high and shrill, it wavered at the threshold of audibility.

The other was that a fine spray of liquid was being directed down at him from the ceiling. It had an odor, of which technician Jenner took a single whiff. Quickly he scrambled out of the room, coughing, tears in his eyes, his face already burning from chemical reaction.

He snatched his handkerchief and hastily wiped the exposed parts of his body and face.

He reached the outside and there paused, striving to understand what had happened.

The village seemed unchanged.

Leaves trembled in a gentle breeze. The sun was poised on a mountain peak. Jenner guessed from its position that it was morning again and that he had slept at least a dozen hours. The glaring white light suffused the valley. Half hidden by trees and shrubbery, the buildings flashed and shimmered.

He seemed to be in an oasis in a vast desert. It was an oasis, all right,

Jenner reflected grimly, but not for a human being. For him, with its poisonous fruit, it was more like a tantalizing mirage.

He went back inside the building and cautiously peered into the room where he had slept. The spray of gas had stopped, not a bit of odor lingered, and the air was fresh and clean.

He edged over the threshold, half inclined to make a test. He had a picture in his mind of a long-dead Martian creature lazing on the floor in the stall while a soothing chemical sprayed down on its body. The fact that the chemical was deadly to human beings merely emphasized how alien to man was the life that had spawned on Mars. But there seemed little doubt of the reason for the gas. The creature was accustomed to taking a morning shower.

Inside the "bathroom," Jenner eased himself feet first into the stall. As his hips came level with the stall entrance, the solid ceiling sprayed a jet of yellowish gas straight down upon his legs. Hastily Jenner pulled himself clear of the stall. The gas stopped as suddenly as it had started.

He tried it again, to make sure it was merely an automatic process. It turned on, then shut off.

Jenner's thirst-puffed lips parted with excitement. He thought, "If there can be one automatic process, there may be others."

Breathing heavily, he raced into the outer room. Carefully he shoved his legs into one of the two stalls. The moment his hips were in, a steaming gruel filled the trough beside the wall.

He stared at the greasy-looking stuff with a horrified fascination—food—and drink. He remembered the poison fruit and felt repelled, but he forced himself to bend down and put his finger into the hot, wet substance. He brought it up, dripping, to his mouth.

It tasted flat and pulpy, like boiled wood fiber. It trickled viscously into his throat. His eyes began to water and his lips drew back convulsively. He realized he was going to be sick, and ran for the outer door—but didn't quite make it.

When he finally got outside, he felt limp and unutterably listless. In that depressed state of mind, he grew aware again of the shrill sound.

He felt amazed that he could have ignored its rasping even for a few minutes. Sharply he glanced about, trying to determine its source, but it seemed to have none. Whenever he approached a point where it appeared to be loudest, then it would fade or shift, perhaps to the far side of the village.

He tried to imagine what an alien culture would want with a mind-shattering noise—although, of course, it would not necessarily have been unpleasant to them.

He stopped and snapped his fingers as a wild but nevertheless plausible notion entered his mind. Could this be music?

He toyed with the idea, trying to visualize the village as it had been long ago. Here a music-loving people had possibly gone about their daily tasks to the accompaniment of what was to them beautiful strains of melody.

The hideous whistling went on and on, waxing and waning. Jenner tried to put buildings between himself and the sound. He sought refuge in various rooms, hoping that at least one would be soundproof. None were. The whistle followed him wherever he went.

He retreated into the desert, and had to climb halfway up one of the slopes before the noise was low enough not to disturb him. Finally, breathless but immeasurably relieved, he sank down on the sand and thought blankly:

What now?

The scene that spread before him had in it qualities of both heaven and hell. It was all too familiar now—the red sands, the stony dunes, the small, alien village promising so much and fulfilling so little.

Jenner looked down at it with his feverish eyes and ran his parched tongue over his cracked, dry lips. He knew that he was a dead man unless he could alter the automatic food-making machines that must be hidden somewhere in the walls and under the floors of the buildings.

In ancient days, a remnant of Martian civilization had survived here in this village. The inhabitants had died off, but the village lived on, keeping itself clean of sand, able to provide refuge for any Martian who might come along. But there were no Martians. There was only Bill Jenner, pilot of the first rocketship ever to land on Mars.

He had to make the village turn out food and drink that he could take. Without tools, except his hands, with scarcely any knowledge of chemistry, he must force it to change its habits.

Tensely he hefted his water bag. He took another sip and fought the same grim fight to prevent himself from guzzling it down to the last drop. And, when he had won the battle once more, he stood up and started down the slope.

He could last, he estimated, not more than three days. In that time he must conquer the village.

He was already among the trees when it suddenly struck him that the "music" had stopped. Relieved, he bent over a small shrub, took a good firm hold of it—and pulled.

It came up easily, and there was a slab of marble attached to it. Jenner stared at it, noting with surprise that he had been mistaken in thinking the stalk came up through a hole in the marble. It was merely stuck to the surface. Then he noticed something else—the shrub had no roots. Almost instinctively, Jenner looked down at the spot from which he had torn the slab of marble along with the plant. There was sand there.

He dropped the shrub, slipped to his knees, and plunged his fingers into the sand. Loose sand trickled through them. He reached deep, using all his strength to force his arm and hand down; sand—nothing but sand.

He stood up and frantically tore up another shrub. It also came easily, bringing with it a slab of marble. It had no roots, and where it had been was sand.

With a kind of mindless disbelief, Jenner rushed over to a fruit tree and shoved at it. There was a momentary resistance, and then the marble on which it stood split and lifted slowly into the air. The tree fell over with a swish and a crackle as its dry branches and leaves broke and crumbled into a thousand pieces. Underneath where it had been was sand.

Sand everywhere. A city built on sand. Mars, planet of sand. That was not completely true, of course. Seasonal vegetation had been observed near the polar icecaps. All but the hardiest of it died with the coming of summer. It had been intended that the rocketship land near one of those shallow, tideless seas.

By coming down out of control, the ship had wrecked more than itself. It had wrecked the chances for life of the only survivor of the voyage.

Jenner came slowly out of his daze. He had a thought then. He picked up one of the shrubs he had already torn loose, braced his foot against the marble to which it was attached, and tugged, gently at first, then with increasing strength.

It came loose finally, but there was no doubt that the two were part of a whole. The shrub was growing out of the marble.

Marble? Jenner knelt beside one of the holes from which he had torn a slab, and bent over an adjoining section. It was quite porous—calciferous rock, most likely, but not true marble at all. As he reached toward it, intending to break off a piece, it changed color. Astounded, Jenner drew back. Around the break, the stone was turning a bright orange-yellow. He studied it uncertainly, then tentatively he touched it.

It was as if he had dipped his fingers into searing acid. There was a sharp, biting, burning pain. With a gasp, Jenner jerked his hand clear.

The continuing anguish made him feel faint. He swayed and moaned, clutching the bruised members to his body. When the agony finally faded and he could look at the injury, he saw that the skin had peeled and that blood blisters had formed already. Grimly Jenner looked down at the break in the stone. The edges remained bright orange-yellow.

The village was alert, ready to defend itself from further attacks.

Suddenly weary, he crawled into the shade of a tree. There was only one possible conclusion to draw from what had happened, and it almost defied common sense. This lonely village was alive.

As he lay there, Jenner tried to imagine a great mass of living substance growing into the shape of buildings, adjusting itself to suit another life form, accepting the role of servant in the widest meaning of the term.

If it would serve one race, why not another? If it could adjust to Martians, why not to human beings?

There would be difficulties, of course. He guessed wearily that essential elements would not be available. The oxygen for water could come from the air . . . thousands of compounds could be made from sand. . . . Though it meant death if he failed to find a solution, he fell asleep even as he started to think about what they might be.

When he awoke it was quite dark.

Jenner climbed heavily to his feet. There was a drag to his muscles that alarmed him. He wet his mouth from his water bag and staggered toward the entrance of the nearest building. Except for the scraping of his shoes on the "marble," the silence was intense.

He stopped short, listened, and looked. The wind had died away. He

couldn't see the mountains that rimmed the valley, but the buildings were still dimly visible, black shadows in a shadow world.

For the first time, it seemed to him that, in spite of his new hope, it might be better if he died. Even if he survived, what had he to look forward to? Only too well he recalled how hard it had been to rouse interest in the trip and to raise the large amount of money required. He remembered the colossal problems that had had to be solved in building the ship, and some of the men who had solved them were buried somewhere in the Martian desert.

It might be twenty years before another ship from Earth would try to reach the only other planet in the Solar System that had shown signs of being able to support life.

During those uncountable days and nights, those years, he would be here alone. That was the most he could hope for—if he lived. As he fumbled his way to a dais in one of the rooms, Jenner considered another problem: How did one let a living village know that it must alter its processes? In a way, it must already have grasped that it had a new tenant. How could he make it realize he needed food in a different chemical combination than that which it had served in the past; that he liked music, but on a different scale system; and that he could use a shower each morning—of water, not of poison gas?

He dozed fitfully, like a man who is sick rather than sleepy. Twice he wakened, his lips on fire, his eyes burning, his body bathed in perspiration. Several times he was startled into consciousness by the sound of his own harsh voice crying out in anger and fear at the night.

He guessed, then, that he was dying.

He spent the long hours of darkness tossing, turning, twisting, befuddled by waves of heat. As the light of morning came, he was vaguely surprised to realize that he was still alive. Restlessly he climbed off the dais and went to the door.

A bitingly cold wind blew, but it felt good to his hot face. He wondered if there were enough pneumococci in his blood for him to catch pneumonia. He decided not.

In a few moments he was shivering. He retreated back into the house, and for the first time noticed that, despite the doorless doorway, the wind did not come into the building at all. The rooms were cold but not draughty.

That started an association: Where had his terrible body heat come from? He teetered over to the dais where he had spent the night. Within seconds he was sweltering in a temperature of about one hundred and thirty.

He climbed off the dais, shaken by his own stupidity. He estimated that he had sweated at least two quarts of moisture out of his dried-up body on that furnace of a bed.

This village was not for human beings. Here even the beds were heated for creatures who needed temperatures far beyond the heat comfortable for men.

Jenner spent most of the day in the shade of a large tree. He felt exhausted, and only occasionally did he even remember that he had a problem. When the whistling started, it bothered him at first, but he was too tired to move away from it. There were long periods when he hardly heard it, so dulled were his senses.

Late in the afternoon he remembered the shrubs and the tree he had torn up the day before and wondered what had happened to them. He wet his swollen tongue with the last few drops of water in his bag, climbed lackadaisically to his feet, and went to look for the dried-up remains.

There weren't any. He couldn't even find the holes where he had torn them out. The living village had absorbed the dead tissue into itself and had repaired the breaks in its "body."

That galvanized Jenner. He began to think again . . . about mutations, genetic readjustment, life forms adapting to new environments. There'd been lectures on that before the ship left Earth, rather generalized talks designed to acquaint the explorers with the problems men might face on an alien planet. The important principle was quite simple: adjust or die.

The village had to adjust to him. He doubted if he could seriously damage it, but he could try. His own need to survive must be placed on as sharp and hostile a basis as that.

Frantically Jenner began to search his pockets. Before leaving the rocket he had loaded himself with odds and ends of small equipment. A jackknife, a folding metal cup, a printed radio, a tiny superbattery that could be charged by spinning an attached wheel—and for which he had brought along, among other things, a powerful electric fire lighter.

Jenner plugged the lighter into the battery and deliberately scraped

the red-hot end along the surface of the "marble." The reaction was swift. The substance turned an angry purple this time. When an entire section of the floor had changed color, Jenner headed for the nearest stall trough, entering far enough to activate it.

There was a noticeable delay. When the food finally flowed into the trough, it was clear that the living village had realized the reason for what he had done. The food was a pale, creamy color, where earlier it had been a murky gray.

Jenner put his finger into it but withdrew it with a yell and wiped his finger. It continued to sting for several moments. The vital question was: Had it deliberately offered him food that would damage him, or was it trying to appease him without knowing what he could eat?

He decided to give it another chance, and entered the adjoining stall. The gritty stuff that flooded up this time was yellower. It didn't burn his finger, but Jenner took one taste and spat it out. He had the feeling that he had been offered a soup made of a greasy mixture of clay and gasoline.

He was thirsty now with a need heightened by the unpleasant taste in his mouth. Desperately he rushed outside and tore open the water bag, seeking the wetness inside. In his fumbling eagerness, he spilled a few precious drops onto the courtyard. Down he went on his face and licked them up.

Half a minute later, he was still licking, and there was still water.

The fact penetrated suddenly. He raised himself and gazed wonderingly at the droplets of water that sparkled on the smooth stone. As he watched, another one squeezed up from the apparently solid surface and shimmered in the light of the sinking sun.

He bent, and with the tip of his tongue sponged up each visible drop. For a long time he lay with his mouth pressed to the "marble," sucking up the tiny bits of water that the village doled out to him.

The glowing white sun disappeared behind a hill. Night fell, like the dropping of a black screen. The air turned cold, then icy. He shivered as the wind keened through his ragged clothes. But what finally stopped him was the collapse of the surface from which he had been drinking.

Jenner lifted himself in surprise, and in the darkness gingerly felt over the stone. It had genuinely crumbled. Evidently the substance had yielded up its available water and had disintegrated in the process. Jenner estimated that he had drunk altogether an ounce of water.

It was a convincing demonstration of the willingness of the village to please him, but there was another, less satisfying, implication. If the village had to destroy a part of itself every time it gave him a drink, then clearly the supply was not unlimited.

Jenner hurried inside the nearest building, climbed onto a dais—and climbed off again hastily, as the heat blazed up at him. He waited, to give the Intelligence a chance to realize he wanted a change, then lay down once more. The heat was as great as ever.

He gave that up because he was too tired to persist and too sleepy to think of a method that might let the village know he needed a different bedroom temperature. He slept on the floor with an uneasy conviction that it could *not* sustain him for long. He woke up many times during the night and thought, "Not enough water. No matter how hard it tries—" Then he would sleep again, only to wake once more, tense and unhappy.

Nevertheless, morning found him briefly alert; and all his steely determination was back—that iron will power that had brought him at least five hundred miles across an unknown desert.

He headed for the nearest trough. This time, after he had activated it, there was a pause of more than a minute; and then about a thimbleful of water made a wet splotch at the bottom.

Jenner licked it dry, then waited hopefully for more. When none came he reflected gloomily that somewhere in the village an entire group of cells had broken down and released their water for him.

Then and there he decided that it was up to the human being, who could move around, to find a new source of water for the village, which could not move.

In the interim, of course, the village would have to keep him alive, until he had investigated the possibilities. That meant, above everything else, he must have some food to sustain him while he looked around.

He began to search his pockets. Toward the end of his food supply, he had carried scraps and pieces wrapped in small bits of cloth. Crumbs had broken off into the pocket, and he had searched for them often during those long days in the desert. Now, by actually ripping the seams, he discovered tiny particles of meat and bread, little bits of grease and other unidentifiable substances.

Carefully he leaned over the adjoining stall and placed the scrappings

in the trough there. The village would not be able to offer him more than a reasonable facsimile. If the spilling of a few drops on the courtyard could make it aware of his need for water, then a similar offering might give it the clue it needed as to the chemical nature of the food he could eat.

Jenner waited, then entered the second stall and activated it. About a pint of thick, creamy substance trickled into the bottom of the trough. The smallness of the quantity seemed evidence that perhaps it contained water.

He tasted it. It had a sharp, musty flavor and a stale odor. It was almost as dry as flour—but his stomach did not reject it.

Jenner ate slowly, acutely aware that at such moments as this the village had him at its mercy. He could never be sure that one of the food ingredients was not a slow-acting poison.

When he had finished the meal he went to a food trough in another building. He refused to eat the food that came up, but activated still another trough. This time he received a few drops of water.

He had come purposefully to one of the tower buildings. Now he started up the ramp that led to the upper floor. He paused only briefly in the room he came to, as he had already discovered that they seemed to be additional bedrooms. The familiar dais was there in a group of three.

What interested him was that the circular ramp continued to wind on upward. First to another, smaller room that seemed to have no particular reason for being. Then it wound on up to the top of the tower, some seventy feet above the ground. It was high enough for him to see beyond the rim of all the surrounding hilltops. He had thought it might be, but he had been too weak to make the climb before. Now he looked out to every horizon. Almost immediately the hope that had brought him up faded.

The view was immeasurably desolate. As far as he could see was an arid waste, and every horizon was hidden in a midst of wind-blown sand.

Jenner gazed with a sense of despair. If there was a Martian sea out there somewhere, it was beyond his reach.

Abruptly he clenched his hands in anger against his fate, which seemed inevitable now. At the very worst, he had hoped he would find himself in a mountainous region. Seas and mountains were generally

the two main sources of water. He should have known, of course, that there were very few mountains on Mars. It would have been a wild coincidence if he had actually run into a mountain range.

His fury faded because he lacked the strength to sustain any emotion. Numbly he went down the ramp.

His vague plan to help the village ended as swiftly and finally as that.

The days drifted by, but as to how many he had no idea. Each time he went to eat, a smaller amount of water was doled out to him. Jenner kept telling himself that each meal would have to be his last. It was unreasonable for him to expect the village to destroy itself when his fate was certain now.

What was worse, it became increasingly clear that the food was not good for him. He had misled the village as to his needs by giving it stale, perhaps even tainted, samples, and prolonged the agony for himself. At times after he had eaten, Jenner felt dizzy for hours. All too frequently his head ached and his body shivered with fever.

The village was doing what it could. The rest was up to him, and he couldn't even adjust to an approximation of Earth food.

For two days he was too sick to drag himself to one of the troughs. Hour after hour he lay on the floor. Some time during the second night the pain in his body grew so terrible that he finally made up his mind.

"If I can get to a dais," he told himself, "the heat alone will kill me; and in absorbing my body, the village will get back some of its lost water."

He spent at least an hour crawling laboriously up the ramp of the nearest dais, and when he finally made it, he lay as one already dead. His last waking thought was: "Beloved friends, I'm coming."

The hallucination was so complete that momentarily he seemed to be back in the control room of the rocketship, and all around him were his former companions.

With a sigh of relief Jenner sank into a dreamless sleep.

He woke to the sound of a violin. It was a sad-sweet music that told of the rise and fall of a race long dead.

Jenner listened for a while and then with abrupt excitement realized

the truth. This was a substitute for the whistling—the village had adjusted its music to him!

Other sensory phenomena stole in upon him. The dais felt comfortably warm, not hot at all. He had a feeling of wonderful physical well-being.

Eagerly he scrambled down the ramp to the nearest food stall. As he crawled forward, his nose close to the floor, the trough filled with a steamy mixture. The odor was so rich and pleasant that he plunged his face into it and slopped it up greedily. It had the flavor of thick, meaty soup and was warm and soothing to his lips and mouth. When he had eaten it all, for the first time he did not need a drink of water.

"I've won!" thought Jenner. "The village has found a way!"

After a while he remembered something and crawled to the bathroom. Cautiously, watching the ceiling, he eased himself backward into the shower stall. The yellowish spray came down, cool and delightful.

Ecstatically Jenner wriggled his four-foot tail and lifted his long snout to let the thin streams of liquid wash away the food impurities that clung to his sharp teeth.

Then he waddled out to bask in the sun and listen to the timeless music.

Malcolm Jameson

LILIES OF LIFE

The next planet after Mars to be invaded by man, most experts agree, will be Venus—mysterious globe which, from Earth, is eternally concealed behind immense roiling layers of cloud. We do not know a single useful fact about the surface conditions on this planet, and consequently we have had stories describing it as everything from a desert-dry waste to a completely ocean-covered ball. The late Malcolm Jameson, who was one of modern science fiction's most graphic and effective writers, has made some highly plausible guesses along a different line of development in this richly variegated picture of extraordinary life forms on a supertropical planet.

THE test tube dropped to the floor with a crash. A wisp of acrid vapor trailed up from it.

Parks, ignoring it and gripping the edge of the table, moaned, "Something's happened to my schedule—this isn't due for an hour yet—"

He broke off, shivering.

Maxwell looked sharply at him from where he sat, and then glanced at the clock. It was only two. Their next shots were due at three o'clock. But there was no doubt that Parks was working himself into a seizure. Already his hands were twitching and jumping convulsively, and the telltale tics of the deadly Venusian swamp jitters were commencing to go to work. Parks's face was no longer his own, but a travesty of a human countenance—a wildly leering, alternately staring and squinting, mask of agony.

With a sigh, Maxwell rose and pushed back his chair. If Parks was going that way, so would he, soon. Unhurriedly he walked to the medicine cabinet and took out two shiny syringes. He filled them both from their supply of ampules. Paracobrine was not much good, but it was the best men knew. Then he laid them by the "wailing wall"—an iron railing firmly secured to heavy stanchions—and went to where the now whimpering Parks huddled on his stool.

"Come on, old man," he said gently, "let's get it over with."

Parks allowed himself to be led to the place, and long practice did

the rest. By the time Maxwell had the needle in and the plunger thrust home, Parks was gripping the rail as if he meant to squeeze it flat. Maxwell took a deep breath. It was his turn. He rolled up his sleeve and forced the amber liquid into his own veins.

For five interminable minutes the two men clung there, writhing and sobbing as the fiery stuff coursed through their bodies—molten iron, searing acid, soul-destroying agony. And then it passed. Fingers relaxed their deathlike hold, muscles untensed, and their gasping again became breathing.

"I . . . won't go . . . through . . . this . . . again—" began Parks through clenched teeth, "I—"

"Oh, yes you will," said Maxwell grimly. "We always say that . . . everybody says it . . . but still we go on. You know the alternatives don't you?"

"I know them," said Parks dully. Without paracobrine the jitters became a permanent condition, not a recurrent one, and one that ended necessarily in madness. The other course was the rope, or the jump from a high place, or a swifter poison.

"All right, let's get back to work then. What was in that tube?"

"Experiment eleven-o-four. It doesn't matter now. I used the last of the snooker bark. We haven't the stuff to duplicate it with. Not unless Hoskins smuggles in another supply."

"Forget it, then. Let's have a look in the ward. Maybe eleven-o-three did the trick."

Parks followed silently, gradually pulling himself back into his normal self. Next time he would know enough to advance the clock. Paracobrine was no fun, but it was less hard to take in a calm mood then after the attack had begun.

The ward brought the usual disappointment. The monkey in the victim cage was gibbering hideously in his last convulsions. Within a minute it would be as dead as the limp piles of inoculated guinea pigs in the pens beyond. The last try at the formula had not worked. Two thirds of the human race would have to go on suffering for a while, for a better answer to the swamp jitters than paracobrine was not yet invented.

Maxwell looked at the other cages. There were still some monkeys and guinea pigs, and there were a few other combinations yet to try. Men in vital research must be resilient. A thousand or so failures was nothing. It is a part of the business.

"I think," he started to say, "that we had best—"

"I'll get the door," Parks interrupted, as a discreet tapping broke in on them. "Sounds like Hoskins."

It was Hoskins, Hoskins the interplanetary smuggler. He carried a heavy satchel and wore a sour grin.

"Bad news, fellows," he said, setting down his bag. "No more stuff out of Venus from now on. They've trebled the off-planet patrol and tightened up on port inspection. Tony was pinched, and his ship and the stuff for you with it. They threw him in the clink, of course, and burned the cargo. That means you won't get any more snooker bark, or gizzle bugs, twangi-twangi, melons, or any other of that stuff. Shan Dhee has chucked his job, which leaves me without a buyer. I'm going out of business. Sorry."

"There's *nothing* for us?" asked Parks, aghast. He clung fiercely to his theory that the specific for the jitters would be found only in some organic product of Venus, where the disease originated. It would be there, if anywhere, that the virus's natural enemies would have evolved. But lately other Venusian maladies had been turning up, and the quarantine authorities must have ordered a stricter embargo. Without smuggled organics, his and Maxwell's hands would be tied.

"I've got this stuff," said Hoskins, opening the bag. "It's not the sort you usually order, but I happen to have it on hand and want to close it out. It's loot Shan Dhee got out of a Tombov temple he once robbed. It ought to go to a museum, but the stuff's hot and they ask too many questions. Could you use it?"

He dug into the bag and came up with a figurine. It was a piece of the curious coffee-colored semi-jade regarded as a sacred stone by the savage Tombovs, and, considered as Tombov work, was extraordinarily well executed. Its subject was a rotund, jolly old Tombov godlet, sitting comfortably on a throne with his pudgy hands clasped across his belly. About his neck hung a rope of what appeared to be large pearls, and he was crowned with a chaplet of swamp lilies. Lily plants grew all about the throne, and there the jade had been cunningly colored green by the application of a kind of lacquer—the pale-yellow lilies being similarly tinted.

"Shan Dhee says it is the Tombov God of Health, and the temple was the big one in Angra Swamp where the Angra tribes hold their orgies."

"Ugh!" shuddered Parks. Those who had seen them reported the Tombov ritual was not a pretty thing to watch. "No, it's no good to us."

"I don't know," said Maxwell slowly. "God of Health, you say? M-m-m. Come to think of it, most Tombovs are immune to the jitters, or were until our pioneers went there. Maybe we ought to study it. How much?"

"Nothing, to you," said Hoskins. "You've been good customers. Take it for cumshaw. But I'll have to ask money for these."

He dug again into the bag and came out with a double handful of beautiful, iridescent spherelets. They were each about the size of a golf ball, and looked for all the world like so many soap bubbles—thin, fragile, and shimmering. Yet when Maxwell examined one he found it to be exceedingly hard, though almost weightless, and it appeared to be made of the toughest imaginable crystal.

"What are they?"

"Gems, I guess," shrugged Hoskins. "They came out of the temple, too. Shan Dhee said they hung around the neck of the big idol like a necklace—roped together with wisps of grass. See, the little idol wears a replica of it."

Maxwell considered the jewels, frowning. Hoskins added that the price would be a thousand for the lot. That was a lot of money, but what was money to men doomed to a lingering, fearful death? The baubles were somehow linked to the Tombov health rites, and the wild Tombov—though a filthy beast—was notoriously healthy. It was only the civilized ones who withered and died. It was doubtful that the gems themselves had any therapeutic value, but they came out of a temple. Therefore they were symbolic of something or other, a possible clue to the real secret.

Maxwell hauled a drawer open and swept the glistening spheres into it.

"Make out a check, Parks. I'm going to play a hunch."

Parks, still dazed from his premature seizure, nodded dumbly. And after Hoskins had gone, they took out the spheres again and huddled over them. Then they divided up the work and went at it.

Tests were applied, with results that were largely negative. The iridescent balls were acidproof, shatterproof, and exceedingly hard. But Maxwell managed to saw one in half, and found it empty, though as

the saw first bit through the thin shell there was a sharp hissing as trapped inner gases escaped into the room. Parks was quick to catch a sample of the foul-smelling stuff, only to be baffled by the analysis. The organic gases of Venus have most complex molecular structures.

"Hey," yelled Maxwell a little later, taking his eye away from the microscope. "I have some of that sawdust here. It isn't crystalline at all. It's definitely a cellular structure. These balls are certainly not minerals, but they are not plant or animal tissue, either—not as we know them. They're just—"

"Just Venusian," Parks completed for him, sighing. Anything that lived on Venus was a headache to the investigator. There was no perceptible borderline between flora and fauna, and there were times when both encroached into the mineral zone. Venusian life cycles made those of such devious transformations as the human tapeworm on Earth seem as bleakly simple as the reproductive processes of the amoeba. Parks knew of a sort of aquatic ant, to name just one, that was fertilized by clinging to the skin of eels, and which then crawled ashore and laid its eggs, the eggs subsequently growing up into masses of moss. Weird, featherless birds ate that moss and developed intestinal parasites. Those, upon deserting their host, became crawling ants, sprouted wings, and then took off for the ocean. It was merely the usual Venusian complicated symbiotic setup: the ants being somehow necessary to the survival of the eels, and, in their later forms, to the birds, both as food and as digestive enzymes. Scientists who attempted to follow through lost themselves in a maze of still other ramifications.

Maxwell and Parks stared at one another.

"There's only one thing to do," said Maxwell. "Hoskins can't bring any more stuff to us; we'll have to go to it. I want to know why wild Tombovs don't have jitters, and why lilies are sacred to them, and what these things are. We're going to Venus."

Their arrival at Port Angra was not a cheerful occasion. Their arms and legs were puffed and aching from scores of prophylactic shots. Moreover, they had had to sign away most of their civil rights. Despite all precautions, white men rarely could remain more than three months on Venus without picking up one or more virulent infections, any of which would prevent his ever returning to sanitary Earth. People therefore went there at their own risk, absolving in advance the government and all others concerned.

There was also nothing reassuring about their fellow passengers. A

few were desperate scientists like themselves, stragglers in the procession that had been going by for years. Others were missionaries, gone to relieve brothers whose three months were about up. For similar reasons there were relief quarantine-enforcement officers along, and representatives of the Radioactive Syndicate, come to take their turn at keeping the uranium mines going. Most regarded their assignments with unalloyed distaste.

They came down in the inevitable sticky, yellow, hot mist and landed in a clearing made in a lush jungle. Awaiting them was a pathetic sight—rows and rows of grounded palanquins with the weathered and mildewing white and red insignia of the Red Cross. In litters lay the men they were coming to relieve, mere wrecks of what they had been a few short weeks before. For not a few of them, their coming to the port was no more than a hopeless gesture. Whether they were accepted for the passage home would depend upon the doctors.

"This is some place," growled Parks.

"When the jitters hit you again," reminded Maxwell grimly, "it won't matter. Any place you happen to be in will be that."

He studied the ranks of tamed Tombovs standing patiently beside the grounded chairs. They were the bearers, the helots of this hole. They stood gaunt and shivering, for they were sick men, too, sicker even than the whites. It was thought profitable to keep Earthmen alive by periodic doses of paracobrine, but a waste of good drugs when it came to natives. The swamps were full of them, and the promise of tobacco—the one nonnative commodity valued by the savages—always filled up the ranks again. As Maxwell looked, one of the chair bearers jerked into violent convulsions and fell writhing and howling to the muddy ground. No one noticed. It was too routine. Tomorrow, maybe, the scavengers would attend to it.

The Tombov was remarkably humanoid, grotesquely so, more so than the great apes of Earth. The salient difference was in the feet, huge splayed pedals that served as mudshoes, distributing the body weight over a larger area so that the Tombov could walk safely on the thin crust that topped the viscous mire of the swamplands. They were ducklike feet, mostly membrane spread between long, tapering toes.

The port captain came up and called litters for the new arrivals, one each for the men, and additional ones for their equipment. Then he barked out an order in the harsh Tombov tongue, and the bearers picked up their loads and went on splashing away.

Despite the poor visibility, Maxwell found it an interesting ride. There was a feeling of luxuriousness in being carried along over impossibly sloppy ground on the bare shoulders of a half-dozen jogging slaves. And he was interested and at the same time appalled at the riot of vegetation he glimpsed on all sides. There was an infinitude of species of every kind of living thing, an overwhelming field for scientific study. With human mortality rates what they were, man would probably never know much about Venusian life forms. For the animals, if they were animals, that peered out from time to time were as weird and incredible as the fantastic flowering lianas, smoking bushes, and trees that gave off metallic, cracked-bell, clanking sounds.

His momentary sense of well-being abruptly departed from him as their caravan hove into a clearing and moved past a low mud wall. Over the group of buildings beyond the wall flew the drab banner of the U.M.—United Missions. He saw the corrals into which newly arrived Tombovs were being herded preparatory to their being "processed" for the slave market. For since Earthmen could not work and survive in that vile climate, they had to have natives as the beasts of burden. It was natives who dug the uranium, who did the building and the hauling. And heathen Tombovs would not do. They were too intractable.

Maxwell thought cynically of the conversion statistics, of the thousands run through the salvation mills each year. It was not basically an evangelical proposition. It was an economic necessity. For all Earthmen, whatever their faith, agreed on one point—the Tombov in the raw was a lazy, lascivious, irresponsible rascal. The wild native was a chronic liar, a congenital thief, and what displeased him he was prone to kill out of hand, and his means of doing it were rarely nice. He saw no point in working, for natural food was on every hand. He was tough; therefore physical punishment meant nothing. His philosophy was virtually nil, so he was deaf to abstract appeal. In short, to be useful, he *had* to be Christianized.

A turn of the road put behind them the mission and its hateful appendage—the labor mart. Ahead were the first straggling huts of Angra. They passed the inevitable dispensary, with its white-coated attendants and wailing wall. Then they stopped beyond at a low building whose sign read:

Bureau of Research Coordination

The doctor in charge was a haggard, sallow man with woebegone eyes. His hopeless expression did not change while Maxwell was outlining his theory. When he stopped, the doctor shook his head.

"A chimera," he said, "a waste of work. Others have come to Venus with the notion that it was something the Tombovs ate or drank that made them immune to jitters. Every item of their diet has been analyzed many times, even the foul fen air they breathe. The results were always negative. Nor is there any appreciable difference between Tombov blood types and ours, or their vitamin reactions. We think now that the so-called Tombov immunity is due to nothing more mysterious than natural selection. The ones now in the swamps are descendants of those who simply could not be killed by the disease, and therefore have great resistance."

"Nonsense," said Maxwell, nettled by the negativeness of the man. "What becomes of their natural resistance when they are converted? Baptism has no effects on antibodies. Did it ever occur to you that there may be something they do at their secret rites which makes the difference?"

"Religion," said the doctor stiffly, "is a subject I never discuss, and the less said about the abominable rites of the swamp savages the better. I assure you, sir, if you knew the Tombov as well as we here do—"

Maxwell snorted and turned away.

"Let's go, Parks. It's the 'old China hand' story all over again. When a scientist lets himself be blinded by prejudice, he isn't a scientist any more."

At the dispensary they asked the whereabouts of Hoskins' former scout, Shan Dhee. According to Hoskins, Shan Dhee was a convert who backslid after living with the whites a while, and turned native again. It was because he had promptly contracted the jitters and had had sense enough to run away. The result of being apostate from both camps was that he became a sort of pariah, tolerated, but distrusted, by both races. Yet he served well as a go-between because he was the one heathen Tombov who knew the ways of Earthmen and spoke their language, though Hoskins warned it would be in a variety of code.

"Shan Dhee?" said the interne, lifting an eyebrow in surprise that a respectable person should inquire about one so shifty and disreputable. "Why, in jail, probably. If not, you'll find him hanging around one of the dives down at the Edge, loaded to the gills with zankra. Take my

advice and have a patrolman go along, if you have to see him. When a convert goes bad, he's *bad.*"

"Oh, we'll manage," said Maxwell. The anti-Tombov prejudice seemed well distributed. He was still inclined to rely on Hoskins' recommendation.

The zankra joint was not a savory place. It was dark and dirty and very, very smelly. Its patrons, white men who couldn't stand the gaff and had been barred from going home by reason of their condition, lay all about on dirty mats. They were dead to the world, even if their muscles did occasionally knot up in spasmodic twitchings. This was the way they chose to ease their doom—they had gone the zankra route. For zankra, though not a cure for anything, brought blissful anesthesia, being as it was a natural elixir—a blend of protomezyl alcohol and a number of potent alkaloids. It was cheap, too, since the gourds of which it was the juice could be had for a copper coin or so. A gourd of it was just being broached as Maxwell and Parks walked in. They saw a native squat by the door and jab a hole in the fruit so he could insert a sucking quill.

"We're Mr. Hoskins' friends," Maxwell said to him. "Where can we find Shan Dhee?"

The Tombov studied him shiftily. There was some hesitation, and then,

"Me Shan Dhee."

Maxwell had also been studying him. He was gratified to note that the fellow seemed to be magnificently healthy. There was none of the residual tremor that persists even after paracobrine shots. Yet Shan Dhee's shoulders and arms bore mute testimony that he had been a jitters' victim at one time. They were covered with the scars of self-inflicted bites, usually a sure sign of an untreated case. The scars were very old and confirmed, in a way, what Maxwell wanted to believe. The man had evidently been cured—a thing believed to be impossible. But how? By his reversion to his former pagan practices?

Shan Dhee turned out to be a poor subject. It was bad enough that he spoke the barbarous pidgin brought by the first missionaries, but he was also suspicious, stubborn, and evasive. By Maxwell's questions Shan Dhee at once divined that Maxwell knew that he had once robbed a temple, and he knew that if other Tombovs ever found that out he was sure to die horribly.

"No know what lily flower good for," he would say, averting his eyes. "Tombov no eat. Tombov wear. Lily flower no good Earthfellow. Kankilona come out of lily flower. Earthfellow kankilona no like. Earthfellow priestfellow say kankilona horres . . . horres*n*ous monster. Earthfellow priestfellow wantchee kill all kankilona. Kankilona die, Tombov die. Die no good for Tombov. More better Earthfellow no see kankilona."

That was that. No amount of questioning could elicit more. They had to guess at what sort of "horrendous monster" a kankilona might be. On Venus it could be anything from an ambulatory flytrap to a fire-breathing dragon. All that was clear was that there was a relation between the lilies and the monsters, that the missionaries did not approve of them, and that the monsters were somehow necessary to Tombov well-being.

Questions as to the iridescent, gas-filled spheres brought little that was comprehensible, though much later it did come to have meaning. Shan Dhee tried desperately to duck the question, for evidently he had lied about them to Hoskins.

"Littily shiny balls no gems," he confessed at last. "Littily shiny ball no good at all. Littily shiny ball one day pretty . . . six, eight, day more . . . no more littily shiny ball. All gone. Maybeso litilly shiny ball papa-papa-fellow kankilona."

"He's lying," said Parks. "We've got eighteen of 'em at home in our vault. We studied 'em a lot longer than a week, and none of them vanished. I'd call 'em pretty permanent."

Shan Dhee refused to amplify. Maxwell noted the hinted link to the mysterious kankilona but let it pass and went straight to the purpose of his call. Would Shan Dhee fix it so they could attend a Tombov orgy?

Shan Dhee's reaction was close to terror. Tombov temples were strictly taboo to Earthmen at all times. They were even taboo to Tombovs, including the priesthood, except during the days of actual festival. The Tombovs would hardly dare slaughter the Earthmen if they were found desecrating the place—the Tombovs had learned that hard lesson long before—but what they would do to Shan Dhee was too dreadful to think about. Shan Dhee would steal, smuggle, even murder for them—if enough tobacco was to be had—but not that.

"Don't Tombov priests like tobacco, too?" Maxwell asked softly.

It was a lucky question. It rang the bell. Shan Dhee reconsidered.

He sipped zankra and made calculations on his fingers. In the end he yielded.

"Maybeso can do," he admitted uneasily. "Maybeso Tombov priestfellow letchee Shan Dhee hidum Earthfellow godhouse-side, but priestfellow no likee Earthfellow in Tombov godhouse. Earthfellow no likee see Tombov eatchee kankilona. Earthfellow get sick. Earthfellow pukum. Earthfellow get mad. Earthfellow smashee Tombov godhouse. Earthfellow in godhouse no good. More better Earthfellow hidee outside."

Both investigators promised faithfully they would watch unseen. They would be the soul of discretion. And they would pay any reasonable price. They were not scoffers or reformers. They wanted only to know the secret of Tombov health. Shan Dhee relaxed. He even grinned a crooked grin.

"Tombov priestfellow more better Earthfellow priestfellow. Tombov wantchee long life *now,* swampside. Tombov no wantchee long life *bimebye,* Heavenside. Heavenside no good. Too far. Swampside more better."

Parks and Maxwell smiled. After all, they couldn't blame the poor devil. How could the warped missionary doctrine preached them be any solace for hard labor and suffering? Better good health now, and let them take their chances on Heaven. So they argued no further, but tolled up the quantities of tobacco Shan Dhee said would be required.

It took three weeks of dreary slogging over slimy mud, sometimes proceeding by dugout canoe, before they came to the place of the Festival of Long Life. Shan Dhee showed them the markers that set off the sacred areas. Until they were removed three days later, it was forbidden for ordinary Tombovs to pass them. But Shan Dhee shot the clumsy craft ahead. His coming had been arranged. He directed the canoe past the tripods of saplings with their warning plumed skulls. The sluggish lagoon narrowed. Presently they came in between two lily fields. Shan Dhee explained that there were only a few places where such lilies grew and that the penalty for taking one off holy ground was death.

Maxwell studied the plants with interest but saw little to distinguish them from the Terran variety except their great size and yellow color. And then he was startled to see monstrous hairy creatures crawling around among them. For a long time he got only glimpses, and then he saw one entire. It was a sort of giant tarantula—a horror of mottled silky hair hanging from a bulbous, palpitating body as large as a bas-

ketball. There seemed to be a score of arching legs, each hairy and clawed at the tip. There were ugly, knifelike fangs, too, from which a greenish poison drooled. A cluster of luminous eyes were set above them, glaring venomously in shifting reds and violets.

"Kankilona," said Shan Dhee.

Parks shuddered. It was upsetting even to look on one. Had Shan Dhee said that the Tombovs *ate* them?

The lagoon shoaled and narrowed. In a moment Shan Dhee drove the dugout nose up onto a muddy bank. It was the island hummock of the temple grounds. They climbed out and dragged the canoe into the underbrush and hid it under broad leaves. Then they gathered up their baggage and went up onto the hummock.

It was a glade surrounded by heavy cypress, and under the trees were hundreds of little huts. In the distance stood the temple—an astonishing structure of gray stone, astonishing because the nearest solid ground was more than a hundred miles away. Only stubborn devotion could have carried those massive stones to where they were. But the temple's great portal was closed and barred. The whole place was deserted.

Shan Dhee disregarded everything until he could build their hiding place. It was a two-roomed hut he made for them, considerably apart from any other. As a tolerated outcast Shan Dhee said he was permitted to attend the festival, but he must keep his distance from the truly faithful. As it happened, his status was most convenient, for the two Earthmen could live in the rear, watching the show through peepholes, while Shan Dhee sat stolidly in the doorway, sure that no wild Tombov would venture near an untouchable. Shan Dhee said they could see all there was to see from there until the night of the culmination of the revels. By then the Tombovs would be blind drunk and would not notice if they were being spied on from the darkness outside the temple door.

Maxwell and Parks laid out their gear. There were their food pellets and their store of tobacco twists that must be given to the priests. There was also their scientific paraphernalia—beakers and test tubes and reaction chemicals, and their all-purpose spectrographic camera. But the most essential item was their supply of precious paracobrine, for Parks was slipping fast and needed shots at hourly intervals. They stowed that safely and settled down to wait.

The subsequent week was not especially instructive, nor was it enter-

taining. During the first days the Tombovs began straggling in, filthy with swamp mud encrusted on them. They brought their women and children with them, and a tremendous number of zankra gourds. Each family settled into its own hut and then proceeded to the tribal reunion. The affair was much like barbaric gatherings anywhere in the Solar System—attended by the monotonous banging on tom-toms, by wild, uninhibited dancing, by gorgings with food and drink. There were scenes of reckless drunkenness, but until the beginning of the fifth day it was essentially a social gathering. It was not until the fifth day that the priests showed up.

The activities thereafter took on a different tinge. No longer did the Tombov braves lie around in drunken stupor until midafternoon. They were put to work. And their women were put to work.

They went out into the swamp, paddling along on their splayed, webbed feet. The men carried curious nets made of twisted small lianas. The boys trailed them, bearing roomy cages made of a sort of wicker. For the women's part, their job seemed to be the gathering of lilies. They stripped the plants methodically, taking blooms and leaves alike, leaving little more than pulpy stubble behind. It was not until evening came and the men came back that Maxwell knew what they had gone for. They returned triumphantly with scores upon scores of captured kankilonas, the trapped arachnids ululating horribly in protest at their restricted movement. The priests opened the temple doors long enough to receive the spiders, and then closed them again.

That went on for three days more, but as the swamps were stripped of their leafy covering and crawling monsters, Maxwell made an astounding discovery. For a few minutes one day the sun came through —a rarity on cloudy Venus—and as it did a miracle seemed to happen. The dull mud flats became beds of scintillating fire. What he had bought from Hoskins as jewels lay thick everywhere. They were as numerous as the dead leaves of fall. Then the clouds took over again and the glow died.

"What do you make of it?" asked Parks, who was looking on in wonder. "Could they be lily seed?"

"Hardly," said Maxwell. "They are too light and airy. Seeds have to sink into the soil to germinate. Those things won't even sink in water."

At last the final day of the festival came. Men and women dressed themselves in gala garments made from lilies. There were chaplets and

leis, garlands and leafy headdresses. And they were drinking zankra in colossal doses. All afternoon there was unrestrained dancing, and toward dark the drunken choruses became a bedlam of hideous howling. Then the temple doors were thrown open wide and torches lit inside.

"Pretty soon you Hoskins friendfellow see kankilona feast," remarked Shan Dhee. He looked worried, as if repenting the deal. "No letchee priestfellow catchee looksee," he warned. Maxwell and Parks repeated their promise.

It was near midnight when they decided the worshipers were so drunk that nothing would matter. Maxwell and Parks stole out of their hut and across the glade, being careful not to step on the many Tombovs who had already passed out. They stopped close to the great door and looked in. The orgy was at its height. They saw now how the feast was conducted. Two acolytes would hand up a squirming kankilona, stripped of its legs. The high priest would receive it and then defang it with two swift jerks. The slimy fangs he would hurl into a basket at the foot of the chief idol; the carcass he would throw to the yelling celebrants. There would be a scramble for it, then a howl of disappointment as the unlucky ones watched the Favored sink his teeth into the soft venom sac of the mangled tarantula.

Parks gripped Maxwell's arms.

"I . . . I've got to go back to the hut," he gasped.

"What's the matter?" asked Maxwell sharply. "Can't you take it? We're not squeamish missionaries."

"T-that's not it. I forgot my shot. See how I'm jumping? But you stick around. I'll be back in a jiffy."

Maxwell let him go. It was routine, more or less, and he did not want to miss any unexpected feature of the rites before him. He watched Parks disappear into the dark, and then started to turn his gaze back to the orgies.

He did not complete the movement. A surprisingly strong arm encircled him, and a husky knee entwined and gripped his. He knew from the wide flat foot that it was a Tombov that assailed him. Then there was a mocking voice in his ear—it was Shan Dhee's voice, and Shan Dhee was crazy drunk. His breath stank of zankra, and worse.

"Earthfellow wantchee long life, huh?" he taunted. "Okeh, okeh. Earthfellow catchee long life. Earthfellow catchee kankilona juice."

Maxwell felt himself being bent irresistibly backward, to the peals of the maddened Tombov's maniacal laughter. A disgusting gob of

hairy, mushing something was slapped down on his face. He could not get his breath. He struggled and tried to cry out. It was what Shan Dhee wanted him to do. His teeth broke the tender membrane of the kankilona's venom sac. There was a gush of indescribably nauseating oily stuff. It stung his cheeks and shoulders. Maxwell felt utterly defiled and ashamed. He wanted to die then and there. And then something happened to him.

In one swift instant all the nausea and revulsion was swept away. In its place there was heavenly exhilaration, an exaltation that exceeded any ecstasy he had ever known. He was no longer a sick man; would never be one again. He was strong, well—a champion among champions. Life was wonderful. It had to be expressed. Maxwell cut loose with a war whoop that shook the glade. Then things went madly round and round. Lights flared up and faded. The howling within the temple died, dwindling into an infinitude of distance. After that, Maxwell did not remember.

He awoke in what he thought must be the gray dawn of the morning after. He was lying face down in the muck outside the temple door. He lay very still for a moment, wondering when the inescapable headache would begin to rack him, for after the heady intoxication he now faintly remembered, it was unthinkable that there would not be one—and a super one at that. But there was no headache. There was no foul taste in the mouth. Maxwell had to admit he felt fine, which, under the circumstances, was humiliating. He wondered if he was altogether sane. He started gingerly to get up, expecting to find himself full of Charley horses. There weren't any. He was fit as a fiddle. He quit worrying and arose briskly, but promptly regretted it. His head thumped into something, and there was a crash. He stood amazed and aghast at what fell. It was three long sticks of wood lashed together and tied with a bunch of plumes. A skull lay grinning at him from the wreckage. During the night someone had erected that dire symbol over him—the warning that he was taboo—under a curse!

Maxwell shot a glance at the temple. Its doors were closed and barred. It was that way also in the glade. The huts were empty, the celebrants gone. The festival was over. Now everything was taboo. Maxwell's wrist watch said it was late afternoon. He had slept more than the night.

Then his heart jumped as he belatedly remembered Parks. Parks said

he would come back. Where was he? Had Shan Dhee assaulted him, too? Maxwell looked around, but there was no sign of him. He started off across the glade in great strides.

Before the hut he was brought to an abrupt stop. Another taboo tripod stood there. But there was more besides. On a stake nearby there was the grinning, newly severed head of a Tombov, and scattered about the foot of the stake were freshly picked bones—near-human bones. The head was Shan Dhee's head. It meant that Shan Dee had transgressed somehow, and Shan Dhee had paid the penalty. It was ominous. Maxwell feared to think of what he might find inside.

What was inside was bad enough. Both rooms were a shambles of smashed possessions. Most of the scientific equipment was hopelessly ruined, and food pellets were mixed indiscriminately with spilled chemicals. Every scrap of tobacco was gone. But far worse, the whole interior reeked of paracobrine. Shattered ampules and broken syringes explained that readily enough. The looters, Nazi-like, had destroyed what they did not value themselves.

At the moment none of that bothered Maxwell overmuch. It was Parks he wanted to find. And find him he did, half hidden beneath a pile of torn clothes. Maxwell uncovered him and knelt beside him, staring at him in bitter dejection. He felt like a murderer, for Parks had never been keen about this wild-goose expedition. It was Maxwell who insisted on playing the hunch. Now Parks's tense face had a deathly pallor, and the few weak tremors were eloquent of the complete exhaustion that must follow a night and day of uncontrolled convulsions. Parks had been late for his shot and must have fallen, out of control. Maxwell should have foreseen that, and returned with him. Now it was too late. There was no more paracobrine. By morning Parks would be dead.

Maxwell sat for minutes, torturing himself. Then, of a sudden, a great light dawned on him. Why, he himself had missed at least two shots, and he felt fine! Unbelieving, he stretched out his arm. There was not so much as a hint of a tremor. What . . . why . . .

In another instant Maxwell was outside, ransacking abandoned huts. In a little while it would be deep twilight, and he had no time to lose. In the third hut he found a kankilona net. In another a broken cage, which he speedily repaired. Then he set off for the swamp's edge.

Maxwell quickly discovered that catching wily kankilonas alive was

work that required men in gangs. The first several he spotted eluded him. The fourth one squared off and circled, warily fighting back. Maxwell was in no mood to quibble. Did kankilona venom lose its potency when the spider died? He couldn't know. But he knew he had to have some—of *any* strength—and quickly. He hurled his knife into the monster and watched it die. Then, lacking any kind of container, he tore off part of his shirt and dipped it into the dripping poison. He ran back to Parks with that.

"Open your mouth, old man," he coaxed, but there was no response. Maxwell pried the jaws apart and blocked them. Then, drop by drop, he wrung nauseous oil out of the rag. Parks winced and tried to avert his head, but he was too weak. He gulped the stuff down, perforce. Maxwell fed it all, then waited.

The reaction was mercifully quick. Within seconds, Parks's almost imperceptible breathing deepened and his absent pulse returned. Slowly the iron-set neck muscles softened, the face relaxed, and there was a show of warming pink. In a little while Parks was sleeping peacefully. Maxwell examined him carefully from head to foot. There were no tremors. Not any. Maxwell heaved a big sigh of relief. Then he lit a torch. He had to do something about retrieving those food pellets.

Miraculous as the new-found remedy was, Parks's convalescence was slow, either because he was so far gone in the beginning or because the venom was not strictly fresh. His complete recovery was a matter of weeks, not hours or days, and in that time Maxwell had the opportunity to observe many things.

He kept a sharp watch on the swamp. He wanted to see what happened to the crystalline spheres which Shan Dhee had said would vanish after a while. He put on mudshoes and gathered a few and stored them in the hut. Then he maintained a vigil at the hummock's edge.

Nothing whatever happened for almost a week, and when it did happen, it happened at night. It was by the purest chance that Maxwell couldn't go to sleep and walked out into the glade for more air. It was then he saw the shimmering violet light that seemed to pervade the entire swamp area. It was as if the mud flats were a bed of smoldering anthracite dimly lit by flickering bluish flame. Maxwell went back to the hut for the torch and mudshoes. Then he investigated.

What he discovered was a horde of sluggish crawlers, creatures not too distantly related to the queer Australian platypus. Many were feed-

ing noisily on the lily stubble, but most just lay, as if entranced, staring at the crystalline spherelets. It was the light of their violet eyes that furnished the illumination, a fact that did not astonish Maxwell. The majority of Venusian fauna *had* luminous eyes. What did bowl him over was what the light did to the shimmering balls. They shrank and and shrank. They dwindled to mere pellets, hard and relatively heavy. Then they were no more. There were only bubbles to mark the spot where they had sunk into the mire. Maxwell pocketed several of the shrunken balls just before they disappeared.

The next day he dissected one. It was now obviously a seed, perhaps a lily seed. It was one more curious example of the deviousness of Nature. Apparently in its first state it was infertile and therefore of a shape and weight which would keep it on the marsh surface. Then, perhaps by symbiotic impulse, the platypus creatures were attracted to it, gazed upon it with their violet rays, and somehow fertilized it. Whereupon it planted itself by gravity.

Maxwell followed through on that theory. That night he went into the swamp differently armed. He carried a bundle of dry sticks and the spectrographic camera. He recorded the exact composition of the violet light and noted the duration of exposure. Then he marked a number of the bubbly places with his sticks. If lilies came up there, the spheres were lily seeds.

The next day he reversed his camera, making it a projector. He duplicated the platyputian light and shed it on the crystalline balls he first retrieved. They did shrink into seed. He had at least one bit of positive proof. Then he planted them at a marked spot.

Slowly Parks improved. For several days Maxwell sought and found more spiders, but each day they grew scarcer. There came a day when there were none at all. The festival apparently had been timed to coincide with their greatest density. When would the new crop of them come, and from where? Maxwell thought about that, and began the study of the small pile of carcasses piled outside the hut. He hoped to learn something about the reproduction methods of the kankilona.

All but one of his dissections were negative. In that one he found an object that definitely jolted him. It was obviously an egg. But the kankilona egg was one of those crystalline balls! He now had one more link in its life cycle. He would have to wait for the rest of it to develop.

He had to wait for another reason. Parks was gaining, but he would not be able to travel under his own steam for some time to come. On the way back they would not have the assistance of Shan Dhee. Maxwell wondered whether the angry priests had left them the canoe. He dashed off worriedly to investigate.

The dugout was safe where they had left it. Maxwell eased it into the water and tried it out. And while he was learning the trick of handling it, he paddled it part way down the lagoon. He backed water vigorously as he neared the tripod taboo signs that marked the boundary of the lily reservation. Just beyond, there was an encampment of Tombov braves. It was a troubling discovery.

But a moment later he was a little bit relieved. A Tombov had spotted him just as he sighted them, and for a long minute both men stared at each other. Other Tombovs got up and looked, stolidly inexpressive. They made no outcry or hostile gesture, and as Maxwell turned the dugout about and headed back toward the temple clearing, the savages sat down again, as if the incident was closed.

It was Parks who guessed the purpose of the outpost. He was strong enough to talk, then, and was following Maxwell's theories with great interest.

"This kankilona business is the Tombov's big secret. They know by now how selfish the Earthman is and how ruthlessly and wastefully he exploits. They don't want to kill us—if they had, they would have done it the night they left. But they are not going to let us get back to Angra with a live spider, or its egg, or any other thing they value. If we leave here alive, it will have to be barehanded."

"I get it," said Maxwell gloomily. "They know, as you and I do, that if our race learned about spider venom, swarms of humans would invade these swamps and exterminate the genus in a single season. There just aren't enough kankilona. They would go the way of the bison and the dodo. And then we would be in a fix."

"Right," agreed Parks. "What we ought to do, of course, is analyze that poison and see what ingredient makes it work. But our stuff is smashed. If we can't take back a specimen of it, all this has gone for nothing."

"We'll see," said Maxwell.

Meantime lily plants were sprouting where the ball-seeds had sunk. Soon the plants would be maturing. Then it would be time for another

festival. They wanted to leave before that came, and they *had* to leave for a still more urgent reason. If they did not get back to Angra soon, their stay would overstretch the six-month time limit. Nothing would convince stupid quarantine officials that they weren't crawling with every variety of Venusian virus.

The first lilies were well in bloom the day they climbed into the dugout for the trip back. Maxwell shunted the canoe over close to a stand of the flowers and plucked one. It was a very curious blossom, lacking both stamen and pistil. It was a sexless plant. But he observed a fatty swelling in one of the lush petals. He slit it open and laid bare a small tumor. He cut into that. Dozens of tiny black objects scuttered out, like ants from a disturbed hill. They were baby kankilona!

"Well, that's that," said Maxwell, dropping the torn lily into the lagoon. "Now we have the whole story. Lilies beget spiders, spiders lay eggs, friend platypus comes along, and the egg becomes a lily seed. That is where we came in."

"And," supplemented Parks, "kankilonas are health-giving, so *after* they have laid their eggs, the Tombovs come and eat them. The so-called temple jewels, I suppose, are simply a reserve seed crop in case of a drought."

"Drought on Venus," laughed Maxwell. "You're crazy." But he got the idea.

At the edge of the lily swamp the Tombovs looked them over. They were grave and silent and offered no violence, but they were thorough. Their search of the boat revealed no contraband. A surly chieftain waved in the general direction of Angra. Maxwell dipped his paddle in and thrust the dugout ahead.

"It's tough," remarked Parks regretfully, "but at least you and I are cured. On another trip we may have better luck."

"We're not cured," said Maxwell grimly. "Our cases are arrested, that's all. The Tombovs do this twice a year, you know. But we have succeeded better than you know. The proof of it is here."

He tapped the notebook where he had noted the spectrum of the platypus gaze.

"At home," he said, "we have a lot of kankilona eggs, and we know how to activate them. We can start in a properly humidified hothouse for our first few batches. After that we'll expand. The world need never know that what they're taking is a distillation of kankilona

poison. They'll probably label it Nixijit, or something cute like that."

"Oh, well," said Parks irrelevantly, "I suppose the Congo valley won't be so bad."

"Nothing is ever as bad as it seems," said Maxwell.

A month later he made the same observation in a different form. They were on the homebound liner and were among the few well enough to sit up and enjoy the lounge. A pest of a missionary came over and dropped into a seat beside him.

"It's great to be getting back to God's footstool," he wheezed. "What a cross I've had to bear working with those beastly Tombovs. Ugh! A race of brutes, steeped in the vilest superstitions and practicing the most abominable rites. Our own primitives had some horrible customs, but the Tombov culture hasn't a single redeeming feature."

"Oh," said Maxwell, screwing up one eye and smiling faintly, "I wouldn't say *that.*"

Ray Bradbury

ASLEEP IN ARMAGEDDON

Here on an asteroid, one of over fifteen hundred minute, airless rocks tumbling around orbits between Mars and Jupiter, we find fearful evidence of what was once a magnificent and martial civilization. There can be no normal life now existing on these planetoids, even science-fiction writers agree, for the most part; the largest of them is only 480-odd miles in diameter, certainly too small for the development of any sort of complex civilization.

But what of the past? Astronomers suspect that the asteroids are remnants of a much larger planet that once sailed the skies in that region of space—a planet destroyed countless eons ago either by some cosmic catastrophe or by the superscience of its own highly "civilized" people. In any event, we are asked to imagine in this story that some of these ancient beings are still able to make themselves known—in a peculiarly horrible way—to the sleeping mind of a human whose spaceship is wrecked on its inhospitable boulders.

YOU don't want death and you don't expect death. Something goes wrong, your rocket tilts in space, a planetoid jumps up, blackness, movement, hands over the eyes, a violent pulling back of available power in the fore-jets, the crash . . .

The darkness. In the darkness, the senseless pain. In the pain, the nightmare.

He was not unconscious.

Your name? asked hidden voices. "Sale," he replied in whirling nausea. "Leonard Sale." *Occupation,* cried the voices. "Spaceman!" he cried, alone in the night. *Welcome,* said the voices. *Welcome, welcome.* They faded.

He stood up in the wreckage of his ship. It lay like a folded, tattered garment around him.

The sun rose and it was morning.

Sale pried himself out of the small airlock and stood breathing the atmosphere. Luck. Sheer luck. The air was breathable. An instant's checking showed him that he had two months' supply of food with

him. Fine, fine! And this—he fingered at the wreckage. Miracle of miracles! The radio was intact.

He stuttered out the message on the sending key. CRASHED ON PLANETOID 787. SALE. SEND HELP. SALE. SEND HELP.

The reply came instantly: HELLO, SALE. THIS IS ADDAMS IN MARSPORT. SENDING RESCUE SHIP LOGARITHM. WILL ARRIVE PLANETOID 787 IN SIX DAYS. HANG ON.

Sale did a little dance.

It was simple as that. One crashed. One had food. One radioed for help. Help came. La! He clapped his hands.

The sun rose and was warm. He felt no sense of mortality. Six days would be no time at all. He would eat, he would sleep. He glanced at his surroundings. No dangerous animals; a tolerable oxygen supply. What more could one ask? Beans and bacon, was the answer. The happy smell of breakfast filled the air.

After breakfast he smoked a cigarette slowly, deeply, blowing out. He nodded contentedly. What a life! Not a scratch on him. Luck. Sheer luck.

His head nodded. Sleep, he thought.

Good idea. Forty winks. Plenty of time to sleep, take it easy. Six whole long, luxurious days of idling and philosophizing. Sleep.

He stretched himself out, tucked his arm under his head, and shut his eyes.

Insanity came in to take him. The voices whispered.

Sleep, yes, sleep, said the voices. *Ah, sleep, sleep.*

He opened his eyes. The voices stopped. Everything was normal. He shrugged. He shut his eyes casually, fitfully. He settled his long body.

Eeeeeeeee, sang the voices, far away.

Ahhhhhhhh, sang the voices.

Sleep, sleep, sleep, sleep, sleep, sang the voices.

Die, die, die, die, die, sang the voices.

Ooooooooo, cried the voices.

MMMmmmmmm, a bee ran through his brain.

He sat up. He shook his head. He put his hands to his ears. He blinked at the crashed ship. Hard metal. He felt the solid rock under his fingers. He saw the real sun warming the blue sky.

Let's try sleeping on our back, he thought. He adjusted himself, lying back down. His watch ticked on his wrist. The blood burned in his veins.

Sleep, sleep, sleep, sleep, sleep, sang the voices.

Ohhhhhhhh, sang the voices.

Ahhhhhhhh, sang the voices.

Die, die, die, die, die. Sleep, sleep, die, sleep, die, sleep, die! Oohhh. Ahhhh. Eeeeeee!

Blood tappd in his ears. The sound of the wind rising.

Mine, mine, said a voice. *Mine, mine, he's mine!*

No, mine, mine, said another voice. *No, mine, mine; he's mine!*

No, ours, ours, sang ten voices. *Ours, ours, he's ours!*

His fingers twitched. His jaws spasmed. His eyelids jerked.

At last, at last, sang a high voice. *Now, now. The long time, the waiting. Over, over,* sang the high voice. *Over, over at last!*

It was like being undersea. Green songs, green visions, green time. Bubbled voices drowning in deep liquors of sea tide. Far away choruses chanting senseless rhymes. Leonard Sale stirred in agony.

Mine, mine, cried a loud voice. *Mine, mine!* shrieked another. *Ours, ours!* shrieked the chorus.

The din of metal, the crash of sword, the conflict, the battle, the fight, the war. All of it exploding, his mind fiercely torn apart!

Eeeeeeee!

He leaped up, screaming. The landscape melted and flowed.

A voice said, "I am Tylle of Rathalar. Proud Tylle, Tylle of the Blood Mound and the Death Drum. Tylle of Rathalar, Killer of Men!"

Another spoke, "I am Iorr of Wendillo, Wise Iorr, Destroyer of Infidels!"

The chorus chanted, *And we the warriors, we the steel, we the warriors, we the red blood rushing, the red blood falling, the red blood steaming in the sun—*

Leonard Sale staggered under the burden. "Go away!" he cried. "Leave me, in God's name, leave me!"

Eeeeeeeee, shrieked the high sound of steel hot on steel.

Silence.

He stood with the sweat boiling out of him. He was trembling so violently he could not stand. Insane, he thought. Absolutely insane. Raving insane. Insane.

He jerked the food kit open, did something to a chemical packet. Hot coffee was ready in an instant. He mouthed it, spilled gushes of it down his shirt. He shivered. He sucked in raw gulps of breath.

Let's be logical, he thought, sitting down heavily. The coffee seared

his tongue. No record of insanity in the family for two hundred years. All healthy, well balanced. No reason for insanity now. Shock? Silly. No shock. I'm to be rescued in six days. No shock to that. No danger. Just an ordinary planetoid. Ordinary, ordinary place. No reason for insanity. I'm sane.

Oh? cried a small metal voice within. An echo. Fading.

"Yes!" he cried, beating his fists together. "Sane!"

Hahahahahahahahahaha. Somewhere a vanishing laughter.

He whirled about. "Shut up, you!" he cried.

We didn't say anything, said the mountains. *We didn't say anything,* said the sky. *We didn't say anything,* said the wreckage.

"All right, then," he said, swaying. "See that you don't."

Everything was normal.

The pebbles were getting hot. The sky was big and blue. He looked at his fingers and saw the way the sun burned on every black hair. He looked at his boots and the dust on them. Suddenly he felt very happy because he made a decision. I won't go to sleep, he thought. I'm having nightmares, so why sleep? There's your solution.

He made a routine. From nine o'clock in the morning, which was this minute, until twelve, he would walk around and see the planetoid. He would write on a pad with a yellow pencil everything he saw. Then he would sit down and open a can of oily sardines and some canned fresh bread with good butter on it. From twelve-thirty until four he would read nine chapters of *War and Peace.* He took the book from the wreckage and laid it where he might find it later. There was a book of T. S. Eliot's poetry, too. That might be nice.

Supper would come at five-thirty, and then from six until ten he would listen to the radio from Earth. There would be a couple of bad comedians telling jokes, and a bad singer singing some song, and the latest news flashes, signing off at midnight with the U.N. anthem.

After that?

He felt sick.

I'll play solitaire until dawn, he thought. I'll sit up and drink hot black coffee and play solitaire, no cheating, until sunrise.

Ho, ho, he thought.

"What did you say?" he asked himself.

"I said 'Ha, ha'," he replied. "*Some* time you'll have to sleep."

"I'm wide awake," he said.

"Liar," he retorted, enjoying the conversation.

"I feel fine," he said.

"Hyprocrite," he replied.

"I'm not afraid of the night, or sleep, or anything," he said.

"*Very* funny," he said.

He felt bad. He wanted to sleep. And the fact that he was afraid of sleep made him want to lie down all the more and shut his eyes and curl up. "Comfy-cozy?" asked his ironic censor.

"I'll just walk and look at the rocks and the geological formations and think how good it is to be alive," he said.

"Ye gods," cried his censor. "William Saroyan!"

You'll go on, he thought, maybe one day, maybe one night, but what about the next night, and the next, and the *next*? Can you stay awake *all* that time, for six nights? Until the rescue ship comes? Are you *that* good, *that* strong?

The answer was no.

What are you afraid of? I don't know. Those voices. Those sounds. But they can't hurt you, can they?

They *might*. You've got to face them some time. Must I? Brace up to it, old man. Chin up, and all that rot.

He sat down on the hard ground. He felt very much like crying. He felt as if life were over and he was entering new and unknown territory. It was such a deceiving day, with the sun warm; physically, he felt able and well; one might fish on such a day as this, or pick flowers, or kiss a woman, or anything. But in the midst of a lovely day, what did one get?

Death.

Well, hardly *that*.

Death, he insisted.

He lay down and closed his eyes. He was tired of messing around.

All right, he thought, if you *are* death, come get me. I want to know what all this damned nonsense is about.

Death came.

Eeeeeeeee, said a voice.

"Yes, I know," said Leonard Sale, lying there. "But what else?"

Ahhhhhhhh, said a voice.

"I know that, also," said Leonard Sale irritably. He turned cold. His mouth hung open wildly.

"I am Tylle of Rathalar, Killer of Men!"

"I am Iorr of Wendillo, Destroyer of Infidels!"

"What is this place?" asked Leonard Sale, struggling against horror.

"Once a mighty planet!" said Tylle of Rathalar.

"Once a place of battles!" said Iorr of Wendillo.

"Now dead," said Tylle.

"Now silent," said Iorr.

"Until *you* came," said Tylle.

"To give us life again," said Iorr.

"You're dead," insisted Leonard Sale, flesh writhing. "You're nothing but empty wind."

"We live, through you."

"And fight, through *you*!"

So that's it, thought Leonard Sale. I'm to be a battleground, am I? "Are you friends?"

"Enemies!" cried Iorr.

"Foul enemies!" cried Tylle.

Leonard smiled a rictal smile. He felt ghastly. "How long have you waited?" he demanded.

"How long is *time*?"

"Ten thousand years?"

"Perhaps."

"Ten million years?"

"Perhaps."

"What are you? Thoughts, spirits, ghosts?" he asked.

"All of those, and more."

"Intelligences?"

"Precisely."

"How did you survive?"

Eeeeeeee, sang the chorus, far away.

Ahhhhhhhh, sang another army, waiting to fight.

"Once upon a time, this was fertile land, a rich planet. And there were two nations, strong nations, led by two strong men. I, Iorr. And he, that one who calls himself Tylle. And the planet declined and gave way to nothingness. The peoples and the armies languished in the midst of a great war which had lasted five thousand years. We lived long lives and loved long loves, drank much, slept much, fought much. And when the planet died, our bodies withered, and only in time, and with much science, did we survive."

"Survive," wondered Leonard Sale. "But there is nothing of you!"

"Our *minds,* fool, our *minds!* What is a body without a mind?"

"What is a mind without a *body?"* laughed Leonard Sale. "I've got you there. Admit it, I've *got* you!"

"True," said the cruel voice. "One is useless lacking the other. But survival is survival even when unconscious. The minds of our nations, through science, through wonder, survived."

"But without senses, lacking eyes, ears, lacking touch, smell, and the rest?"

"Lacking all those, yes. We were vapors merely. For a long time. Until today."

"And now I am here," thought Leonard Sale.

"You are here," said the voice. "To give substance to our mentalities. To give us our needed body."

"I'm only one," thought Sale.

"Nevertheless, you are of use."

"I'm an individual," thought Sale. "I resent your intrusion."

"He resents our intrusion! Did you hear him, Iorr? He resents!"

"As if he had a right to resent!"

"Be careful," warned Sale. "I'll blink my eyes and you'll be gone, phantoms! I'll wake up and rub you out!"

"But you'll have to sleep again *some* time!" cried Iorr. "And when you do, we'll be here, waiting, waiting, waiting. For you."

"What do you want?"

"Solidity. Mass. Sensation again."

"You can't *both* have it."

"We'll fight that out between us."

A hot clamp twisted his skull. It was as if a spike had been thrust and beaten down between the bivalvular halves of his brain.

Now it was terribly clear. Horribly, magnificently clear. He was their universe. The world of his thoughts, his brain, his skull, divided into two camps, that of Iorr, that of Tylle. They were *using* him!

Pennants flung up on a pink mind sky! Brass shields caught the sun. Gray animals shifted and came rushing in bristling tides of sword and plume and trumpet.

Eeeeeeeee! The rushing.

Ahhhhhhhh! The roaring.

Nowwwwwwww! The whirling.

Mmmmmmmm—

Ten thousand men hurtled across the small hidden stage. Ten thou-

sand men floated on the shellacked inner ball of his eye. Ten thousand javelins hissed between the small bone hulls of his head. Ten thousand jeweled guns exploded. Ten thousand voices chanted in his ears. Now his body was riven and extended, shaken and rolled, he was screaming, writing, the plates of his skull threatened to burst asunder. The gabbling, the shrilling, as, across bone plains of mind and continent of inner marrow, through gullies of vein, down hills of artery, over rivers of melancholy, came armies and armies, one army, two armies, swords flashed in the sun, bearing down upon one another, fifty thousand minds snatching, scrabbling, cutting at him, demanding, using. In a moment, the hard collision, one army on another, the rush, the blood, the sound, the fury, the death, the insanity!

Like cymbals, the armies struck!

He leaped up, raving. He ran across the desert. He ran and ran and did not stop running.

He sat down and cried. He sobbed until his lungs ached. He cried very hard and long. Tears ran down his cheeks and into his upraised, trembling fingers. "God, God, help me, oh, God, help me," he said.

All was normal again.

It was four o'clock in the afternoon. The rocks were baked by the sun. He managed, after a time, to cook himself a few hot biscuits, which he ate with strawberry jam. He wiped his stained fingers on his shirt, blindly, trying not to think.

At least I know what I'm up against, he thought. Oh, Lord, what a world. What an innocent-looking world, and what a monster it really is. It's good no one ever explored it before. Or *did* they? He shook his aching head. Pity them, who ever crashed here before, if any ever did. Warm sun, hard rocks, not a sign of hostility. A lovely world.

Until you shut your eyes and relaxed your mind.

And the night and the voices and the insanity and the death padded in on soft feet.

"I'm all right now, though," he said proudly. "Look at that." He displayed his hand. By a supreme effort of will, it was no longer shaking. "I'll show you who in hell's ruler here," he announced to the innocent sky. "*I* am." He tapped his chest.

To think that *thought* could live that long! A million years, perhaps, all these thoughts of death and disorder and conquest, lingering in the innocent but poisonous air of the planet, waiting for a real man to give

them a channel through which they might issue again in all their senseless virulence.

Now that he was feeling better, it was all silly. All I have to do, he thought, is stay awake six nights. They won't bother me that way. When I'm awake, I'm dominant. I'm stronger than those crazy monarchs and their silly tribes of sword flingers and shield bearers and horn blowers. I'll stay awake.

But *can* you? he wondered. Six whole nights? Awake?

There's coffee and medicine and books and cards.

But I'm tired *now,* so tired, he thought. Can I hold out?

Well, if not . . . There's always the gun.

Where will these silly monarchs be if you put a bullet through their stage? All the world's a stage? No. *You,* Leonard Sale, are the small stage. And they the players. And what if you put a bullet through the wings, tearing down scenes, destroying curtains, ruining lines! Destroy the stage, the players, all, if they aren't careful!

First of all he must radio through to Marsport again. If there was any way they could rush the rescue ship sooner, then maybe he could hang on. Anyway, he must warn them what sort of planet this was, this so innocent-seeming spot of nightmare and fever vision—

He tapped on the radio key for a minute. His mouth tightened. The radio was dead.

It had sent through the proper rescue message, received a reply, and then extinguished itself.

The proper touch of irony, he thought. There was only one thing to do. Draw a plan.

This he did. He got a yellow pencil and delineated his six-day plan of escape.

Tonight, he wrote, *read six more chapters of* War and Peace. *At four in the morning have hot black coffee. At four-fifteen take cards from pack and play ten games of solitaire. This should take until six-thirty when—more coffee. At seven o'clock, listen to early morning programs from Earth, if the receiving equipment on the radio works at all. Does it?*

He tried the radio receiver. It was dead.

Well, he wrote, *from seven o'clock until eight, sing all the songs you remember, make your own entertainment. From eight until nine think about Helen King. Remember Helen. On second thought, think about Helen right now.*

He marked that out with his pencil.

The rest of the days were set down in minute detail.

He checked the medical kit. There were several packets of tablets that would keep you awake. One tablet an hour every hour for six days. He felt quite confident.

"Here's mud in your evil eye, Iorr, Tylle!"

He swallowed one of the stay-awake tablets with a scalding mouthful of black coffee.

Well, with one thing and another, it was Tolstoi or Balzac, gin rummy, coffee, tablets, walking, more Tolstoi, more Balzac, more gin rummy, more solitaire. The first day passed, as did the second and the third.

On the fourth day he lay quietly in the shade of a rock, counting to a thousand by fives, then by tens, to keep his mind occupied and awake. His eyes were so tired he had to bathe them frequently in cool water. He couldn't read, he was bothered with splitting headaches. He was so exhausted he couldn't move. He was numb with medicine. He resembled a waxen dummy, stuffed with things to preserve him in a state of horrified wakefulness. His eyes were glass, his tongue a rusted pike, his fingers felt as if they were gloved in needles and fur.

He followed the hand of his watch. One second less to wait, he thought. Two seconds, three seconds, four, five, ten, thirty seconds. A whole minute. Now an hour less time to wait. Oh, ship, hurry on thy appointed round!

He began to laugh softly.

What would happen if he just gave up, drifted off to sleep? Sleep, ah, sleep; perchance to dream. All the world a stage . . . What if he gave up the unequal struggle, lapsed down?

Eeeeeeeee, the high, shrill warning sound of battle metal.

He shivered. His tongue moved in his dry, burry mouth.

Iorr and Tylle would battle out their ancient battle.

Leonard Sale would become quite insane.

And whichever won the battle would take this ruin of an insane man, the shaking, laughing, wild body, and wander it across the face of this world for ten, twenty years, occupying it, striding in it, pompous, holding court, making grand gestures, ordering heads severed, calling on inward unseen dancing girls. Leonard Sale, what remained of him, would be led off to some hidden cave, there to be infested

with wars and worms for twenty insane years, occupied and prostituted by old and outlandish thoughts.

When the rescue ship arrived it would find nothing. Sale would be hidden somewhere by a triumphant army in his head. Hidden in some cleft rock, placed there like a nest for Iorr to lie upon in evil occupation.

The thought of it almost broke him in half.

Twenty years of insanity. Twenty years of torture, doing what you don't want to do. Twenty years of wars raging and being split apart, twenty years of nausea and trembling.

His head sank down between his knees. His eyes snapped and cracked and made soft noises. His eardrum popped tiredly.

Sleep, sleep, sang soft sea voices.

"I'll—I'll make a proposition with you. Listen," thought Leonard Sale. "You, Iorr, you, too, Tylle! Iorr, you, you, too, Tylle! Iorr, you can occupy me on Mondays, Wednesdays, and Fridays. Tylle, you can take me over on Sundays, Tuesdays, and Saturdays. Thursday is maid's night out. Okay?"

Eeeeeeeee, sang the sea tides, seething in his brain.

Ohhhhhhhh, sang the distant voices softly, soft.

"What'll you say, is it a *bargain,* Iorr, Tylle?"

No, said a voice.

No, said another.

"Greedy, both of you, greedy!" complained Sale. "A pox on both your houses!"

He slept.

He *was* Iorr, jeweled rings on his hands. He arose beside his rocket and held out his fingers, commanding blind armies. He was Iorr, ancient ruler of jeweled warriors.

He *was* Tylle, lover of women, killer of dogs!

With some hidden bit of awareness, his hand crept to the holster at his hip. The sleeping hand withdrew the gun there. The hand lifted, the gun pointed.

The armies of Tylle and Iorr gave battle.

The gun exploded.

The bullet tore across Sale's forehead, wakening him.

He stayed awake for another six hours, getting over his latest siege. He knew it to be hopeless now. He washed and bandaged the wound

he had given himself. He wished he had aimed straighter and it was all over. He watched the sky. Two more days. Two more. Come on, ship, come on. He was heavy with sleeplessness.

No use. At the end of six hours he was raving badly. He took the gun up and put it down and took it up again, put it against his head, tightened his hand on the trigger, changed his mind, looked at the sky again.

Night settled. He tried to read, threw the book away. He tore it up and burned it, just to have something to do.

So tired. In another hour, he decided. If nothing happens, I'll kill myself. This is for certain now. I'll *do* it, this time.

He got the gun ready and laid it on the ground next to himself.

He was very calm now, though tired. It would be over and done. He would be dead.

He watched the minute hand of his watch. One minute, five minutes, twenty-five minutes.

The flame appeared on the sky.

It was so unbelievable he started to cry. "A rocket," he said, standing up. "A rocket!" he cried, rubbing his eyes. He ran forward.

The flame brightened, grew, came down.

He waved frantically, running forward, leaving his gun, his supplies, everything behind. "You *see* that, Iorr, Tylle! You savages, you monsters, I beat you! I *won!* They're coming to rescue me now! I've won, damn you."

He laughed harshly at the rocks and the sky and the backs of his hands.

The rocket landed. Leonard Sale stood swaying, waiting for the door to slide open.

"Good-by, Iorr, good-by, Tylle!" he shouted in triumph, grinning, eyes hot.

Eeeee, sang a diminishing roar in time.

Ahhhhh, voices faded.

The rocket flipped wide its airlock. Two men jumped out.

"Sale?" they called. "We're Ship ACDN13. Intercepted your SOS and decided to pick you up ourselves. The Marsport ship won't get through until day after tomorrow. We want a spot of rest ourselves. Thought it'd be good to spend the night here, pick you up, and go on."

"No," said Sale, face melting with terror. "No spend night—"

He couldn't talk. He fell to the ground.

"Quick," said a voice in the bleary vortex over him. "Give him a shot of food liquid, another of sedative. He needs sustenance and rest."

"No rest!" screamed Sale.

"Delirious," said one man softly.

"No sleep!" screamed Sale.

"There, there," said the man gently. A needle poked into Sale's arm.

Sale thrashed. "No sleep, go!" he mouthed horribly. "Oh, go!"

"Delirious," said one man. "Shock."

"No *sedative!*" screamed Sale.

The sedative flowed into him.

Eeeeeeee, sang the ancient winds.

Ahhhhhhhh, sang the ancient seas.

"No sedative, no sleep, please, don't, don't, *don't!*" screamed Sale, trying to get up. "You don't—understand!"

"Take it easy, old man, you're safe among us now, nothing to worry about," said the rescuer above him.

Leonard Sale slept. The two men stood over him.

As they watched, Sale's features changed violently. He groaned and cried and snarled in his sleep. His face was riven with emotion. It was the face of a saint, a sinner, a fiend, a monster, a darkness, a light, one, many, an army, a vacuum, all, all!

He writhed in his sleep.

Eeeeeeeee! The sound burst from his mouth. *Ahhhhhhhh*! he screamed.

"What's wrong with him?" asked one of the two rescuers.

"I don't know. More sedative?"

"More sedative. Nerves. He needs more sleep."

They stuck the needle in his arm. Sale writhed and spat and moaned.

Then, suddenly, he was dead.

He lay there, the two men over him. "What a shame," said one of them. "Can you figure that?"

"Shock. Poor guy. What a pity." They covered his face. "Did you ever see a face like that?"

"Totally insane."

"Loneliness. Shock."

"Yes. Lord, what an expression. I hope never to see a face like *that* again."

"What a shame, waiting for us, and we arrive, and he dies anyway."

They glanced around. "What shall we do? Shall we spend the night?"

"Yes. It's good to be out of the ship."

"We'll bury him first, of course."

"Naturally."

"And spend the night in the open, with good air, right? Good to be in the open again. After two weeks in that damned ship."

"Right. I'll find a spot for him. You start supper, eh?"

"Done."

"Should be good sleeping tonight."

"Fine, fine."

They made a grave and said a word over it. They drank their evening coffee silently. They smelled the sweet air of the planet and looked at the lovely sky and the bright and beautiful stars.

"What a night," they said, lying down.

"Pleasant dreams," said one, rolling over.

And the other replied, "Pleasant dreams."

They slept.

Isaac Asimov

NOT FINAL!

Jupiter—five times as far from the Sun as Earth—ten times Earth's diameter (over 86,000 miles)—largest of all the solar planets. Unwise to land on it; its gravity, plus the enormous depth and weight of its atmosphere, would make it practically impossible for a spaceship powered by methods now known or imagined by science on Earth to escape from it. Once down, there for good.

Consequently, man will first explore Jupiter's moons (she has eleven), and Ganymede, which is a little larger than our own Moon, will probably be one of the first to be approached. Like our own Moon, it may turn out to be airless and uninhabited; but as to Jupiter itself, no one dare venture so positive a statement. You will get some uncomfortably eerie ideas about the Jovians from this story, though—and the trouble is, none of us ever will know for sure whether such beings exist and what they are like until they discover us!

NICHOLAS ORLOFF inserted a monocle in his left eye with all the incorruptible Briticism of a Russian educated at Oxford, and said reproachfully, "But, my dear Mr. Secretary! Half a billion dollars!"

Leo Birnam shrugged his shoulders wearily and allowed his lank body to cramp up still farther in the chair. "The appropriation must go through, Commissioner. The Dominion government here at Ganymede is becoming desperate. So far I've been holding them off, but as secretary of scientific affairs, my powers are small."

"I know, but—" and Orloff spread his hands helplessly.

"I suppose so," agreed Birnam. "The Empire government finds it easier to look the other way. They've done it consistently up to now. I've tried for a year now to have them understand the nature of the danger that hangs over the entire System, but it seems that it can't be done. But I'm appealing to you, Mr. Commissioner. You're new in your post and can approach this Jovian affair with an unjaundiced eye."

Orloff coughed and eyed the tips of his boots. In the three months since he had succeeded Gridley as colonial commissioner he had ta-

bled unread everything relating to "those damned Jovian D.T.'s." That had been according to the established cabinet policy which had labeled the Jovian affair as "deadwood" long before he had entered office.

But now that Ganymede was becoming nasty, he found himself sent out to Jovopolis with instructions to hold the "blasted provincials" down. It was a nasty spot.

Birnam was speaking. "The Dominion government has reached the point where it needs the money so badly, in fact, that if they don't get it, they're going to publicize everything."

Orloff's phlegm broke completely, and he snatched at the monocle as it dropped. "My dear fellow!"

"I know what it would mean. I've advised against it, but they're justified. Once the inside of the Jovian affair is out, once the people know about it, the Empire government won't stay in power a week. And when the Technocrats come in, they'll give us whatever we ask. Public opinion will see to that."

"But you'll also create a panic and hysteria—"

"Surely! That is why we hesitate. But you might call this an ultimatum. We want secrecy, we *need* secrecy; but we need money more."

"I see." Orloff was thinking rapidly, and the conclusions he came to were not pleasant. "In that case, it would be advisable to investigate the case further. If you have the papers concerning the communications with the planet Jupiter—"

"I have them," replied Birnam dryly, "and so has the Empire government at Washington. That won't do, Commissioner. It's the same cud that's been chewed by Earth officials for the last year, and it's gotten us nowhere. I want you to come to Ether Station with me."

The Ganymedan had risen from his chair, and he glowered down upon Orloff from his six and a half feet of height.

Orloff flushed. "Are you ordering me?"

"In a way, yes. I tell you there is no time. If you intend acting, you must act quickly or not at all." Birnam paused, then added, "You don't mind walking, I hope. Power vehicles aren't allowed to approach Ether Station ordinarily, and I can use the walk to explain a few of the facts. It's only two miles off."

"I'll walk," was the brusque reply.

The trip upward to subground level was made in silence, which was broken by Orloff when they stepped into the dimly lit anteroom.

"It's chilly here."

"I know. It's difficult to keep the temperature up to norm this near the surface. But it will be colder outside. Here!"

Birnam had kicked open a closet door and was indicating the garments suspended from the ceiling. "Put them on. You'll need them."

Orloff fingered them doubtfully. "Are they heavy enough?"

Birnam was pouring into his own costume as he spoke. "They're electrically heated. You'll find them plenty warm. That's it! Tuck the trouser legs inside the boots and lace them tight."

He turned then and, with a grunt, brought out a double compressed-gas cylinder from its rack in one corner of the closet. He glanced at the dial reading and then turned the stopcock. There was a thin wheeze of escaping gas, at which Birnam sniffed with satisfaction.

"Do you know how to work one of these?" he asked, as he screwed onto the jet a flexible tube of metal mesh, at the other end of which was a curiously curved object of thick, clear glass.

"What is it?"

"Oxygen nosepiece! What there is of Ganymede's atmosphere is argon and nitrogen, just about half and half. It isn't particularly breathable." He heaved the double cylinder into position and tightened it in its harness on Orloff's back.

Orloff staggered, "It's heavy. I can't walk two miles with this."

"It won't be heavy out there." Birnam nodded carelessly upward and lowered the glass nosepiece over Orloff's head. "Just remember to breathe in through the nose and out through the mouth, and you won't have any trouble. By the way, did you eat recently?"

"I lunched before I came to your place."

Birnam sniffed dubiously. "Well, that's a little awkward." He drew a small metal container from one of his pockets and tossed it to the commissioner. "Put one of those pills in your mouth and keep sucking on it."

Orloff worked clumsily with gloved fingers and finally managed to get a brown spheroid out of the tin and into his mouth. He followed Birnam up a gently sloped ramp. The blind-alley ending of the corridor slid aside smoothly when they reached it, and there was a faint soughing as air slipped out into the thinner atmosphere of Ganymede.

Birnam caught the other's elbow and fairly dragged him out.

"I've turned your air tank on full," he shouted. "Breathe deeply and keep sucking at that pill."

Gravity had flicked to Ganymedan normality as they crossed the threshold, and Orloff, after one horrible moment of apparent levitation, felt his stomach turn a somersault and explode.

He gagged, and fumbled the pill with his tongue in a desperate attempt at self-control. The oxygen-rich mixture from the air cylinders burned his throat, and gradually Ganymede steadied. His stomach shuddered back into place. He tried walking.

"Take it easy, now," came Birnam's soothing voice. "It gets you that way the first few times you change gravity fields quickly. Walk slowly and get the rhythm, or you'll take a tumble. That's right, you're getting it."

The ground seemed resilient. Orloff could feel the pressure of the other's arm holding him down at each step to keep him from springing too high. Steps were longer now—and flatter, as he got the rhythm. Birnam continued speaking, a voice a little muffled from behind the leather flap drawn loosely across mouth and chin.

"Each to his own world," he grinned. "I visited Earth a few years back, with my wife, and had a hell of a time. I couldn't get myself to learn to walk on a planet's surface without a nosepiece. I kept choking —I really did. The sunlight was too bright and the sky was too blue and the grass was too green. And the buildings were right out on the surface. I'll never forget the time they tried to get me to sleep in a room twenty stories up in the air, with the window wide open and the moon shining in.

"I went back on the first spaceship going my way and don't ever intend returning. How are you feeling now?"

"Fine! Splendid!" Now that the first discomfort had gone, Orloff found the low gravity exhilarating. He looked about him. The broken, hilly ground, bathed in a drenching yellow light, was covered with ground-hugging broad-leaved shrubs that showed the orderly arrangement of careful cultivation.

Birnam answered the unspoken question. "There's enough carbon dioxide in the air to keep the plants alive, and they all have the power to fix atmospheric nitrogen. That's what makes agriculture Ganymede's greatest industry. Those plants are worth their weight in gold as fertilizers back on Earth and worth double or triple that as sources for half a hundred alkaloids that can't be gotten anywhere else in the System. And, of course, everyone knows that Ganymedan green-leaf has Terrestrial tobacco beat hollow."

There was the drone of a strato-rocket overhead, shrill in the thin atmosphere, and Orloff looked up.

He stopped—stopped dead—and forgot to breathe!

It was his first glimpse of Jupiter in the sky.

It is one thing to see Jupiter, coldly harsh, against the ebon backdrop of space. At six hundred thousand miles, it is majestic enough. But on Ganymede, barely topping the hills, its outlines softened and ever so faintly hazed by the thin atmosphere, shining mellowly from a purple sky in which only a few fugitive stars dare compete with the Jovian giant—it can be described by no conceivable combination of words.

At first, Orloff absorbed the gibbous disk in silence. It was gigantic, thirty-two times the apparent diameter of the Sun as seen from Earth. Its stripes stood out in faint washes of color against the yellowness beneath, and the Great Red Spot was an oval splotch of orange near the western rim.

And finally Orloff murmured weakly, "It's beautiful!"

Leo Birnam stared, too, but there was no awe in his eyes. There was the mechanical weariness of viewing a sight often seen, and besides that, an expression of sick revulsion. The chin flap hid his twitching smile, but his grasp upon Orloff's arm left bruises through the tough fabric of the surface suit.

He said slowly, "It's the most horrible sight in the System."

Orloff turned reluctant attention to his companion. "Eh?" Then, disagreeably, "Oh, yes, those mysterious Jovians."

At that, the Ganymedan turned away angrily and broke into swinging, fifteen-foot strides. Orloff followed clumsily after, keeping his balance with difficulty.

"Here, now," he gasped.

But Birnam wasn't listening. He was speaking coldly, bitterly. "You on Earth can afford to ignore Jupiter. You know nothing of it. It's a little pinprick in your sky, a little flyspeck. You don't live here on Ganymede, watching that damned colossus gloating over you. Up and over fifteen hours—hiding God knows what on its surface. Hiding something that's waiting and waiting and *trying to get out.* Like a giant bomb just waiting to explode!"

"Nonsense!" Orloff managed to jerk out. "*Will* you slow down. I can't keep up."

Birnam cut his strides in half and said tensely, "Everyone knows that Jupiter is inhabited, but practically no one ever stops to realize what that means. I tell you that those Jovians, whatever they are, are born to the purple. *They are the natural rulers of the Solar System.*"

"Pure hysteria," muttered Orloff. "The Empire government has been hearing nothing else from your Dominion for a year."

"And you've shrugged it off. Well, listen! Jupiter, discounting the thickness of its colossal atmosphere, is eighty thousand miles in diameter. That means it possesses a surface one hundred times that of Earth, and more than fifty times that of the entire Terrestrial Empire. Its population, its resources, its war potential are in proportion."

"Mere numbers—"

"I know what you mean," Birnam drove on passionately. "Wars are not fought with numbers but with science and with organization. The Jovians have both. In the quarter of a century during which we have communicated with them, we've learned a bit. They have atomic power and they have radio. And in a world of ammonia under great pressure —a world, in other words, in which almost none of the metals can exist *as* metals for any length of time because of the tendency to form soluble ammonia complexes—they have managed to build up a complicated civilization. That means they have had to work through plastics, glasses, silicates, and synthetic building materials of one sort or another. *That* means a chemistry developed just as far as ours is, and I'd put odds on its having developed further."

Orloff waited long before answering. And then, "But how certain are you people about the Jovians' last message? We on Earth are inclined to doubt that the Jovians can possibly be as unreasonably belligerent as they have been described."

The Ganymedan laughed shortly. "They broke off all communication after that last message, didn't they? That doesn't sound friendly on their part, does it? I assure you that we've all but stood on our ears trying to contact them.

"Here, now, don't talk. Let me explain something to you. For twenty-five years here on Ganymede a little group of men have worked their hearts out trying to make sense out of a static-ridden, gravity-distorted set of variable clicks in our radio apparatus, for those clicks were our only connection with living intelligence upon Jupiter. It was a job for a world of scientists, but we never had more than two dozen at the Station at any one time. I was one of them from the very be-

ginning and, as a philologist, did my part in helping construct and interpret the code that developed between ourselves and the Jovians, so that you can see I am speaking from the real inside.

"It was a devil of a heartbreaking job. It was five years before we got past the elementary clicks of arithmetic: three and four are seven; the square root of twenty-five is five; factorial six is seven hundred and twenty. After that, months sometimes passed before we could work out and check by further communication a single new fragment of thought.

"*But*—and this is the point—by the time the Jovians broke off relations, we understood them *thoroughly*. There was no more chance of a mistake in comprehension than there was of Ganymede's suddenly cutting loose from Jupiter. And their last message was a threat and a promise of destruction. Oh, there's no doubt—there's no doubt!"

They were walking through a shallow pass in which the yellow Jupiter light gave way to a clammy darkness.

Orloff was disturbed. He had never had the case presented to him in this fashion before. He said, "But the reason, man. What reason did we give them—"

"No reason! It was simply this: the Jovians had finally discovered from our messages—just where and how I don't know—that *we* were *not* Jovians."

"Well, of course."

"It wasn't 'of course' to them. In their experiences they had never come across intelligences that were not Jovian. Why should they make an exception in favor of those from outer space?"

"You say they were scientists." Orloff's voice had assumed a wary frigidity. "Wouldn't they realize that alien environments would breed alien life? *We* knew it. We never thought the Jovians were Earthmen, though we had never met intelligences other than those of Earth."

They were back in the drenching wash of Jupiter light again, and a spreading region of ice glimmered amberly in a depression to the right.

Birnam answered, "I said they were chemists and physicists—but I never said they were astronomers. Jupiter, my dear Commissioner, has an atmosphere three thousand miles or more thick, and those miles of gas block off everything but the Sun and the four largest of Jupiter's moons. The Jovians know nothing of alien environments."

Orloff considered. "And so they decided we were aliens. What next?"

"If we weren't Jovians, then, in their eyes, we weren't people. It turned out that a non-Jovian was 'vermin' by definition."

Orloff's automatic protest was cut off sharply by Birnam. "In their eyes, I said, vermin we were; and vermin we are. Moreover, we were vermin with the peculiar audacity of having dared to attempt to treat with Jovians—with *human beings*. Their last message was this, word for word—'Jovians are the masters. There is no room for vermin. We will destroy you immediately.' I doubt if there was any animosity in that message—simply a cold statement of fact. But they meant it."

"But why?"

"Why did man exterminate the housefly?"

"Come sir. You're not seriously presenting an analogy of that nature."

"Why not, since it is certain that the Jovian considers us a sort of housefly—an insufferable type of housefly that dares aspire to intelligence."

Orloff made a last attempt. "But truly, Mr. Secretary, it seems impossible for intelligent life to adopt such an attitude."

"Do you possess much of an acquaintance with any other type of intelligent life than our own?" came with immediate sarcasm. "Do you feel competent to pass on Jovian psychology? Do you know just *how* alien Jovians must be physically? Just think of their world, with its gravity at two and one-half Earth normal; with its ammonia oceans—oceans that you might throw all Earth into without raising a respectable splash; with its three-thousand-mile atmosphere, dragged down by the colossal gravity into densities and pressures in its surface layers that make the sea bottoms of Earth resemble a medium-thick vacuum. I tell you, we've tried to figure out what sort of life could exist under those conditions and we've given up. It's thoroughly incomprehensible. Do you expect their mentality, then, to be any more understandable? Never! Accept it as it is. They intend destroying us. That's all we know and all we need to know."

He lifted a gloved hand as he finished, and one finger pointed. "There's Ether Station just ahead."

Orloff's head swiveled. "Underground?"

"Certainly! All except the Observatory. That's that steel-and-quartz dome to the right—the small one."

They had stopped before two large boulders that flanked an earthy embankment, and from behind either one a nosepieced, suited soldier in Ganymedan orange, with blasters ready, advanced upon the two.

Birnam lifted his face into Jupiter's light, and the soldiers saluted and stepped aside. A short word was barked into the wrist mike of one of them, and the camouflaged opening between the boulders fell into two and Orloff followed the secretary into the yawning airlock.

The Earthman caught one last glimpse of sprawling Jupiter before the closing door cut off the surface altogether.

It was no longer quite so beautiful.

Orloff did not feel quite normal again until he had seated himself in the overstuffed chair in Dr. Edward Prosser's private office. With a sigh of utter relaxation he propped his monocle under his eyebrow.

"Would Dr. Prosser mind if I smoked in here while we're waiting?" he asked.

"Go ahead," replied Birnam carelessly. "My own idea would be to drag Prosser away from whatever he's fooling with just now, but he's a queer chap. We'll get more out of him if we wait until he's ready for us." He withdrew a gnarled stick of greenish tobacco from its case and bit off the edge viciously.

Orloff smiled through the smoke of his own cigarette. "I don't mind waiting. I still have something to say. You see, for the moment, Mr. Secretary, you gave me the jitters, but, after all, granted that the Jovians intend mischief once they get at us, it remains a fact," and here he spaced his words emphatically, "that they can't get at us."

"A bomb without a fuse, hey?"

"Exactly! It's simplicity itself, and not really worth discussing. You will admit, I suppose, that under no circumstances can the Jovians get away from Jupiter."

"Under *no* circumstances?" There was a quizzical tinge to Birnam's slow reply. "Shall we analyze that?"

He stared hard at the purple flame of his cigar. "It's an old trite saying that the Jovians can't leave Jupiter. The fact has been highly publicized by the sensation mongers of Earth and Ganymede, and a great deal of sentiment has been driveled about the unfortunate intelligences who are irrevocably surface-bound and must forever stare into the Universe without, watching, watching, wondering, and never attaining.

"But, after all, what holds the Jovians to their planet? Two factors!

That's all! The first is the immense gravity field of the planet. Two and a half Earth normal."

Orloff nodded. "Pretty bad!" he agreed.

"And Jupiter's gravitational potential is even worse, for, because of its greater diameter, the intensity of its gravitational field decreases with distance only one-tenth as rapidly as Earth's field does. It's a terrible problem—*but it's been solved.*"

"Hey?" Orloff straightened.

"They've got atomic power. Gravity—even Jupiter's—means nothing once you've put unstable atomic nuclei to work for you."

Orloff crushed his cigarette to extinction with a nervous gesture. "But their atmosphere—"

"Yes, that's what's stopping them. They're living at the bottom of a three-thousand-mile-deep ocean of it, where the hydrogen of which it is composed is collapsed by sheer pressure to something approaching the density of *solid* hydrogen. It stays a gas because the temperature of Jupiter is above the critical point of hydrogen, but you just try to figure out the pressure that can make hydrogen *gas* half as heavy as water. You'll be surprised at the number of zeros you'll have to put down.

"No spaceship of metal or of any kind of matter can stand that pressure. No Terrestrial spaceship can land on Jupiter without smashing like an eggshell, and no Jovian spaceship can leave Jupiter without exploding like a soap bubble. That problem has not yet been solved, but it will be some day. Maybe tomorrow, maybe not for a hundred years, or a thousand. We don't know, but when it is solved, the Jovians will be on top of us. And it can be solved in a specific way."

"I don't see how—"

"Force fields! We've got them now, you know."

"Force fields!" Orloff seemed genuinely astonished, and he chewed the word over and over to himself for a few moments. "They're used as meteor shields for ships in the asteroid zone—but I don't see the application to the Jovian problem."

"The ordinary force field," explained Birnam, "is a feeble rarefied zone of energy extending over a hundred miles or more outside the ship. It'll stop meteors, but it's just so much empty ether to an object like a gas molecule. *But* what if you took that same zone of energy and compressed it to a thickness of a tenth of an inch. Molecules would bounce off it like this—*ping-g-g-g*! And if you used stronger generators, and compressed the field to a hundredth of an inch, molecules would

bounce off even when driven by the unthinkable pressure of Jupiter's atmosphere—and then if you build a ship inside—" He left the sentence dangling.

Orloff was pale. "You're not saying it can be done?"

"I'll bet you anything you like that the Jovians are *trying* to do it. And *we're* trying to do it right here at Ether Station."

The colonial commissioner jerked his chair closer to Birnam and grabbed the Ganymedan's wrist. "Why can't we bombard Jupiter with atomic bombs? Give it a thorough going over, I mean! With her gravity and her surface area, we can't miss."

Birnam smiled faintly. "We've thought of that. But atomite bombs would merely tear holes in the atmosphere. And even if you could penetrate, just divide the surface of Jupiter by the area of damage of a single bomb and find how many years we must bombard Jupiter at the rate of a bomb a minute before we begin to do significant damage. Jupiter's *big!* Don't ever forget that!"

His cigar had gone out, but he did not pause to relight. He continued in a low, tense voice. "No, we can't attack the Jovians as long as they're on Jupiter. We must wait for them to come out—and once they do, they're going to have the edge on us in numbers. A terrific, heartbreaking edge—so we'll just have to have the edge on them in science."

"But," Orloff broke in, and there was a note of fascinated horror in his voice, "how can we tell in advance what they'll have?"

"We can't. We've got to scrape up everything we can lay our hands on and hope for the best. But there's one thing we *do* know they'll have, and that's force fields. They can't get out without them. And if they have them, we must, too, and that's the problem we're trying to solve here. They will not insure us victory, but without them we will suffer certain defeat. And now you know why we need money—and more than that. We want Earth itself to get to work. It's got to start a drive for scientific armaments and subordinate everything to that. You see?"

Orloff was on his feet. "Birnam, I'm with you—a hundred per cent with you. You can count on me back in Washington."

There was no mistaking his sincerity. Birnam gripped the hand outstretched toward him and wrung it—and at the moment the door flew open and a little pixie of a man hurtled in.

The newcomer spoke in rapid jerks, and exclusively to Birnam. "Where'd you come from? Been trying to get in touch with you. Secre-

tary said you weren't in. Then five minutes later you show up on your own. Can't understand it." He busied himself furiously at his desk.

Birnam grinned. "If you'll take time out, doc, you might say hello to Colonial Commissioner Orloff."

Dr. Edward Prosser turned on his toe like a ballet dancer and looked the Earthman up and down twice. "The new un, hey? We getting any money? We ought to. Been working on a shoestring ever since. At that we might not be needing any. It depends." He was back at the desk.

Orloff seemed a trifle disconcerted, but Birnam winked impressively, and he contented himself with a glassy stare through the monocle.

Prosser pounced upon a black leather booklet in the recesses of a pigeonhole, threw himself into his swivel chair, and wheeled about.

"Glad you came, Birnam," he said, leafing through the booklet. "Got something to show you. Commissioner Orloff, too."

"What were you keeping us waiting for?" demanded Birnam. "Where were you?"

"Busy! Busy as a pig! No sleep for three nights." He looked up and his small puckered face fairly flushed with delight. "Everything fell into place of a sudden. Like a jigsaw puzzle. Never saw anything like it. Kept us hopping, I tell you."

"You've gotten the dense force fields you're after?" asked Orloff in sudden excitement.

Prosser seemed annoyed. "No, not that. Something else. Come on." He glared at his watch and jumped out of his seat. "We've got half an hour. Let's go."

An electric-motored flivver waited outside, and Prosser spoke excitedly as he sped the purring vehicle down the ramps into the depths of the Station.

"Theory!" he said. "Theory! Damned important, that. You set a technician on a problem. He'll fool around. Waste lifetimes. Get nowhere. Just putter about at random. A true scientist works with theory. Lets math solve his problems." He overflowed with self-satisfaction.

The flivver stopped on a dime before a huge double door, and Prosser tumbled out, followed by the other two at a more leisurely pace.

"Through here! Through here!" he said. He shoved the door open and led them down the corridor and up a narrow flight of stairs onto a wall-hugging passageway that circled a huge three-level room. Orloff

recognized the gleaming quartz-and-steel pipe-sprouting ellipsoid two levels below as an atomic generator.

He adjusted his monocle and watched the scurrying activity below. An earphoned man on a high stool before a control board studded with dials looked up and waved. Prosser waved back and grinned.

Orloff said, "You create your force fields here?"

"That's right! Ever see one?"

"No." The commissioner smiled ruefully. "I don't even know what one *is*, except that it can be used as a meteor shield."

Prosser said, "It's very simple. Elementary matter. All matter is composed of atoms. Atoms are held together by interatomic forces. Take away atoms. Leave interatomic forces behind. *That's* a force field."

Orloff looked blank, and Birnam chuckled deep in his throat and scratched the back of his ear.

"That explanation reminds me of our Ganymedan method of suspending an egg a mile high in the air. It goes like this. You find a mountain just a mile high and put the egg on top. Then, keeping the egg where it is, you take the mountain away. That's all."

The colonial commissioner threw his head back to laugh, and the irascible Dr. Prosser puckered his lips into a pursed symbol of disapproval.

"Come, come. No joke, you know. Force fields most important. Got to be ready for the Jovians when they come."

A sudden rasping burr from below sent Prosser back from the railing.

"Get behind screen here," he babbled. "The twenty-millimeter field is going up. Bad radiation."

The burr muted almost into silence, and the three walked out onto the passageway again. There was no apparent change, but Prosser shoved his hand out over the railing and said, "Feel!"

Orloff extended a cautious finger, gasped, and slapped out with the palm of his hand. It was like pushing against very soft sponge rubber or superresilient steel springs.

Birnam tried, too. "That's better than anything we've done yet, isn't it?" He explained to Orloff, "A twenty-millimeter screen is one that can hold an atmosphere of a pressure of twenty millimeters of mercury against a vacuum without appreciable leakage."

The commissioner nodded. "I see! You'd need a seven-hundred-sixty-millimeter screen to hold Earth's atmosphere, then."

"Yes! That would be a unit atmosphere screen. Well, Prosser, is this what got you excited?"

"This twenty-millimeter screen. Of course not. I can go up to two hundred fifty millimeters using the activated vanadium pentasulphide in the praseodymium breakdown. But it's not necessary. Technician would do it and blow up the place. Scientist checks on theory and goes slow." He winked. "We're hardening the field now. Watch!"

"Shall we get behind the screen?"

"Not necessary now. Radiation bad only at beginning."

The burring waxed again, but not as loudly as before. Prosser shouted to the man at the control board, and a spreading wave of the hand was the only reply.

Then the control man waved a clenched fist and Prosser cried, "We've passed fifty millimeters! Feel the field!"

Orloff extended his hand and poked it curiously. The sponge rubber had hardened! He tried to pinch it between finger and thumb, so perfect was the illusion, but here the "rubber" faded to unresisting air.

Prosser *tch-tched* impatiently. "No resistance at right angles to force. Elementary mechanics that is."

The control man was gesturing again. "Past seventy," explained Prosser. "We're slowing down now. Critical point is 83.42."

He hung over the railing and kicked out with his feet at the other two. "Stay away! Dangerous!"

And then he yelled, "Careful! The generator's bucking!"

The burr had risen to a hoarse maximum and the control man worked frantically at his switches. From within the quartz heart of the central atomic generator the sullen red glow of the bursting atoms had brightened dangerously.

There was a break in the burr, a reverberant roar, and a blast of air that threw Orloff hard against the wall.

Prosser dashed up. There was a cut over his eye. "Hurt? No? Good, good! I was expecting something of the sort. Should have warned you. Let's go down. Where's Birnam?"

The tall Ganymedan picked himself up off the floor and brushed at his clothes. "Here I am. What blew up?"

"Nothing blew up. Something buckled. Come on, down we go." He dabbed at his forehead with a handkerchief and led the way downward.

The control man removed his earphones as he approached, and got

off his stool. He looked tired, and his dirt-smeared face was greasy with perspiration.

"The damn thing started going at 82.8, boss. It almost caught me."

"It did, did it?" growled Prosser. "Within limits of error, isn't it? How's the generator? Hey, Stoddard!"

The technician addressed replied from his station at the generator, "Tube Five died. It'll take two days to replace."

Prosser turned in satisfaction and said, "It worked. Went exactly as presumed. Problem solved, gentlemen. Trouble over. Let's get back to my office. I want to eat. And then I want to sleep."

He did not refer to the subject again until once more behind the desk in his office, and then he spoke between huge bites of a liver-and-onion sandwich.

He addressed Birnam. "Remember the work on space strain last June? It flopped, but we kept at it. Finch got a lead last week and I developed it. Everything fell into place. Slick as goose grease. Never saw anything like it."

"Go ahead," said Birnam calmly. He knew Prosser sufficiently well to avoid showing impatience.

"You saw what happened. When a field tops 83.42 millimeters, it becomes unstable. Space won't stand the strain. It buckles and the field blows. *Boom!*"

Birnam's mouth dropped open, and the arms of Orloff's chair creaked under sudden pressure. Silence for a while, and then Birnam said unsteadily, "You mean force fields stronger than that are impossible."

"They're possible. You can create them. But the denser they are, the more unstable they are. If I had turned on the two-hundred-and-fifty-millimeter field, it would have lasted one-tenth of a second. Then, blooie! Would have blown up the Station! *And* myself! Technician would have done it. Scientist is warned by theory. Works carefully, the way I did. No harm done."

Orloff tucked his monocle into his vest pocket and said tremulously, "But if a force field is the same thing as interatomic forces, why is it that steel has such a strong interatomic binding force without bucking space? There's a flaw there."

Prosser eyed him in annoyance. "No flaw. Critical strength depends on number of generators. In steel, each atom is a force-field generator.

That means about three hundred billion trillion generators for every ounce of matter. If we could use that many— As it is, one hundred generators would be the practical limit. That only raises the critical point to ninety-seven or thereabouts."

He got to his feet and continued with sudden fervor, "No. Problem's over, I tell you. Absolutely impossible to create a force field capable of holding Earth's atmosphere for more than a hundredth of a second. Jovian atmosphere entirely out of question. Cold figures say that; backed by experiment. *Space won't stand it!*

"Let the Jovians do their damnedest. They can't get out! That's final! That's final! *That's final!*"

Orloff said, "Mr. Secretary, can I send a spacegram anywhere in the Station? I want to tell Earth that I'm returning by the next ship and that the Jovian problem is liquidated—entirely and for good."

Birnam said nothing, but the relief on his face as he shook hands with the colonial commissioner transfigured its gaunt homeliness unbelievably.

And Dr. Prosser repeated, with a birdlike jerk of his head, "That's *final!*"

Hal Tuttle looked up as Captain Everett, of the spaceship *Transparent,* newest ship of the Comet Space Lines, entered his private observation room in the nose of the ship.

The captain said, "A spacegram has just reached me from the home offices at Tucson. We're to pick up Colonial Commissioner Orloff at Jovopolis, Ganymede, and take him back to Earth."

"Good. We haven't sighted any ships?"

"No, no! We're way off the regular space lanes. The first the System will know of us will be the landing of the *Transparent* on Ganymede. It will be the greatest thing in space travel since the first trip to the Moon." His voice softened suddenly. "What's wrong, Hal? This is *your* triumph, after all."

Hal Tuttle looked up and out into the blackness of space. "I suppose it is. Ten years of work, Sam. I lost an arm and an eye in that first explosion, but I don't regret them. It's the reaction that's got me. The problem is solved; my lifework is finished."

"So is every steel-hulled ship in the System."

Tuttle smiled. "Yes. It's hard to realize, isn't it?" He gestured outward. "You see the stars? Part of the time there's nothing between

them and us. It gives us a queasy feeling." His voice brooded, "Nine years I worked for nothing. I wasn't a theoretician, and never really knew where I was headed—just tried everything. I tried a little too hard, and space wouldn't stand it. I paid an arm and an eye and started fresh."

Captain Everett balled his fist and pounded the hull—the hull through which the stars shone unobstructed. There was the muffled thud of flesh striking an unyielding surface—but no response whatever from the invisible wall.

Tuttle nodded. "It's solid enough, now—though it flicks on and off eight hundred thousand times a second. I got the idea from the stroboscopic lamp. You know them—they flash on and off so rapidly that it gives all the impression of steady illumination.

"And so it is with the hull. It's not on long enough to buckle space. It's not off long enough to allow appreciable leakage of the atmosphere. And the net effect is a strength better than steel."

He paused and added slowly, "And there's no telling how far we can go. Speed up the intermission effect. Have the field flick off and on millions of times per second—billions of times. You can get fields strong enough to hold an atomic explosion. My lifework!"

Captain Everett pounded the other's shoulder. "Snap out of it, man. Think of the landing on Ganymede. The devil! It will be great publicity. Think of Orloff's face, for instance, when he finds he is to be the first passenger in history ever to travel in a spaceship with a force-field hull. How do you suppose he'll feel?"

Hal Tuttle shrugged. "I imagine he'll be rather pleased."

Frank Belknap Long

CONES

Mercury is the planet nearest to the Sun, and consequently the most dangerous of all to approach. Whether it will be explored about the same time that Jupiter is will probably depend upon the speed with which terrestrial science is able to develop heat-resisting spaceships; for that near to the Sun the radiations will be nearly unbearable.

On the Sunward planet we meet our first pure-energy life form, a kind of being which will in all likelihood remain forever alien to Earth's people. Such a life is the only type that could exist where extremes of heat and cold are so enormous and where electrical phenomena must be so incredibly powerful. Since it is the only type that could exist—perhaps it does! In any event, there is no question that its portrait, given here, is uncomfortably vivid—and not illogical.

THEY had never seen such skies. Glory beyond bright glory, wonder beyond wonder, in the black celestial vault above them. Earth the brightest of all the bright stars; Venus a small, watery green moon suspended in the bottomless depths of the sky; Mars a tiny reddish dot. And all the stars of the Galaxy shining in the brilliant whorls and angles of half-familiar constellations.

It was night on Mercury—cold night in a narrow world of infrequent night and day. Across a thin strip on the surface of the Sun's nearest neighbor there occurred at forty four-day intervals the familiar alternations of sunlight and darkness which Gibbs Crayley and the other members of the First Mercury Exploring Expedition knew and loved on their home planet. The liberations of the little celestial body, which rotated only once on its axis in its eighty eight-day journey about the Sun, splashed alternate bands of sunlight and dark over a relatively restricted strip of its metallic crust.

Where the face of Mercury was forever turned away from the Sun, the temperature was within a few degrees of absolute zero; there oxygen was a fine white snow. On the bright side, continuously under the Sun's rays, heat blighted and blasted the surface, and no alien shape of protoplasm could live there for long, no matter how well protected

by the sciences of man. But on the strip where light and dark alternated, the conditions of climate and temperature were less extreme, and protected human life could exist there, if only for brief periods. Encased in a flexible metallic spacesuit surmounted by a rigid helmet, with fifty-pound weights attached to thighs, and oxygen tanks strapped to shoulders, a man could survive—and explore.

Gibbs Crayley, scientist-explorer, was leading the first expedition from Earth ever to land on the surface of Mercury. It was an invasion in force, spearheaded by the indomitable will and daring of the one man whose whole life had been directed toward this moment. Crayley was a representative of the small, select tribe of pure scientist-explorers, fanatics whose driving motivations were tempered only by the cautions of science. And now he led the way as he and his small band cautiously ventured out on the surface of the unknown planet.

Beside him was his wife, Helen. To her, the disciplines, exactions, and rewards of scientific exploration were a steadily sustaining flame; she made a magnificent complement to her husband's cold daring, his almost personal obsession with the mysteries of the Sunward planet.

William Seaton, trailing the Crayleys by a few feet, was impatient of natural wonders, preferring the cool precision of man-made instruments, a pattern of beauty an engineer could understand. Immediately behind him came Frederick Parkerson, a middle-aged biologist, and Ralph Wilkus, a tall, gangling youth who excelled in the arts of astrogation and cookery. These two, close friends as they had become, were alike absorbed by the fascinations and complexities of exploration in its more immediate aspects; they lived for what the next moment might bring that was new and strange.

Behind them trailed Tom Grayson, a metallurgist, and young Allan Wilson, an associate member of the National Biological Institute, essentially unimaginative men whose minds were occupied largely with the problems of movement and personal safety on this incredible planet. They completed the roster of the crew.

The explorers were setting out on their longest expedition since they had landed on Mercury. It was their hope to make it to the foothills of the high, craggy peaks which reared their angular shapes above the curiously near horizon. Behind them the immense, melon-shaped hull of their cobalt-glass spaceship loomed, flecked with Venus light. It was hardly more than half a mile away, yet its stern was already hidden by the abrupt curvature of the planet's surface.

Crayley led the way with slowly deliberate caution. With only his flash lamp to guide him, he walked slowly forward, step by step, testing every foot of the ground ahead of him with his electrodynamometer-tipped staff. The very surface on which the group trod was a treacherous mystery; in particular, they knew it to be spotted irregularly with shock patches of enormously high electrical potential. A step into one of them would crumple a man in his spacesuit and sear his body to a crisp.

These shock patches had been discovered several days before ("day" being defined in terms of an Earthian twenty-four hours, not in Mercury's own terms) when the Crayleys' dog had stumbled into one of them. Its body was now a charred cinder under the glittering Mercurian night sky. Crayley had provided a miniature spacesuit for the animal, complete with oxygen tank, heating coils, and weights, and it had run ahead a short distance to the end of its leash, as dogs will do, exploring on its own. Now Scottie was gone, a martyr to science.

After that, the explorers had thoroughly investigated the electromagnetic qualities of the crust, testing it until the full strangeness and menace of the phenomenon was apparent to all. It was because of the raging interference set up by the patches that they had to move in silence, for radio communication was obviously impossible.

Slowly the little group filed across the slightly luminous surface of the Mercurian plain. All around them surged an alien atmosphere tainted with heavy gases and ionized by cosmic rays. Their oxygen tanks were their sole protection against the corrosive horrors of this Mercurian air.

Gibbs Crayley, thinking of this and of the extended journey they were hoping to make, cut down the release gauge on his tank by two degrees, and signaled to the rest of the crew to do likewise. He knew that as the flow diminished they would all breathe less freely, but oxygen here was more precious than water on the deserts of Earth, and they could not afford to squander it.

A moment later Crayley noticed with some concern that, of all the group, his wife alone had not followed instructions. He stared at her and motioned to her oxygen gauge. She ignored him; and so, standing still, he raised his dynamometer-tipped staff from the ground and gave her tank a rap.

Behind the thick goggles of her helmet, Crayley could see Helen's

eyes widen in momentary vexation. He knew she was convinced that there was more than enough oxygen in the tank to last the round trip; they had discussed it before they started out. Obviously she planned to leave her gauge alone; and apparently she had an impulse to rebuke her husband by tapping his tank in return.

In any event, she actually raised her own staff from the ground and swung it toward Crayley's encased form. But as the metal wand swung up and toward him, Crayley stopped abruptly and stiffened. His electrodynamometer had recorded a mountain-moving charge in the patch of glowing soil immediately before him. And as Helen's staff thumped against his shoulder, he swooped sideways, caught her about the knees, and in a running tackle carried her swiftly backward to safety.

Unfortunately, young Grayson let his attention be diverted by this odd action on his superior's part. Momentarily swinging his forgotten detector aside, he stepped forward into the shock patch while looking over his shoulder at the odd sight the Crayleys presented.

One moment he was walking in the bright circle cast by his electric torch. The next, only a tortured part of him could be seen, waving frantic hands in the faint Venus light. There was a burst of flame that blotted out the stars.

Like a dry leaf in a blast furnace, Grayson's limbs withered instantaneously into inert ash. Then the upper part of the youth's body crashed horribly in front of Seaton. For an instant the engineer was too appalled to move. He simply stood with his own staff extended, as though the fact that it was a man-made device could give him security when all else failed.

Behind him the other members of the group crowded forward in horror. Through their goggles they saw the hideous spectacle of a limbless torso, spacesuit blasted away, spinning upright on a blazing red field, light spiraling from sandy hair galvanically extended. Faster and faster spun the body—and then flame mercifully engulfed it.

Crayley set Helen down and threw one arm about her shoulder to steady her. For an instant she stood swaying, eyes lowered in sick comprehension. Then she stiffened and resumed her position beside her husband. There was no attempt at communication. Messages in sign languages could have been exchanged, but none were. There was nothing to say. The group moved on almost instantly, to avoid funking—like aviators going up immediately after a crash. The accident was due

to human error, and they could not afford to stop for that. With slow steps they resumed their journey into the dark Mercurian night.

It was nearly half an hour later when Crayley halted again, staring intently ahead through his thick goggles. On the torchlit circle of soil before him, something had moved. Helen saw it, too, and threw out her right arm, waving back the men behind her.

Only Ralph Wilkus, perhaps missing the signal, moved forward into the region of dubious stirring. He did not recoil or shrivel but stepped right on through and continued to test his way with his staff on the featureless plain beyond.

Obviously, this was not a new type of shock patch; but what it was wanted investigating. Less foolhardy than Wilkus, the other explorers hesitated before advancing, their staffs waving experimentally above the region of stirring. Only the surface sand moved, as though blown by a faint, circularly whirling breeze.

Crayley knew there was no breeze. The wind needle on Helen's helmet did not even vibrate. He raised his gloved hand and made signs in the torchlight.

"Something unknown here," he motioned. "Stay back."

They spread out, trying to measure the size of the whirling patch of particles. Several yards ahead, Wilkus, his back to them, was moving steadily forward, his dynamometer swinging in the light of his torch.

No one would ever know whether he had missed Crayley's signal or had ignored it: for suddenly, with shocking abruptness, a blinding purple light flared out in the darkness above him and to his right, and seemed to reach out and touch him. With a terrible wrenching, he doubled up, hands pawing at his stomach. His torch and staff fell to the ground.

For an instant the light hovered above him, pulsing with a greedy brilliance. Then it dimmed and whipped away into the darkness. Wilkus collapsed limply, like a deflating balloon.

When Crayley picked up the stricken youth he seemed to be holding a nearly empty suit. The light of his torch on Wilkus's helmet revealed two eyes that shone with the light of idiocy in a formless, boneless face.

Crayley clicked his torch off and stood for an instant in nearly total darkness, holding the awful burden. The others were coming toward him, swinging their lights in wide arcs.

Helen was the first to reach him. "What happened?" she gestured.

Crayley's helmet turned slowy in negation. He snapped on his torch again and focused it on Wilkus's helmet. Helen cried out involuntarily. The face of the stricken man was chillingly expressionless, the features like wax. But the twitching of his mouth showed he was still alive. By now the others had come up and clustered about the tall scientist and his limp burden. He motioned, "We've got to go back. Wilkus is seriously injured."

Parkerson stepped to Crayley's side and took part of his friend's weight upon his shoulders, although it was so negligible that Crayley could easily have borne it alone. Seaton picked up Wilkus's torch and staff, and with leaden hearts the group began retracing its steps.

Imbued with abnormal caution, they walked slowly, swinging their staffs in wide arcs before them, but they did not encounter any more shock patches until the vast, gleaming bulk of the spaceship loomed in reassuring relief against the sky. Then Helen's dynamometer recorded one about five hundred feet from the stern of the ship, and the party made a cautious circle about it.

A moment later they were ascending a metal ladder over the curving surface of cobalt glass. The little group crawled in beneath enormous hatches, down another short ladder inside, and along a narrow corridor that blazed with cold-light lamps. Then Helen threw a switch at the end of the passage and the hatches fell into place with a sharp clang. Air hissed in; another hatch opened before them.

They emerged into the ship's combined control room and bunkhouse. Crayley gently eased Wilkus down on one of the bunks and then sat down, fumbling with the screws of his helmet. Helen and the others also slumped down on their bunks, still wordless in the cold light of the room.

Crayley got his helmet off first and then shucked off his spacesuit, depositing it in inside-out disarray on one of the benches. As the others struggled out of their suits, he turned and began unscrewing Wilkus's helmet. His thoughts were under grim self-control; he half expected what he would find and was stoically prepared for it.

Not so the others. As Crayley stripped the spacesuit from the injured man, the other men took one shocked look and turned away. Helen saw the shriveled body with the drooling, idiot face moving, jerking about on the bench; for fully five seconds she stared without a sound, lips slack. Then she crumpled.

When she opened her eyes again she was lying on her bunk, concealed behind the automatic privacy screen that provided the only seclusion she had on the vessel. Parkerson was standing beside her. For a moment she could not recall where she was nor what had happened; then, with a little cry, memory returned and she swung her feet out and tried to stand up.

Parkerson sat on the edge of the berth and took her small hand in his, restraining her lightly.

"Frightened?" he asked.

She shook her head. "What happened to Wilkus?"

Parkerson avoided her gaze.

"Tell me," she insisted.

"He died."

Some of the strain went out of Helen's face; she moistened her dry lips with her tongue.

"I'm going to Gibbs," she said, struggling to her feet. "Where is he now?"

"In the laboratory," said Parkerson.

He stood regarding her for a moment with a troubled expression, still holding her hand. Helen looked in his eyes. "What's—what is it, Parky?"

"I—nothing . . ."

"Wilkus was your friend . . ."

Parkerson made an impatient gesture. "He was more than that. We grew up together. But that's not it. Forgive me, Helen; I'm upset. It's Gibbs . . ."

"Gibbs?"

"Yes. You're married to him. You know him better than any of us. I wonder if it ever occurs to you how he looks to other people." Parkerson looked away from her. "He's not human," he said in a strained voice. "He's a damned machine. Did you see his face when he took off Wilkus's suit? You'd think he was taking a clock apart!"

Helen touched his arm. "You know you're wrong, Parky. It's the situation we're in that's getting you. Gibbs Crayley wouldn't be what he is if he didn't have that kind of iron control. He's in charge, Parky. Wilkus and Grayson were out there on his orders. In spite of the fact that they were careless, both of them, Gibbs feels responsible. He always will; you know that. You've lost a dear friend; but at least you

didn't acquire that kind of a burden at the same time." She squeezed his shoulder gently. "Think it over."

Parkerson managed a small smile. "You're right, of course. I guess—I guess I blew my top. Thanks, Helen."

Helen found her husband sitting motionless beside the covered body of Ralph Wilkus. He looked up and scowled when she entered the tiny laboratory and shut the sliding door behind her.

"Parkerson told me," she said, looking down at the narrow ledge where the dead man lay.

Crayley said nothing for a moment. He was grateful for the assurance of her hand seeking his and tightening in sympathy.

At last he said, "He died before I could etherize him."

"What did you find, darling?"

Crayley's lips tightened. "Something . . . incredible." He turned to the ledge and removed the sheet. "Let me show you."

Helen turned pale. Wilkus's body was flaccid and blue. It looked as though it had been poured on the ledge. The girl bit at her lower lip and dug her nails into her palms in her effort to maintain self-control.

"He should have died out there," said the calm man beside her. "His vitality must have been tremendous."

Helen said, "It's incredible, Gibbs."

Crayley looked down at the body before him. "Look, I'll show you something."

He put on his rubber gloves and raised the limp, bluish hand of the dead man. With the other he turned up a Bunsen burner standing on the table until the flame was blue-hot.

"Watch."

He sprayed the intense flame of the burner on the corpse's hand as far as the wrist. The flame flared, shot out fiery jets; its color turned greenish, then purple, then blue again, as Crayley moved the torch here and there over the lifeless member.

"I have dipped that arm in hydrochloric acid, dilute solution," he said. His tone was clinical, impersonal.

Helen's eyes widened as she grasped a little of what this meant. Crayley turned to the table again and picked up a thin glass slide. He held it before the flame-sheathed flesh.

"What color do you see through that glass, Helen?"

"Yellow," she whispered, awe-struck.

"Only the faintest tinge of orange in the flame," he said. "And when you view it through green glass it looks yellow, not green as it should."

Helen drew in a long breath. "Then there's no calcium at all. No calcium—even in the cells of his flesh! What—?"

Crayley shrugged. "I don't know. All I know is that when calcium compounds are moistened with hydrochloric acid, they turn the blue flame deep orange. Strontium also turns it orange-red, often concealing the characteristic calcium glow—but strontium shows yellow under green glass. The faintly orange tinge was undoubtedly imparted by strontium. Calcium would show finch-green under green glass."

He turned down the flame of the torch. "I used spectroscopic tests to make sure," he said. "The characteristic lines of calcium—orange and green and faint indigo—were wholly absent. Helen, something has extracted all the calcium from Wilkus's body!"

"But could a man live if—"

"A little while, apparently," said Crayley, anticipating his wife's thought. "I would have said no, but we can't dispute the evidence. The instantaneous withdrawal of calcium from his body must have left behind the neural patterns, temporarily at least. Motor and sensory nerves functioned, although the brain failed completely."

"But what could have caused it?" asked Helen.

"Only one thing. Radiation. Invisible-spectrum radiation, more intense than anything we have ever known on Earth. A terrific bombardment by ultraviolet. So-called black-sheep rays, perhaps, which would be deadly to all life on Earth."

He turned off the Bunsen burner. "Why, even the comparatively harmless members of the ultraviolet family will drain calcium from protoplasm. You know—single cells, amoebae, slipper animalcules, things like that, exposed to ultraviolet and whirled in a centrifuge become viscous blobs in a few seconds—blobs with a hardened core. The radiation drains the calcium from the outer surface of the cell and deposits it about the nucleus. Such radiation as I have suggested would do that to all the cells of the human body, drain off the external lime and—"

Crayley shivered for the first time. "It's pretty horrible, dear. Horrible. And yet there's something wonderful here, too. This looks like a directed, a purposeful, effect. Outside there in the darkness there may

be living—perhaps intelligent—beings. Mercury is not a lifeless planet, as we thought!"

Helen shook her head in bewilderment. "But ultraviolet does not penetrate metal, Gibbs."

"You are forgetting that difolchrome is a silver alloy, Helen. Ultraviolet could penetrate our difolchrome suits if the radiation is sufficiently intense. And it must have been unimaginably intense to do what it did to Wilkus."

"You think it is a life form?" breathed Helen. "Why? Did you see anything?"

"Just that flash of purple light. And we both saw the moving sands. Something was resting on the sand, perhaps, and arose as we approached."

"You don't think the form was composed of invisible light itself?"

Crayley shook his head. "I hardly think so. I think it used the rays as a weapon. Something *tangible* moved out there."

He covered Wilkus's body again, and then slipped off his gloves. His fingers were shaking a little.

Helen said, "Are you going out again, Gibbs?"

Crayley nodded slowly. "I shall take the infrared stroboscopic camera with me, too," he said.

"Stroboscopic?—"

"Suppose the shapes are moving incredibly fast. Maybe that is why we couldn't see them with our own eyes. The stroboscopic camera can take dozens of swift images at intervals of ten-millionths of a second. The infrared plates will take care of the darkness, and the strobe will catch movements too swift for the eye to catch."

"But why do you think the objects are moving so fast, Gibbs?"

"They are invisible, or nearly so. That means either that they are composed of some alien form of energy which emits light waves too long or short for visual perception—or else that they are moving so fast that they can be seen only as faint blurs in bright light, and in darkness not at all."

The two started to walk from the laboratory. Helen took her husband's hand.

"It will be a terrible risk, Gibbs," she said quietly.

He looked down at her with a faint smile on his lips but said nothing.

The next two hours were to confirm Helen's fears more grimly than she had anticipated, but a perverse fate denied Crayley the privilege of sharing that risk in person. On the way up to the main observation chamber, the leader of the First Mercury Exploring Expedition wrenched a tendon in his right ankle atrociously on a ladder rung.

Parkerson, Seaton, and Wilson stood white-faced, listening to him curse and rave. For the first time during the trip, Crayley surrendered to his emotions with an explosive vehemence which did not even respect the presence of his wife. The ankle wrench had thwarted him at a vital point.

Helen suddenly found herself half smiling, catching Parkerson's shocked gaze. Slowly a half grin spread across his face, too, and she knew his thought: *Well, what do you know! The skipper's human, after all!*

The other men immediately volunteered to serve as proxies, and Crayley, after he had calmed down, selected Seaton and Wilson. Helen found herself wondering if the men would have volunteered so readily had she not been present in the passageway. Meeting Parkerson's half-disappointed gaze after the other two had been chosen, she suddenly realized that there was no doubt about it at all. A woman's presence did act as a catalyst, making lonely men more willing to endure hardship and heightening the intensity of their subconscious drives.

While the two men climbed into their spacesuits again, Parkerson went to get the stroboscopic camera from its storage compartment. It was a compact device, a small metallic cone about the size of an oxygen tank on top of a stroboscopic focusing panel and a curved, flexible carrier. Parkerson handed it to young Seaton, and then stood beside Crayley and Helen while the two men climbed awkwardly up the ladder to the airtight hatch above.

Crayley took a step, and a spasm of pain convulsed his features. Helen tried to restrain him, but with a muffled grunt he pulled free of her grasp and limped across the chamber to seat himself in a swivel chair before the control panel of the ship. For a moment he swayed in the chair, while the pain receded.

Then he threw a switch on the panel, and immediately a small opening appeared in the center of the wall above it. Swiftly the hole widened as the cobalt glass withdrew in overlapping crescents from an observation window of miraculously transparent glass.

Through the exposed window the three in the spaceship stared out into the black Mercurian night. Suddenly one torch flared out, then another, and into the cone of light thrown by the first the cumbersomely clad figure of Allan Wilson moved. Slowly, slowly he walked, with testing staff extended and his own torch focused on the soil before him.

Suddenly, for an instant, a purple light shone blinding clear above the plodding figure. Then it vanished, and as it did, Wilson seemed to stagger. For a full ten seconds the torches of both explorers continued to sweep across the terrain, but all at once it seemed as if Wilson was moving much too rapidly. Before any of the three could say a word, they saw the man pivot about, his legs kicking free of the surface, and abruptly disappear upward. With him went his torch, its beams dancing fantastically on objects far away.

Seaton's torch beam wavered, as if he had been shocked into indecision. It turned out later, however, that he had intrepidly set up the stroboscopic camera and was trying to take some pictures of the invisible horror that had captured his crewmate.

Inside the ship, Crayley manipulated a rheostat near the center of the panel, and instantly the plain was flooded with a blue-white light from an immense arc lamp set in the spaceship's entry hatch. In the light, the three in the ship saw a sight that none of them ever would forget. High above the rust-red plain the body of Wilson was dancing and bobbing about, arms thrown wide. He seemed spread-eagled against a field of star-flecked blackness—impaled upon empty air. Below the suspended man a vague, grayish blur seemed to intercept the light and dim the plain beyond.

Crayley turned to the other two, his fists clenched. "He's dead, I think," he said. "He couldn't live—"

But then Helen gave a low scream and pointed out the window. The suspended figure had been released and was falling leaflike to the ground. It struck and bounced, then rolled over and over, careening along the plain until it collided with a boulder, when it disappeared in a burst of flame.

Seaton had turned and was racing headlong back to the ship. In one hand he held his torch, while his dynamometer staff, momentarily forgotten, jogged at his shoulder like a sheathed wagon. In the other hand he held the camera in a convulsive grip. Soon he disappeared into the ship's shadow.

Crayley swung about, shut off the arc-light control switch, and said in a coldly calm voice, "Seaton made it. Better help him in and get the camera, Fred."

Parkerson nodded and went up the ladder to the hatch, which soon opened, revealing a sagging Seaton still hanging on to the camera. Parkerson gently wrested it from his grasp, clicked open the wafer-thin steel cover, and thrust his hand deep into the protecting tube. The cold of space seemed to gnaw at his fingers as he grasped the little camera and drew it forth. He tossed it to Crayley and then helped Seaton down the ladder and unscrewed his helmet.

As soon as it was off, Seaton gasped, "God, God! . . . It went for me . . . I could almost feel it . . . and Wilson ran to me . . . tried to throw his light at it . . . to attract it . . . it—it *took* him! . . ."

Parkerson murmured, "I know, I know," helplessly, mechanically, as he unloosened the fastenings on the difolchrome suit. Wilson and Seaton had been the kind of buddies Parkerson and Wilkus were. "But Bill—you ran the camera, didn't you? You exposed some of the film? Maybe we can trap these—"

Seaton nodded wordlessly, then slumped onto one of the bunks, his head in his hands.

Crayley broke open the camera and let fall from its interior a thin sheaf of automatically developed photographic plates. He handed these to Helen, whose fingers had not been chilled by the unbelievable cold of the camera.

With wordless apprehension, Helen lifted the topmost plate and turned it slowly about under one of the control-room lights.

The plate contained a clear image. Helen handed it to her husband, scarcely understanding what she saw. But Crayley took one glance and said:

"It's life, all right!"

With that, both Parkerson and Seaton rushed to stare over Crayley's shoulder. For a moment all that could be heard was the swift breathing of the four explorers.

Then Crayley spoke again. "Life, Helen—a sentient form, perhaps not intelligent, but certainly sentient. Seaton, did you *feel* anything—out there?"

Seaton said, "Feel? . . . Nothing . . . Nothing except . . . well, it was like a continuous electric shock, growing stronger and stronger. . . . Horrible! . . ."

Crayley studied the picture more closely. By comparing it with the metallic pebbles on the ground, he concluded that the shape was very large, perhaps four times as tall as a man, and proportionately huge in its other dimensions.

It was cone-shaped, mathematically clean in line and yet disturbingly vital. From its broad base a single long rod descended to the ground, and four smaller rods projected sideways from its pointed summit. Where the base of the rod rested on the soil there were many little flares, as though the shape were standing on a surface which constantly reacted to it with electrical coruscations.

Crayley said quietly, "The second plate, Helen."

Helen looked at it, gasped. "Three of them."

Crayley seized the plate and studied it. "Three—and see how they are grouped!"

"Five on this one," said Helen, extending the third plate.

Crayley swiftly went through the rest of the plates without another word. When he had finished examining the twelfth and last, he looked up slowly, his lips set in a tight line.

"The ship is in danger," he said.

Parkerson stared. "What do you mean, Gibbs?"

"Simply this. These cones are sentient entities. I think they are energy shapes, moving fields of force, endowed with intelligence and purpose. My guess is that they are connected in some way with the electromagnetic fields, the shock patches."

He stood up, wincing as the wrenched tendon reminded him of its presence. "I think these cones generate ultraviolet and nourish themselves on the electromagnetic resources of the shock patches. Remember that protoplasm itself is an electrical phenomenon, shaped by energy and radiation. But protoplasm is the product of an environment only lightly charged with solar energies. Mercury is different."

He handed the pictures to Parkerson. "Note this series, Fred. I think they prove that these cones are planning to attack. They seem to be forming some kind of a wedge-shaped formation. There are at least fifteen cones in the last shot—and *all of them are pointing toward this ship!*"

Crayley pivoted and stared out through the view port. Below was blackness, save for the faintest glimmerings of light where the tenuous Venus rays glittered on tiny pebble points. But the explorer knew that strange shapes of power were there, though he could not see

them. And he also suspected that the cones were assembling on the immense shock patch which lay less than five hundred feet from the stern of the ship.

Time for action, Crayley thought regretfully. The odds were too great—this time. He sat again in his control seat, and turned to activate the starting motors of the great vessel.

Before he could do so, a violent glare pierced through the ship. A roar drowned out all other sound. A shaking detonation vibrated every object in the control room. The floor seemed to rise up, suddenly and horribly. Then came the familiar crushing weight of acceleration, and Crayley blacked out momentarily, despite the fact that he was cupped in the cushions of the control chair.

He regained consciousness by a feat of buried will, coming up hand over hand out of the mists of blackout. There was an ominous silence in the ship, punctured by eerie creaks and cracklings from the tortured cobalt-glass plates. Crayley glanced, then stared at the vision port. The haunted plain, the distant, twisted hills of Mercury were gone, and in their place was black space and the wheeling stars.

Instantly his trained eyes flicked over the dials and gauges of the control panel. The great atomic motors were still. The only operating machinery was the auxiliary plant—light, heat, atmosphere. A red light glowed above one gauge, indicating the firing of two of the chemical jets which were used to give nonradioactive thrust at take-off.

Crayley's quick mind assimilated and computed the evidence. The strange cones of the plain unquestionably had loosed a blast of energy which had fired the chemical jets and had sent the ship screaming upwards from the face of the planet. An occurrence so unlikely as to seem providential—except that Crayley knew that statistically it lay high in the realm of probability.

His fingers played the switches on the panel with a controlled frenzy. The silence ended with a dull thunder from the atom motors, and the ship steadied as they took hold. Crayley let out a noisy sigh of relief: The atomic fuels were immune even to the fantastic temperatures of the cone's ultraviolet radiation. Artificial gravity and running lights came on, and at last the great cobalt-glass ship was under full control.

Only then did Crayley permit himself to look around.

Parkerson was huddled in a broken heap by the after bulkhead. Next

to him lay Seaton, his head turning slowly, his eyelids fluttering. And—

"*Helen!*"

He limped to her, unconscious of his own wrenching pain; touched her body swiftly, deftly, in a frantic mixture of caresses and skillful probing for injuries. She moaned.

"Are you all right? Helen! Helen . . ."

She opened her eyes, moaned again, and then gave him the tiniest of smiles. "Wh-what . . ."

He helped her up. She was badly shaken but relatively unhurt. She had apparently hurtled back and struck Parkerson, and his body had cushioned the impact when they struck the bulkhead.

Crayley gently lowered Helen onto one of the benches and turned to Parkerson. He was unconscious, breathing painfully. A trickle of blood oozed from the corner of his mouth.

"Ribs broken," said Crayley tersely. "Possible puncture. See to Seaton if you can, darling. I'll take care of Fred."

An hour later they were droning through the dark, building up acceleration for the long loop back to Earth. Seaton, his arm in a sling, crouched over the computer, checking their flight line. Helen sat by Parkerson's bunk, watching the flow of plasma from a plastic container into his veins. The automatic privacy screen was partly drawn, concealing the front of the control room from Parkerson's view.

"Home . . ." Parkerson said weakly. "It's going to be good, Helen."

She nodded. "Try not to talk, Parky."

Ignoring her, Parkerson said, "Wilkus, Wilson, Grayson. Scottie, too. All dead. For what? Bloody unnecessary business. What has anyone gained because they're dead?" Tears appeared under his lids. He shook them away angrily. "Sorry, Helen. But it's such a waste."

With a strange, tight smile, Helen rose and raised the automatic screen. "Look," she said softly.

Parkerson slowly turned his head, following her gaze. Crayley was there in the control chair. His shoulders were squared, his hands quiet on the ledge of the panel before him, his face lifted to the spangled immensities of space. He did not move.

She came back and sat down, her eyes first on the plasma bottle and then on the injured man. "Parky," she whispered, "you wondered

once whether he was human. Look at him now. We were driven off. They killed our men and hurt our ship. We were defeated. We cut and ran." She smiled wryly. "But—look at him, Parky. He's an explorer. He's the new frontiersman, in an age which knows the greatest frontier of all."

She pushed back her hair with a tired motion. "Maybe he isn't human. Maybe he's just—humanity. Look at him, Parky. In spite of death and in spite of danger, in spite of life forms which have all the advantage of their own mystery—he'll be back. Don't you see it?"

Parkerson gazed at the still, strong figure and then at the woman.

"He'll be back," he whispered. "Yes—that's it." And as the full realization of what Helen Crayley had been saying flooded him, he said, "*We'll* be back!"

D. L. James

MOON OF DELIRIUM

Here on Saturn's small moon Dione (one of its nine satellites), we meet a truly fantastic and incredible form of life. Whether it is extra-solar in origin or stems from an earlier era in the Sun's development there is no point in guessing, any more than there is reason to ask if it could or could not actually exist. There are no answers to those questions except common-sense ones, and answers of that sort are always so dull!

Whether Dione's life forms are "possible" or not, they assuredly constitute a vivid and circumstantial creation of the human imagination.

THERE was an interval of tense silence in the control room of the *Pegasus*. Then a bell clanged sharply. Immediately thereafter came a dull thump as the ship made contact with the surface of Dione, and for a second low-pitched vibrations raced to swift death up and down that drum-tight, molybdic alloy hull.

"Hall, take an atmosphere test immediately." Captain Egard's voice was edged with more than a trace of strain. "And be sure you don't let any of that stuff loose here inside the ship! Griffin, what's the temperature outside?"

"Still subzero, captain; but the meter's slowly rising."

"Norm—if you can pull your head out of that port—run down to the rocket room and tell McDill and Perrin I want 'em up here just as soon as they can leave things. Get Rives and Talbot, too."

Eric Norm, junior member of the crew, tore himself away from the port through which he had been staring. That scene of alien grotesqueness had held a peculiar fascination for him. Black rocks jutting up between fernlike mounds of frozen vapor; ice crystals sparkling and throwing back the light of the tiny, but still-brilliant Sun in delicate tints of purple, rose, and golden-green.

He entered the cartridgelike car, which shuttled through a tube from stem to stern, and a few seconds later emerged into the rocket room. McDill and his mate, Perrin, appeared to be in exultant moods—as well they might.

"Hey, there, Norm," grinned the solidly-built chief, welcoming Norm with a hearty slap on the back. "We made it, son!"

"Cap wants you and Perrin in the control rooms," said Norm.

"Why didn't he phone?" asked Perrin, tossing aside a handful of waste.

Norm shook his head as he turned back to re-enter the lift. He didn't like to mention Captain Egard's unprecedented display of jitteriness.

On the deck above the rocket room he found Rives and Talbot staring from a port. They had evidently just finished giving their oxygen suits a last careful inspection.

Talbot was speaking: ". . . a green mote! I saw it drift past the port."

"You're seeing things," scoffed Rives.

Five minutes later, the entire crew of the *Pegasus*—nine men including the ship's surgeon, Dr. Frontain—were congregated in the not too spacious control room. That is, all except Hall, who was still busy with his atmosphere analysis.

"Men, here we are on Dione—fourth moon of the ringed planet," said Captain Egard, his shrewd, bushy-thatched eyes stabbing around to rest for an instant on those of every man present. "You've all done your duty. I'm proud of you—so proud I want to take you all back with me."

"Cap," spoke up the irrepressible McDill, giving Norm a sly nudge in the ribs, "none of us figure to desert ship."

Grins and a tense laugh or two followed, but they quieted immediately. Nerves were keyed to a high pitch, as must always be when men face the unknown.

"You all know our purpose here," continued Egard. "We've sworn to collect thought-nuggets and take them back to Earth—or die trying! But what some of you don't know is the exact hazard we're up against. You were all warned of the danger attending this voyage—but not in detail. Until now I've withheld just a little of the slight information I possess, so that our morale might be maintained—not that you're men inclined to flinch, but anticipating dangers too far ahead is bad. So far as I'm aware, no man ever set foot here on Dione and lived to tell about it."

Navigator Griffin cleared his throat. "But, Captain, that can't be right." Bronzed, square-jawed, he was leaning against the chart table,

his light-blue eyes regarding the older man steadily. "What about Morgran, the explorer, who brought back the first thought-nugget—ten years ago?"

Captain Egard answered slowly, "Explorer Morgran used a radio-controlled mobile robot to do the actual ground work. His ship touched here only for a few hours; the airlock was never unsealed."

Griffin nodded. "Right, Captain—pardon the interruption."

"Unfortunately, Morgran died before his ship reached Earth," continued Egard. "We had only his notes to go by—and the thought-nugget. Here," he added, fishing a small object from his pocket, "this is an imitation, made to resemble closely the original, so we'll know what we're looking for. Pass it around. Milk-white, the size of a peanut. The original was of crystalline structure, but whether an organic product or a mineral is something we don't know.

"You are all aware of what happened when that thing was turned over to scientists. They soon discovered that it was thought-sensitive—capable of receiving and amplifying telepathic impressions—an element long sought by physicists.

"Enthusiasm waxed feverish over this astounding discovery. And during the years that followed, ship after ship left Earth for this remote moon, to collect more of the treasured nodules. But not one of them ever came back—"

"Captain Egard," interrupted Hall at this moment, elbowing his way into the crowded control room. Tall and lanky, he was able to stretch an arm over Norm's shoulder. "Here's the atmosphere formula."

Egard grasped the slip of paper, his eyes sliding quickly over the penciled symbols.

"Hm-m-m. Quite an envelope for a body only twelve hundred miles through—mostly inert gases, nothing poisonous—and no oxygen, either."

A mutter of voices had started up among the crew.

"The old boy don't sound any too cheerful," husked McDill in Norm's ear. "Don't take it too seriously, though. He'd cut his throat before he'd lose a man here on this confounded chunk of rock. I know him!"

Norm nodded, in full agreement. "But I wonder what else he's got up his sleeve."

Egard raised his hand for silence.

"One or two things more, and then we'll get busy. Ill fate was met

with by our predecessors. From Morgran's report we know there is life here on Dione. We know that this life is parasitic and uses a symbiosis—a damned queer life form, deadly to anything else that's alive, and even to itself—"

"I don't get that," broke in Rives, eying first Egard and then Talbot, his inseparable companion, but with whom he maintained a serial argument about everything within and without the cosmos. "About that symbiosis—"

"I can't do better," said Captain Egard, turning to fumble in the files under the chart table, "than to read you Morgran's own notes. Then you'll know just as much as I know. Here they are, as published in a monthly report of the Academy of Science, dated May, 2371—or roughly ten years ago: 'Green Animals of Dione: There is no such thing as a distinct plant life on Satellite IV. The primary substance composing Dione's green-animal life is somewhat comparable to the protoplasmic base of all earthly life, insofar as the fluid entering its composition is, in both instances, water; but in the case of Dione, an unidentified chemical reagent renders this solvent free from crystallization into ice at low temperatures.

" 'This living animal matter is perfectly transparent, to allow the passage of sunlight to the millions of chlorophyll-bearing vegetable cells within its substance; hence its green color. Here we observe what might be called an instance of perfect symbiosis between animal and plant, the animal cells supplying carbon anhydride and nitrogenous matter to the vegetable cells, and they in turn supplying oxygen and starch to the animal cells.

" 'Thus we have organisms maintained almost entirely by sunlight. But growth and regeneration can take place only by the absorption of fresh protein from another living body—hence the evolution of parasitism. Constant, insidious warfare must necessarily be carried on against one another by Dione's individual life units.' "

There was a moment's silence after Egard finished reading.

"Parasitic life—hell," muttered Rives. But his exact meaning, if any, was not clear.

"There you have it, men," concluded the captain. "Now we'll get busy. I know there's not one of you but would volunteer to be the first to go outside the ship. But that would be side-stepping good judgment on my part. Rives, you and Talbot jump into your oxygen suits. But just because you're supposed to be good at outside space

work, don't try anything fancy. Take every precaution. You'll be in constant communication with Norm here, by microwave. Stick close to the ship until we find out where we stand."

The conference broke up quietly. Rives and Talbot were hustled into their oxygen suits. Backslapping and rough joking followed, such as men sometimes indulge in when their nerves are on edge; then the bubblelike hoods of transparent glassoplast were clamped down and the two men prepared to leave ship.

Norm watched these activities with mingled feelings. Although naturally of a rather unobtrusive disposition, he had often wondered if his job as communications technician wasn't robbing him of certain adventurous thrills, such as Talbot and Rives must now be experiencing.

"Norm, get to your post," ordered the captain. "They'll be outside in a couple of minutes."

Seated at the microwave panel in the control room, directly in front of an observation port, Norm clamped earphones on his head, adjusted various switches. A moment later the shuttling car brought Captain Egard.

"They're outside," he growled, snatching up an auxiliary headset.

"Talbot! Rives!" Norm spoke into the transmitter.

"Sure, son," came Talbot's matter-of-fact voice.

"Keep your shirt on," advised Rives. "There's nothing to it, kid."

Almost at once the two figures, bulky in their oxygen suits, appeared outside and below the port. They were walking slowly away from the ship on the brittle frost crystals that covered the rocks.

"Is everything right?" queried the captain sharply, speaking into the transmitter attached to his own headset.

"Okay," reported Talbot.

"Same here, Cap," came Rives's voice.

There was an interval of silence while the two men drew farther away.

"Any sign of life?" asked Egard, his tone easier.

Talbot answered, "Something floating in the air—green motes."

"Not motes, you blockhead," Rives's voice cut in. "Nor spores, either. Too large, some of 'em. More like burrs—"

"Yea, that's it—burrs," conceded Talbot grudgingly. "Like green chestnut burrs."

"Do they try to attack you?" asked Egard quickly.

"Well—not exactly," said Talbot, after a momentary pause. "But they kind of swarm around. Hear that tapping? That's them hitting against my hood."

By peering intently, Norm himself could now catch a vague glimpse of these green dots in the air.

"But you're safe in the oxygen suit?" persisted Captain Egard.

"Sure, Cap. Now we'll start looking for thought-nuggets."

With a gusty sigh of relief, Egard removed his earphones. He turned to Griffin, the navigator, who had entered quietly and was watching from another port.

"There's our answer," he declared. "A man in an oxygen suit is safe. The real danger lies in the chance that some of those burrs may get inside the ship. In the construction of the *Pegasus'* airlocks, this was all foreseen. With the ordinary lock, a pocket of outside air follows a man in through the neutralizing chamber when he enters the ship. That was undoubtedly the fate met by our predecessors. Dione's atmosphere is contaminated by parasitic life. Some of those burrs got inside their ship. But with our locks, the neutralizing chamber is automatically cleared by a blast of sterile air before the inner slide opens."

Griffin nodded. "Then there's no reason why the rest of us shouldn't go out and give a hand with the search."

After some hesitation Egard agreed. "You and Hall can go. But don't get separated. What I'd like to do, if possible, is to collect a few of the nuggets and leave before darkness sets in. The sunlight period here on Dione lasts for thirty-three hours, which may give us time enough. I think I'll let McDill and Perrin loose, also. That will make three searching parties, leaving Dr. Frontain, Norm, and myself to take care of the ship. I don't think that this is being incautious. I'm of the opinion that these burrs are the only life on Dione. The ship itself will hardly require any defending, and the more men we have outside, the better chance of helping one another in case of accident."

Norm cursed softly under his breath at this arrangement. He wanted to go out and join in the search. Meanwhile, Rives and Talbot had moved out of sight from the port, but he could still hear them chaffing each other in their half-serious fashion.

"This stuff isn't 'snow,' as you call it," Rives was saying. "It's too cold to snow here on this lousy moon."

"Oh, yeah? Well, notice that haze floating a few feet above the ground," rejoined Talbot. "That's due to the Sun's action on patches

of bare rock. And see how those mounds are building up all around. Miniature snowstorms in action, I call 'em."

"Shucks! Norm—ask Cap where's the best place to look for those nuggets."

"Cap isn't here right now," Norm said into the transmitter. "Besides, you've already been told all that. Look where the rocks are bare; in chinks—you know."

Hall and Griffin, clad in oxygen suits, were soon leaving the ship. A few minutes later, McDill and his mate Perrin also joined in the search. Each was promptly surrounded by a convoy of floating green burrs.

Time passed. Presently a rousing report came from Rives.

The first thought-nugget had been found!

Captain Egard received the word with elation.

"We only need a few," he explained to Norm and Dr. Frontain. "Then, with information as to where and how more can be obtained, we'll have accomplished our purpose here. Norm, tell Rives to bring the thing in; I want to make sure it's genuine."

Rives arrived a few minutes later.

"There's nothing to it!" said he, hood tipped back from his alert-eyed countenance. "Those burrs can't hurt you—they can't get at you to touch your flesh. Here—"

He dropped a milk-white nodule into Egard's hand.

"It's real!" breathed the captain, after a close scrutiny. "Rives—you'll be a blasted hero when we get back to Earth!"

Again the search went on. Rives departed to rejoin Talbot. And during the next hour, with six men outside the ship to be kept track of, Norm's attention was so thoroughly occupied that few spare moments remained in which to bewail his own enforced nonparticipation.

Meanwhile, no more nuggets had been found. But, as time passed, Norm began to gain a kind of vicarious familiarity with the immediate locale. The *Pegasus* was resting in a wide, saucerlike depression. Fantastic mountain chains, serrated and ice-spangled, rimmed this depression. But even close to the ship, the moon was very rough, being crossed by innumerable chasms and littered with fragments of rock and other mineral detritus.

The search gradually widened as the men began wandering farther and farther from the ship. Still no more nuggets were found. It was

perhaps two hours later when the first untoward incident occurred.

Then, without giving notice of anything amiss, McDill, the rocket engineer, returned to the ship, bearing on his broad shoulders the body of his mate Perrin—no great muscular feat, however, in the weak gravity of Dione.

"The clumsy son took a fall in the rocks," he explained to the three men waiting in the ship.

"Why didn't you send in word?" demanded Captain Egard, scowling darkly as Dr. Frontain stripped the oxygen suit off Perrin.

"Didn't want to tie things up," McDill confessed, grinning broadly. "He isn't hurt bad."

"Broken leg," reported Dr. Frontain, after a short examination.

"You big sap!" McDill said to the injured Perrin unfeelingly. "You could have done that by falling downstairs at home."

Perrin groaned.

"So long. I'm going out again," said McDill.

"You join up with Griffin and Hall," ordered the captain. "And don't try anything smart. We'll need you, now that Perrin is laid up."

"I'll have him on his feet in three days," promised Dr. Frontain. "A shot of B-X-44 in the fracture will do the trick."

For a time thereafter, Norm was alone in the control room while Captain Egard and Frontain were making the injured man comfortable in his bunk amidship.

McDill was again outside. Presently his voice sounded in Norm's phone: "Kid—you don't know what you're missing."

"Where you going?" asked Norm, for the direction finder certainly did not indicate that the engineer was following Egard's orders.

"Back where Perrin took that fall," said McDill. "I got a hunch that it's a likely place to look."

"Griffin and Hall aren't over there."

"I know, but they're finding no nuggets. Why should I tag along with them? We've got to spread out."

The other searchers seemed to be of this opinion also. They were now rather widely dispersed over the rugged area surrounding the *Pegasus*; Rives and Talbot were perhaps two miles from the ship, Hall and Griffin nearly as far away. But the impetuous McDill was choosing a course which lay on the opposite side of the ship, far from any of the others.

Norm stretched his cramped legs under the microwave panel. He

longed to take a more active part in things. Presently he threw the switch over to Griffin and Hall. They had nothing to report; neither had Rives and Talbot. The latter two were still disagreeing monotonously about the surrounding scenery in whole and in part, occasionally reverting to the earlier dispute concerning frost mounds and to the exact meaning of the word "snow."

Twenty minutes passed.

"McDill, how are you making out?" asked Norm for the tenth time.

"Stop worrying about me!" bawled McDill desperately. Then in a milder tone he confided, "Listen, kid—just between you and me—I think I'm finding something."

At this moment Captain Egard returned to the control room. The general enthusiasm following the discovery of that first nugget had by this time cooled. Egard's face looked tired and drawn as he received Norm's report.

"Did McDill join up with Griffin and Hall?" he demanded.

"Well . . . er . . . no," confessed Norm. "He's over there where Perrin met with his accident."

Egard snatched up the auxiliary headset.

"McDill, you crazy fool!" he roared into the transmitter. "McDill—McDill—"

There was no reply.

"Norm, why doesn't he answer?" demanded Egard sharply.

Norm shook his head. "He was on only a moment ago."

Egard's hand flipped over the control switches. "Rives, Talbot! And you, Griffin and Hall—start back on the jump! McDill's silent; something may be wrong. You're too far away to help immediately, so I'm sending Norm—"

Norm snatched off his own headset. At last he was to engage in a little action—personally!

"Use Perrin's oxygen suit," directed Captain Egard. "You know where to go—or I hope you do! I'll take your place here. Now get a move on, my lad—but watch yourself!"

So Eric Norm went into action. With Dr. Frontain's help he thrust his lean body into Perrin's oxygen suit—which was the only one quickly available—clamped the glassoplast hood down over his head, and adjusted the flow of oxygen.

The *Pegasus'* airlocks were almost automatic in action. Less than five minutes after the initial alarm Norm was outside the ship, surrounded by the life-infested atmosphere of Dione.

With long strides he started out across that rough basin in the direction he knew McDill had taken. Over him the tiny, brilliant disk of the Sun gleamed coldly down, its slow advance across the blue-black sky almost imperceptible.

A green burr circled close to Norm in the thin air. Then another, and another. Some were large. Talbot's simile, suggesting their resemblance to chestnut burrs, seemed very apt. Parasitic life, evolved through some strange symbiosis of plant and animal to resist the rigors of existence on this inhospitable moon. Was the captain right in thinking these burrs were its only manifestation?

And what was now happening to McDill? His sudden silence, through ominous, might have a simple explanation. Microwaves were very beamlike in action. If he had entered some pocket or cavern surrounded by metallic rocks—

Norm raced down a declivity, leaped a rod-wide fissure. Then for the first time he noticed that his own communication unit was not functioning. Perrin's fall, in this same suit, had evidently broken or displaced some essential part of the instrument!

Well, thought Norm, perhaps it wouldn't make any difference. He could still go on, though his silence would probably add to the captain's worries. No telling what McDill had gotten into, and a few minutes' delay might spell the difference between life and death.

As he climbed the opposite slope a thin, bitterly cold wind whispered around him—quite audible through the direct-sound diaphragm in his hood. But the oxygen suit was especially designed to maintain an even temperature. He could still see the *Pegasus*, although it was now a good half mile distant. From this particular side of Dione, the ringed planet Saturn was never visible. For as Dione raced swiftly around the mother planet in an orbital period of only sixty-six hours, she kept always this desolate, mountain-rimmed depression facing outward toward the depths of space.

And now, with that almost black sky staring down at him, Norm experienced a sudden foreboding. This was new work, in which he had comparatively little practice. He paused for an instant to glance around. He must now be nearing the point from which McDill had last

spoken. The sight was not reassuring. For behind him now trailed a swarm of green burrs.

The oxygen suit, inflated with a pressure considerably above that of Dione's shallow atmosphere, kept these harbingers of death safely away from him; but now, during this brief pause, he could hear the tiny tapping sounds of them against his hood.

Eyes straining sharply ahead for a first glimpse of the engineer, Norm raced on again. The ground here was very broken and rocky, with large spaces clear of frost mounds. He began shouting—although fully aware that through this thin atmosphere a voice could not travel far from the diaphragm.

He had reached a point where, according to his best judgment, he should find McDill, when catastrophe overtook him. It came unexpectedly. There was a sudden, soft *s-s-swooshing* sound, followed by the immediate collapse of his oxygen suit!

With stunning clearness, Norm realized the cause. Perrin's accidental fall in this same suit had done more than damage the communication unit. Some sharp point of rock must have scraped along the tough fabric, straining it almost to the point of rupture. For the suit had now split open in a foot-long gash across the shoulders.

Immediately succeeding that loss of pressure, Norm's lungs began to work overtime in labored gasps as the unfamiliar scent of Dione's thin, bitterly cold atmosphere entered his nostrils.

And tending to add a note of panic to this truly grim situation, that swarm of green burrs awoke into sudden, vicious activity. Here and there they darted around him like angry hornets. The sound as they struck his hood grew continuous—*tap . . . tap . . . tap . . .*

Despair entered Norm's heart. Nothing in his experience indicated what should be done in a crisis of this sort, but his alert mind groped for some saving expedient.

An answer came in the very nick of time. He jerked the valve of his oxygen tank wide open.

Again he could breathe—after a fashion. For even Dione's shallow atmosphere offered a certain pressure, enough to inflate his lungs and keep the oxygen from dissipating immediately.

He stood there for a moment, trembling, exhausted.

Hope sprang up again as his lungs absorbed oxygen. His breathing became freer. He might possibly last long enough to return to the ship!

But what about McDill?

Norm groaned regretfully. Even Rives or Talbot would not be expected to carry on in the face of such disaster. He cast a last look around for the engineer. No human shape was visible. McDill would have to take his chances.

Gathering his feet together, Norm set off in a long leap for the *Pegasus.* Immediately, a stinging pain in the back of his neck diverted his attention, brought him tumbling in a heap against a mound of brittle ice crystals.

Dione, moon of delirium, was only just starting with him!

He endeavored to clap a hand to the source of the pain, swearing in a breathless mumble, "Damn green burr—got in through that hole."

But encumbered as he was by the deflated suit, a moment passed while he struggled to reach the thing and tear it away.

Meanwhile, a purely local numbness, like that produced by the injection of cocaine, had succeeded that first agonizing twinge; and by the time Norm finally managed to touch the area in question, a lump the size of a walnut had puffed up there—a lump, and nothing more. The burr had drilled in, embedding itself in the flesh almost at the base of the brain.

And unknown to Norm, a tiny, filament-like rootlet had penetrated even deeper, contacting nerves of the spinal cord.

Norm struggled to his feet. Even slight exertion made him pant and gasp for more oxygen. Then he noticed that all those other greenish burrs had departed from him, as if—well, as if his fate had been squabbled over, decided, sealed.

And suddenly he noticed something else, an utterly strange, incomprehensible thing—he possessed a new sense!

A sixth sense—a sense in addition to sight and hearing and the other normal senses; an alien, unfamiliar sense, and with it he could now sense—life!

Life all around him—an awareness of life as a form of radiant energy. Life that he couldn't see or hear—

"Lord," he muttered, "it's got me. I'm all—"

He was going to say "crazy," but he didn't actually feel crazy, merely unfamiliar with himself. He could sense life here and there around him, but more particularly he could sense something off to his right, something—a monstrous organism—that had its lair in a deep cleft in the rocks; something that was calling.

He realized that he was not himself mentally. No longer could he go on; no longer could he struggle to reach the *Pegasus* and thereby prolong his own life. His mind seemed to be divided against itself. Yet with every atom of his reason—his former self—he tried to fight against that compelling, insidious call.

"Food . . . food . . . food," boomed that soundless voice from the rock cleft. "Food . . . come nearer . . . nearer."

A strange rapture seized Eric Norm.

Food—that meant him! He was food. And this realization filled him with an elation that was pure madness. For suddenly it seemed that the entire purpose of his existence lay in the fulfillment of a certain obligation to that hidden monstrosity now calling him.

And yet his reasoning powers were apparently unimpaired. He realized that he had been trapped by one of the strange parasitic life forms of Dione. The thing on his neck was a decoy to beguile and delude him—sent out by that dreadful organism hiding in the rock cleft.

But he didn't mind this delusion. No! Above all things he longed to answer that call.

Breathless, panting, he turned aside. How long would his oxygen hold out? He had only the vaguest idea. But long enough now, in all likelihood, for him to accomplish his new purpose.

The rock cleft lay only a short distance to his right. He staggered down a talus of frost-bound rocks, into the opening. Before him he could now see that it formed one of numerous entrances into a wide gully or ravine.

Suddenly his new sense told him that McDill was down there somewhere, although it didn't seem to matter greatly. Against his reasoning self, he entered this ravine.

"Food . . . food . . . food!" With rising clearness radiated that thought-voice ahead of him, now almost shrieking its eager commands. "Nearer . . . nearer . . . nearer!"

This was the end, thought Eric Norm vaguely. The *Pagasus* would return to Earth without him. Perhaps no one would ever learn exactly what had happened to him here on this frightful moon of Saturn.

But all this was misty and unimportant.

Presently, as he staggered around a jagged block of rock which rose from the floor of the ravine, he saw his fate—a vividly green, star-shaped monstrosity! Twenty feet from tip to tip, its body bulged upward in the center to form a hideous mamelon of glaucous, glistening

flesh on which emerald eyespots pulsed with rhythmic dilation and shrinkage. The thing was advancing slowly up the ravine on its hundreds of short, pseudopodial legs.

"Food . . . food . . . food!" It was shrieking with that extrasensory voice. "Food . . . come nearer—nearer!"

Again that strange rapture seized Eric Norm—intensified now into an exquisite ecstasy of longing, a yearning to be consumed, absorbed, combined!

And as he reeled onward, his mind half numbed with horror, half frenzied with this nameless delirium, he noticed dully a strange thing on the rocks under his stumbling feet.

The floor of the ravine was strewn with milk-white nodules.

Hundreds of them lay there. And in a flash of odd vision he realized the answer. Thought-nuggets and green burrs were the same thing! This frightful organism sent out the green burrs, in a sporelike fashion, to snare and lure. When they failed to contact a living crature, they returned to this ravine where the monster had its lair, and here metamorphosed into thought-nuggets—retaining for some obscure reason the quality of being telepathically sensitive.

A pertinent discovery, thought Norm. But now nothing seemed to matter except the quick relinquishment of his ego as a separate being. So, blindly and deliriously, he reeled forward.

Now he was almost within the monster's reach—so close, indeed, that one of the triangular extremities of its star-shaped body had lifted to draw him close in its frightful embrace—when a thin, distant voice bawled out behind him.

"Norm! What the hell? Norm—come back!"

It was a real voice this time, a voice edged with fear and astonishment, a voice that he knew—McDill's voice.

McDill was trying to call him back from death. But the mystery of the engineer's voice, of his presence here, seemed of slight importance. Not worth troubling over.

Moreover, to Norm, with his new sense, there was nothing strange about it anyway. He seemed instinctively to know McDill's recent line of experience, just as well as his own. McDill had wandered into this ravine from a different angle. Enthusiastic over his discovery of myriad thought-nuggets, he was not even aware that his microwave connection with the ship had been occulted by these black, metallic rocks; and only this very instant had he glimpsed the Dionian monster.

All this was very clear to Norm—although unimportant. And yet McDill's shout, fraught with urgency, did cause him to raise his eyes for a last look around before taking that final step.

"Food . . . food!" boomed that soundless voice. With a slowly flowing motion the monster's multitudinous feet bore it closer.

McDill, corpulent in his oxygen suit, hip pouches overflowing with milk-white nodules, was bounding across the rock-strewn floor of the ravine, shouting as he came, "Norm—for God's sake—beat it!"

The fact that McDill was not himself in any danger pleased Norm distinctly. But not so pleasing came knowledge of the loyal-hearted engineer's determination to take an active hand in these proceedings.

Something touched Norm's shoulder. He glanced around. The monster had heaved itself half upright over him. The undersurface thus exposed was a writhing mass of pseudopodial legs and absorptive disks pulsing with a dreadful eagerness.

"Food . . . food . . . food!" The thing seemed to gurgle.

A gloved hand suddenly clamped itself around Norm's arm, tried to yank him back. But like a lunatic poised on the brink of a cliff, he resisted rescue, struggled to twist his arm free.

That grasp, however, was not to be broken, for McDill was solidly boned and muscled.

"Norm!" he was half shouting, half gasping. "You dope! Don't you know me? Stop fighting! Come away!"

The affrighted and desperate appeal in McDill's voice penetrated only dimly through the delirium drowning Norm's reason. He continued to struggle.

Suddenly McDill's hard fist swung up in a crushing blow that pliable glassoplast could not divert. Norm's hood bulged in against his jaw. His head snapped back, and forthwith all that scene of madness evaporated into mist.

With returning consciousness came the impression that a rather long interval had elapsed. Again Norm could breathe without gasping; there was plenty of oxygen. And even before he opened his eyes he knew where he was—back aboard the *Pegasus,* in his own bunk!

He opened his eyes. In the soft glow cast by the nimbus tube on the metal ceiling he blinked at the group of worried faces around him—Captain Egard, Griffin, Talbot, all the crew, in fact, except Perrin.

"He's coming around," said the voice of Dr. Frontain. "Take it easy, Norm—just relax. Are you in any pain?"

For a moment Norm didn't answer. He was trying to figure things out—with strangely good success! All that former obsession, the sacrifice of his body to the monster in the ravine, had vanished. He felt, if not perfectly normal, very fit indeed—and in a certain odd way even *more* than normal.

McDill shouldered his way forward. Despite Frontain's remonstrances, the impulsive chief grasped Norm's hand. "Kid, you got into this on my account. I'm sorry I had to crack you."

Norm sat up in the bunk. "That's all right. You saved my life. Thanks for packing me back here to the ship."

Frontain pushed McDill aside. "Better lie down," he urged Norm soothingly.

But Norm had no desire to lie down. Instead, he raised a hand to the back of his neck. The swelling was not nearly so noticeable, and a piece of tape was plastered over the place where the burr had entered.

"You tried to operate," he said, looking at the troubled Dr. Frontain. Norm's words were more in the form of a statement than a question.

The ship's surgeon nodded unwillingly. "Just lie down and relax," he said. "You'll come through all right."

"Why not tell the truth?" asked Norm gently. "You tried to remove the burr and found that most of it had already been absorbed. Moreover, the small vestige still remaining was so thoroughly incorporated with the spinal cord that to attempt its removal would cause my death."

Frontain's jaw dropped. "How did you know that?" he gulped.

"Because," said Norm quietly, "I can read your thoughts."

Blank amazement fell across that circle of faces.

They watched Norm rise from the bunk.

Then Captain Egard stepped forward. Worry had deepened the lines on his face. "Lad," he said gruffly, "I'll never forgive myself for ordering one of my men out in a bad oxygen suit."

"Forget it, Cap," said Norm. "I'm okay."

And this seemed to be the truth. Eric Norm had never felt better in his life. Formerly he had been of a rather quiet, retiring disposition; but now, with the possession of this new sense, a certain ease and sureness of himself had descended on him—for his mind seemed to reach out and encompass that of every man present.

Nevertheless, he was mystified. What had become of that obsession,

that delirium he had labored under? Of course, McDill's interference, which had prevented him from uniting immediately with the Dionian monster, might be the solution. For the telepathic control exerted by the monster over its burrs might conceivably be expected to grow weaker with the passage of time.

But what about the burr itself? Why had it not killed him? Would it eventually kill him?

Rives and Talbot were staring at him with odd, slightly abashed expressions. And for once Rives was speechless.

Norm grinned. It seemed almost as if they were all expecting him to take charge of things.

"I think," he observed with quiet assurance, "that Dr. Frontain has figured out a possible explanation as to why that burr hasn't killed me. Won't you tell us about it, Doc?"

"This is the most astounding thing that every happened to mankind!" gasped Dr. Frontain. "Yes, it is true! I do have a theory. These burrs, as we know, belong to a symbiotic life form. It is quite apparent that when they attack man, the burrs are not in themselves deadly. The man attacked immediately acquires a new sense. And if he is prevented from sacrificing himself to the parent organism during the subsequent brief delirium, he may even be permanently benefited. This life form, since it works on a symbiosis, does not kill him but merely attempts to continue its symbiosis. It is mutually profitable both to the life form and the man, but more profitable to the man because he has at last acquired a long-desired faculty.

"Moreover, this new sense will undoubtedly be transmitted from generation to generation, as are certain earthly forms of symbiosis with which we are already familiar.

"This, gentleman, is my theory!"

As Dr. Frontain ceased speaking, Captain Egard stepped to Norman's side.

"Men," he announced gravely, yet in a deep tone of triumph, "we shall leave Dione immediately. We have more than accomplished our mission. Not only shall we return to Earth with a plethora of thought-nuggets but with something much more auspicious.

"Behold the superman!" he rumbled, placing his hand on Norm's shoulder. "The possible progenitor of a new race of humans—the first man with a complete telepathic sense!"

Theodore Sturgeon

COMPLETELY AUTOMATIC

By the time man has developed space flight to a point where he can explore beyond Jupiter and Saturn, his spaceships will have had to reach a high point of perfection. No longer will the engines tend to blow up on the slightest provocation; no longer will the average *meteor present a serious hazard. The greatest danger in those days will be complacency and overconfidence. This story, which describes the "possible world" of a huge interplanetary liner of tomorrow, shows what the costs of overreliance on automatic machinery may lead to, what may happen when the need for human responsibility has presumably been eliminated.*

"WHAT the devil does he do for a living?" I asked as the petty officer left the mess room.

"Nothing," said the second officer. "Nothing at all."

"What do you carry him for, then?"

The second was a man in his middle forties with a very nice grin. He used it now. "We carry him just in case," he said. "He's the chemical supervisor. He stands no watches, makes no reports. He reports aboard before we take off and disappears when we make port. For that he knocks down six hundred and forty credits a month."

"Six—Holy Kit, that's a lot of change for doing nothing. I was always under the impression that the crew of a spaceship was streamlined down to practically nothing. Does every ship carry these . . . these paid passengers?"

The second nodded as he filled my glass again. "There was a time, four or five hundred years ago, when a ship couldn't have done without them. They had no automatic machinery to speak of then. The ships were self-powered, and half their capacity was given over to fuel. Half the rest was driving machinery. They had no power beams then; they had to plot their courses and steer them every trip. Now, of course, with the power beams that both guide and drive the vessels, things are different. There are only two or three hundred men in the System that know the theory of astrogation nowadays, and they are either research scientists or doddering scholars. It's only tradition that

keeps a crew aboard any more—that and the fact that the more jobs the Supreme Council can create, the better for everybody. I don't kid myself—I know damn well that I could be replaced in a minute by two switches and a rheostat on the control panel back on Earth. That goes for everyone else riding these ships, too. Only the passenger ships carry captains, and they are there to impress the passengers. Sort of glorified masters of ceremonies. No, space travel isn't what it used to be."

"That may be true," I said, "but at least you do something for a living. You stand a regular watch and supervise the stowage and the passenger lists and keep the log and give the passengers the idea that the ship is in competent hands—but what about the chem super? False front is false front, but it's usually attached to something solid. That guy hasn't even an excuse for being aboard."

"You don't think so? Granted, his work is taken care of entirely by automatic machinery that hasn't broken down once in the last three hundred years, but that isn't the point. Remember—I told you that he is here *just in case.*"

"In case of what?"

"Certain eventualities. Got an hour or so? I'll tell you a story about a chemical supervisor that might interest you."

"Go ahead," I said. "I've got three weeks with nothing to do, let alone an hour. Start spinning."

The second officer unzipped his colar, flipped a lever on his chair to tilt it back a little, and began.

The reason I think you in particular would be interested in this yarn is that it has to do with what happened when they did exactly what you say they should do—get rid of some hundred-odd thousand pieces of deadwood in the way of chem supers and their apprentices. Yeah, they did, about twenty-eight years ago. There was a great deal of noise about it at the time, because most of the old conservatives didn't like the idea of breaking an old space tradition that way. They said that spaceships should no more take off without chem supers than they should without lifeboats. The fact that no one within the memory of living man had ever used a lifeboat for anything but joy riding didn't faze them.

The machinery was foolproof, rigidly inspected every trip, and all of it either one hundred per cent automatic or remote control. Supers sim-

ply were not needed. The boys that held down the jobs were, with a few exceptions, friends of somebody who had a friend in the office. Their qualifications were courtesy ones; a couple of oral questions were examination enough for them. Many skippers carried their relatives with them as supers. A lot of fellows grabbed the jobs because they were sincerely interested in space travel, and that way they could have a good look around the ship to see how they liked it and what kind of work would suit them best. It was a setup—harmless enough, to be sure, except for the fact that the supers got paid a high wage, and that made the rest of the crew a little sore because they had to work for a living.

This was before the days of the Functionalist government, when many of the space lines were privately owned and the big boys at the top were anxious to cut costs and increase profits without regard to the number of men they threw out of work. I don't have to tell you that space transportation is as big an industry as they come; to get rid of a chem super and his apprentice on every single ship in the System that ever left any atmosphere was a big jolt. A few hundred thousand men thrown out of work all at once played hell with the economic balance, close as it was. Besides, most of those supers were absolutely worthless—bums, parasites, drifters, troublemakers.

It was a foolish move, and the Council knew it; but the pressure put on by the profit-drunk "efficiency" experts of the space companies was too strong. They bounced them out—every last one of them. It's interesting to know that it was that group of worthless ex-supers who, by the noise they made, were ultimately responsible for the new setup, where men are hired and paid for jobs that could be done away with—my job, for instance. It's better that way. No one loses anything; the companies don't gain so much, that's all. They can afford it. And it has completely done away with unemployment.

But to get back to the supers. I know all about what happened because it happened aboard the *Maggie Northern,* my first ship—my first job on these cans. It was a first for the ship, too—her first trip without a super.

I came aboard her—I was a teen-age kid at the time—with a suitcase with a busted handle under my arm and more ignorance than sense under my hat. I got in a lot of people's way and was finally shunted into the rocketman's fo'c'sle. I stood in the middle of the floor feeling shy. I hadn't known a spaceship would be like this. Like every kid my

age, I had filled myself full of stories about the trade, and thought it would be cramped and stuffy with tiered bunks and lacking every facility a he-man would sneer at. But this, one of the poorest equipped freighters in the Great Northern ore fleet, had three men to a room, each with a bed with innerspring mattress, hot and cold running water —the works. Some bright soul had painted a garden scene on the windowless bulkhead and had rigged it up with a window frame, glass, and curtains. There was a kid a couple of years older than me sitting on a bench looking sad. He looked up at me.

"Hi. You the new wiper?"

"Yeah."

He got up and stuck out a hand. He was a good-looking kid, very tall. Well set up. "My name's Hume. Welcome to our dirty little home."

"I'm Babson. It don't look so bad."

"Neither does Fuzzy here," said Hume as a burly individual, the third wiper, came into the room. "But, boy—wait till you get to know him."

Fuzzy stopped in his tracks as he saw me, and waited while his apelike face lit up. Then he ambled over to me, looked into my face, circled me slowly. "I seen that hay spread on the gangplank an' I figgered they was goin' to coax somethin' like this aboard," he said as if to himself. "What they doin', Hume—shippin' hog callers now that they got rid of the supers?"

I got sore right away, not knowing kidding when I ran against it. "I don't think I like this guy, Hume," I said, and squared off to this Fuzzy.

Fuzzy said, "Heh! It talks!" But he went over to the lockers and began being busy.

"Don't mind him," Hume told me. "He ain't happy. I was super on this scow, see, and he was tired of working for a living and was after my job. Darn near got it, too—didn't you, Fuzzy?"

Fuzzy grunted.

"Would have, too, only the Council wiped the job off the books. That's the only thing about losing my job I like—it didn't go to a heel like that."

Since Hume seemed to be getting away with talking behind Fuzzy's back to his face that way, I thought I might as well chime in. "What'd he do?"

"Started studying chemistry, of all things! He was all set to prove to

the Board that he knew more about my job than I did. As if anyone cared about how much a chem super knew! Anyhow, he's all set to pull his little blitz on me, when the job disappears. This scow, being an ore boat and notably ill equipped, has no apprentice super. I get demoted to wiper; Fuzzy is still a wiper; you're another."

I laughed. Fuzzy swung around. "All right, you mugs. I'll get my chance to show you wise eggs up yet. Some day that job's going back on the books. When it does, I get it."

"Not a chance," said Hume. "It took the Council three hundred years to get rid of the job. You'll be on a government pension before you ever hear of it again."

Fuzzy opened his mouth to say something else, but the loud-speaker cleared its throat and announced the take-off. The two wipers jumped to their bunks, threw up a lever, and lay down. I followed suit; in a few seconds there was a grinding roar and our beds slid on quadrantal rollers up against the bulkhead. There was a moment of crushing weight, and just when I thought I'd never get the strength to draw in another breath, the beds slid back off the bulkhead and were parallel with the floor again. In those days the momentum screens were inoperable inside the Heaviside Layer, and during the few seconds it took to get outside, the acceleration was really rough. They could lay it on thick because it lasted such a short time, but I can tell you, the headache you carried around with you for a couple of hours after starting was one to stand up and sneer at all the other headaches on Earth, laid end to end.

I learned all I had to know about being a wiper within two days after starting. I had a station to keep clean, a few alleyways to sweep, and the twelve-to-four spaceman to keep entertained. His job was to clean another station, sweep the alleyways I didn't sweep, and entertain me. In the old days, you know, they had an engine room aboard, and a crew to run it; and they had a control room and another crew to run that. The Plotnick-Martin power beams take care of that now. The three spacemen held lifeboat tickets and the wipers didn't, and that was the crew. They stood watches, two at a time, four hours on and eight off, and then there was a pinheaded individual who used to wander around the alleyways at odd hours doing nothing that I could see. He answered to the title of captain and he carried papers certifying his ability as a stowage expert for this particular ship.

That ship was quite something. There may be a few of them left—bulky old KH-type ore carriers. The series has been discontinued now, but it seems to me I saw one or two of them on the interasteroid runs a few years ago. Her capacity was something like two hundred thousand tons net, and she was loaded to the ceil plates with granular magnesium and sodium for the Sun mirrors of Titan. I don't have to tell you about the seven two-mile-diameter orbital mirrors that circulate around the satellite, making it habitable. You may not know, though, that the girders are all solid mag, because great rigidity isn't needed out there, and mag is cheap. The mirrors are silvered with sodium, which is easy to handle and bright. They have a patrol for each of the mirrors, which patches up meteorite punctures when they occur, squirting liquid sodium around the holes until they fill, then shaving them down with N-rays. Well, we were bringing them their stock in trade, and it was an interesting cargo to handle. The mag was flaked to facilitate melting and casting, and the sodium was melted on Earth and run right into the holds, where it "froze." When we discharged it, we would simply heat up the holds and pump it out. As long as it was loaded in an atmosphere of nitrogen and pumped out in space, there was little danger from it. We had tanks of nitrogen under pressure aboard, because after the sodium solidified in the holds it was contracted. The space it left had to be filled with something, and it better not be air or water! Hence the nitrogen.

After a couple of weeks of this kind of life I began to wonder about the stories I had read, and what happened to all the glamour and adventure the space service was steeped in. I even went so far as to ask Hume about it. He thought it was very funny.

"That whiffed out with the power beams," he told me. "There wouldn't be anyone aboard these ships if it weren't for the fact that someone has to keep the chrome clean and the books up to date. Then, of course, there are emergencies."

"What?" I asked hopefully.

"Oh—I dunno. I never heard of any. But just in case some of the machinery turned out not to be fool-proof, which has never happened so far, or in case something happened to the ship—"

"But what *could* happen?"

"Well—aw, why worry about it? Nothing ever has. If it did, it would happen so quickly we'd never know about it, or the ship would take care of itself so fast that by the time we realized there was an emer-

gency, it would be past history." He sat down on the mess-room table and put his feet on the bench. "Look, kid, I might as well wise you up. This is no kind of a life for a human being. If any of us were worth a damn in any trade at all, we wouldn't be here. If the Board members weren't as worthless as we are, they'd build ships without crew's quarters. If you have any gumption, you'll get off as soon as we get back to Terra, and go back to raising castor beans or whatever else it was you were doing before you shipped aboard this mud hen. If you have no gumption, you'll stay here with the rest of us bums and pray that the world in general and the Space Commerce Board in particular doesn't get hep to what soft, soft cushions a space tradition has shoved under our fat—"

Crash!

It wasn't a loud noise, and it wasn't much of a lurch, but both were so utterly unexpected that we found ourselves thrown very hard and very flat.

Hume looked at me blankly. The lights went out, flashed on again as an automatic emergency circuit snapped in. He said in a weak voice, "Well, there's your emergency!" and fainted away.

A voice I had never heard before said sharply, through the speakers, "Emergency! Stand by!" I rightly assumed that this, too, was an automatic alarm. I shook Hume until he sat up.

"What do we do now?" I snapped at him. I rather think I was a little panicky.

"I only work here," he said with a sickly attempt at levity. There were voices in the alleyway outside. We drifted out there. It was the captain and two of the spacemen.

"How should I know? Who do you think I am—Plotnick?"

"Who's Plotnick?" asked one of the stooges. The fact that Plotnick had invented the power beam that Martin had adapted to interstellar commerce was just another of those things that those guys never got around to learning.

"Plotnick's dead," said the other stooge brightly.

"The captain ain't dead," said the first stooge even more brightly.

"Oh, go on back to bed," said the captain pettishly. "Something happened. I don't know what it was. It'll be fixed when we get to Titan. Pass the word."

There was no necessity for that since the whole crew was there by that time. Those not on watch went back to bed. Yeah—back to bed,

in the most desperate emergency any of them were ever destined to live through.

I went on watch two hours later. I hadn't slept very well. Breathing was hard, and my heart was racing violently. I dozed fitfully, not realizing what the trouble was until the sting of sweat got into my eyes and I came awake. Just then Fuzzy came in to call me.

"One bell, lug," he said. His usual shirt and dungarees had given way to a pair of underwear shorts, and he, too, was sweating profusely. What jolted me more than anything else was his voice. It had been a deep gas-on-the-stomach bass. Now it was a quavering tenor-baritone.

"Comin' up," I said, and rolled out. We stared at each other curiously. My voice had positively pip-squeaked. He opened his mouth, closed it again, and went out. I noticed he was panting.

There was a red light blinking over the door. I'd never noticed it before. Somewhere an alarm siren began wailing. I didn't know what that meant, either. I rolled out and headed for the mess room. They were all there. Everyone looked worried except the captain. He just looked unhappy. They were all asking him what had happened, what was happening. I gathered that everyone was having trouble breathing, and I know everyone's voice sounded like a recording speeded up three hundred per cent.

It was hot as hell.

Came that throat-clearing sound from the annunciators. Everyone shut up. Here at last was the blessed voice of authority. "Air pressure falling," it said. "All hands into spacesuits. Look for leaks."

We looked at one another stupidly. No one had the slightest idea where a spacesuit might be found.

There was a whir and click from the alleyway. Someone looked out and reported, "An impenetron shield's blocked us off from the rest of the crew's quarters, Cap."

"My word," said the captain.

"My cigarettes," said Fuzzy.

The captain started forward. We followed because there was nothing else for us to do. When we got to the control room another shield dropped quietly behind us.

"No more mess room," said Fuzzy sadly.

"Yeah. No more eats," said one of the stooges.

"I don't see what's so funny about this," I said. I was scared. I was

more scared than I ever even heard of anyone being. I was wishing I was working in the mines instead of this. I was wishing I was home in bed.

"There isn't anything funny about this," said the captain worriedly. He began fumbling a door open. We trailed in.

Thank heavens the captain knew something about the ship. The room was lined with case upon case of supplies—food, weapons, coils of wire, masses of spare apparatus that none of us knew anything about. But we knew cases of food when we saw them. There was even a roomy refrigerator there for storage. Also—eight spacesuits. Spares.

The captain checked our rush for them. "The air's all right here," he said. "Those automatic gates must have cut off the sections where the leaks were. We'll just have to make ourselves comfortable here."

"Yeah," said one of the stooges. "No beds. Where am *I* gonna sleep?"

There was a babel over that childish question. I drew Hume aside. He was no gem, but he seemed a little more intelligent than the rest of them. "What's this all about?"

He scratched his ear. "I dunno."

That seemed to be a reflex with these boys—"I dunno." "I guess we hit something—or something hit us."

"That would account for the loss of pressure," I said, "but what about the heat?" He began to speak; I stopped him. *"Don't* say, 'I dunno.' Think, for a change!"

It was a new idea for Hume. He turned it over for a minute and then came out with, "Why should I worry about it? The ship can take care of us till we get to Titan, and then the repair crews can worry about it."

"Okay, okay," I said, sore. "Go on, worm, spin yourself a cocoon. Me, I'll do my worrying now. That heat isn't coming from just nothing. Seems to me if we were just punctured it'd be getting cold here, not hot. But—you ain't worried. So go ahead. Be happy." I walked away.

He stared after me for a second and then shrugged and started looking for a place to bunk. Twice, out of the corner of my eye, I saw him stop and stare at me. He seemed to be going through pangs of some sort. I had a hunch what it was. The birth of thought. The stirring of an awakening intellect. It isn't surprising. Brains atrophy when they're not used, same as arms or legs. Boy, he was a case.

It got hotter.

I went to the captain about it. He actually seemed to be listening to everything I had to say. He nodded sagely every time I paused for breath. I was a little more than annoyed when I realized that he was nodding because he didn't understand a word of what I was saying. In some kind of desperation I asked him if there was, by any chance, a manual aboard, describing the ship and its equipment. When I had finished he went right on nodding his head, realized I had asked him a direct question, and stopped, not knowing what to do with his little head. Not use it to think with, certainly. He was another. The things that happen in the name of civilization! Some people would call this kind of ship progress. I was calling it poison.

"Yes," he said uncertainly, "there ought to be some such thing around." He began fumbling through the stores. I had to keep on his tail or he'd have forgotten what it was he was looking for. "Don't know what you want it for. Can't imagine. Terribly dull reading," he kept muttering. Suddenly he came across a box of books. He pulled one out, looked at it—the son of a gun could read, apparently—and exclaimed, "Now *here* is something!" He handed it to me. It was a trilogy of romantic novels.

"What the hell's this for?"

"One of the finest books I ever read," he said in a let-me-be-a-sister-to-you tone.

I threw it at his head, tipped the books out. The manual was there, all right. It was a thick volume, very efficient-looking. It was. It was streamlined. It consisted of column after column, page after page, of figures and letters and dozens of symbols I'd never heard of. I couldn't understand a letter of it. In the foreward it said something about a key. Apparently there was a twenty- or thirty-volume key somewhere which gave the definitions of all that spaghetti. There was, the captain informed me—in the after magazine.

The after magazine was closed off by those precious automatic gates.

I groaned and took myself and my manual off into a corner. Somewhere in that book must be what I was looking for—instructions on how to proceed when your ship seems to be burning up. I raised my head. Burning up? If something was burning—

But what could be burning? The ship was all steel and impenetron. The cargo—*magnesium. Sodium!*

I almost let out a shout, but I hadn't the heart to disturb all those happy, stupid, unworried drifters. What good would it do them to

know what the trouble was? They wouldn't know what to do about it if I did tell them.

No one got in my way as I circulated around the control chambers, staring at the maze of dials and indicators banked around the walls. The ship's designers had had a shot of the interior decorator's virus mixed in with their blood, it seemed to me. There were more damn concealed closets and sliding panels than a dope addict could dream up. It was mostly by accident that I found what I was looking for—a panel studded with tiny centigrade dials, with a monel plate at the top bearing the inscription "Cargo Temperatures."

Now the *Maggie Northern* had seventy-six holds of various sizes. Our cargo was about one-sixth sodium, the rest mag. According to the dials—and there was no reason why they should lie about it—fourteen of the mag holds were at temperatures ranging from nine to eleven hundred-odd degrees. Fourteen of them, all on the starboard bilge. That was all I wanted to know. I called the captain over. He peered owlishly at the dials.

"There's your trouble," I said with the air of a man completing a very complicated card trick. He nodded and looked at me as if he expected me to say something else.

"Well, what's the matter with you?" I roared. "The mag's afire! We hit something—sideswiped it! The frictional heat raised the mag to its kindling temperature; there was a residue of air in the holds; the mag started to burn, softened the bulkheads, and the air pressure from alleyways and living quarters and other holds caved them in and fed more air to the burning mag!"

The captain shook his head in wonderment. "You certainly seem to have doped it out," he said admiringly.

I stared at him, unable to believe my own eyes and ears. "What's the matter with you?" I screamed. By this time the rest of them were gathered around us, looking like a flock of sheep just over the hill from blasting operations. "Radio in to Titan! Find out what to do about it!"

The captain looked about him blankly. "What's the use? The ship's duplicate indicator board has already told the Titans all about it. I can't imagine why they haven't already let us hear from them."

"Try it," I gritted.

"Why?" he said.

I plowed into him. I only got a couple of good ones in before Hume and Fuzzy piled on me and held me down. The captain ran into the storeroom and shut the door.

"You shouldn't have done that," said Hume amazedly.

I said something like "Ugh!" and shrugged loose.

Fuzzy's ape face was disgustingly slack. Those guys didn't have the guts God gave a goose.

I went over to what looked to me more like a visiscreen than anything else in the place. There was a switch beside it. I threw it. Nothing happened. "Where's the receiver and transmitter?" I growled.

One of the spacemen piped up. "That's my station," he said. "Starboard side, down below."

I had another look at the hold-temperature indicators. "Fused solid by this time," I grunted. "You know anything about radio?"

He shook his chowder head. So did everyone else. I felt like crying.

Somebody had to do something. I couldn't—I didn't know anything. If only I had—aw, what's the use! And then it was I had my bright idea. I turned to Hume.

"Listen—didn't you say you were chem controller aboard this ship?"

He nodded.

"Well—come on then—give. We got a fire aboard. Put it out!"

"Me?"

"You."

"Oh." He counted on his fingers in slow motion, which, I gathered, was his substitute for thought. Finally he came out with, "I don't know how."

"You don't know how." I was going to get started on a long diatribe about how he ever got to be a chemical controller when he didn't even know how to put a little fire out—a fire that would have us all well-done and tender a week before what was left of the ship reached Titan. I decided to try to be patient.

"Look," I said gently. "Unless something is done by somebody, and soon, you and you and you are going to be roasted alive in this pig. See? I don't suppose you've noticed it, but it's getting warm in here too, already. Look— Four more holds have gone. Okay. Sit around and tell each other some bedtime stories. Go on. Die. See if anyone cares. Wait until the air gets so hot in here you can't breathe it. Watch your lazy ignorant flesh slough off when it starts to cook. It won't be quick,

you know. You'll stay alive a long time. You have plenty to eat, plenty to drink. It'll hurt some, but what do you care? You're too damned comfortable to do anything about it."

The boys looked definitely sober. After a while Fuzzy spoke up. "Come on, Hume—can't you think of something?"

Hume had suddenly become very important to all of them. And I think the guy was really trying to come through. "We could put water on it," he said finally.

"This ain't a house fire, you know," I said.

"So what?"

"So—nothing," I said in my ignorance. "Try it, anyway; try something."

We coaxed the captain out and explained what went on. It was all right with him. Anything was all right with him. He showed us the tank valves and the controls to the hold pipelines. Luckily they were very plainly labeled. Hume went to work on No. 14 hold. It wasn't as hot as the others, according to the temperature readings. The hottest any of them got was around eleven hundred, for some reason. Fourteen was about eight hundred. That was the mean temperature for the hold; I gathered from that that it was part afire. After a lot of fumbling Hume got the vents into the tank open and the water turned on. We could spare the water—all those ships stored themselves with a safety factor of five. Council law.

The hold had gotten fifty degrees hotter before Hume got the water in there. As soon as he turned his valve the needle bounced up to about two thousand and quivered there.

"Turn it off!" I squawked. "That mag likes water. It likes it very much. Look at that!" I pointed at the board. The next hold was getting hot.

"Now what?" said Hume worriedly.

Me, I didn't know what to say. Fuzzy saved me the trouble.

"Get out of the way," he spat, suddenly very much alive. "You call yourself a chem super! I wasn't far off when I got the idea I could push you out of that job! Let a man in there." He slammed Hume aside, began to be very busy with the valves. "The setup's perfect," he said. "What's in a fire extinguisher? Water? No, dope—carbon dioxide. We have a fire in an enclosed space—all we have to do to blank it is fill the hold with CO_2! Cap—give me a hand."

I just watched. It sounded all right to me. Hume looked ashamed

of himself. The rest of the boys clustered around the temperature gauges.

"Try hold number twenty," I said.

Fuzzy threw over a lever and turned a valve quickly. There was a new confidence in the way he worked that was like a breath of cool air in the control room. Only there wasn't any cool air in the control room. It was getting hotter. Seven pairs of eyes watched the needle, narrowed as it flickered, widened as it slid over the dial to two thousand plus.

"Cut!" I cried.

There was a dead silence. Someone said unnecessarily, "It likes carbon dioxide, too."

"I don't understand it," said the captain. "I've been loading mag on this run for eight years now." He mopped his head. "I know all about it—specific gravity 1.75, boiling point 1100, melting point 632.7. But I guess no one ever thought I'd have to know how to put it out if it started to burn."

"And you never thought to look it up," I said.

He shook his head.

I'd noticed that Hume had been sulking a little too silently in a corner after Fuzzy had shoved him there. He suddenly let out a yip and dove for the valves.

"Now what?" I asked.

"That would-be over there," Hume said, nodding toward Fuzzy, "barked up the wrong stump. I've got it! We're safe! Look—when mag burns—when anything burns—it hooks up with oxygen—right? It burned the oxygen in the air. It burned the oxygen in water. It burned the oxygen in the CO_2. But there ain't no oxygen in nitrogen!"

I turned it over gleefully and slapped him on the back. He and the captain got busy hooking up the nitrogen tanks to the hold pipelines. I called for No. 22. It took a little longer this time, due to Hume's accidentally turning the water valve on instead of off when he had finished turning a whole set of wrong valves, so that the nitrogen, under pressure, backed up into the water tanks. But we got that straightened out and proceeded.

Nothing happened. One of the stooges got hysterical and had to be locked in the storeroom. The needle wavered a little, went down twenty degrees, stayed there. In a few minutes it went up.

"It used up all the nitrogen!" wailed the captain.

Hume said, "Must have combined with it. Damn. That mag sure is hungry." He looked at me as if I were a policeman and he were a little lost boy.

"Don't look at me that way," I said. I glanced at the dials. More than half the mag cargo was either burning or ready to. I had a bright idea. "Dump the cargo!"

The captain spread his hands. "Can't. If the hatches are opened, the automatic relays will break the power beam. The ship can't take off, operate, or anything else with the hatches open."

"Oh," I started walking up and down. I took off my shirt. Everyone else already had. Some had gone further than that. These automatic controls might have some good points, but—boy, oh, boy! when they started working against you!

I whirled on the captain. "What about the lifeboats?"

He looked up hopefully and then shook his head. "There's one forward and one aft. But they're both aft of here; we're right up in the nose now. The impenetron shields have locked us in. There's an escape hatch here, but—no, the lifeboat locks can only be opened from the inside. We couldn't get to the boats if we went out in spacesuits."

Hume got excited then. "How about those spacesuits?" he rapped out. "When it gets too hot in here, couldn't we cling to the hull in suits until the ship docks?"

We streamed into the storeroom. On each of the space helmets was a tag describing the air, water, and food rations for each suit. Enough for eight days. We wouldn't be in for another two weeks. We went back to the control room and sat down. The stooge who had been locked in came out with us, much chastened. It got hotter.

Four days later we were a sorry-looking lot. No one had spoken for twelve hours. We'd thrown away all our clothing with metal fasteners, all rings, wrist chronometers, and radios, because the metal was too hot to bear. The refrigerator in the storeroom had afforded some relief until it broke down. We were in a bad way. And one by one the crew started to crack. Hume began to giggle quietly to himself, on and on and on. Fuzzy lay still like some great hairy animal, panting silently. The captain sat unmoving, with an insanely complacent smirk on his excuse for a face. No one dared move or speak because of the

agonizing impact of the hot air on their bare flesh when they did so. There was no relief, no help for it. By now the sodium cargo was molten, the mag burning wherever it could find air—and it found air every time it got a bulkhead hot enough to work on it. The bulkheads weren't built for that sort of thing. They could take any kind of hammering when they were fairly cool, but that damn alloy couldn't take it when it got much over a thousand degrees. The hull resisted nicely enough, more's the pity. We'd have been happy to see the mag burn its way through into space.

No one noticed the faint rumbling sound any more, once we had doped it out as merely the opening up of new bulkheads, feeding more air and more mag to the voracious fire. But all of us started weakly at the tremendous shuddering crash that echoed suddenly through the ship. The captain began to laugh crazily. We looked at him numbly.

"She's still working," he whispered hoarsely. "And that finishes us. The ship was getting off balance. The automatic equalizing chutes just opened. All the mag on the port side's open to the fire now." He waved weakly at the temperature board. Every needle on it had begun to climb.

Hume said something that made my flesh creep. "I wish I had the guts to kill myself."

Another two days. The crew sprawled around, asleep or unconscious or dead. I came to for a little while, I remember, because I started coughing weakly. Hume, in a last effort to accomplish something, had opened a water valve he'd discovered in the storeroom, thinking it would cool us off. It puffed into steam where it touched metal, and the air was full of it. Somehow someone else—Fuzzy, I think—managed to turn it off.

Then there was a time when someone began shaking me and shaking me. I didn't see how I could be alive, but I must have been because I felt the heat again. It was Hume. He had lost about thirty pounds. He had a red beard. Red eyes.

"Whassamarrer?"

"The gauges! They're . . . they're going down!"

I lay there for a long time, not able to react. He crouched over me, a thin line of moisture creeping out of the corner of his mouth.

"The holds are cooling down!" he said again, and began shaking me.

I sat up, blinked at the board. It took quite a while for me to focus my eyes, but when I saw he was right I somehow found the energy to get my feet under me, climb upright.

It was unbelievable, it was past all hope, but it was true! Hume started giggling again, and this time it didn't annoy me because I giggled too.

"The mag," he said. "You see? Why'n hell didn't we think of that before? Mag's a good conductor. When the ship equalized herself, the rest of the mag smashed down on what was burning, soaked up heat, distributed it so much that it lowered the temperature below kindling point!"

"Throw another log on the fire," I crooned, "an' the fire goes out!" And then the rest of it occurred to me.

"Th' sodium!" I said. "See what happened? It dumped onto the hot mag, vaporized. The vapor conducted the heat to the ship's hull. She's radiating it off! If it wasn't for that, the temperature would just get to a certain point and stay there, and we'd have gotten roasted anyway, fire or no fire!"

We hugged each other gleefully and then started working on the rest of the crew.

"Well, that's all there is to it. We rode in to Titan on the super-efficient wreck. We were all of us more dead than alive, but what the hell —as long as there was life enough left to bring back." The second officer of the new passenger liner stood up and stretched himself.

"So they restored the office of chem super?"

"Yep. But now those boys really know their stuff. Man—you ought to see the examinations they have to pass to get that kind of money for doing nothing! I'd sooner work for pay all along the line than work for nothing trying to learn that much about a job I might flunk out of anyway."

"Just a second," I said. "A couple of things I'd like to know. What happened to Hume and Fuzzy?"

"Both got the jobs they wanted. You'd be surprised how hard they studied their chemistry!"

"Not under those circumstances I wouldn't," I said. "Er . . . one thing I don't understand. You said that the ship was thrown off balance when one half of the mag cargo was ignited. How come? Where'd the weight come from?"

The second officer fastened his collar. "Very shrewd of you, my lad. Can you keep something to yourself?"

"I can try."

He sat down again and put his head close. "The *Maggie Northern* didn't put her own fire out. I did."

"*You* did?"

"Yeah. Now wait a minute—don't go giving me credit for it. I turned plumb yellow. I got hysterical. I couldn't stand to see those boys gasping out their lives for days on end. Most of all, I guess, I couldn't stand the idea of dying that way myself. That 'log on the fire' business was my idea. If half the cargo would burn and kill us slowly, I assumed that if the whole cargo burned we'd die fast. I dumped the rest of the cargo on the fire. Maybe some of them saw me, but no one noticed. Well, it turned the trick, and it wasn't the kind of thing I'd bring out at the inquest if nobody else did."

"Completely automatic," I murmured. "I've sure changed my opinion about these useless jobs. You guys can get along swell without brains!"

Nelson S. Bond

THE DAY WE CELEBRATE

Uranus, nine and a half times as far from the Sun as Earth, is a planet with gravity nearly the same as Earth's—eight per cent less—even though its diameter is roughly four times as great. This means that its density is very much less than Earth's. However, in view of its estimated surface temperature (—300°F), most of its gases will certainly be frozen solid enough to form a crust upon which man could exist—always provided that our insulating materials and methods are by then much more perfect than anything now available.

This story imagines a native life form which is definitely humanoid, though obviously unlike ourselves in many respects. What the humans on Uranus, with their atomic energy, their fire power, and their arrogance, do to these natives makes for a wryly satirical study of colonial administration under unprecedented conditions.

IT HAD snowed yesterday and the day before. It was snowing now. It would snow again tomorrow and the next day.

"—and the day after that," said Baldy Harrigan, warden of Penal Colony No. 1, Uranus, "and the day after that, and the day after *that!* And so on. *Ad infinooty.*"

He turned disgustedly from the quartzite view pane. There was nothing to see outside there but rolling dunes of frozen carbon dioxide, rime-crusted hills of raw metal, and a tempest of white granules sifting endlessly out of a dull and sullen sky.

Beside him, his companion, Rusty Peters—once an inmate of P. C. 1, then a trusty, now, by choice, Baldy's chief assistant—crammed another fistful of scrap into an already bulging jowl.

"Odd which?"

"Infinooty," repeated Harrigan. "That's Latin for, 'till it gives you the screaming meemies.' Don't it never do nothing but snow on this here lousy planet?"

"Sometimes," consoled Rusty, "it sleets. Gee, what the hell, Baldy! We ain't got no squawk. It's safe an' warm here in the dome, anyway. S'posin' we lived in caverns, like the natives? They've *really* got it tough."

Baldy Harrigan's space-faded eyes crackled.

"The tougher," he snarled, "the better! Them green scuts give me a headache in the sitting-down place. We could be hearing music and seeing pictures from New Oslo except for them. Something to pass the time away.

"But, no! They pick a season like this to smash up our outside aerials. Which means that all we get in the line of entertainment is coded weather reports and flight transfer orders.

"Just wait! The first clear spell comes along, I'm going to take out an expedition and give them dead pans what-for! Somebody ought to 'a' done it long ago, anyhow—"

"Don't look now," said Rusty, "but it's been tried. Not once or twice, but about six million times. The Patrol's been warrin' on the Uranians ever since the first flight ship dropped gravs here. So what? So they still ain't managed to squelch 'em. The natives is still makin' periodic attacks on the Earth colonies.

"For which," he added pensively, "I don't know as I blame 'em much. After all, Uranus *was* their planet. Till we come along. An' the Patrol ain't exactly what you might call no debatin' team. Its missionary method is *bang-bang!* with a rotor gun, an' you're civilized. R.I.P."

"The Solar Space Patrol—" began Harrigan stiffly.

"Yeah, I know. It brang order out o' chaos. Or so the buttons on the unyform say. Nuts, Baldy! The Rocketeers ain't no diff'rent from any other bunch of conquerors. They do just what England done in India, Holland done in the Pacific, an' the States done in the Philippines. 'Underneath the starry flag, civilize 'em with a Krag'—an' so on!"

Rusty grunted, scanned the metal-walled antechamber hopefully with his eyes, and dropped a quivering arc of brown liquid dead center into a distant gobboon.

"Nevertheless—" said Baldy.

"The Uranians *are* pests," admitted Rusty. "They git in our hair. They raid our outposts an' bust up our vallybul equipment an' when they can git gunpowder—which ain't often—they even attack domed cities like New Oslo.

"But why do we hafta be so rough with 'em? Why not call a big conference an' parley our diff'rences? That would be better'n formin' parties to blast 'em out of existence."

"Nevertheless," repeated Baldy, "and howsomever—"

"Hey!" said Rusty. "What's up?"

The intercommunicating visiplate on the far wall of the chamber had brightened. The face of Tommy Henderson, the Penal Colony's radioman, was imaged on the gleaming platter.

"Warden Harrigan?"

"Yes."

"An important message from Patrol H.Q."

"Go ahead."

"It's a G. O. signed by Colonel Cochrane, commanding Interplanetary Division 134. It says, 'The governing council of the Planetary Union, in congress assembled, has decided to finally achieve a solution of the Uranian problem—' "

"Hold it!" snapped Baldy. He stared at his copper-thatched associate. "I and you must be psychic! Just what we was talking about. We'll be right there, Sparks!"

This last was over his shoulder to the visiplate as he tugged at Baldy's elbow, his walk breaking into a waddling run. The radioman's puzzled face faded from the plate as the two men hurried through the dome to the communications room.

There, a few moments later, they saw the message in its entirety. It was, as Sparks had said, from the commander of the New Oslo garrison.

" 'The governing council of the Planetary Union,' it ran, 'in congress assembled, has decided to finally achieve a solution of the Uranian problem.

" 'This is to be done immediately, in order that the date of accomplishment may coincide with the date of tomorrow—a holiday observed and respected by all Earthmen.

" 'The present order supersedes all former orders or combat plans. Upon receiving this message, the commanders of all outposts will rendezvous instantly to this base for more, and definite, instructions—'

"And so on, and so on," concluded Baldy. He looked at Peters with something like awe in his eyes. "Commanders!" he said. "Commanders of all outposts! Hey . . . that's me!"

But even more dazed was his companion. Rusty's jaw had dropped perilously agape.

"Ain't that a whipper!" whispered Rusty. " 'Achieve a solution o' the 'Rainie problem.' Kickin' overboard all the old combat plans. An' all because of a date. *What* date?"

Baldy said curtly, "Don't look at me. I lost track of time something

like nine years ago. Who gives a damn what *Earth* date it is on a planet which takes eighty-four years to swing around the Sun? The main thing is, there's going to be something done. At last. And me, I'm in on it. I've got to get to— Hey, Sparks!"

"Yessir?"

"Get Hogan in the lock room. Tell him to get me out a bulger, check and fuel a motosled, and call a driver. I've got to get to New Oslo, and fast!"

"Yessir!"

Rusty said, "Look, Baldy—when we get there, tell 'em like I just been sayin', huh? About bein' kind o' gentle with the 'Ranies, remember? Honest, I think that's the smart way to—"

"To find out," snorted Harrigan, "which is hottest, Hades or Mercury! I'll tell them nothing, Rusty. The Patrol knows what it's doing. Now, look—you're in command of this dump while I'm away. Do a good job of it, and I'll enter you for a credit boost next period. Keep the men working on them wore-out drain pipes, and see that Slops don't make soup with the dishwater.

"And put the stiff on that big soft heart of yours! Lapsley and Youst are supposed to be serving punishment hours in sol; don't go throwing no pink teas or parties for them—understand?"

"Aw, Baldy—"

"Are you going to do like I say? Or—"

"Sure, Baldy. Only gosh—"

"All right, then. Sparks, get the lock room. Well, Hogan, that you? Got that stuff ready? Okay. I'll be right there. Okay!"

He shoved a beefy paw in Peters's direction.

"Carry on, fella. Be seeing you!"

Then he was gone.

Through the radio-room wall plate, Rusty watched his friend's motosled nose from the ground lock, swing in a great circle to catch the guide beam, and scud eastward over frost-silvered terrain. The incessant snow was like a great, thick veil, first dimming the outlines of the sturdy skier, the one type of mobile unit practical on Uranus's frozen bosom, then hiding its form entirely. When solid white had obliterated even the tiny red dot of the exhaust, Rusty turned, a still-unanswered question in his eyes.

"I don't get it, Sparks. I don't get it nohow! It don't make sense for

the Patrol to issue such an order unless they— Look, you know what day tomorrow is, don't you, maybe?"

The radioman looked helplessly at his audio banks.

"Tuesday?" he hazarded.

"I *know* it's Tuesday," said Rusty. "I mean—what day of what month? Earth figgerin'?"

"Well, it's like this, Rusty. I've been out here a long time. We don't have much contact with the Outside, you know. And I tried to keep a diary for a while, but, well you know how it is. The days sort of slip by and—"

"In other words," complained Rusty, "you don't know. When I got you for a helper, a huluva git I got! It must be some day special to make the Patrol decide—"

Again his eyes sought the quartzite view pane. And then suddenly he gasped. Gasped and chortled, a great roar of glee bursting from his lips.

"*Of course!*"

"Huh?" said the startled Sparks.

"Why, sure! Now I know. Sparks, I'm ashamed o' myself! Of all of us. We musta left our finer instincts behind us when we left Earth!" His eyes sparkled with excitement and swift decision. "Sparks, hop the ditty! Audio the workshops, the labs, the rec rooms. I want every man under the dome to be in the auditorium in five minutes flat!"

The radioman looked at him dubiously. "But Harrigan said—"

"Harrigan said I was in command, didn't he? Now, are you gonna do like I say, or—" Almost as an after thought he offered the alternative —"or do I have to yank off your head an' shove it down your throat?"

Sparks said, "I'm doing it, Mr. Peters," and got to work on the plugs. Rusty rubbed freckled hands together. He had swallowed his chaw some time ago. He would discover that fact later, to his great embarrassment. But right now he was beaming with delight and enthusiasm.

"Ever since they made me assistant warden here," he gloated, "I been tryin' to tell the Earth authorities that we ain't no ordinary prison, here at P. C. 1. It's punishment enough for the men to be eighteen hundred million miles from home, without they should also be treated like scum.

"Baldy an' me managed to convince Inspector Wegland of that, the time he cracked up on the steppes. But now we've got a chance to

prove to the whole damn Universe that, cons or no cons, the inmates of this jug is human bein's. Complete with feelin's an' *ee*-motions.

"Sparks—where was the nearest native hide-out, last time you heard?"

"Not far from here. Scar Mountains. A half-hour's run."

"That's what I thought. So we're lots nearer the 'Ranies than the Patrol is. Which makes my ideer a lallapaloozy. Now, look, Sparks. Here's what we're gonna do—"

Colonel Cochrane of the S. S. P., grim, gray, glorious with medals betokening his valor in a half hundred segments of the Universe, stopped talking and studied the faces of the men who had come to New Oslo in response to his summons.

"Are there any questions, gentlemen?"

Warden Pat Harrigan coughed nervously. He rated as a captain, but he was fully aware that his was only a semimilitary rating. He smoothed a sweating palm over his barren pate.

"Ain't this—" he began, and stopped, flushing, to begin over again. "*Isn't* this a sort of ruthless way to work on the 'Ranies, Colonel? After all, like one of the guys in my outfit—my assistant, Rusty Peters —said, Uranus used to be their planet. Till we come here. Maybe we ought to be gentle with them. Negotiate, or—"

Cochrane frowned, and a half dozen of his underling officers obediently masked their faces with disapproval.

"Negotiation has proven fruitless, warden. The Uranian natives are a sullen, dangerous, treacherous lot. It is our task to put an end to their periodic uprisings. Force is indicated; force concluding in utter annihilation should they show resistance."

"But if you want peace—"

"That is exactly what we want. But since they will not sign a peace pact, we will adopt the more stringent means of ending hostilities." Cochrane's chest lifted. "And it is altogether fitting and appropriate that tomorrow should bring Uranus into the family of solar children. A date revered by all Earthmen, hallowed in our annals, celebrated by Earthmen the Universe over—"

There it was again. Baldy said, "Oh, yeah. That's right. Tomorrow's the . . . er . . . er—"

"The nineteenth of November!" said Colonel Cochrane proudly. "The day we celebrate. Empire Day!"

"Hell!" muttered Harrigan under his breath. "Sure! Empire Day!"

He should have guessed it. He should have remembered the moment he saw the message calling him to this meeting. The nineteenth of November was the anniversary of the day on which, some seventy-odd years ago, Earth's military might had brought about the armistice and eventual peace that welded into a solid empire the four inner planets.

Not without reason was it Earth's greatest holiday. It had taken thirty long years, and millions of lives, and an unguessable wealth in craft and arms to bring about the union now governed so placidly from Earth. The Rollie Rebellion on Mercury, the Fontanaland uprising on Mars, the Twelve Years' Siege of Venus City—all of these had come to a peaceful ending on November 19, 2238 A.D.

That day, too, had ushered in a new era. An era of further exploration. Earth's factories, able at long last to cease wholesale production of armaments, had delved into the problem of perfecting spacecraft. From their researches had come such things as the Wittenberg converter, the Holloway vacuum-feed chambers, the anatherms—and the frontiers once more began to roll back on before man's onslaught of knowledge.

Where once the planetoids had been a chaotic network of unplumbed mystery, frequented only by space scavengers and occasional pirate hordes, now it was a huge, charted, floating ore deposit for the entire Solar System. Jupiter had not been—nor could it be for countless centuries—conquered, but two of its satellites now gave refuge to Earthling colonists. In the outer rings of Saturn worked space placers, gathering to Earth's wealth the valuable shards of what had once been two satellites. Uranus boasted its tiny colonies; Neptune was now being studied for a colonization project. And far Pluto was under constant electrono-mirror bombardment, that its icy surface might some day be cleared.

Empire Day! "The day," thought Baldy, "the day we celebrate." With a swift, devastating nostalgia he remembered his boyhood on Earth. The public gatherings in vast, buttressed auditoriums, the political speeches, the flag waving, the firecrackers and sandwiches and drinks, the parade of veterans, the evening spectacle of mock warfare in the vaulted lofts of Earth's soft, blue skies—

Empire Day!

Colonel Cochrane was talking again.

"—more than fitting that this day, symbolic of our great victories in the the past, should also be the day on which we add Uranus to our list of permanent colonies.

"And now, gentlemen, to the specific problem. Our scouts inform me that the headquarters of the Uranian native chief, Ras Tirl, lies in the caverns of the Scar Mountains. There we shall take our punitive expedition. Captain Mancum, you will lead Company A; Captain Larey, Company B—"

Baldy said, "Pardon, sir—you said Scar Mountains? That's right near P. C. 1."

"Yes, warden. That is why you were summoned to the staff conference. We will use the Colony as our base, in the unlikely event that our aims cannot be completed in one day. You will, therefore, send a message to your next-in-command, ordering him to arrange food and quarters for us."

"Yes, sir!" said Baldy.

Rusty Peters looked with satisfaction upon the huge auditorium of P. C. 1. He had, he thought, done pretty darned well in so short a time. Four hours ago this had been just a meeting place. Now it bristled with equipment for the action to take place.

He said, "Hm-m-m!" and rubbed his hands together. He said, "Well, that's that! Slops, everything ready in the culin . . . the cuul . . . the kitchen?"

The Colony cook nodded surlily. "Yeah. But if you ask me—"

"I ain't askin' you," said Rusty. And added piously, "An army travels on its stummick."

"So does a worm," commented Slops.

"Okay. An' worms win in the end, don't they? Now, Johnson, Bridges, Howe—you all set?"

The three bulger-clad convicts nodded. Each bore a Traimers-Lincoln heat gun. Johson, the appointed leader of the trio, said, "We sled to their hide-out, kick up a fuss, get 'em coming after us. And retreat slowly to the Colony."

"Right," said Rusty.

"Suppose they don't follow us?"

"Suppose Mercury has a snowstorm!" snorted Peters. "They'll folly you. Them 'Ranies has their faults, but they are the fightin'est fools I ever seen. They'd stalk a human from Hell to Hercules. Which is

what ye're bankin' on. Because when they git here"—again he stared about him with tight satisfaction—"they bump into *this!*"

Johnson looked dubious.

"I don't know, Rusty. It's tricky business."

"Tomorrow," Rusty told him succinctly, "is the day we celebrate. Fust, because it's a holiday; second, because we're gonna make the Rocketeers look like monkeys. Now, git goin'!"

They got.

It was scant seconds later that Sparks brought him the message from Baldy, ordering him to have everything ready for the feeding and quartering of three mechanized Rocketeer units. And Rusty grinned.

"They," he opined, "got a su'prise comin'. By the time they git here, the squabblin' will be over. But we got to work fast!"

Dull white monotony, endless and unbroken, accompanied the motosled in which he rode. Baldy looked at the chronometer on his wrist. Nine hours. Almost there. Shortly, through the white veil that shredded itself interminably against the foreshield, should appear the hoary crest of the Scar Mountains.

It did. Sallow sunlight glinted feebly on towering crags that, through aeons of time, had never known the green mantle of vegetation. Around the topmost peak fingered pink and angry streamers of cold fire. An ionic storm in the upper atmosphere. Uranus's Heaviside was weak; ever and again it broke down beneath constant cosmic bombardment, permitting those devastating, body-destroying radiations to burst through. Which was another of the many reasons frail man must live in domed cities carved out of the frozen wilderness.

The 'Ranies were of hardier breed. Spawn of a mad desolation, all-knowing Nature had supplied them with bodies able to endure infinite rigors. Yet even here, as man had discovered to his vast amazement, Nature had followed the same rough pattern of form that characterized highest life on all planets. The Uranians walked upright on two legs; from their upper trunks branched jointed arms equipped with hands; hands, six fingers, an opposed thumb.

But there were differences, too. The Uranian sense of sight was an abortive sense. 'Ranies could differentiate only between tons of light and dark, otherwise they were color-blind—as might be expected in a land of white snow and black night. Their eating apparatus was

equipped with extrasensitive taste buds—a sharp necessity on a planet where the food supply was so limited. Their hearing was dulled by ages of exposure to howling gales and shrieking storms. They had no sense of smell, which was not strange, considering the fact that they did not breathe through the nostrils but respired into a network of subcutaneous lungs sponges through every pore of their bodies.

"Which," thought Baldy, "ain't hard to understand. What with an atmosphere of ammonia and stuff—"

The mean body temperature of the Uranians was a remarkable example of colloidal adaptability. Interior chemistry allowed them to withstand, naked, the biting frigidity of their native planet. Their garments were solely for the purposes of impediment portage and personal adornment. Yet they did not suffer in the least when brought into the domed cities of the Earthmen. They seemed impervious to heat and cold alike; their lunged pores breathed with equal facility their own poisonous atmosphere and the oxygenated Earth atmosphere within the domes.

Baldy's driver brought his sled to a curving stop as the column before him set the style. And already Patrolmen, bulger-clad, armed, were clambering from the convoy. A company began moving toward a narrow pass to the right. Harrigan sought the flag sled of Colonel Cochrane.

"Colonel?"

"Ah, yes, warden. This is the defile you mentioned, isn't it?"

"Yes, sir. Only there's something funny. See them drifts?"

"Well?"

"They ain't normal for this time of year. Ought to be solid instead of broken like that. This storm's so heavy it covers tracks almost immediate, but—"

"Yes?"

"Well, it looks to me like the 'Ranies is been on the march. And lately, too."

Colonel Cochrane said impatiently, "We'll know in a few minutes. The first company is approaching the caves now. Reynolds—catch that signal!"

A figure, dim in the heights above, was motioning to the commander below. The Signal Corps lieutenant watched intently. Cochrane watched the lieutenant, and Baldy watched the commander. An expression of

surprise and alarm communicated itself to three faces, one after another.

"Yeah?" said Baldy. "There *is* something wrong?"

The lieutenant ignored him, made report to his commander.

"He says, sir, they have entered the caverns. But they are empty. The Uranians have gone."

"Gone! But . . . but gone where?"

Baldy, a wild surmise suddenly sweeping through him, had climbed to the top of a motosled. There was an old trick of hunters and trappers he had been taught in the Venusian jungle lands. It was the stunt of "spotting" a trail by the "pearl necklace" method. You got a little elevation, closed your eyes, opened them suddenly. Where, in woodland, a trail had once existed, there would appear a dim, thin, weaving line that would linger for an instant, then disappear. Perhaps the same trick would work even on a snow-covered terrain. Everything would be white, of course. But the trail should be newer, closer packed, broken; should show against the smoothness of unbroken drift.

It did. Barely visible, disappearing even as his eyes strained to mark it. But unmistakable in direction and—in meaning!

"Colonel!"

"Yes, Harrigan?"

"They've marched," said Baldy in a strangled tone, "on the Colony!"

There was a jangling commotion at the ground lock. Bells rang, a siren screamed, the face of Hogan leaped to the visiplate before Rusty Peters.

"They're coming in, Rusty."

"Good!" Rusty tossed one last look about him, nodded. Everything was in readiness. The boys were at their stations. The auditorium had been set in order for the little "party" he was planning. The necessary items had been brought from the storehouse; every last man had been instructed as to the part he must play.

Rusty hurried to the lock chamber. Johnson, Bridges, and Howe stumbled in from outside, stomping powdery snow from their thick-soled antigrav boots. Rusty, heedless of biting cold metal, impatiently helped Johnson off with his bulger.

"You find 'em?" he demanded.

Johnson grunted.

"If we didn't, that's the D.T.s chasing up across the valley. Like you said, they took out after us. They'll be here before you can say 'Andromeda.'"

"Nice work!" enthused Rusty. "All right, Hogan—you know what to do next."

Hogan looked grave. He looked doubtful, too.

"Rusty, we've got a couple of rotor guns mounted on the topside turret. Don't you think it'd be a good idea to give 'em a couple of blasts, just to prove we won't stand for no monkey business—"

"That'll do! I'm in command here. You do what I said. The ideer o' this whole shindig is to solve the 'Ranie problem for all time, ain't it? Well, we ain't gonna do that by bumpin' off a handful of them an' lettin' the rest get away.

"This is gonna be the end of our troubles. The end which was wanted by the Council when they decided on this day for a settlement—All right, boys! Everything out o' the lock chamber. It's gonna be cold in here when we let them gates open. Cold an' smelly."

Johnson, who had not heard this much of the plan before, gulped his dismay.

"You . . . you mean you're gonna let them come right into the dome? Invade us?"

"That's the general ideer," said Rusty jovially.

"But they'll *massacree* us!"

"Mebbe. I think not. We're prepared for them." Rusty chuckled tautly. "Wait till you get a look at our fust line o' defense. The auditorium. They got a big su'prise comin' to them, boy. Okay, Hogan. Open the lock!"

Hogan sighed. But his hand pressed a lever. The Earthmen fled from an exposed chamber as the gigantic airlock swung open invitingly.

Baldy Harrigan tapped his driver on the shoulder.

"Look, pal," he pleaded, "can't you get another hunk of speed out this crate?"

The driver said, "Have to stay in formation, warden. Colonel's orders."

Baldy relaxed. Physically, that is. He threw himself back against the cushions, forcing his body to sit still. But his mind was aflame with anxiety.

Not too swiftly had the colonel accepted his opinion as to where the Uranians had gone. With the calm, unhurried precision of the trained Patrolman, he had insisted that the Scar Mountain refuge be searched thoroughly. Which resulted in nothing more than lost time—for the caverns were deserted.

Thus, hours had passed since Baldy's warning that the 'Ranies had marched on P. C. 1. And now, belatedly, the companies were hurrying to the relief of what Baldy feared might be, by now, a desperately besieged post.

There was only one good thing about it. P. C. 1 was not far away. A half-hour's run—and the thirty minutes had now nearly slipped beneath the motosled's gliders. Harrigan peered once more, and with feverish intensity, toward the dome which should soon loom through the white murk.

"There it is!" he cried.

The columns had spotted the prison; were swinging in a great arc to take positions before the ground lock. As his sled moved into its alloted post, Baldy squinted—and groaned.

"The lock! It's open!"

Then suddenly the motosled was at rest and Harrigan was throwing himself from it, stumbling, slipping, racing awkwardly across the ground to the commander's sled.

"The ground lock's open, Colonel! They've busted in!"

"I see that." Cochrane's face was grim. He rapped swift commands to his aides. "But, at any rate, we have them trapped now, Harrigan. If they've harmed any of your men, we will avenge—"

But Harrigan wasn't thinking of vengeance. He was thinking of Rusty. And of the dozens of others whom he'd left, yesterday, at P. C. 1. Friends of his, all of the men—even though they were exiles from Earth, even though they were convicts and he was their warden.

It seemed incredible that marauding 'Ranies should have been able to force entry into the dome—but the proof lay before his eyes: the outer lock gate gaping wide. There was still a chance, though, that the 'Ranies had not penetrated the secondary defense positions. There was another lock beyond this. Then the entire dome was so barred that a handful of men could defend themselves for hours against many times their number.

Baldy was in the van as the three Patrol companies marched in formation to the open lock. His dismay deepened as he saw the interior

of that antechamber. There was something radically wrong here! He had half expected to find in the lock evidences of a battle. Charred bodies of the 'Ranie invaders, perhaps even the mangled remains of some of his own men.

There was—nothing! Only mute evidence that the Uranians had marched into the dome. For inside here, where the gales could not heap their huge drifts of frozen carbon dioxide, there were footprints in the thin hoarfrost.

And beyond?

The relief party halted at the second lock. Baldy sprang to an audio unit, pressed its button with trembling fingers. Through its speaker emanated an echo of the tumult within the dome proper. And the Rocketeers heard that which can be, at times, the grimmest of all sounds—the sound of riotous laughter!

Baldy's cheeks were wet with unashamed tears.

"They've won! The damned, murdering scoundrels have taken the dome! They're in there torturing my men, gloating over it—"

And Colonel Cochrane's eyes were like bits of flint, his voice the rasp of a file on stone, as he snapped his grim command: "Make entry!"

Fourscore angry, vengeful men of the Space Patrol swung into action as one. The massive lock door shook before their efforts. A steel ram, wielded by strong arms, *croonged* hollowly against the barrier, swung back, forward again. The audio speaker suddenly went dead as the laughter from within ended abruptly in frightened, curious cries. The voices of Uranians bellowed above the shouts of a few Earthlings. And then—

"What the hell," demanded an irate voice, "is going on out there!"

The lock wheezed asthmatically, swung back. Pumps sucked the foul Uranian air from the outer chamber, replaced it with fresh, pure, artificial Earth atmosphere. And Baldy started as, before him in the lock, appeared the figure of his friend and assistant, Rusty Peters!

"That's a hell of a way," roared Rusty aggrievedly, "to crash a party!"

Once, when Baldy was a young space swab, still wet behind the ears, he had made the mistake of trying to pet an ampie. The jolt of electricity that had knocked him sprawling on that occasion was a mild

tingle compared to that which he now experienced as his eyes sought and found the auditorium behind Rusty.

The Uranians had invaded P. C. 1—yes! But *how* they had invaded the station was another thing. If this was war—if this was murderous onslaught—

There was a huge table set in the middle of the hall. It was groaning like a festive board with every delicacy known to the storage bins of the Colony. Food galore, and drinks! And more drinks! And still more drinks!

And about this banquet table, shoulder to shoulder in riotous amity, were the men of P. C. 1 and their Uranian enemies. The laughter that had chilled Baldy's blood was not the gloating of fiends and ghouls—it was the gay and not too sober laughter of men and 'Ranies having one hell of a good time!

Here a 'Ranie, his green-lipped slit-shaped mouth preposterously wide in a grin, attempted to eat the breast of a fried chicken and at the same time sing his joy. There an Earthman, weeping with mirth, related in high, intoxicated falsetto a joke that could, to his audience of polygamous Uranians, have seemed only mildly funny at best. Off in one corner a group of Uranians, confused but game, were trying to point their toneless voices to the harmony of a tune pounded on the piano by burly Don Larkin. And in another corner, a Uranian warrior was solemnly displaying his prowess with the blade by slicing, in mid-air, sugar lumps tossed at him by a circle of admiring cons.

Baldy stammered, "Wh-what . . . Rusty, I don't get it! What's it all about?"

But Colonel Cochrane was an opportunist. His keen mind sized the situation at a glance, and his order was curt.

"Nice work, Peters! Devilishly clever! Don't know how you did it, but you did! All right, men—grab the Uranians! Clap them in irons!"

"Waaaait a minute!" It was Rusty Peters's turn to look stunned. He barred the entrance as a group of Patrolmen leaped forward. "Grab them? Clap them in irons? Why?"

"That's all right, Peters. You can relax now. I'll take over. We'll find out which of them is Ras Tirl, beat the warlike ideas out of his head, and—"

"But, dammit!" exploded Rusty, "you don't have to beat nothin' out o' nobody! This here's Ras Tirl! Hey, Ras! C'mere'n meet the boss o'

the Space Patrol. Ras," he added to the shocked colonel, "is a great guy. Him an' me's old pals now."

The outlaw chieftain ambled forward. Seven feet of brute strength surmounted by a foolish grin. Ras Tirl was a little bit drunk. He was also, it developed, a little bit on the amative side. He said, "Um frens Rusty, um frens Ras. Hokay. Murkissumuss!" He tried to kiss the colonel. The colonel backed away. Ras Tirl, still grinning, fell forward onto Baldy's shoulder, held on for dear life.

Rusty said, "See? It's all fixed up, Colonel, just like the Council wanted. We got peace at last. I opened up the outer lock, let 'em come in. Then I shot 'em a big dose of nitrous oxide; got 'em feelin' jovial. By the time they come out of it, me an' the men had carted 'em all into the banquet hall. Made a couple friendly speeches, told 'em from now on we was all buddies.

"They went for it like homeless pups. For years us Earthmen been pushin' 'em around, scarin' 'em, chasin' 'em, never givin' 'em a break. They almost wep' with joy. An' when they got their paws on that good food—the best they ever et in their lives—

"Well, anyhow, Ras give me his pledge that from now on his people'd keep peace with Earthmen. An' anybody will tell you that one thing a 'Ranie never does is go back on his word of honor. So—peace is here. And I'm sorry I misjudged the Patrol, Colonel. Only yesterday I was tellin' Baldy the S. S. P. was a pack of bullies. I was wrong. It took kind hearts an' good guys to think up the ideer of makin' peace with the 'Ranies on this particular date. Hadn't it been for that fact, I'd of never thought of the ideer—"

"Day?" said Baldy. "What the blue blazes has the date got to do with it?"

"Yes, Peters," chimed in Colonel Cochrane. "Just why should you decide to adopt this successful but peaceful plan of operations on—of all days—*Empire* Day?"

Rusty's jaw sagged.

"Em-empire Day?"

"Why, yes. You knew, of course, that—"

"Omigawd! Empire Day!" Rusty put his head in his hands, wagged it violently back and forth. "How the hell should I know! I done all this because I . . . I thought today was Chris'mas!"

He stared at Baldy dazedly. Ras Tirl, head cradled on Baldy's

shoulder, opened his eyes and muttered, "Murkissmus!" and went back to sleep again. Baldy looked at the colonel. It seemed he should say something. He *had* to say something. He found the right words at last. He said:

"Colonel . . . suppose we all have a drink—"

Which wasn't a bad idea, at that.

Margaret St. Clair

THE PILLOWS

Here is a really sinister "life" form, found only on Triton, one of the two known moons of distant Neptune. The object lesson is clear: Outside the atmosphere of our own Earth, everything *is unknown; nothing can be taken at its face value. Some interesting parallels can be drawn between man's blithe acceptance of the "pillows" and his comfortable reliance on machinery, as described in "Completely Automatic." In other words, in space the watchword must always be*—"Vigilance!"

"THEY'RE lucky," McTeague said with emphasis. "I told Thelma—she's secretary to one of the big shots in the company—they ought to bring that out more in the advertising, stress it, like, and she said nobody had ever written in about it. People just buy the pillows for novelties, and once in a while to keep their hands warm.

"But anybody that works around the pillows knows that they're the luckiest damn' things in the Universe. Look at me. Before I got this job with Interplanetary Novelties, I'd just spent three months in the hospital with a fractured pelvis. Lolli and I were quarreling all the time, and I was sure she was planning to leave me. I just got out of the hospital when Lottie, that's our kid, came home from school with a stiff neck and a sore throat, and two days later the clinician said it was almost certain to be infantile paralysis, the third type. They've never found a cure for that. That really broke me up. I spent most of the first leg of the trip taking soma and trying not to think about things.

"Listen, when we hit Aphrodition there was a 'gram from Lolli telling me not to worry, Lottie was better and it seemed to be type one after all. Lottie was all over it in a month, and she's never been sick, not even the sniffles, since. For that matter, none of us have. I don't even cut myself or get hang-overs any more. And Lolli and I get along like—like a couple of Venusian quohogs."

"Then you think the pillows aren't fakes?" Kent asked. They were two days out from Terra, on board the *Tryphe,* traveling at one sixtieth the velocity of light. He leaned back in his bunk and drew deeply on the tube of cocohol-cured tobacco.

"Fakes? How do you mean, fakes? I know they're lucky—ask anyone on the ship—and I know they stay hot. Lottie's had one I brought her from Triton, on that first voyage out to Neptune's moon, sitting on the shelf in her bedroom ever since, and it's still as hot as it was when I dug it out."

Kent sighed. He rumpled up his blond hair and frowned. Here it was again, the evidence, so utterly at variance with what he'd been able to get in the laboratory. Stick a thermometer near one of the pillows, and it registered forty-four degrees Celsius at first, then showed a very gradual cooling until the pillow reached room temperature, where it remained. And yet everyone who'd ever handled a pillow or bought one at a novelty store knew they stayed hot.

"Maybe there's some kind of gimmick in it," he suggested, "something like those Mexican jumping beans my grandfather used to tell me about. Or maybe it's something the company rigged up, a little atomic motor, say."

McTeague snorted. "Anytime you can make an atomic motor to sell for six bits," he said, "let me know. I'll buy 'em up, sell 'em on the open market for five dollars, and become a millionaire. I never heard of Mexican jumping beans before, so for all I know they're the same sort of thing. All I know is, you dig the pillows up out of the rock on Triton, which the long-hairs say is probably the coldest spot in the known universe, and they're hot, nice and hot. You can dig up some in a few days and see for yourself."

"How do you locate them?"

"Oh, we've got a darkside Mercurian hexapod. He hates hunting them. Sits down and shivers when he finds a colony. That's how we know where to dig."

"What do you use to dig with?"

"Atom blast, special design."

"Ever damage the pillows with it?"

"Naw, you have to train one right on them for about fifteen minutes to make a dent in them. They're not only hot, and lucky—they're tough."

Kent was thoughtful. "You know, that's really remarkable."

"Hell, they're just novelties." McTeague spat into the incinerator, reached for the cards, and began to lay out an elaborate three-deck solitaire. Kent went on thinking.

It was that attitude, that "hell, they're just novelties," that had made him decide to spend his vacation working for the Interplanetary Novelty Company. He'd brought four or five of the pillows (they were a couple of inches in diameter—about the size of sand dollars—and black and puffy) into the laboratory and thrown a bunch of experiments at them; his fellow workers had kidded him both ways from the abscissa, and Dr. Roberts had called him into the office and told him gently that he really wasn't employed to investigate—ah—children's toys, and that there was a group of very interesting experiments he'd like him to try on the low radioactives. So now he was an A.B.S. on the S.S. *Tryphe*, bound for Triton.

"Anything else on Triton?" he asked.

"Nope. Not another blasted thing. We bring back some of that greenish rock, though—it works up into nice paperweights." McTeague moved a long column of cards to a pile headed by a purple ace, and went on playing.

Ten days later they landed on Triton—a routine landing, but interesting to Kent, who had done little space traveling. The ship had gone into snail-slow planetary drive hours before. Now he watched with fascination through the bow visiplates while the navigator snaked the ship expertly through a long spiral down to Triton's surface. The cloudy aquamarine of Neptune, half occluded by the little world, shone palely bright.

"Getting an eyeful?" McTeague said, joining him. "If you'd landed here as often as the rest of us have, you'd want to look the other way. Neptune gives me the grue, and Triton stinks. Except for the pillows—and I consider myself honored to be on the same satellite with them—I hate the place. A lousy little pebble, so *damn* cold you'd be understating grossly if you said it was frozen." He started to bite a chew of tobacco from the hunk in his hand, and then checked himself. "No spitting in pressure suits," he said morosely. "That, and the dampness, are the worst things about suits."

Overhead, the bull horn began: "Phweet! Phweet! Break out pressure suits. Break out pressure suits. A working party consisting of McTeague, Willets, Abrams, Kent will leave ship at 1630 to hunt pillows. A working party consisting of . . . Atom blasts in Number Five locker. Atom blasts in Number Five locker."

As Kent climbed stiffly into his pressure suit, he saw McTeague, al-

ready hardly human in the florid bulges of his own suit, inserting the protesting hexapod into a special job for hexapods. It must have been fifty inches long. Kent switched on his suit's radio.

". . . Look at the poor little tyke shiver," McTeague said. "He hates this hunting worse than pulling teeth." Then, to the hexapod, "Never mind, Toots. When we get back you can have a nice bowl of vitamush and berl steak."

They started out. McTeague, by right of seniority, was in the lead. He held the hexapod by a leash of psychroplex. Kent, walking beside Willets, felt a flash of pleasure at being out in the open again, though the visible curvature of Triton's surface made him move unsteadily. He looked up and ducked involuntarily. Neptune's blue-green disk, now directly overhead, filled half the sky.

"Watch out for low grav, Kent," McTeague's voice said in his ear. "Don't worry, old Nept won't fall on you. All you men, set your object comps on the ship."

"Don't you have a map or chart?" Kent asked.

"Nope. The navigator keeps a record, of course, and sets us down on a different spot each time. He and the old man are doing it methodically. . . . Look at Toots! We must be getting near a colony."

The hexapod was pulling back on the lead and struggling. McTeague took a firmer grip on the leash and began to tug him along. Three or four hundred yards farther the hexapod sat down and refused to move. Kent could see him shivering inside his pressure suit. His purplish fur was fluffed out like chenille. McTeague snapped the creature's lead onto a chock on his suit.

"This is it," he said. "Kent, this is for you. The others have dug lots of pillows. Set your atom blast to three, and cut out a section of rock about two feet square. Use your blast to pry it up with—I'll show you how—and then cut it crossways twice so it's in fours. By then you ought to be able to see the pillows—they're in cells, sort of, in the rock. If it is rock."

They began work. Kent found a weird fascination in seeing the rock curdle and flow in the unearthly glare of his atom blast. "When you see the pillows," McTeague said over the suit radio, "take your blast and sort of flick down the edges of the cells, see, like this, and pick up the rock and shake them out. They come out easy."

He fitted action to his words. Kent, imitating him, began to make good progress. "Cute little things, aren't they?" commented McTeague.

Out of his shoulder pack he drew a shapeless bundle and pressed a button on its side. It began to expand.

"When you got enough pillows," McTeague ordered, "take the scoop hanging on the left side of your suit and shovel them into the sled. Those inflators are certainly a bright idea. Oh, an' if your suit gets too damp, shove the dryer up. It helps."

"How do you like it?" he asked Kent when the party had been working for three or four hours.

The question took Kent somewhat by surprise. He straightened in his pressure suit. He hadn't, he found, been thinking about much of anything; he had been cutting out pumicelike rock and extracting pillows from it in a mindless trance that was definitely tinged with pleasure.

"It's nice, somehow," he answered.

"I thought you'd like it," McTeague answered, pleased. "Everybody on the ship does, even the old man."

"Except Toots."

"Yeah, except Toots."

They finished with the colony of pillows; further investigation with the blasts showed only one or two isolated specimens. Neptune was beginning to set.

"Might as well hunt another spot," McTeague said. "Look at Toots—see how he's pulling back toward the ship, and at the same time's got a sort of list to the right? That means there's probably another colony off to the left. Let's go." He started off to the left, pulling the big, inflated sled and tugging the reluctant Toots after him.

They had gone four or five kilometers, vapor trails from their suit vents floating behind them, when Toots suddenly reared back and began fighting the leash enthusiastically.

"What's got into him?" McTeague said. "He doesn't usually act like that even when it's a big colony. Abrams, you take his lead and the sled; I'll go ahead and see what's doing."

"I might have known it was a stiff," he said when he returned. "Toots hates dead bodies worse than hunting pillows, even. Abrams, you hold on to Toots, and I want you other two men to come help cut a grave for whoever it is."

"I thought nobody except us ever visited Triton," Kent said as they walked along. "Did he have a ship?"

"Not around within seeing range. I suppose he could have come

here on a life craft, after a wreck, or maybe he was marooned; it's been done. We'll get his identity badge and look through his sack before we bury him. Too bad we can't take him back to Terra, but it's too long for him to keep, and the old man hates dead bodies, anyhow. Jonahs, he says."

They came upon the body. The man had died in a pressure suit, on his feet, with an atom blast of recent design in his hand. His face was intelligent and young. "Looks like he was fixing to dig for pillows," McTeague said. "Maybe Venus Novelties sent him out. I hate to say it, but in that case he deserved what he got. Anybody that would work for a scab outfit like that—!"

"What killed him, do you think?" Kent asked.

"Hard to say. His shoulder tanks had plenty of oxy. They say death is always heart failure in one way or another. . . . Get busy with that grave. I want it about two meters by one by one." McTeague took the dead man about the waist and put him down on the stony surface of the satellite, He opened the psychroplex helmet and fumbled around the man's neck for the identity disk.

"Edward Clutts," he read with the aid of his suit light. "The serial's K20-4340. What's K20, anyhow?"

"Scientific worker," Kent replied.

"Um. Then I doubt Venus Novelties sent him. The disk was issued four years ago, so he hasn't been here less than two years or more than four. . . . Funny he's not decayed at all; the suit heater usually keeps running long enough for them to spoil some."

"That's only if the oxy runs out," Willets said. "He probably froze to death."

"Could be. Let's see what he's got in his sack." McTeague turned the body over and opened the container on the back of the suit.

"He's got a lot of stuff. Thermometers and all sorts of things. What's this gadget?"

"Geiger counter," Kent replied. He had been watching with intense, strained attention.

"Hm. Looks like he was trying to investigate Triton. The poor chump, he might as well have investigated Nereid. There's nothing here at all. Except the pillows, I mean. Have you got the grave ready yet?"

"Yeah, but there're a lot of pillows in the slab we just levered up,"

Willets replied. "You want we should just leave them, or can we break down the cell walls and shake them out?"

McTeague considered. "No reason why we shouldn't get as many out as we can," he said. "He'll never know the difference. We're bound to leave a good many in the rock anyhow."

Obediently, Kent and Willets began flicking their blasts back and forth over the cell walls and shaking the pillows out. When they had finished McTeague put the body down gently in the hole they had left, and the slab was replaced. Then McTeague called Abrams to come up with the hexapod, and they all began digging pillows again. At the end of the shift, the sled was nearly full.

"Good day's work," McTeague said with approval. "Don't let me forget to tell the old man about the stiff and give him the identity disk and stuff. It's got to go in the log."

"Will there be an investigation?" Kent queried.

"Nothing to investigate. His heater stopped."

"I suppose." Kent was far from convinced, and yet he had to admit that McTeague was probably right. Edward Clutts had died when his suit heater stopped running. "It—could it have had anything to do with the pillows?" he asked.

McTeague turned and stared at him. "With the *pillows?* Why, the pillows don't do anything at all except keep hot."

"On Triton."

"Well, Triton's their home. If they're going to keep warm any place, it's got to be there."

They reached the ship, Toots leaping and frisking around them. Sometimes he got all six legs off the ground at once. The sled was taken up the gangplank and its burden of pillows emptied into Number One hold. Kent held one of them in his ungloved hand, and it was hot. And not eight hours ago he had himself dug it out of Triton's rock. The coldest spot in the known universe . . .

After supper—Toots messed with the spacemen, and they all broke the old man's orders by slipping the hexapod bits of berl meat and gravy-sticks under the table—McTeague came up to where Kent was sitting and began to talk.

"Kent," he said, "I think finding that man's body upset you more than you realize. You don't want to let it get you down. A spaceman has to get used to things like that. That idea of yours about the pillows,

for instance—that's the kind of crazy thing only a green hand would think of. The pillows! Why, they're just novelties, that's all."

Kent nodded and leaned back in his bunk, trying to appear relaxed. McTeague watched him. After a moment he looked relieved. "Well—that's that. Want to play some bizareque?"

Kent nodded. While McTeague was shuffling and dealing the cards, he went on thinking. What was it about the pillows that bemused everyone, put a glamor on them? There was some excuse for scientists such as Dr. Roberts; they had to consider the whole range of the fascinating phenomena that the last twenty years had opened up for investigation. And besides, most of them suffered from a form of scientific snobbery, a human desire not to make fools of themselves by investigating something that was only a novelty, a child's toy. But what about men like McTeague? Did no one besides himself, Kent, find anything odd in the continued heat of the pillows? Presumably Edward Clutts had. Edward Clutts was dead.

McTeague's voice broke in on his thoughts. "Do you mean to lead a trump?" He pointed to the purple knight Kent had just laid down.

"Oh. No. Thanks."

Before he went to bed that night, Kent put a thermometer by one of the pillows he had dug up. It registered forty-four Celsius, as he had known it would.

By morning it had dropped a degreee or two, and it went on dropping slowly for the next few days until it reached room temperature, twenty Celsius, where it remained.

The holds were beginning to fill up. Toots had been dragged out on eight or ten pillow hunts, McTeague said there must be nearly a million and a half pillows on the ship and they'd be heading back to Terra pretty soon, and still Kent was baffled by the pillows. Every time he dug pillows he felt the blank euphoria which possessed the others, and it was only when he got back to the ship that he could even wonder about them. What had Edward Clutts been doing with his thermometers and his sackful of gadgets? Why had he died?

He might never have guessed if he had not happened to upset the glass.

He had been reaching into McTeague's bunk for a magazine the big man had discarded, and his left elbow had struck against the long lap board on which McTeague laid out his solitaire when he was in his bunk. Kent hadn't seen the glass of soma and ginger ale, which was

sitting on the end of the board, until it started to fall over. He grabbed at it quickly—his reflexes were considerably faster than average—and set it upright again before more than a drop or two had spilled, feeling, as he moved, a sharp sensation of cold against his wrist.

He looked down, surprised. It was as if he had passed his arm above a large piece of dry ice. There was nothing in the bunk except the magazine, the glass of soma, the lap board, and, under its edge, one of the pillows.

Wondering, he picked it up. It was, as usual, agreeably warm to the touch. Where had the cold come from? The ice in the glass of soma had melted long ago.

He stood frowning at the edge of the bunk, feeling an impossible hypothesis beat at the threshold of consciousness. What could it be? Was it—what— To hell with it. But—

He slipped between the sheets of his bunk at lights-out, expecting to turn and toss all night long, and was instantly asleep. He woke just at seven the next morning. He lit a smoke and lay on his back, one arm under his head, sorting out his ideas.

In the first place, the pillows were sentient and intelligent. He would deal with that later.

In the second place, they had some sort of mental reach. That was why everyone on the ship, except Toots (the psychology of darkside hexapods had not been much investigated, but it seemed that their mental abilities were parallel to those of dogs only up to a point, after which they went soaring off into some sort of high, supersensory cloudland), loved hunting them. That was why nobody had ever taken them seriously; the pillows didn't want to be investigated. It was probable, too, that the pillows had some sort of control over events; else why the streak of luck that McTeague (and everyone else on board the *Tryphe* had similar experiences to relate) had enjoyed? The pillows wanted to be hunted and disseminated, and they had put a premium, in the form of pleasure and good fortune, on their dissemination.

In the third place— This was where Kent's mind jibbed. Really, it was no more fantastic than the assumption he had already made, without much mental discomfort, that they could influence the flow of events. But this was something that every human being, that every sentient being, takes for granted every moment of his life. To endow the pillows with this ability was to fracture the supporting column of the Universe.

In the third place, the pillows could reverse entropy.

A pillow could extract heat, as a man sucks milk through a straw, from a substance colder than itself. They were intelligent; they took care never to display their faculty where it could be observed.

In the laboratory, they cooled gradually from forty-four degrees Celsius to room temperature. Otherwise, the difference between their fairly high temperature and the abnormal coolness of the objects around them might have been noticed even by the beglamored (it was the only word) wits of the indifferent scientists. But if a pillow were not on its guard (he had caught the one on McTeague's bunk off guard last night when he had reached across it so suddenly), or if a pillow had nothing to fear, it would be possible to hold one of them in the hand, comfortably warm as usual, and feel the hand grow chill around it, feel the chill creep inward, have the hand freeze to the bone. That, on a larger scale, was what has happened to Edward Clutts.

Make a hypothesis. Clutts had been landed on Triton, at his own request, to investigate the pillows on their home terrain. There had been a rendezvous appointed at some specific time. They had looked for him, of course, but a man is a small object, even on a pebble like Triton. Clutts hadn't gone to the rendezvous because he was dead. The pillows had killed him. The pillows didn't like to be investigated.

What did the pillows do with the heat? Kent rolled over on his side and lit another smoke. Presumably they needed it in their metabolism. Maybe they used it to make more pillows; no one had ever seen a pillow under the regulation sand-dollar size, and their reproduction and origin was a mystery in which no one had ever taken the slightest interest.

What did the pillows want? It seemed to him there was only one answer possible. Kent shuddered and rubbed his eyes. They were the inheritors, the successors to the human race. Maybe in the near future, maybe not for billions of years, they were going to run the show. It was probably a near threat rather than a remote one; the bribes they were paying to be disseminated *now* would indicate that they did not intend to wait for any long time, not until the Universe began to run down. No wonder Toots hated them.

What was the Latin for pillow? *Pul—pulvinus.* They ought to be called Pulvinus victor.

McTeague's alarm clock went off. He yawned, stretched, and sat up

in his bunk. "Time to get up," he said to Kent. "Two days more, and we'll be heading back for Terra. With all the holds full of pillows. Nice hot, tough, lucky pillows."

"McTeague . . ." Kent said.

"Yes?"

It was hard to tell McTeague what he had discovered, even harder than he had thought it would be. McTeague listened to him without interrupting him, sitting on the edge of his bunk, rubbing his reddish eyebrows now and then with his hands.

"We mustn't take them back," Kent finished almost desperately. "We've got to tell the captain and the crew, have them dump the pillows out. No pillows must ever leave Triton again."

It sounded horribly weak. McTeague looked at him for a moment and then got up, still massaging his eyebrows. "I'll have to tell the old man about this," he said.

They put him into the navigator's cabin—the navigator had to move in with the old man—and stationed a guard in front of the door. Kent sat on the edge of the bed, his hands between his knees, and stared down at the design of the eutex on the deck. He could hear Toots howling somewhere; it sounded a couple of compartments off.

What was going to happen to him? When he got back to Terra, he supposed, there would be a commission in lunacy, and then a lot of little white buildings and occupational therapy. And meantime the pillows . . .

The cabin was getting cold. He went over to the toggle in the wall to turn on more heat and then paused, his hand on it, realizing what was happening.

He wasn't going back to Terra.

The pillows were intelligent, they were sentient, and they weren't going to let him go back alive. He'd be buried on Triton, with Neptune glowering overhead. The thermometer on the wall registered twenty, but he was shivering, he was growing colder by the second. The heat was leaving him in great waves; it was being sucked from his body as a pump draws air from a jar.

As the incredible coldness closed over him, he found time to wonder how the pillows could direct their force, what their method of operation was, and he felt a flash of triumph at the thought that this would

show McTeague and the others. When they found him frozen to death in the warm cabin, surely they would wonder and remember what he had said. The pillows had overreached themselves.

Just before he stopped thinking permanently, the fallacy came to him. The pillows knew what they were doing. They would let the heat flow back to him once he was dead; there would not be even an icicle to warn McTeague. It would be written down in the log as heart failure.

"Stow that noise, Toots," McTeague said. They were at mess; he was holding a juicy chunk of berl meat before the hexapod's sleek nose and waving it back and forth enticingly. "Be a good hexapod. Here." He made another pass with the meat at the hexapod.

"He's not interested," Willets said above the din of the creature's howls. "It upset him, that young fellow dying that way." He poured more cream on his frujuit.

"Yeah, it's too bad he had a bum pump and all that, but hell, he was nothing but a nut. Toots is a smart cookie. He oughtn't to take on so over a guy like that." He studied the hexapod thoughtfully an instant and then spread a piece of bread thickly with bollo tongue paste.

Toots pushed the offering aside and howled again, a long, dismal howl, a very sad howl, that seemed to come from a long way off.

"I don't know what ails him, anyway," said McTeague. He clicked his tongue against his teeth. "Something's bothering him, that's sure. The way he's going on, you'd think it was the end of the world."

Hal Clement

PROOF

For the last story on the Solar System, one has been chosen which many people will call science fantasy rather than science fiction. It is obviously unlike any other story in this book, for it deals with a world which man, by his very nature as living matter composed of chemical bonds, will never be able to explore, and a life form the existence of which he never will be able to prove (or disprove).

For the world is the Sun, and the life form a sort of energy-being beside which the Cones described in Frank Belknap Long's story are simple and understandable constructions.

The story is included partly for its shock value, partly to remind readers that to the open mind practically anything can exist in this mysterious Universe, and partly because it forms a link between the Solar System and the rest of our Galaxy. To these energy-beings, interstellar travel is a daily commonplace!

KRON held his huge freighter motionless, feeling forward for outside contact. The tremendous interplay of magnetic and electrostatic fields just beyond the city's edge was as clearly perceptible to his senses as the city itself—a mile-wide disk ringed with conical field towers, stretching away behind and to each side. The ship was poised between two of the towers; immediately behind it was the field from which Kron had just taken off. The area was covered with cradles of various forms—cup-shaped receptacles which held city craft like Kron's own; long, boat-shaped hollows wherein reposed the cigarlike vessels which plied between the cities; and towering skeleton frameworks which held upright the slender double cones that hurtled across the dark, lifeless regions between stars.

Beyond the landing field was the city proper; the surface of the disk was covered with geometrically shaped buildings—cones, cylinders, prisms, and hemispheres, jumbled together.

Kron could "see" all this as easily as a human being in an airplane can see New York; but no human eyes could have perceived this city, even if a man could have existed anywhere near it. The city, buildings and all, glowed a savage, white heat; and about and beyond it—a

part of it, to human eyes—raged the equally dazzling, incandescent gases of the solar photosphere.

The freighter was preparing to launch itself into that fiery ocean; Kron was watching the play of the artificial reaction fields that supported the city, preparatory to plunging through them at a safe moment.

There was considerable risk of being flattened against the edge of the disk if an inauspicious choice was made, but Kron was an experienced flier, and slipped past the barrier with a sudden, hurtling acceleration that would have pulped any body of flesh and bone. The outer fringe of the field flung the globe sharply downward; then it was free, and the city was dwindling above them.

Kron and four others remained at their posts; the rest of the crew of thirty relaxed, their spherical bodies lying passive in the cuplike rests distributed through the ship, bathing in the fierce radiance on which those bodies fed, and which was continually streaming from a three-inch spheroid at the center of the craft. That an artificial source of energy should be needed in such an environment may seem strange, but to these creatures the outer layers of the Sun were far more inhospitable to life than is the stratosphere of Earth to human beings.

They had evolved far down near the solar core, where pressures and temperatures were such that matter existed in the "collapsed" state characteristic of the entire mass of white dwarf stars. Their bodies were simply constructed: a matrix of close-packed electrons—really an unimaginably dense electrostatic field, possessing quasi-solid properties—surrounded a core of neutrons, compacted to the ultimate degree. Radiation of sufficient energy, falling on the "skin," was stabilized, altered to the pattern and structure of neutrons; the tiny particles of neutronium which resulted were borne along a circulatory system—of magnetic fields, instead of blood—to the nucleus, where it was stored.

The race had evolved to the point where no material appendages were needed. Projected beams and fields of force were their limbs, powered by the annihilation of some of their own neutron substance. Their strange senses gave them awareness not only of electromagnetic radiation, permitting them to "see" in a more or less normal fashion, but also of energies still undreamed of by human scientists. Kron, now hundreds of miles below the city, was still dimly aware of its location, though radio waves, light and gamma rays were all hopelessly fogged in the clouds of free electrons. At his goal, far down in the solar interior,

"seeing" conditions would be worse—anything more than a few hundred yards distant would be quite indetectable even to him.

Poised beside Kron, near the center of the spheroidal Sunship, was another being. Its body was ovoid in shape, like that of the Solarian, but longer and narrower, while the ends were tipped with pyramidal structures of neutronium, which projected through the "skin." A second, fainter static aura outside the principal surface enveloped the creature; and as the crew relaxed in their cups, a beam of energy from this envelope impinged on Kron's body. It carried a meaning, transmitting a clear thought from one being to the other.

"I still find difficulty in believing my senses," stated the stranger. "My own worlds revolve about another which is somewhat similar to this; but such a vast and tenuous atmosphere is most unlike conditions at home. Have you ever been away from Sol?"

"Yes," replied Kron, "I was once on the crew of an interstellar projectile. I have never seen your star, however; my acquaintance with it is entirely through hearsay. I am told it consists almost entirely of collapsed matter, like the core of our own; but there is practically no atmosphere. Can this be so? I should think, at the temperature necessary for life, gases would break free of the core and form an envelope."

"They tend to do so, of course," returned the other, "but our surface gravity is immeasurably greater than anything you have here; even your core pull is less, since it is much less dense than our star. Only the fact that our worlds are small, thus causing a rapid diminution of gravity as one leaves them, makes it possible to get a ship away from them at all; atoms, with only their original velocities, remain within a few miles of the surface.

"But you remind me of my purpose on this world—to check certain points of a new theory concerning the possible behavior of aggregations of normal atoms. That was why I arranged a trip on your flier; I have to make density, pressure, temperature, and a dozen other kinds of measurements at a couple of thousand different levels, in your atmosphere. While I'm doing it, would you mind telling me why you make these regular trips—and why, for that matter, you live so far above your natural level? I should think you would find life easier below, since there would be no need to remain in sealed buildings or to expend such a terrific amount of power in supporting your cities."

Kron's answer was slow.

"We make the journeys to obtain neutronium. It is impossible to con-

vert enough power from the immediate neighborhood of the cities to support them; we must descend periodically for more, even though our converters take so much as to lower the solar temperature considerably for thousands of miles around each city.

"The trips are dangerous—you should have been told that. We carry a crew of thirty, when two would be enough to man this ship, for we must fight, as well as fly. You spoke truly when you said that the lower regions of Sol are our natural home; but for aeons we have not dared to make more than fleeting visits, to steal the power which is life to us.

"Your little worlds have been almost completely subjugated by your people, Sirian; they never had life forms sufficiently powerful to threaten seriously your domination. But Sol, whose core alone is far larger than the Sirius B pair, did develop such creatures. Some are vast, stupid, slow-moving, or immobile; others are semi-intelligent, and rapid movers; all are more than willing to ingest the ready-compacted neutronium of another living being."

Kron's tale was interrupted for a moment, as the Sirian sent a ray probing out through the ship's wall, testing the physical state of the inferno beyond. A record was made, and the Solarian resumed.

"We, according to logical theory, were once just such a race—of small intelligence, seeking the needs of life among a horde of competing organisms. Our greatest enemy was a being much like ourselves in size and power—just slightly superior in both ways. We were somewhat ahead in intelligence, and I suppose we owe them some thanks—without the competition they provided, we should not have been forced to develop our minds to their present level. We learned to cooperate in fighting them, and from that came the discovery that many of us together could handle natural forces that a single individual could not even approach, and survive. The creation of force effects that had no counterpart in Nature was the next step; and, with the understanding of them, our science grew.

"The first cities were of neutronium, like those of today, but it was necessary to stabilize the neutrons with fields of energy; at core temperature, as you know, neutronium is a gas. The cities were spherical and much smaller than our present ones. For a long time, we managed to defend them.

"But our enemies evolved, too; not in intelligence, but in power and fecundity. With overspecialization of their physical powers, their men-

talities actually degenerated; they became little more than highly organized machines, driven, by an age-old enmity toward our race, to seek us out and destroy us. Their new powers at last enabled them to neutralize, by brute force, the fields which held our cities in shape; and then it was that, from necessity, we fled to the wild, inhospitable upper regions of Sol's atmosphere. Many cities were destroyed by the enemy before a means of supporting them was devised; many more fell victims to forces which we generated, without being able to control, in the effort. The dangers of our present-day trips seem trivial beside those our ancestors braved, in spite of the fact that ships not infrequently fail to return from their flights. Does that answer your question?"

The Sirian's reply was hesitant. "I guess it does. You of Sol must have developed far more rapidly than we, under that drive; your science, I know, is superior to ours in certain ways, although it was my race which first developed space flight."

"You had greater opportunities in that line," returned Kron. "Two small stars, less than a diameter apart, circling a larger one at a distance incomparably smaller than the usual interstellar interval, provided perfect ground for experimental flights; between your world and mine, even radiation requires some hundred and thirty rotations to make the journey, and even the nearest other star is almost half as far.

"But enough of this—history is considered by too many to be a dry subject. What brings you on a trip with a power flier? You certainly have not learned anything yet which you could not have been told in the city."

During the conversation, the Sirian had periodically tested the atmosphere beyond the hull. He spoke rather absently, as though concentrating on something other than his words.

"I would not be too sure of that, Solarian. My measurements are of greater delicacy than we have ever before achieved. I am looking for a very special effect, to substantiate or disprove an hypothesis which I have recently advanced—much to the detriment of my prestige. If you are interested, I might explain: laugh afterward if you care to—you will not be the first.

"The theory is simplicity itself. It has occurred to me that matter—ordinary substances like iron and calcium—might actually take on solid form, like neutronium, under the proper conditions. The normal gas, you know, consists of minute particles traveling with considerable

speed in all directions. There seems to be no way of telling whether or not these atoms exert appreciable forces on one another; but it seems to me that if they were brought closely enough together, or slowed down sufficiently, some such effects might be detected."

"How, and why?" asked Kron. "If the forces are there, why should they not be detectable under ordinary conditions?"

"Tiny changes in velocity due to mutual attraction or repulsion would scarcely be noticed when the atomic speeds are of the order of hundreds of kilometers per second," returned the Sirian. "The effects I seek to detect are of a different nature. Consider, please. We know the sizes of the various atoms, from their radiations. We also know that, under normal conditions, a given mass of any particular gas fills a certain volume. If, however, we surround this gas with an impenetrable container and exert pressure, that volume decreases. We would expect that decrease to be proportional to the pressure, except for an easily determined constant due to the size of the atoms, if no interatomic forces existed; to detect such forces, I am making a complete series of pressure-density tests, more delicate than any heretofore, from the level of your cities down to the neutron core of your world.

"If we could reduce the kinetic energy of the atoms—slow down their motions of translation—the task would probably be simpler; but I see no way to accomplish that. Perhaps, if we could negate nearly all of that energy, the interatomic forces would actually hold the atoms in definite relative positions, approximating the solid state. It was that somewhat injudicious and perhaps too imaginative suggestion which caused my whole idea to be ridiculed on Sirius."

The ship dropped several hundred miles in the few seconds before Kron answered; since gaseous friction is independent of change in density, the high pressures of the regions being penetrated would be no bar to high speed of flight. Unfortunately, the viscosity of a gas does increase directly as the square root of its temperature; and at the lower levels of the Sun, travel would be slow.

"Whether or not our scientists will listen to you, I cannot say," said Kron finally. "Some of them are a rather imaginative crowd, I guess, and none of them will ignore any data you may produce.

"I do not laugh, either. My reason will certainly interest you, as your theory intrigues me. It is the first time anyone has accounted even partly for the things that happened to us on one of my flights."

The other members of the crew shifted slightly on their cradles; a

ripple of interest passed through them, for all had heard rumors and vague tales of Kron's time in the space carrier fleets. The Sirian settled himself more comfortably; Kron dimmed the central globe of radiance a trifle, for the outside temperature was now considerably higher, and began the tale.

"This happened toward the end of my career in space. I had made many voyages with the merchant and passenger vessels, had been promoted from the lowest ranks, through many rotations, to the post of independent captain. I had my own cruiser—a special long-period explorer, owned by the Solarian government. She was shaped like our modern interstellar carriers, consisting of two cones, bases together, with the field ring just forward of their meeting point. She was larger than most, being designed to carry fuel for exceptionally long flights.

"Another cruiser, similar in every respect, was under the command of a comrade of mine, named Akro; and the two of us were commissioned to transport a party of scientists and explorers to the then newly discovered Fourth System, which lies, as you know, nearly in the plane of the solar equator, but about half again as distant as Sirius.

"We made good time, averaging nearly half the speed of radiation, and reached the star with a good portion of our hulls still unconsumed. We need not have worried about that, in any case; the star was denser even than the Sirius B twins, and neutronium was very plentiful. I restocked at once, plating my inner walls with the stuff until they had reached their original thickness, although experience indicated that the original supply was ample to carry us back to Sol, to Sirius, or to Procyon B.

"Akro, at the request of the scientists, did not refuel. Life was present on the star, as it seems to be on all stars where the atomic velocities and the density are high enough; and the biologists wanted to bring back specimens. That meant that room would be needed, and if Akro replated his walls to normal thickness, that room would be lacking—as I have mentioned, these were special long-range craft, and a large portion of their volume consisted of available neutronium.

"So it happened that the other ship left the Fourth System with a low, but theoretically sufficient, stock of fuel, and half a dozen compartments filled with specimens of alien life. I kept within detection distance at all times, in case of trouble, for some of those life forms were as dangerous as those of Sol, and, like them, all consumed neu-

tronium. They had to be kept well under control to safeguard the very walls of the ship, and it is surprisingly difficult to make a wild beast, surrounded by food, stay on short rations.

"Some of the creatures proved absolutely unmanageable; they had to be destroyed. Others were calmed by lowering the atomic excitation of their compartments, sending them into a stupor; but the scientists were reluctant to try that in most cases, since not all of the beings could stand such treatment.

"So, for nearly four hundred solar rotations, Akro practically fought his vessel across space—fought successfully. He managed on his own power until we were within a few hundred diameters of Sol; but I had to help him with the landing—or try to, for the landing was never made.

"It may seem strange, but there is a large volume of space in the neighborhood of this Sun which is hardly ever traversed. The normal landing orbit arches high over one of the poles of rotation, enters atmosphere almost tangentially somewhere between that pole and the equator, and kills as much as remains of the ship's velocity in the outer atmospheric layers. There is a minimum of magnetic interference that way, since the flier practically coasts along the lines of force of the solar magnetic field.

"As a result, few ships pass through the space near the plane of the solar equator. One or two may have done so before us, and I know of several that searched the region later; but none encountered the thing which we found.

"About the time we would normally have started correcting our orbits for a tangential landing, Akro radiated me the information that he could not possibly control his ship any farther with the power still available to him. His walls were already so thin that radiation loss, ordinarily negligible, was becoming a definite menace to his vessel. All his remaining energy would have to be employed in keeping the interior of his ship habitable.

"The only thing I could do was to attach our ships together with an attractor beam, and make a nearly perpendicular drop to Sol. We would have to take our chances with magnetic and electrostatic disturbances in the city-supporting fields which cover so much of the near-equatorial zones, and try to graze the nucleus of the Sun instead of its outer atmosphere, so that Akro could replenish his rapidly failing power.

"Akro's hull was radiating quite perceptibly now; it made an easy target for an attractor. We connected without difficulty, and our slightly different linear velocities caused us to revolve slowly about each other, pivoting on the center of mass of our two ships. I cut off my driving fields, and we fell spinning toward Sol.

"I was becoming seriously worried about Akro's chances of survival. The now-alarming energy loss through his almost consumed hull threatened to exhaust his supply long before we reached the core; and we were still more than a hundred diameters out. I could not give him any power; we were revolving about each other at a distance of about one-tenth of a solar diameter. To lessen that distance materially would increase our speed of revolution to a point where the attractor could not overcome centrifugal force; and I had neither power nor time to perform the delicate job of exactly neutralizing our rotary momentum without throwing us entirely off course. All we could do was hope.

"We were somewhere between one hundred and one hundred and fifty diameters out when there occurred the most peculiar phenomenon I have ever encountered. The plane of revolution of our two ships passed near Sol, but was nearly perpendicular to the solar equator; at the time of which I speak, Akro's ship was almost directly between my flier and the Sun. Observations had just shown that we were accelerating Sunward at an unexpectedly high pace, when a call came from Akro.

" 'Kron! I am being pulled away from your attractor! There is a large mass somewhere near, for the pull is gravitational, but it emits no radiation that I can detect. Increase your pull, if you can; I cannot possibly free myself alone.'

"I did what I could, which was very little. Since we did not know the location of the disturbing dark body, it was impossible to tell just what I should do to avoid bringing my own or Akro's vessel too close. I think now that if I had released him immediately he would have swung clear, for the body was not large, I believe. Unfortunately, I did the opposite, and nearly lost my own ship as well. Two of my crew were throwing as much power as they could convert and handle into the attractor, and trying to hold it on the still easily visible hull of Akro's ship; but the motions of the latter were so peculiar that aiming was a difficult task. They held the ship as long as we could see it; but quite suddenly the radiations by means of which we perceived the

vessel faded out, and before we could find a band which would get through, the sudden cessation of our centripetal acceleration told us that the beam had slipped from its target.

"We found that electromagnetic radiations of wave lengths in the octave above H-alpha would penetrate the interference, and Akro's hull was leaking energy enough to radiate in that band. When we found him, however, we could scarcely believe our senses; his velocity was now nearly at right angles to his former course, and his hull radiation had become far weaker. What terrific force had caused this acceleration, and what strange field was blanketing the radiation, were questions none of us could answer.

"Strain as we might, not one of us could pick up an erg of radiant energy that might emanate from the thing that had trapped Akro. We could only watch, and endeavor to plot his course relative to our own, at first. Our ships were nearing each other rapidly, and we were attempting to determine the time and distance of closest approach, when we were startled by the impact of a communicator beam. Akro was alive! The beam was weak, very weak, showing what an infinitesimal amount of power he felt he could spare. His words were not encouraging.

" 'Kron! You may as well cut your attractor, if you are still trying to catch me. No power that I dare apply seems to move me perceptibly in any direction from this course. We are all badly shocked, for we hit something that felt almost solid. The walls, even, are strained, and may go at any time.'

" 'Can you perceive anything around you?' I returned. 'You seem to us to be alone in space, though something is absorbing most of your radiated energy. There must be energies in the cosmos of which we have never dreamed, simply because they did not affect our senses. What do your scientists say?'

" 'Very little,' was the answer. 'They have made a few tests, but they say that anything they project is absorbed without reradiating anything useful. We seem to be in a sort of energy vacuum—it takes everything and returns nothing.'

"This was the most alarming item yet. Even in free space, we had been doubtful of Akro's chances of survival; now they seemed reduced to the ultimate zero.

"Meanwhile, our ships were rapidly approaching each other. As nearly as my navigators could tell, both vessels were pursuing almost

straight lines in space. The lines were nearly perpendicular but did not lie in a common plane; their minimum distance apart was about one one-thousandth of a solar diameter. His velocity seemed nearly constant, while I was accelerating Sunward. It seemed that we would reach the near-intersection point almost simultaneously, which meant that my ship was certain to approach the energy vacuum much too closely. I did not dare to try to pull Akro free with an attractor; it was only too obvious that such an attempt could only end in disaster for both vessels. If he could not free himself, he was lost.

"We could only watch helplessly as the point of light marking the position of Akro's flier swept closer and closer. At first, as I have said, it seemed perfectly free in space; but as we looked, the region around it began to radiate feebly. There was nothing recognizable about the vibrations, simply a continuous spectrum, cut off by some interference just below the H-alpha wave length and, at the other end, some three octaves higher. As the emission grew stronger, the visible region around the stranded ship grew larger, fading into nothingness at the edges. Brighter and broader the patch of radiance grew, as we swept toward it."

That same radiance was seriously inconveniencing Gordon Aller, who was supposed to be surveying for a geological map of northern Australia. He was camped by the only water hole in many miles, and had stayed up long after dark preparing his cameras, barometer, soil kit, and other equipment for the morrow's work.

The arrangement of instruments completed, he did not at once retire to his blankets. With his back against a smooth rock, and a short, blackened pipe clenched in his teeth, he sat for some time, pondering. The object of his musing does not matter to us; though his eyes were directed heavenward, he was sufficiently accustomed to the southern sky to render it improbable that he was paying much attention to its beauties.

However that may be, his gaze was suddenly attracted to the zenith. He had often seen stars which appeared to move when near the edge of his field of vision—it is a common illusion; but this one continued to shift as he turned his eyes upward.

Not far from Achernar was a brilliant white point, which brightened as Aller watched it. It was moving slowly northward, it seemed; but only a moment was needed for the man to realize that the slowness

was illusory. The thing was slashing almost vertically downward at an enormous speed, and must strike Earth not far from his camp.

Aller was not an astronomer and had no idea of astronomical distances or speeds. He may be forgiven for thinking of the object as traveling perhaps as fast as a modern fighting plane, and first appearing at a height of two or three miles. The natural conclusion from this belief was that the crash would occur within a few hundred feet of the camp. Aller paled; he had seen pictures of the Devil's Pit in Arizona.

Actually, of course, the meteor first presented itself to his gaze at a height of some eighty miles, and was then traveling at a rate of many miles per second relative to Earth. At that speed, the air presented a practically solid obstacle to its flight, and the object was forced to a fairly constant velocity of ten or twelve hundred yards a second while still nearly ten miles from Earth's surface. It was at that point that Aller's eyes caught up with, and succeeded in focusing upon, the celestial visitor.

That first burst of light had been radiated by the frightfully compressed and heated air in front of the thing; as the original velocity departed, so did the dazzling light. Aller got a clear view of the meteor at a range of less than five miles, for perhaps ten seconds before the impact. It was still incandescent, radiating a bright cherry-red; this must have been due to the loss from within, for so brief a contact even with such highly heated air could not have warmed the Sunship's neutronium walls a measurable fraction of a degree.

Aller felt the ground tremble as the vessel struck. A geyser of earth, barely visible in the reddish light of the hull, spouted skyward, to fall back seconds later with a long-drawn-out rumble. The man stared at the spot, two miles away, which was still giving off a faint glow. Were "shooting stars" as regularly shaped as that? He had seen a smooth, slender body, more than a hundred feet in length, apparently composed of two cones of unequal length, joined together at the bases. Around the longer cone, not far from the point of juncture, was a thick bulging ring; no further details were visible at the distance from which he had observed. Aller's vague recollections of meteorites, seen in various museums, brought images of irregular, clinkerlike objects before his mind's eye. What, then, could this thing be?

He was not imaginative enough to think for a moment of any possible extraterrestrial source for an aircraft; when it did occur to him that the object was of artificial origin, he thought more of some experi-

mental machine produced by one of the more progressive Earth nations.

At the thought, Aller strapped a first-aid kit to his side and set out toward the crater, in the face of the obvious fact that nothing human could possibly have survived such a crash. He stumbled over the uneven terrain for a quarter of a mile and then stopped on a small rise of ground to examine more closely the site of the wreck.

The glow should have died by this time, for Aller had taken all of ten minutes to pick his way those few hundred yards; but the dull-red light ahead had changed to a brilliant orange radiance against which the serrated edges of the pit were clearly sillhouetted. No flames were visible; whence came the increasing heat? Aller attempted to get closer, but a wave of frightfully hot air blistered his face and hands and drove him back. He took up a station near his former camp, and watched.

If the hull of the flier had been anywhere near its normal thickness, the tremendous mass of neutronium would have sunk through the hardest of rocks as though they were liquid. There was, however, scarcely more than a paper thickness of the substance at any part of the walls; and an upthrust of adamantine volcanic rock not far beneath the surface of the desert proved thick enough to absorb the Sunship's momentum and to support its still enormous weight. Consequently, the ship was covered only by a thin layer of powdered rock which had fallen back into the crater. The disturbances arising from the now extremely rapid loss of energy from Akro's ship were, as a result, decidedly visible from the surface.

The hull, though thin, was still intact; but its temperature was now far above the melting point of the surrounding rocks. The thin layer of pulverized material above the ship melted and flowed away almost instantly, permitting free radiation to the air above; and so enormous is the specific heat of neutronium that no perceptible lowering of hull temperature occurred.

Aller, from his point of observation, saw the brilliant fan of light that sprang from the pit as the flier's hull was exposed—the vessel itself was invisible to him, since he was only slightly above the level of the crater's mouth. He wondered if the impact of the "meteor" had released some pent-up volcanic energy, and began to doubt, quite justifiably, if he was at a safe distance. His doubts vanished and were replaced by certainty as the edges of the crater began to glow dull red, then bright orange, and slowly subsided out of sight. He began packing the most

valuable items of his equipment, while a muted, continuous roaring and occasional heavy thuds from the direction of the pit admonished him to hasten.

When he straightened up, with the seventy-pound pack settled on his shoulders, there was simply a lake of lava where the crater had been. The fiery area spread even as he watched; and without further delay he set off on his own back trail. He could see easily by the light diffused from the inferno behind him; and he made faily good time, considering his burden and the fact that he had not slept since the preceding night.

The rock beneath Akro's craft was, as we have said, extremely hard. Since there was relatively free escape upward for the constantly liberated energy, this stratum melted very slowly, gradually letting the vessel sink deeper into the earth. What would have happened if Akro's power supply had been greater is problematical; Aller can tell us only that some five hours after the landing, as he was resting for a few moments near the top of a rocky hillock, the phenomenon came to a cataclysmic end.

A quivering of the earth beneath him caused the surveyor to look back toward his erstwhile camp. The lake of lava, which by this time was the better part of a mile in breadth, seemed curiously agitated. Aller, from his rather poor vantage point, could see huge bubbles of pasty lava hump themselves up and burst, releasing brilliant clouds of vapor. Each cloud illuminated earth and sky before cooling to invisibility, so that the effect was somewhat similar to a series of lightning flashes.

For a short time—certainly no longer than a quarter of a minute—Aller was able to watch as the activity increased. Then a particularly violent shock almost flung him from the hilltop, and at nearly the same instant the entire volume of molten rock fountained skyward. For an instant it seemed to hang there, a white, raging pillar of liquid and gas; then it dissolved, giving way before the savage thrust of the suddenly released energy below. A tongue of radiance, of an intensity indescribable in mere words, stabbed upward, into and through the lava, volatilizing instantly. A dozen square miles of desert glowed white, then an almost invisible violet, and disappeared in superheated gas. Around the edges of this region, great gouts of lava and immense fragments of solid rock were hurled to all points of the compass.

Radiation exerts pressure; at the temperature found in the cores of stars, that pressure must be measured in thousands of tons per square

inch. It was this thrust, rather than the by no means negligible gas pressure of the boiling lava, which wrought most of the destruction.

Aller saw little of what occurred. When the lava was hurled upward, he had flung an arm across his face to protect his eyes from the glare. That act unquestionably saved his eyesight as the real flash followed; as it was, his body was seared and blistered through his clothing. The second, heavier, shock knocked his feet from under him, and he half crawled, half rolled down to the comparative shelter of the little hill. Even here, gusts of hot air almost cooked him; only the speed with which the phenomenon ended saved his life.

Within minutes, both the tremblors and hot winds had ceased; and he crawled painfully to the hilltop again to gaze wonderingly at the five-mile-wide crater, ringed by a pile of tumbled, still-glowing rock fragments.

Far beneath that pit, shards of neutronium, no more able to remain near the surface than the steel pieces of a wrecked ocean vessel can float on water, were sinking through rock and metal to a final resting place at Earth's heart.

"The glow spread as we watched, still giving no clue to the nature of the substance radiating it," continued Kron. "Most of it seemed to originate between us and Akro's ship; Akro himself said that but little energy was being lost on the far side. His messages, during that last brief period as we swept by our point of closest approach, were clear—so clear that we could almost see, as he did, the tenuous light beyond the ever-thinning walls of his ship; the light that represented but a tiny percentage of the energy being sucked from the hull surface.

"We saw, as though with his own senses, the tiny perforation appear near one end of the ship; saw it extend, with the speed of thought, from one end of the hull to the other, permitting the free escape of all the energy in a single instant; and, from our point of vantage, saw the glowing area where the ship had been suddenly brightened, blazing for a moment almost as brightly as a piece of Sun matter.

"In that moment, every one of us saw the identifying frequencies as the heat from Akro's disrupted ship raised the substance which had trapped him to an energy level which permitted atomic radiation. Every one of us recognized the spectra of iron, of calcium, of carbon and silicon and a score of the other elements—Sirian, I tell you that that 'trapping field' was *matter*—matter in such a state that it could not

radiate, and could offer resistance to other bodies in exactly the fashion of a solid. I thought, and have always thought, that some strange field of force held the atoms in their 'solid' positions; you have convinced me that I was wrong. The 'field' was the sum of the interacting atomic forces which you are trying to detect. The energy level of that material body was so low that those forces were able to act without interference. The condition you could not conceive of reaching artificially actually exists in Nature!"

"You go too fast, Kron," responded the Sirian. "Your first idea is far more likely to be the true one. The idea of unknown radiant or static force fields is easy to grasp; the one you propose in its place defies common sense. My theories called for some such conditions as you described, granted the one premise of a sufficiently low energy level; but a place in the real Universe so devoid of energy as to absorb that of a well-insulated interstellar flier is utterly inconceivable. I have assumed your tale to be true as to details, though you offer neither witnesses nor records to support it; but I seem to have heard that you have somewhat of a reputation as an entertainer, and you seem quick-witted enough to have woven such a tale on the spot, purely from the ideas I suggested. I compliment you on the tale, Kron; it was entrancing; but I seriously advise you not to make anything more out of it. Shall we leave it at that, my friend?"

"As you will," replied Kron.

EDITOR'S NOTE:

. . . And what about Pluto? Pluto, the outermost planet of the Solar System, is so far away (forty times as far from the Sun as the Earth is) and so small that practically nothing is known about it, except that it would not be a particularly comfortable place for human beings. No science-fiction story about Pluto has been found that merits reprinting, and for that reason it shall be left up to the reader to dream up his own private notion about what sort of "possible world" it may be. Ideas welcome!

PART TWO

THE GALAXY

AS SOON as we escape from the limiting confines of the Solar System, we immediately notice a sense of freedom and an uninhibited imagination which makes even the more fantastic of the tales about life on our own planets seem quiet and ordinary. We know some restrictive data about the planets around the Sun, but about the worlds of other stars we know absolutely nothing, and therefore we are under no restrictions whatsoever.

Consequently, from here on you may expect anything—even ordinary folks exactly like human beings—on the imagined worlds of the Galaxy.

Murray Leinster

PROPAGANDIST

The problem of establishing communications between peoples of two alien planetary systems has long worried science-fiction writers. By the very nature of things, it would be unwise to assume automatic friendliness on the part of such strangers light-years away from us. Means of communication and understanding would have to be developed; and the technical difficulties of working out such methods might well be almost insurmountable, particularly if the evidence indicated a high level of civilization among such alien people. The more civilized, the more trigger-happy. . . .

In this story the problem is solved by a most fortunate accident, involving perhaps the only Earthian life form which could not possibly be deceitful, which by its very nature always represents reality in its primitive emotions, and which is therefore able to reflect accurately the essential decency of dog-loving man.

YOU remember the Space Assassins, of course. They were that race of which no human being ever saw a living member, and escaped to tell about it afterward. You also remember the deadly, far-flung search that was made for their base, their home. They'd been sniping our ships for a long time. But then a squadron of their space fleet raided the Earth colony on Capella Three and without warning or provocation or alternative slaughtered every one of the colony's half million human population. Then the hunt for them began.

This is the story of one of the incidents of that hunt—and also it's the story of a dog named Buck.

Buck trailed his master sedately into the control room of the light cruiser *Kennessee*. He waited patiently until the skipper looked up from the electron telescope. Then Buck's master—Holden—sat down with the sheaf of wave records he'd brought from the communications room. Buck blinked wisely at the skipper and lay down on the floor with an audible, loose-jointed thump. He put his nose between his paws and sighed heavily. But the sigh was not of unhappiness. Buck

was a simple dog. He was friendly with everybody on the *Kennessee,* from the skipper himself to the lowliest mess boy, but his master and private deity was Junior Lieutenant Holden. Whithersoever Holden went, there Buck went also—regulations permitting—and waited until Holden wanted to go somewhere else.

Now he lay on the foamite flooring. He heard his master's voice, and the skipper's in reply. They were concerned and uneasy. Buck dozed. Little, half-formed dreams ran through his slumber. Memory dreams, mostly, of himself racing gloriously through tall grass on the green fields of Earth, with Holden always somewhere near. The voices of the two men formed a half-heard background to his dozing.

The men were troubled. The *Kennessee* rode a comet's orbit through the solar system of Masa Gamma, her drive off and giving no sign of life. She was impersonating a barren visitor from the void, spying out the ground for what would be—if she was successful—the monstrous destruction of an entire race by planet-smasher guided missiles and the merciless weapons of an Earth fleet. The men did not like it. They'd hoped that some other ship would be the one to meet with success in its search. But they had their orders.

Some weeks back the ship had dropped from overdrive to less-than-light speed far beyond the outermost of the Masa Gamma planets. She'd decelerated to an appropriate speed and course for a wanderer, and she'd begun her ride along a comet's path through the eleven-planet system. And almost immediately her receptors had picked up evidence of civilization here. Space-radio signals. They were unintelligible, of course, but they told that here was a civilization comparable to human culture on a technical basis. And that was what the *Kennessee,* with every other light ship of Earth's space navy, was hunting for. There was a race which, without known contact with Earthmen, was the deadly enemy of humanity. For years past, exploring ships from Earth had dropped out of sight with ominous frequency. There had been suspicions, but no proof of an inimical race which destroyed humans wherever it came upon them. But six months ago the Earth colony on Capella Three had been wiped out, terribly, by raiders of whom nothing was known except that they were not human. So somewhere there was a race which held Earth to be its enemy. It had to be found. If it could not be negotiated with, it must be destroyed before it grew strong enough to wipe out all of humankind. And the men on the *Kennessee* knew that they might have found it on the planets of Masa

Gamma. This system had never been explored before, and this civilization which had space radio might be the one—

Buck, the dog, dozed lightly on the control-room floor. Little fragments of dreams ran through his half-slumbering consciousness: the smells in the engine room; an irrelevant fragment of chasing a cat; a moment or two in which he sniffed elaborately at a tree . . . A slightly louder comment made him open his eyes.

"They've interplanetary travel, sir, at least"—that was Holden. "We've picked up space-radio messages from definitely between planets. It looks like this is the race we were sent to find."

The skipper nodded.

"It could be. But if they're to be smashed on our report, we need to make sure. That's orders, too. Can they smash the *Kennessee?* That's the test for the enemy. If this race can't kill us, they're not the enemy we're looking for. If they can, they are. We've got to find out."

"But interplanetary travel is good evidence—"

"It's not interstellar travel," said the skipper. "We'll send a torp back immediately with all the data to date. But you've picked up no whango waves, Holden. We've no proof that these folk can travel between the stars. The enemy can."

"They might be concealing the fact," said Holden. "They'd have picked up our whango wave on arrival. They might be laying for us, waiting for us to walk into their parlor where they can smash us without a chance to fight back or report. That would be typical."

He stood up and Buck got immediately to his four paws and wagged his tail. His master, Holden, was going to go somewhere. So Buck was going with him. He waited contently. To Buck, happiness was going where Holden went, being wherever Holden was, simply soaking in the sensation of being with Holden. It was a very simple pleasure, but it was all he asked of fate or chance. When Holden petted him or played roughly with him, Buck was filled with ecstatic happiness, but now he waited contentedly enough simply to follow Holden.

"What you say is true enough," agreed the skipper. "They could be laying for us. We'll see. A message torp will make sure that if we don't get back our fleet will know where to come and who to smash. Then we'll make a landing in a lifeboat. Our enemy couldn't resist smashing that! And if it gets away, we'll know something about their weapons, anyhow."

"I volunteer, sir, for the lifeboat," said Holden quickly.

"We'll see," said the skipper. "You get your data ready for the torp. You're sure this record is a scanning beam? Like the old-fashioned radar? And it's being kept on us from this fourth planet?"

"Quite sure, sir," said Holden. "We can't know how detailed the information may be that it takes back. Of course, it would be logical enough to scan a supposed comet—"

"Let's hope," said the skipper, twinkling, "that the echo from our hull says, 'Nobody out here but us comets, boss.' Get your stuff ready for half an hour from now, Holden."

Holden saluted and went out of the control room. Buck went sedately after him, a large brown dog who did not bother his head over such trivia as interstellar travel or nonhuman races that massacred half a million humans with an insensate ferocity.

Buck was a very contented dog. He was with his master.

The Planetary Council of Masa Four was in session. It was not a happy gathering. Scanning beams had reported that a supposed new comet, driving in on a perfectly convincing orbit, was actually an artifact—a spaceship. It used no drive and seemed empty of life. But it had come in through the gravitation field of the outermost planets—and it showed no sign of rotation. Which was impossible unless gyroscopes or some similar device were running within it.

"We have had one visitor from space, before," said the Moderator of the Planetary Council. He looked very weary. "Our histories tell us of the consequences. If this is another ship of the same race, we must destroy it. Since it is attempting secrecy, such action is justified, I think. But that secrecy suggests suspicion of us—a suspicion that we may have destroyed the last visitor. If we destroy this ship also, we may be sure that suspicion will become certainty and a third visit will be made in overwhelming force. That means that we will have to convert our whole civilization for war. We will have somehow to develop an interstellar drive, and we will have to spend the rest of the time in battle for our very survival. We will have to change from a peaceful race to one with a psychology adapted only to war."

The Spokesman for the First Continent said hopefully:

"Is it certain that this is a ship of the same race as the first? It is not of the same form. Is it certain that this race is of a not-possibly-friendly type, like the first?"

"It is not certain," said the Moderator tiredly. "The psychological

factors implied by its outer design suggest a different race. But can we risk an attempt at peaceful contact? The crew of one ship would be at our mercy. Might they not pretend friendship in order to escape with information leading to our destruction? Could we trust the friendship of any race at all which sent a single ship to spy?"

There was silence. Two centuries before, another ship had entered the Masan system. Half a planet devastated, and millions upon millions of lives, had been the cost of the destruction of that one ship. But its destruction had been necessary. Its crew made no response to peaceful overtures. Wherever they landed they destroyed, ferociously, everything savoring of a rival civilization. Especially the inhabitants. They could not be treated with—only killed.

"If," said the Spokesman for the Third Continent wistfully, "we could capture a single member of this spaceship's crew, we could make sure that friendship was hopeless. It is a pity we cannot make sure before—"

"It is a great pity," said the Moderator bleakly. "To convert not only our civilization but our people to endless war, for all time, is the greatest of pities. But I do not think there is anything else to do. Will you vote upon preparations for the destruction of this ship?"

The vote was reluctant but unanimous. For war.

The *Kennessee* sent off the torp from the aft communications room. It was not an impressive device, the torp, merely a cigar-shaped object some six feet long. After leaving the *Kennessee* it would drive away at thirty-five gravities' acceleration for fifteen minutes and then go into overdrive—when it would cease to exist, as far as normal space was concerned. Its disappearance would be marked by the emission of a monstrous surge of energy—a "whango wave"—which could be detected at hundreds of millions of miles. Near home base it would come out of overdrive with the emission of another, similar, wave. The second wave was useful. From Masa Gamma to the *Kennessee*'s home base was some eighty light-years. A space-radio message transmitted by tight beam would reach home base only in time to be of interest to the crew's great-grandchildren. But the torp would arrive within days, its reappearance wave would be picked up by a far-flung net of communications ships, and they would receive and forward the torp's automatically transmitted messages, and later pick it up for the recovery of written data and physical specimens.

Buck was not allowed to be present at the launching. He was a large dog, and the aft communications room was in the tapering, slender tail of the *Kennessee*. It would be crowded. Holden ordered him out. And Buck was far too well assured, both of Holden's affection for him and of his own worth, to be sensitive about such a matter. He knew there were times when he couldn't be underfoot. But he also knew that he was welcome anywhere else on the ship. He went trotting sedately in search of inferior, but still human, company until his master could allow him around again.

He found crew members stocking a lifeboat for its special mission. He went companionably into the lifeboat with the working party. He wriggled into the control cubicle with the man sent to remove its records—and observed. Presently other men arrived, the work party left, and there were sundry heaving movements of the lifeboat. Buck blinked from where he lay more or less curled up on the floor. Stars shone in the lifeboat portholes. There was a glaring bright light. Unshielded sunshine from Masa Gamma came in a forward port and made a patch of incandescence on the back wall. Junior Lieutenant Maynard walked into the control cubicle and flipped the phone switch.

"Lifeboat in launching position, blister removed, ready to take off," he said briskly.

"All right," said Holden's voice from the speaker. It sounded gloomy. "Take off when the whango wave hits. It may jam their scanner and get you out of the beam unobserved. Luck."

Buck knew loud-speakers. But also he knew his master's voice. He wagged his tail. It thumped. Maynard jerked his head around and yelled: "Buck! Here's Buck! Behind me!"

An instant's silence. Then Holden's voice, more gloomy still.

"No time to get him back on board. He'll have to go along. Sorry, Maynard."

"No harm," said Maynard cheerfully. "Maybe he'll mascot us. How much time?"

"Twenty seconds," said Holden's voice. "You have all the luck! I was high man for this job until you drew that ace!"

Maynard chuckled. The *Kennessee* rode into a very probably hostile solar system. If it was the home of the race that had been sniping off Earth ships and had massacred the colonists of Capella Three, there was not much chance that the cruiser would ever get away again. But

its junior officers had played a hand of stud poker for the privilege of making a dare-landing on the system's largest planet.

The speaker suddenly emitted a sound so savage and so loud that the diaphragm jangled musically only once, and then made strangled, rasping noises. That was the whango wave of the message torp. It was a blast of untuned and untunable radiation which would jam every receiver in range while it lasted.

There was a crushing feeling of weight. Buck slid back against the back rest of the seat on which he now lay. He was pressed hard against the upholstery. He wriggled and panted. His eyes grew plaintive. Buck did not like acceleration. In fact, he did not like lifeboat travel. But he had his fill of it in the next eighteen hours, anyhow.

A message arrived at the hastily improvised Department of War on Masa Four. The Department of War was being feverishly organized to coordinate every erg of energy in the entire solar system into synchrophased power beams which at a given moment would stab out from four planets at once—all of them on the same side of the local sun—and converge terribly upon the pseudo comet. There would be no material weapon for the ship's detectors to note in time for any maneuver of escape. This weapon would strike at the speed of light. An object in the focus of the combined beams would experience the interior temperature of a sun. It was unthinkable that any possible relay could operate before it was volatilized. The weapon was irresistible—as against a single ship. But the computation of phase relationships for the moving planetary projectors, so that the separate beams would reinforce instead of partially canceling one another, was a matter of terrifying complexity. This weapon could destroy one ship of known course and speed, or one ship on the ground, if enough time could be had for calculations. But it would be useless against a fleet. Days or weeks were required for the adjustment of the multitude of beams for a hit on a predetermined spot. Against ships of changing course and speed, the weapon was useless.

A message arrived at the Department of War.

SMALL SPACE CRAFT DETACHED ITSELF FROM INVADING VESSEL AT INSTANT OF STRONG UNTUNED WAVE DISTURBANCE. SMALL CRAFT MAKING GUIDED FLIGHT TOWARD PLANET FOUR. WILL LAND ON DARK SIDE NORTHERN AREA FIRST CONTINENT. REQUEST ORDERS.

The Department of War was newly organized and had not time to acquire traditions of pomposity and bureaucratic delay. Within minutes its orders went back:

EVACUATE ALL POPULATION FROM AREA IN QUESTION. HAVE GROUND VEHICLES ATMOSPHERE FLIERS READY TO TEST ARMAMENT OF CRAFT. BROADCAST APPEAL FOR VOLUNTEERS, GIVING DUE WARNING OF PROBABLE DEATH. NO SPACE CRAFT TO BE USED. NO HINT OF ADEQUATE DEFENSES MUST BE GIVEN TO ENEMY UNTIL FULL-SCALE OPERATION BY ENTIRE SYSTEM.

The population of the Masa Four had had one experience of invaders from beyond. Some twenty-five million citizens began a swift, orderly evacuation—as a precaution against the landing of an unarmed lifeboat.

Buck waked from an uneasy doze when the lifeboat descended to the planet's dark side. Every observation device known to man was at work to gather information, but Buck was not interested in technicalities. He yawned elaborately, even as scanner beams were noted. He stretched as the scanner beams cut off abruptly. He shook himself comfortably as the analyzers reported the atmosphere to be Earth-type, with a considerable excess of the inert gases but well inside the comfort range of oxygen-nitrogen mixtures.

The lifeboat went down carefully, feeling for dangers. Infrared equipment reported the shore of a sea and oddities that could be the equipment of a harbor. Maynard sheered the tiny craft away. He actually neared ground only a hundred-odd miles away. It was his job to get himself killed if the local population could manage it, but it was not his job to make them. If they knew the seeming comet out in space was a spaceship, they'd be on the alert. If they were the race that had murdered the Capellan colonists, they'd try to keep him from getting back to his ship. If they weren't—

The lifeboat grounded with infinite caution in what the scanners declared was a jungle of feathery-leaved vegetation. For long, long minutes Maynard sat tense, prepared to fling the little craft skyward at any sign of action against it. Nothing happened. The outside microphones transmitted noises, to be sure, but they were the random sounds of wild jungle life. After a long time Maynard cracked a port. Still nothing.

"If anybody wants to volunteer to get biological specimens," said Maynard, "he can step out. In case of alarm, though, I'm going to take

this boat up and try to wriggle back—to find out what they'll try to use to stop us."

Voices answered. There was the clanking of an unlocking door. Buck trotted back to it. Fascinating smells came in the opening. Men stepped out—armed and cautious. The exit door stayed open. One man stood by to shut and dog it if the lifeboat shot skyward.

It took courage for men to venture out, knowing that they might have to be abandoned so the lifeboat's mission of drawing enemy fire —if this race was inimical—could be carried out. But Buck was fascinated by the smells. He would have liked to get back to Holden, of course, but these men were his friends, too. If they went out into this place of innumerable novel smells—

He jumped lightly to the ground. His nose was instantly busy. The ground had a different smell from that of Earth. The plants were new. There were scents which must be animals, but not any animals Buck had ever scented before. He heard a man moving nearby, taking samples of vegetation. Very much could be inferred from the types of starch and cellulose this planet's vegetation contained. But Buck could have told much more, from what his nose discovered. Here a little carnivore had trailed a skittering small thing which periodically darted up into overhanging vegetation, and as periodically darted down again. There a small herbivore had made a vast, terrified leap for no apparent reason—which meant that a flying thing had made a swoop at it, and missed. And here a thing which had almost the smell of a snake moved in distinctive hops, while there was the definite smell of a warm-blooded animal in something which left a completely continuous trail by traveling on its belly.

Buck explored, utterly absorbed in this world of literally new smells. From time to time he heard the sounds made by the men, and was reassured. But he strayed farther and farther from the grounded lifeboat —only sometimes he stopped and listened to it—and he had found the burrow of some living cretaure and was sniffing absorbedly at its entrance when the really significant noises began.

One noise began at the horizon and swept toward the zenith. It was a dull, humming rumble, like the motors of atmosphere fliers Buck had heard back on Earth. It was mechanical and, therefore, of man, and, therefore, not to be feared or suspected. At the same time there came distant clankings. And they were like bulldozers and other machines of

men, and they were not to be feared, either. Buck sniffed fascinatedly at the burrow.

Men's voices called sharply. Had Holden called him, Buck would have gone bounding instantly. But he owed a lesser obedience to other men. He sniffed again and again, lingeringly. Then, as he trotted unhurriedly in response to the call, he heard the zooming roar of a lifeboat drive in atmosphere. It shot toward the sky. It did not occur to Buck that he might have had to be left behind—as a man would have been abandoned under like circumstances—because the lifeboat had to test out the deadliness of armaments on this planet, but had to be aloft to test them fully.

When he got back to the place where the lifeboat had been, though, it was gone.

Buck was simply bewildered. The droning above grew to a thunderous, circling roar. There were many flying things overhead, and they cruised back and forth in the darkness in a pattern which would have made it difficult indeed for the lifeboat to have escaped without coming under radar-aimed fire. At the same time, the clanking mechanical noises came closer from at least three directions.

Buck smelled incredulously at the place where the lifeboat had been but where it was no longer. He ran uneasily along the scent trails left by the men who had gathered biological specimens. It was completely unthinkable that the men had deserted him. He came back again and again to the place where the lifeboat had rested. He was unhappy, of course, but it was not possible for him to imagine himself abandoned. He waited uncomfortably for the men to notice that he'd been left behind and to come back after him.

Roarings circled in the overcast sky above him. Clankings approached in the encircling dark. Those were things of men—not his men, perhaps, but certainly men who would be friendly to a large, brown, well-mannered dog with a collar around his neck which said he belonged to Holden. They might even help him get back to Holden. But meantime he trotted uneasily about the place to which the lifeboat had not returned. The noises and clankings grew louder.

When the noises were very near, a blindingly bright white light abruptly shone down from a low-flying plane which spun in dizzy tight circles overhead. The light showed everything with a pitiless clarity, and Buck blinked dazedly. But he was not alarmed. Machines and

bright lights and flying things meant men. And a self-respecting dog has a perfectly comfortable relationship with all men, though it is a special relationship with the crew of his ship, and his tie to his master is unique.

Buck moved prudently out of the way as machines with glaring lights came clanking through the jungle, thrusting aside the feathery trees with a powerful violence. He moved out of their path, but he did not dodge into the shadows. He blinked and wagged his tail abstractedly and prepared to greet the men in the machines with due courtesy. Of course they would help him get back to Holden!

A machine stopped, and something got out of it. But the figure was not a man. Buck sniffed incredulously. Then his hackles rose. It was not possible! Machines were handled by men! Only by men! The Masan moved toward him. Buck growled warningly. Unbearable light smote upon him. He growled again, bristling, a big brown dog growling in warning that members of a mere race which might have been sniping Earth ships and massacring Earth colonies had better not bother him! Buck, of course, knew nothing of missing ships or massacres. He was a dog, a man's dog, and he could imagine no creature which was not inferior to man and which a man's dog could not reasonably defy.

It was an extraordinary picture. Alien and unlikely jungle trees rising toward an overcast sky in which a bright white light whirled in dizzying circles. Huge, gleaming machines with lights—very bright lights—stabbing through the jungle's feathery leafage and casting innumerable sharp shadows. The Masans, inhabitants of the fourth planet of Masa Gamma—not too much unlike men, to be sure—staring at a place in the jungle where a ship's lifeboat had landed and where a big brown dog stood warningly at bay and growled at them of the wrath of his masters.

There was a pause. A race which has space radios, and interplanetary ships, and radar, is not likely to be altogether stupid. And there were scanners in the ground vehicles, too, which carried back to record rooms everything the machines saw. The best brains of the race watched this meeting. And perhaps it was back where the scanned picture of the event was seen that someone realized that Buck's paws were not made for the handling of machinery or the making of spaceships. Or perhaps something more subtle—

There were sounds which Buck somehow knew were language,

though he could not understand them as words. He turned sedately from the first figure, which had halted at his growl. He blinked dignifiedly at the surrounding lights. None advanced toward him. Buck emitted sundry small, confident, admonitory rumblings. His men had been here. They had gone away. They would come back for him. Of course. He was going to wait for them. He was not arbitrary about it. He would allow the machines to pass as they pleased. Men probably wished the machines to do thus and so, and he would not interfere. But he would wait here.

He deliberately turned himself around twice and lay down on the ground. But his head stayed erect and he blinked at the lights. He calmly and confidently settled down for men to notice that he'd been left behind and to come back for him.

But he hoped desperately that Holden would be with them.

A report went to the Department of War on Planet Four. It was a highly accurate report, covering the landing of a small space craft on the northern area of the First Continent. The footprints of men were accurately transmitted, as well as the impression left by the spaceboat in the soil. There were motion pictures of Buck. Most of the report, naturally, was about him.

". . . Limited but definite intelligence," said the report. "Is aware of social relationships neither hostile nor friendly, but tolerant. Is familiar with machines and regards them without fear but without interest. Has an extraordinary air of self-confidence and seems justified in opposing the wishes of more intelligent beings, though offering no hostility unless an attempt is made to force it to comply . . . Appears to be a member of a subject species to the makers of the space craft, though its utility is not clear, since it has neither prehensile claws nor any apparent technical aptitude for the supervision of machines . . . We are setting up psychoscanning devices to attempt to extract information from its memories, of course without its awareness of the process. Meanwhile we are making every effort to leave it emotionally undisturbed. . . ."

A later report:

". . . Psychoscanners have been able to secure excellent pictures and sound memories from the animal. It is of a species which lives in symbiosis with the creatures operating the space craft. Its utility to the su-

perior race is not yet clear, but its subservience to them—they are not much unlike us—is proven by the records forwarded with this report. The animal's vision appears to be comparatively poor, but its hearing and smell are excellent. Its memories of smells, in particular, are especially vivid. We have vision-memory records of various members of the spaceship's crew, but smell-memories of every individual. Apparently, however, little or no technical information can be had from the animal because of the disinterest of the 'Buck'—this is the auditory memory of the animal's name for itself—in such matters. Memories of the naval base and of the presumed home planet of the invaders are concerned almost exclusively with smells. It is extremely concerned with trees and posts and the smells associated with them. . . . We regret that no useful technical information can be had. . . ."

An order from the Department of War:

URGENT. FIRST ATTENTION. THIS ORDER SUPERSEDES ALL OTHERS WHATSOEVER AND CLAIMS THE OBEDIENCE OF EVERY CITIZEN BEFORE ANY OTHER ACTIVITY WHATEVER.

The Planetary Council has decided that information obtained from the Buck will determine our attitude toward the invaders. The fullest data must be secured concerning the relative loyalty of superior and inferior. Subject races can be psychologically conditioned to loyalty to tyrannical superiors. To what extent was this done to the Buck, and how? To what extent are rights conceded to the inferior race? What punishments are inflicted for mistakes of the race of inferior intelligence? What social stigma attaches to *them? To what degree does the Buck expect loyalty to his kind* from the superior race? What is the nature of the compact between the two—explicit or implied—and to what extent is it observed by the superior? What . . .

The order continued in exhausting detail. It was based upon the realization that Buck—as a domestic animal—contained within his skull an absolutely objective picture of the human race. Buck would not be unbiased in his contemplation of his memories, but his memories would be right. A dog's-eye view of humanity would be, within its limits, an extraordinarily revealing view.

The Planetary Council accepted the conclusion that no technical or military information could be had from Buck. But what information

it could obtain would be priceless. No man could be truthful about his own race, talking to an alien entity. But a dog—

The Planetary Council pushed its preparations for war. It had very little hope of anything but never-ending battle through all the centuries of the future. But what hopes it had were centered in Buck.

Buck himself found life confusing. The place where the lifeboat had landed was fenced in now, and he was inside the fence. The things which were not men treated him with respect, and he treated them with the self-respecting courtesy of a well-mannered dog. They pointed things at him, and he was bored. But presently they had a loud-speaker which made noises. Once it barked at him in exact similitude of another dog—in fact, Buck remembered a dog at the Rigel base whose bark had sounded exactly like that. He barked back angrily. But the loud-speaker did not bark again. Another time, Holden's voice came out of it. And Buck leaped in frenzied joy, his tail wagging until it was almost a blur, and gave tongue in such howlings of heartbroken joy as a dog does give when his master returns after many days. When he realized that it was the loud-speaker, he could not accept the disappointment. He went whimpering about the enclosure, searching for Holden.

There were other stimuli applied to Buck, too. One of the Masans brought him food. At first Buck sniffed at it gingerly. If he must eat of unfamiliar things, he preferred food of his own killing. But ultimately he tolerated the Masan and ate. The Masan had a loud-speaker attached to his body, and it said "Buck" on various occasions, and at first Buck's tail wagged joyously at the familiar syllable. But even when the Masan himself mastered the articulation of the name, Buck did not accept him fully. He wanted men. Especially, he wanted Holden. He dozed, and dreamed of Holden. He slept, and sometimes his dreams were such as to make his paws make tiny, jerking, frustrated movements, and sometimes he barked or whimpered or whined in his sleep. But the whinings were of the desperate joy he felt when in his dreams he saw Holden.

He had no idea that the things pointed at him by the Masans made records of his memories as they were evoked by the increasing stock of stimuli the Masans were able to apply. Buck had understood the meaning of well over a hundred words, when combined with certain tones of voice. These words invariably provoked similar responses as

the loud-speaker uttered them from the record of Buck's memories.

While the preparations for the destruction of the *Kennessee* went on, the Masans studied Buck intensively. With their increasing comprehension of his brain, they tried to win his friendship. The one Masan assigned to the task tried painstakingly to fill the part of Holden. He used the memory-recordings of Holden's voice. He tried to reproduce the strokings that Buck's memories said caused quiverings of ecstasy. Once he tried to tussle with Buck, as Holden did. And that took courage, because Buck was a big and powerful dog and the Masan was slight and relatively frail.

But Buck would not play. He was polite and he was amiable within the limits a dog sets for himself toward other animals also useful to man—horses, for example, and cows and sheep and very occasionally a cat. But a dog will not play with a gamboling lamb nor run with a freed colt. Buck was reserved. His loyalty to man, and especially to Holden, could not be broken. And though he did eat, and condescendingly tolerated the Masan scientist—considered to have one of the two or three best brains in the system—who tried to replace Holden in his affections, he began to pine away as days and days passed by and began to stretch into weeks. He grew thin, though he was abstractedly aware that the people who were not men had begun very definitely to like him.

After all, a man's dog doesn't thrive when he's separated from the man.

The *Kennessee* rode on in the orbit it had chosen. Maynard had made an unhappy, abject apology to Holden for the desertion of Buck, and Holden accepted it, and neither of them felt at all better afterward. A man would have been left behind under exactly the same circumstances, but a dog is somehow different. He can't take care of himself. His abandonment couldn't be helped, but it rankled.

The material brought back from Masa Four was duly examined. The space-radio records piled up, and electron-telescope examination of the planets continued, and evidences of a highly developed civilization accumulated—while scanner-beam observation of the *Kennessee* from Masa Four went on unendingly.

It was a dubious situation extended almost to the breaking point. The lifeboat voyage had produced a reaction of ground vehicles and

atmosphere fliers. It gave an impression of limited offensive power. But, on the other hand, there was interplanetary travel here. And the scanner beam on the *Kennessee* and the instant detection of the lifeboat was proof that the people of this system knew exactly what the *Kennessee* was.

A civilization without defense weapons but with interplanetary ships and space radio should have tried to make contact with the *Kennessee*. If only to placate invaders, some attempt to open communication should have been made. Absence of such efforts was ominous. The appearance was that of a race which played possum until it could strike an overwhelming blow. So the *Kennessee* stayed in a state of nerve-racking alertness, with detectors out all around, and relays set to throw on overdrive should a high-velocity guided missile seem to draw near.

"It looks bad," admitted the skipper to Holden. "We'd have tried to make contact, in their shoes. But whoever raided the Capella colony simply rode in and started killing. Maybe these people are that sort. Anyhow, if they do get us, our fleet will know who did it and come take them apart with planet-smasher bombs."

Holden said dourly:

"I wish I'd been in that lifeboat. When do we send back another message torp?"

"We make no more landings," said the skipper. He added, "You'd never be able to find where the other boat landed, and anyhow Buck—"

"Was probably blasted the instant they saw him," said Holden.

He couldn't blame anybody, but he was angry. He missed Buck.

On the twelfth day after Buck's landing, an interplanetary ship took off from Masa Four. The *Kennessee* had now ridden in beyond that planet and was headed for a perihelion point on the other side of Masa Gamma. If she survived to get there, it was the skipper's intention to put on overdrive and go back to base with all his records. But this interplanetary ship changed all plans. It appeared to be a rocket, in that it left behind a trailing cloud of vapor which looked like ejected gases. The spectroscopes, though, showed it to be merely hydrocarbon—smoke particles. And it altogether lacked the backward velocity which would have proved it a means of propulsion. It was simply a trail of vapor, as if for advertisement.

In two days it had climbed well away from the planet and changed direction in a long smooth curve. The Navigation Officer came to the control room shortly after, to report that it was on an interception course, with interception speed, and would draw gradually closer to the *Kennessee* until contact was made. Then its trail of vapor broke, and swelled, and broke, and swelled, as if unmistakably to draw attention from the cruiser.

The control-room loud-speaker boomed shortly. Holden's voice:

"Sir!" he said harshly. "That phony rocket is beaming signals at us, running up and down the spectrum and trying frequency and amplitude modulation and everything else. Listen!"

The speaker said resonantly: *"Woof!"* It was Buck's joyous bark. An instant later came the word "Buck" in a distorted but definitely recognizable version of Holden's own voice. And then, quite insanely, *"Lie down, sir!" "Come get it, boy!" "Fetch it, Buck,"* and all the other phrases to which the dog Buck had been trained to respond. As a means of opening communication between alien and mutually suspicious races, the vocabulary known to a big brown dog named Buck lacked dignity, but nothing could have been much more informative.

"You see what it means, sir!" said Holden in a strained voice. "They got the stuff out of Buck's brain, somehow! They read his memories! They must have, somehow! They want to make contact!" Then he said thickly, "But if they killed him to rummage in his brain—"

"Mr. Holden," said the skipper, "answer them, please. Speak as if to Buck himself, and see what happens."

In the speaker in the control room he heard Holden's voice as he spoke into another microphone.

"Buck!" said Holden hoarsely. "If you hear me, speak up, boy! Buck! Do you hear me?"

And then the loud-speaker bellowed with the joyous uproar with which Buck replied to his master. He barked and bayed and yelped and whined all at once, and then barked crazily like a creature gone quite mad with joy.

"He . . . he heard me, sir," said Holden unsteadily. "They didn't hurt him! I . . . I think, sir—"

"Quite so, Mr. Holden," said the skipper sedately. "I was about to order you to take a lifeboat and take another chance to learn something of these people. Suppose you go over and make contact with them? A race which knows a good dog when it sees one, and is honest enough

to return him to his master, can't be the race that massacred half a million people on Capella Three!"

The Masan scientist who'd tried to replace Holden in Buck's affections nevertheless grew rather friendly with Holden after the *Kennessee* landed on Masa Four. A message torp, sent back to base, had explained the situation and the reason for friendly contact with the Masan civilization. Of course, if the *Kennessee* vanished, the Masans would be known to be definitely responsible, but that did not seem to bother them. And it did not bother the humans, either.

The Masan scientist explained to Holden:

"It has worked out very well. With your atomic power, you can put any amount of energy into the power beam we've showed you, for battle with our common enemy. It is odd that we made power beams to fuel our interplanetary ships because we didn't have atomic energy, and you made atomic energy because you didn't have power beams!"

"There'll be a lot of stuff that will fit together like that," said Holden. "Our civilization will mesh nicely, as long as we trust each other."

"Yes," said the Masan, somehow ruefully. "We intended to blast you to atoms, because we were afraid, and you intended to destroy our planets, because you were, also. I think both our races owe much to Buck."

"I still," said Holden uncomfortably, "can't see how you were able to trust us so completely. I don't think we'd have trusted strangers as you do us. Just because of Buck—"

"But it is because of Buck," said the Masan wisely. "We could extract all of his memories. All of them. His kind adores men. He would accept any cruelty from you. But you are not cruel. He would give his life gladly, but no man would ask it. He is yours, unreservedly, but you do not accept from him without giving in return. Do you know when the policy of the Planetary Council, to trust men without limit, was finally decided?"

"Why . . . no," said Holden.

"When you entered the airlock of our ship," said the Masan, smiling, "and Buck met you. He had told us every secret he could impart. He had been almost a traitor, without knowing it. He had told us everything he knew of men. But when you entered our ship he leaped joyfully at you and you rolled on the floor together—you hugged him!

You did not think of possible harm he had done. You were as glad to see him as he was to see you. That was when our policy was decided. Then we knew that men will always repay trust with loyalty." Then the Masan added, "That is, most men."

Holden said uncomfortably:

"Well—that's something that has worried the skipper. You people act as if all of us were as decent as our dogs think us. We aren't. You'll have to be . . . well . . . a little cagey, sometimes . . ."

"So," said the Masan, "we learned from Buck. But also we learned that there will always be men to trust."

Buck came dashing madly up the dark-green lawn. Holden and the Masan scientist sat on a sort of terrace of the Masan's home. Buck came racing up, panting happily, and thrust his muzzle into Holden's hand. He gave the Masan a brief tail-wag and went dashing off again.

"That," said the Masan, "is something that he would never do to me, though I . . . yes . . . I think I like him as much as you do."

"That's because he's my dog," said Holden. "But he treats you like a man. Didn't you notice?"

"True! I had not realized! But it is true! Listen! We must have dogs, we Masans! Dogs to like us as they like men! And then no man who likes dogs can ever distrust a Masan who likes them also, and no Masan—" The Masan laughed. "We could not despise a man an honest dog had for a master! Our two races will be brothers!"

That is all of the story about this one part of the hunt for the Space Assassins. Everybody knows that their home system was found, and everybody knows that when we tried to open negotiations with them their ships attacked us in a raging ferocity, and that there was no possible end to it but the extermination of men—and Masans—or of the Assassins. The battle was the first that was ever fought with power beams in Earth ships with Masan gunners. That's history that everybody knows.

But not everybody knows that there is a statue of Buck before the Planetary Council building on Masa Four. The Masans think it quite natural. They like dogs enormously, and dogs like them, too. The Masans already have a proverb that a dog is a Masan's best friend. There's no statue of Buck on Earth, though. But he doesn't mind. Buck is a very happy dog.

He's with Holden. He follows him everywhere.

H. B. Fyfe

IN VALUE DECEIVED

What is valuable? That will depend on the nature of the planetary civilization of which one is a part. In this story we see through the eyes of a strange but highly intelligent life form a picture of how two utterly dissimilar civilizations are forced by their own needs to establish completely different sets of values for various commodities, techniques, and inventions. One man's meat is another man's sawdust; in the world of the Galaxy you never can be sure what will be valueless and what will turn out to be worth more than fine jewels...

RYLAT was quite disappointed at the barrenness of the planet. At that, it was the only one circling the small white star in Sector Twelve that had offered any hope at all.

"Things are as bleak as at home on Olittra," he thought to Akyro. "Nothing growing but a few creepers and moss. No wonder, with the dim light."

He shifted his four eyestalks so as to examine the shallow hills shown on the telescreen. From above the surface, no life had been discernible. They had made the landing only on the strength of Akyro's detection of radiation. That might have meant habitation, which seldom appeared without some form of agriculture.

"It could have been artificial," Akyro had thought in mild hope, raising his tapering, dull-blue body to the flat tips of his eight walking legs.

Seeing the surface at close range, however, he now lost his enthusiasm.

"You look it over," he thought to Rylat. "I'm hungry."

He opened a locker and removed a chunk of synthetic food and a plastic tube of liquid. He manipulated the grayish chunk between two of his tiny eating legs, using the other pair to squirt a drink into his mouth at intervals.

"How can you enjoy that awful stuff?" demanded Rylat in some annoyance. "And how will you like it if we go outside and you get sick in your vacuum suit?"

"One must replenish his energy," replied Akyro contentedly.

Rylat thought a red flame.

"You are nearly as broad as long already," he added.

Before he could invent further caustic ideas, Akyro dropped his food to the plastic deck and waddled hastily to the bank of detector instruments. They were his specialty, upon which he always had at least one eye trained.

"Something?" inquired Rylat.

"Approaching radiation," Akyro answered. "A ship, perhaps."

He worked over his dials, then gave Rylat coordinates for his telescreen. His guess proved correct; it was a spaceship. Not one from Olittra, certainly, to judge by the elongated lines. It cruised close above the surface.

"Only one," announced Akyro. "Shall we signal it down?"

"No harm," Rylat agreed.

He crept over to the piloting bench and pushed certain levers. A series of flares shot up into the thinner part of the planet's shallow atmosphere, there to explode into a standard greeting in Galactic Code.

The other ship leaped straight away from the surface, at considerable acceleration. Then, as the flares were recognized for a peaceful message, it headed more slowly toward the grounded ship. Rylat gestured approvingly.

"If they can maneuver like that, they must be quite advanced. Perhaps they know the location of uninhabited planets where we can obtain plant life for our sterile lands."

Akyro, intent upon translating the answering flares from the other vessel, made no comment. He analyzed the pattern of radiation to check his visual perception—not all beings in the known Galaxy saw the same images from the same stimuli.

"Send them our home identification," he told Rylat. "They say they come from a star in Sector . . . Fourteen, I think. Yes, here it is in the list—Sol, Class G, nine major planets, one dominant race inhabiting three planets, members Sector Fourteen Confederation, rating 'civilized.' "

"What are they doing over here in Twelve?"

"Let us not be impolite," reproved Akyro. "They may be wondering the same about us."

Rylat thought a bad taste at him, but halfheartedly, for he recognized the justice of the reproof.

"Well, I shall invite them down to meet us," he thought back. "See

about unpacking a shelter assembly, in case they come out wearing something clumsy."

Some time later, they watched the port of the other ship open, after a landing that met with Rylat's approval. Since they had set up the shelter on the dimly lit, sandy soil a few lengths from their ship, and did not know how well the visitors could see, he lit a portable light-tube to show the location.

Two of the strangers presently bounded across the irregular ground. They had four large limbs apiece, two of which were sufficient for locomotion. Rylat considered their vacuum suits and personal equipment well made but unnecessarily prettified. He saw no working parts, which suggested added weight to conceal them.

"Notice how easily they run," he observed to Akyro. "They must come from a fairly large, solid planet."

When the Solarians arrived, Rylat invited them by gestures to enter the temporary shelter. Akyro had a heat converter operating, producing as a waste product an atmosphere breathable by the Olittrans. The latter opened the head ends of their suits.

The larger Solarian resorted to the Galactic Gesture Code to express appreciation of the shelter. His vacuum suit was topped by a globular fixture, partly transparent, behind which Rylat could see what must be the creature's face.

There were various rudimentary features, but no small limbs about the mouth. Rylat could not imagine how the Solarian fed himself. The single pair of eyes were further limited by being set immovably in the head.

Yet, Rylat reflected, these beings had obviously overcome such handicaps. Their equipment was, if anything, superior to his own. He decided they must be quite intelligent.

"What does he want to know?" inquired Akyro, as his companion replied to the Solarian's next gestures.

"He was surprised that we set up the shelter in so short a time, and wanted to know what the heat converter is."

"Maybe it is new to them," suggested Akyro.

"I doubt it, for they seemed to lose interest when I explained the principle and how one can produce any element at all as waste."

"Have they identified themselves?"

Rylat went through a series of formal gestures with one of his forelegs. The Solarian answered in kind.

"The one with the reddish fur on top is called 'Clothmaker,' or perhaps 'Weaver' would be closer. The other is named 'Strong-foreleg' as nearly as I can translate."

He proceeded to exchange general information with the Solarian. The smaller one, meanwhile, inspected the shelter curiously. He showed interest in the system for supporting the dome with the pressure of the enclosed atmosphere, and made rough gestures to Akyro to indicate admiration for the simple but effective entrance chamber. He did not pay any further attention to the heat converter, apparently taking it for granted after the first explanation.

From the conversation between Rylat and the Weaver, it developed that the Solarians were also a form of oxygen-breathing life, but that they required much denser air than their hosts. Rylat reported that they acted rather like traders. When he told the Weaver that he and Akyro were merely on an exploring expedition, the Solarian amended his business offer to a suggestion that they exchange souvenirs.

"Perhaps they could tell us of some planet such as we seek," Akyro thought to Rylat.

"I judge it unwise for us to seem overcurious. They might demand some fantastic reward if we reveal the necessity of our finding new plant stocks."

"But that would hardly be ethical," protested Akyro.

Rylat thought a stupid, newly hatched cub, and told Akyro that he was always too trusting with alien beings. "Time enough," he suggested, "to worry about ethics when we are acquainted. Besides," he added, "the Weaver has invited us to see their ship. We should learn what they are like."

They left the shelter one by one. The Solarians, being considerably larger, squeezed gingerly through the exit. Then they led the way to their own ship, moderating their pace politely to accommodate the Olittrans.

The Solarian ship fulfilled the promise of the equipment of its crew. Good workmanship was the rule in the section into which they were guided. Rylat was surprised at the luxury that permitted a division of the living and piloting quarters.

"But then," he reflected, "they are traders and doubtless can afford to waste materials on such refinements."

"What does he think?" inquired Akyro as the Weaver made a series of code gestures to Rylat.

"He invites us to inspect samples of their cargo. I fear he still believes us willing to trade something."

Out of politeness, they permitted the red-topped Solarian to lead them to another compartment. Here he displayed various wares. The Olittrans noted that the Solarian objects ran mostly to gadgets and precision instruments, while things they had obtained by trading were in many cases minerals. The Weaver displayed with strange pride some large chunks of white carbon crystals and small quantities of some of the heavier elements. Those which radiated were kept in shielded containers.

Rylat did not blame him for that. He himself had once incurred a severe rash on his thick hide when he had left too much uranium—a waste product from a heat converter—lying around outside his shelter. The Solarians, without their vacuum suits, looked unpleasantly thin-skinned. He could actually see outlines of a circulatory system right through the Weaver's hide.

"There is little here to attract us," he thought to Akyro.

"True," the other agreed. "Their workmanship is very fine, but our own instruments are adequate. As for the minerals, we could make up any quantity of those in a short time."

"I shall not tell them exactly that," decided Rylat.

"Why not?"

"Oh . . . it would hardly be polite."

He indicated to the Weaver that it was time for them to return to their own ship, at least temporarily, to check its mechanisms and to replenish the tanks of their vacuum suits.

As they passed forward through the living quarters, Rylat glanced with one eye at a flat-topped piece of furniture upon which the other Solarian was setting out food and drink. This included, he noted half unconsciously, a portion of an obviously synthetic substance, but also a number of what looked like vegetables. In fact, one platter held a heap of untreated white stalks with green leaves.

The idea came to Rylat that these must be raw and fresh plants, grown recently; and he turned another eye upon them.

Grown recently!

The realization smote him with almost physical force. His eyestalks retracted halfway before he could control himself, and his walking legs involuntarily bowed in the vestige of a crouch.

Akyro noticed this evidence of excitement, a holdover from primi-

tive times when the best physical defense of their remote ancestors had been to flatten themselves to the ground and rely upon their thick, armorlike hides.

"What is the trouble?" he asked.

"Look at the food!"

Akyro looked, and *his* eyestalks twitched.

"A fresh plant! Quickly—ask them where they got it!"

Rylat controlled himself with an effort. The red-thatched Weaver had turned his head at the Olittrans' hesitation, and was training both eyes curiously upon them.

"Pay no attention to it," Rylat ordered his companion. "And come along! He notices our actions."

"For your love of posterity!" Akyro insisted. "Ask him where he got it! *Ask him!*"

"Later," Rylat thought to him, moving toward the exit port between that compartment and the piloting chamber forward.

Akyro bounced irritably on his walking legs and stared back at the foodstuffs with three of his eyes.

"Do not be a fool!" he urged. "Do you realize what it may mean to us? Since the blight struck Olittra, and with the population what it is? We were not sent to pick up pretty crystals, you know!"

"You need not be sarcastic," retorted Rylat. "I know our mission as well as you, but I have also heard about these races proficient in trading. I know what I am doing."

"Are you sure?"

"Of course! Now stop acting mentally deficient and follow!"

Akyro thought a bottomless swamp of sticky ooze—but quietly, to himself—and followed the others to the exit.

The little Solarian politely donned a vacuum suit to see them safely through the outer valve. Rylat gestured that they would return before long, and led the way across the sand.

Back in their own vessel, after a routine check and a brief rest period, Akyro put a record of the Galactic Gesture Code on the visiplayer for a thorough review. Consequently, he was able to catch some inkling of the conversation when next they called at the Solarian ship.

He was still sufficiently uncertain of the motions to make any communications himself, but he understood the Weaver's greeting and opening remarks.

The Solarians, it developed, had stopped at this star only in search of barter. They were as disappointed with it, in their way, as were the Olittrans.

"We, also, were passing and stopped out of curiosity," Rylat signaled. "But we are merely explorers."

"Traders such as we," waved the Weaver, "often must be their own explorers."

"That is interesting," Rylat told him. "Perhaps you would describe for me how a trading expedition operates."

Akyro was annoyed.

"Why make yourself a simpleton?" he asked Rylat.

His companion briefly thought a set of eyestalks tied in a knot, and continued his gesture talk. The Solarian explained that it was not always necessary to obtain something more valuable than what one gave for it.

"Sometimes," he indicated, "the mere act of transporting an object to a different planetary system increases its value enormously. It may be rare or peculiarly useful there."

"It seems to me close to cheating," thought Akyro, but his thought was ignored.

"Well, of course, I would not understand these matters," Rylat informed the Solarian.

The Weaver gaped at him a moment with small blue eyes, then turned to Strong-foreleg. The two Solarians exchanged a series of oral vibrations which apparently served for communication with them. After a little discussion, the Weaver turned his red-furred head again to Rylat.

"Perhaps, for luck or amusement or what you will, we might make some token exchange. It would provide us with souvenirs of this meeting."

Rylat expressed willingness. There followed rather floundering attempts on both sides to suggest something desirable to the opposite parties.

The Solarians regretfully declined any of the Olittran instruments that Rylat thought he could spare, apologizing that their own were satisfactory. Nor did Rylat profess any interest in the Solarians' knickknacks, picked up on half a dozen worlds lately visited.

"But we have some very good maps of Sector Eleven," he offered in his turn.

The Weaver thanked him, but the Solarians did not plan to travel in that direction. In the end, he suggested that they visit his cargo compartments again.

"Ask him about the plants!" Akyro urged.

"How can I?" Rylat thought back. "What have we to offer for such information? They will surely want something!"

"Well, if you refuse to ask him, I shall stay here and watch to see if his friend brings out any more of them."

"As you please," answered Rylat, and followed the Weaver from the compartment.

They walked along a metal-decked corridor to the same storeroom of samples that Rylat had seen earlier. He found nothing new that interested him, and was careful to make this fact diplomatically clear to the Solarian.

During the process, he felt Akyro calling him, and so he indicated as soon as possible a desire to rejoin the others.

"They grow them themselves!" his friend greeted him as he entered the living quarters with the Weaver.

"Explain that!" demanded Rylat, noting that the Solarians were also seizing the opportunity to communicate privately.

"The *plants!*" Akyro thought to him. "They have tanks on the ship where they grow them in water with chemicals and artificial radiation. I have seen them!"

"How?"

"I stood here looking bored until Strong-foreleg showed me through some of the compartments."

"Did you let him see what interested you?" Rylat paused to think a hollow bubble of clear plastic. "Of course you did, or they would not be vibrating their mouths at each other. Really, Akyro!"

The Weaver turned to Rylat and inquired if he might not be interested in seeing the hydroponic tanks. Rylat agreed without outward enthusiasm. He hoped that the Solarian would not know how to interpret the slight shrinking of his eyestalks.

They all walked into the compartment mentioned, and Rylat's walking legs nearly buckled.

All about the bulkheads of the compartment, and in rows down the center, were large, transparent tanks with plants in various stages of growth. Most were some shade of green in the parts that Rylat guessed normally grew above the ground.

He allowed himself, for a brief moment, to picture Olittra's blighted agricultural areas repopulated with such plant life. The food problem he would solve if he could only get some seeds or cuttings! He was *so* tired of synthetic foods—

"They are very pretty," he signaled. "They remind me of the gorgeous foliage of my home planet."

"Rylat!" came Akyro's horrified thought. "How can you deliver such an untruth? It is not ethical!"

"It is not an untruth. *Any* vegetable matter at present makes me remember Olittra. Besides, how could he know our vegetation was mostly purple?"

He had to request that the Weaver repeat his last gestures.

"I said, we would be very glad to let you have a few. They are quite nourishing."

"Oh, we seldom eat such," replied Rylat. "Still, they would be pleasant decoration in our bare and functional ship."

The Solarians exchanged stares that made him wonder if perhaps they, too, had a form of telepathy. Then the Weaver reached into the nearest tank of dark-green specimens.

"Perhaps—" Rylat began; and then, as the Weaver looked up, "But never mind. It is not necessary—"

Akyro's walking legs folded completely. He crouched on the deck, heedless of the Solarians' astonished glances, and thought a violent volcanic eruption. Rylat caught the whole image distinctly. It included himself at the zenith of the upjetting burst of flames.

"I was about to suggest," he signaled the waiting Weaver imperturbably, "that perhaps you could spare us a complete tank, since you have so many. Growing new plants would be an amusing hobby to us in the loneliness of space."

The Weaver signified that he would be only too pleased. He insisted upon including a supply of chemicals and a special light-tube. He and Rylat examined the latter, and the Olittran assured him that he could arrange to feed the proper power into it. The Olittrans carried enough water to supply the tank.

Both Solarians donned vacuum suits to assist with the transportation of the tank, which they thoughtfully enclosed in an insulated cylinder. Rylat was qualified to bear only a token share of the burden across the sand outside. Akyro trailed the group unsteadily, eyestalks still a bit retracted.

The Solarians helped get the cylinder inside the Olittran vessel but declined to be shown around.

"Probably feel a bit clumsy because of their size and those bulky suits," Rylat thought to Akyro.

To the Solarians, he expressed appreciation and asked if they had not hit upon some gift he could make in return.

"It is nothing!" waved the Weaver. "Do you intend to leave soon?"

"Rylat!" pleaded Akyro. "Tell him *yes,* and quickly! If they take time to reflect, they will surely realize the value of what they are giving us!"

"Patience! I, too, deeply desire to mount a starbeam."

He signaled to the Solarian that they did intend to leave almost immediately. The Weaver expressed regret.

"But tell me what we can do," insisted Rylat, fearful lest cause arise to make him surrender his booty.

"We had considered inspecting the planet's surface and its mineral content," the Weaver informed him.

"An interesting hobby," replied Rylat doubtfully.

By the looks they exchanged, the two Solarians were as puzzled at *that* as he was at their project. Who cared what minerals could be dug up? One could convert them any time.

"Our object," the Weaver tried again, "was to make ourselves comfortable on the surface and take a holiday from the confines of the ship."

"Ah!" answered Rylat, comprehending at last. "Why, if you wish to use our shelter, you are more than welcome."

The Weaver accepted with thanks, but wondered about the Olittrans' departure.

"It will not matter," Rylat assured him. "We can pick up the shelter the next time we pass this way."

"Rylat! *Give* it to him! Let us leave this place with some dispatch," pleaded Akyro.

"In fact," continued Rylat, "I recall that we have another, so you might as well keep the one outside. I will get you a set of instructions for the entrance valve and the heat converter. You will be able to understand the diagrams, at least."

He did so, and after many exchanges of courtesies, the Solarians departed.

Akyro wasted no time in securing the tank of plants in the hold. As soon as the Solarians were safely in their own ship, Rylat took off.

He spiraled away from the planet and set a tentative course for the limit between Sectors Twelve and Eleven.

"About my remark on returning to pick up that shelter," he teased Akyro, "you did not believe I would really risk facing them again? After cheating them like that?"

Akyro did not reply. Rylat turned an eye toward him and saw that he was watching his dials intently.

"What is it?" he asked, vaguely uneasy.

"Moving radiation of the same pattern. It must be the Solarians, leaving the planet."

"How fast?" demanded Rylat, wondering if he dared step up the acceleration even more.

"About as fast as we, perhaps a bit more."

Rylat's eyestalks cringed. He hastily estimated the emergency power available to him.

"Enough to catch us?" he inquired anxiously.

"Oh, no," Akyro told him calmly. "They are heading in the opposite direction."

"*What?*"

"No doubt of it. As fast as they can, apparently."

Rylat rose from the piloting bench and joined the other at the bank of instruments.

"I do not understand it," he thought to Akyro. "They claimed they intended to stay. And we certainly left nothing to make them hurry home."

"Perhaps the mechanism of the entrance valve?"

"No . . . they had better on their ship. And they showed no special interest in the heat converter. I doubt they would want to play at transmuting elements."

"Who would want a heat converter for that? They, too, must have better ways."

"Exactly. So what could be on their consciences?"

They pondered until Rylat returned to the piloting bench and curiously focused the image of the Solarian vessel on the telescreen.

"Let us admire their folly," Akyro suggested, "but not to the extent of lingering."

"No . . . and yet, I wonder why—"

He watched the other ship move out of focus.

"Look at them go!" he thought to Akyro. "Anyone would suspect that *they*—not we—had practically committed theft!"

Jack Vance

HARD-LUCK DIGGINGS

Strange planets will always offer new and unpredictable hazards to human explorers, and trouble will always be in wait for those human exploiters who proceed as if conditions on such planets are the same as on Earth. Magnus Ridolph, the lead character in this story, is a specialist in alien life forms; it his job to correct the errors of less knowledgeable and less intelligent Earthian capitalists and technicians in their attempts to deal with the unusual in alien life. Here he copes dangerously but successfully with one of the more peculiar types of intelligence to be found in the Galaxy.

SUPERINTENDENT JAMES ROGGE'S office occupied the top of a low knoll at Diggings A, and his office, through a semicircular window, overlooked both diggings, A and B, all the way down to the beach and the strange-colored ocean beyond. Rogge sat within, chair turned to the window, drumming his fingers in quick irregular tempo. Suddenly he jumped to his feet and strode across the room. He was tall and thin, and his black eyes sparkled in a face parched and bony, while his chin dished out below his mouth like a shovel blade.

He punched a button at the telescreen, waited, leaning slightly forward, his finger still holding down the button. There was no response. The screen hummed quietly but remained ash-gray, dead.

Rogge clenched his fists. "What a demoralized outfit! Won't even answer the screen."

As he turned his back the screen came alive. Rogge swung around, clasped his hands behind his back. "Well?"

"Sorry, Mr. Rogge, but they've just found another," panted the cadet engineer.

Rogge stiffened. "Where, this time?"

"In the shower room. He'd just been cleaning up." Rogge flung his arms out from his sides.

"How many times have I told them not to shower alone? By Deneb, I can't be everywhere! Haven't they brains enough—" A knock at the door interrupted him. A timekeeper pushed his head in.

"The mail ship's in sight, Mr. Rogge."

Rogge took a step toward the door, looked back over his shoulder. "You attend to that, Kelly. I'm holding you responsible!"

The cadet blinked. "I can't help it if—" he began querulously, but he was speaking to the retreating back of his superior, and then to the empty office. He muttered, dialed off.

Rogge strode out on the beach. He was early, for the ship was still a black spot in the purple-blue sky. When it finally settled, fuming and hissing, on the glinting gray sand, Rogge hardly waited for the steam to billow away before stepping forward to the port.

There was a few minutes' delay while the crew released themselves from their shock-belts. Rogge shuffled his feet, fidgeting like a nervous race horse. Metallic sounds came from within. The dogs twisted, the port opened with a sigh, and Rogge moved irritably back from the smell of hot oil, men, carbolic acid, paint.

A round red face looked out the port.

"Hello, Doc," called Rogge. "All cleared for landing?"

"Germ-free," said the red face. "Safe as Sunday school."

"Well, open 'er up!"

The flushed medico eyed Rogge with a detached birdlike curiosity. "You in a hurry?"

Rogge tilted his head, stared at the doctor eye to eye. The red face disappeared, the port opened wider, a short plump man in blue shorts swung out on the stage, descended the ladder. He flipped a hand to Rogge.

"Hello, Julic," said Rogge, peering up past him to the open port. "Any passengers?"

"Thirteen replacements for you. Cat-skinners, a couple plumbers—spacesick all the way."

Rogge snorted, jerked his head. "Thirteen? Do you know I've lost thirty-three men this last month? Didn't you pick up a T. C. I. man in Starport?"

The captain looked at him sideways. "Yes, he's aboard. Looks like you're anxious."

"Anxious!" Rogge grinned wickedly, humorlessly. "You'd be anxious yourself with two, three men strangled every day."

Captain Julic narrowed his eyes. "It's true, is it?" He looked up to the two tall cliffs that marked diggings A and B, the raw clutter of

barracks and machine shops below. "We heard rumors in Starport, but I didn't—" His voice dwindled away. Then: "Any idea at all who's doing it?"

"Not one in the world. It's a homicidal maniac, no doubt as to that, but every time I think I've got him spotted, there's another killing. The whole camp's demoralized. I can't get an honest day's work out of any man on the place. I'm a month behind schedule. I radioed the T. C. I. two weeks ago."

Captain Julic nodded toward the port. "There he is."

Rogge took a half step forward, halted, blinked. The man descending the ladder was of medium height, medium weight, and something past middle age. He had white hair, a small white beard, a fine straight nose.

Rogge darted a glance at Captain Julic, who returned him a humorous shrug. Rogge turned back to the old man, now gazing leisurely up and down the glistening gray beach, out over the lambent white ocean. Rogge pulled his head between his bony shoulders, stepped forward. "Ah—I'm James Rogge, superintendent," he rasped. The old man turned, and Rogge found himself looking into wide, blue eyes, clear and guileless.

"My name is Magnus Ridolph," said the old man. "I understand that you're having difficulty?"

"Yes," said Rogge. He stood back, looking Magnus Ridolph up and down. "I was expecting a man from the Intelligence Corps."

Magnus Ridolph nodded. "I happened to be passing through Starport, and the commander asked me to visit you. At the moment I'm not officially connected with the Corps, but I'll do all I can to help you."

Rogge clamped his teeth, glared out to sea. At last he turned back to Ridolph. "Here's the situation. Men are being murdered, I don't know by whom. The whole camp is demoralized. I've ordered the entire personnel to go everywhere in couples—and still they're killed!"

Magnus Ridolph looked across the beach to the hills, low rounded masses covered with glistening vegetation in all shades of black, gray, and white.

"Suppose you show me around the camp."

Rogge hesitated. "Are you ready—right now? Sure you don't want to rest first?"

"I'm ready."

Rogge turned to the captain. "See you at dinner, Julic—unless you want to come around with us?"

Captain Julic hesitated. "Just a minute till I tell the mate I'm ashore." He clambered up the ladder.

Magnus Ridolph was gazing out at the slow-heaving, milk-white ocean that glowed as if illuminated from beneath.

"Plankton?"

Rogge nodded. "Intensely luminescent. At night the ocean shines like molten metal."

Magnus Ridolph nodded. "This is a very beautiful planet. So Earth-like and yet so strangely different in its coloring."

"That's right," said Rogge. "Whenever I look up on the hill I think of an extremely complicated steel engraving . . . the different tones of gray in the leaves."

"What, if any, is the fauna of the planet?"

"So far we've found creatures that resemble panthers, quite a few four-armed apes, and any number of rodents," Rogge said.

"No intelligent aborigines?"

Rogge shook his head. "So far as we know—no. And we've surveyed a good deal of the planet."

"How many men in the camp?"

"Eleven hundred, thereabouts," said Rogge. "Eight hundred at Diggings A, three hundred at B. It's at B where the murders occur. I'm thinking of closing down the diggings for a while."

Magnus Ridolph tugged at his beard. "Murders only at Diggings B? Have you shifted the personnel?"

Rogge nodded, glared at the massive column of ore that was Diggings B. "I've changed every man jack in the camp. And still the killings go on—in locked rooms, in the showers, the toilets, anywhere a man happens to be alone for a minute or two."

"It sounds almost as if you've disturbed an invisible *genius loci,*" said Magnus Ridolph.

Rogge snorted. "If that means 'ghost,' I'll agree with you. 'Ghost' is about the only explanation I got left. Four times, now, a man has been killed in a locked room with no opening larger than a barred four-inch ventilator. We've slipped into the room with nets, screened every cubic foot. Nothing."

Captain Julic came down the ladder, joined Rogge and Magnus

Ridolph. They turned up the hard-packed gray beach toward Diggings A, a jut of rock breaking sharply out of the gently rolling hills.

"The ore," Rogge explained, "lies in a layer at about ground level. We're bulldozing the top surface off onto the beach. When we're all done, that big crag will be leveled flat to the ground and the little bay will be entirely filled."

"And Diggings B is the same proposition?" asked Magnus Ridolph. "It looks about the same formation from here."

"Yes, it's about the same. They're old volcanic necks, both of them. At B, we're pushing the fill into a low canyon in back. When we're done at B—if we ever get done—the canyon will be level full a mile back, and we'll use it for a town site."

They climbed up from the beach on a sloping shoulder of rock. Rogge guided them toward the edge of the forest, fifty feet distant.

"I'll show you something," Rogge said. "Fruit like you've never seen before in your life." He stopped at a shiny black trunk, plucked one of the red globes that hung within an easy reach. "Try one of these." And Rogge bit into one of the soft skins himself.

Magnus Ridolph and the captain gravely followed suit.

"They are indeed very good," said the old man.

"They don't grow at B," said Roggie bitterly. "Just along this stretch here. Diggings B is the hard-luck spot of the entire project. The leopards and the apes killed men at B until we put up a charged steel fence. Here at A there's some underbrush that keeps them out. Full of thorns."

A sound in the poliage attracted his attention. He craned his neck. "Look! There's one right now—an ape!" And Magnus Ridolph and the captain, looking where he pointed, glimpsed a monstrous black barrel, a hideous face with red eyes and a fanged mouth. The brute observed them, hissed softly, took a challenging step forward. Magnus Ridolph and the captain jerked back. Rogge laughed.

"You're safe. Watch him."

The ape lunged nearer, then suddenly halted with a roar. He struck out a great arm at the air, roared again. He charged forward, stopped short, howling, retreated.

Rogge threw the core of the fruit at him. "If this were at B, he'd have killed the three of us." He peered through the foliage. "Gah! Get away from here, you ugly devil!" And Rogge ducked in alarm as a length of stick hurtled past his head.

"The creature apparently has a comparatively high order of intelligence," suggested Magnus Ridolph.

"Mmph," snapped Rogge. "Well—perhaps so. We killed one at Diggings B, and two others dug a grave for him under a tree, buried him while we were watching."

Magnus Ridolph looked soberly into the forest. "I can tell you how to stop these murders."

Rogge jerked his head around. "How?"

"Survey off an area of land in such a way that both diggings, A and B, are a mile inside the perimeter. Around the boundary erect a charged steel fence, and clear the land inside of all vegetation."

Rogge stared. "But how—" His belt radio buzzed. He flipped the switch.

"Superintendent Rogge!" came a voice.

"Yes!" barked Rogge.

"Foundry foreman Jelson's got it!"

Rogge turned to Captain Julic and Magnus Ridolph. "Come along. I'll show you."

Ten minutes later they stood staring down at the naked body of foreman Jelson. He had been taking a shower, and his body still glistening with the wet. A red and blue bruise ringed his neck, his eyes popped, and his tongue lolled from the side of his mouth.

"We was right here, sittin' in the dressin' room," babbled a redheaded mechanic. "We didn't see a thing. Jelson went in to shower. The next thing, we heard him flop—and there he was!"

Rogge turned to Magnus Ridolph. "You see? That's what's been going on. Do you still think that building a fence will stop the murders?"

Ridolph mused, a hand at his white beard.

"Tonight, if I am not mistaken, there will be a murder attempted at Diggings A."

Rogge's mouth opened slackly, then snapped shut. From behind came the sobbing breath of the redheaded mechanic.

"Diggings A? How? Why do you say that?"

"No one will be killed, I hope," said Magnus Ridolph. "Indeed, if I'm wrong my theory has been founded on a noncomprehensive survey of the possibilities, and there may be no attempt upon my life." He stared thoughtfully at the corpse. "Perhaps I overestimate the understanding and ability of the murderer."

Rogge turned away. "Call the medics," he snapped to the mechanic.

They rode back to Diggings A in a jeep, and Rogge took Captain Julic and Magnus Ridolph to his apartment for the evening meal.

"I could easily clear the land," he told Ridolph, "but I can't understand what you have in mind."

Magnus Ridolph smiled slowly. "I have an alternate proposal."

"And what's that?"

"Armor the necks of your personnel in steel bands."

Rogge snorted. "Then the murderer would go to smashing skulls or poisoning."

"Bashing heads, no—poisoning, possibly," said Magnus Ridolph. He reached for an enormous purple grape. "For instance, it would be an easy matter to poison the fruit."

"But why—*why!*" cried Rogge. "I've pounded my brain night after night, and all I can get is homicidal maniac."

Magnus Ridolph shook his head, smiled. "I think not. I believe that these killings have a clear, very simple purpose behind them. So simple, perhaps, that you overlook it."

Rogge grunted, glared at the benign countenance. "Suppose you *are* murdered tonight—then what?"

"Then you'll know that my recommendation was founded on a correct analysis of the problem and you'll do as I suggested."

Rogge grunted again, and for a moment there was silence.

"How long a job do you have here, Superintendent?" Magnus Ridolph asked mildly.

Rogge stared sourly out the window past the gray, black, white foliage, out to where a knife-edge horizon divided the bright white sea from the dark-blue sky. "About five years if I can keep men working. Another week of these killings, they'll break their contracts."

Captain Julic chuckled. Rogge turned snapping black eyes on him.

"Already," said Captain Julic, "I've refused twenty men passage back to Starport."

"Contract jumpers, eh?" snorted Rogge. "Just point them out to me and I'll make them toe the mark!"

Captain Julic laughed, shook his head.

At last Magnus Ridolph rose to his feet. "If you'll show me to my quarters, I think I'll take a little rest."

Rogge pushed a button to summon the steward, quizzically eying the white-bearded sage. "You still think your life is in danger?"

"Not if I'm careful," said Magnus Ridolph coolly.

"So far there's been no killings at Diggings A."

"For an excellent reason—if my hypothesis is correct. A very manifest reason, if I may say so."

Rogge leaned back in his chair, curled his lip. "So far it has not been manifest to me, and I have been intimately concerned with the matter since we broke ground at Diggings B."

"Perhaps," said Magnus Ridolph, "you are too close to the problem. You must remember that this is not Planet Earth, and conditions—the psychological, the biological, and," he turned a vastly impassive stare at Rogge, "the essentially logical circumstances—are different from what you have been accustomed to."

He left the room. Rogge arose, paced up and down, kneading the palm of one hand with the fist of the other.

"What a pompous old goat!" he said between clenched teeth. He darted a burning glance at Captain Julic, who sat quietly smiling across a glass of liqueur. "Have you ever seen anything like it? Here I've been on the job seven months now, fighting this problem night and day—and he arrives and in one hour delivers his opinion. Have you ever heard the like? Why, I believe I'll beam Starport this very minute! I asked for an Intelligence operative, not a tourist!" He started for the door.

Captain Julic arose from his seat. "I advise you, Superintendent—" But Rogge was gone. Captain Julic followed the tall wide-pacing figure to the communications room. He knocked at the door and, as his signal was disregarded, quietly entered.

He found Rogge barking at the screen where the space-blurred image of the chief of the Terrestrial Intelligence Corps showed.

"—and he's gone off to bed now," Rogge was bellowing. "And all he tells me is to build a fence!"

There was a short pause while the message raced at near-instantaneous speed to Starport and back. Rogge stood like a great snapping turtle temporarily without its shell, frozen, glaring at the image. The loud-speaker buzzed, crackled.

"Superintendent Rogge," came the words of the Corps chief, "I earnestly advise you to follow the advice of Magnus Ridolph. In my opinion you are fortunate to have him at hand to help you."

The image faded. Rogge turned slowly, looked unseeingly past Julic.

Julic approached, tapped the rigid arm. "If you'd asked me, I could have told you the same."

Rogge wheeled. "What about this Magnus Ridolph? Who is he?"

Captain Julic made an easy gesture. "Magnus Ridolph is an eminent mathematician."

"What's that got to do with the T. C. I.?" demanded Rogge bitterly. "Or the present case? He won't stop the killings with a slide rule."

Captain Julic smiled. "I think he carries a slide rule in his brain."

Rogge turned, stalked slowly from the communications room. "How is it that the Corps commander sent him—a mathematician?"

Julic shrugged. "I imagine that he's an unofficial consultant, something of the sort."

Rogge jerked his long white fingers. "Suppose he's right? Suppose he's killed tonight?"

A steward approached, whispered in his hear. Rogge straightened up, clamped his thin lips together. "Sure. Get him anything he wants."

He and Captain Julic returned to the apartment.

After leaving Rogge, Magnus Ridolph had gone to his room, locked the door, and made a thoughtful survey of his surroundings. One wall was glass, framed on either side by the sharp gray and black foliage of two tall trees. Visible beyond was the curve of a hill down to the beach, the luminescence of the pallid ocean.

Darkness was falling, the sky deepened to a starless black, and the ocean, by contrast, shone softly bright as lamplit parchment.

Magnus Ridolph turned, inspected the remainder of the room. Empty, beyond all question. To the right was his couch; ahead the tiles of the bathroom glistened through an open door.

Ridolph closed the bathroom door, X-polarized the glass panels behind him, and pressed the call button for the steward.

"Bring me quickly, please, a small power-pack, about twenty feet of glochrome wire, and three rolls of heavy insul."

The steward stared, then said, "Yes, sir," turned and closed the door.

Magnus Ridolph waited with his back to the door, looking ruminatively at the walls.

The steward presently returned. Magnus Ridolph removed his tunic, then, on sudden thought, closely inspected the walls.

He donned his tunic once more, rang for the steward.

"Is there anywhere in the building a room with metal walls and a metal door?"

The steward blinked. "The refrigerator room, sir."

Magnus Ridolph nodded. "Take me there."

A short while later he returned to his room, walking stiffly, for his arms and legs were now wrapped with insul tape. He depolarized the glass wall and in the wan light from the ocean selected a chair, lowered himself into it, waited.

An hour passed, and Magnus Ridolph's eyelids grew heavy. He slept.

He awoke with a slight start, a sense of dissatisfaction. Were his deductions at fault? Why had not—

He stiffened, strained his ears, twisted slowly in his seat, glanced toward the bathroom. Nothing was visible. He relaxed in his chair.

Cablelike thongs snapped home—around his ankles, his chest, his throat, constricting with terrible angry strength.

Magnus Ridolph reacted instantly, fighting with primitive fright. Then the discipline of his brain took control. His big toe pressed a switch inside his shoe. Instantly up and down his arms and legs glo-chrome wires under his tunic burned blue-hot, cutting the cloth like a razor, lighting the walls in the brilliance of their heat.

The bands around his arms and legs severed, Magnus Ridolph snatched a knife from his belt, slashed at the band around his neck. With the strength ebbing from his body, he hacked and hewed until he felt a pulsing along the knife, a doubt, a reluctance.

The knife cut through, and the garrote relaxed. Magnus Ridolph gave a great gasp. Tottering, he leaned his back against the wall, staring at the reality of the murdering agency, plain before his eyes.

He rang for the steward.

"Fetch Rogge at once."

Rogge, gaunt and ungraceful, came on the lope.

"Yes, what is it?"

Magnus Ridolph pointed. "Look."

Rogge stared, then reached to the floor, lifted a length of the severed thong.

"I don't understand," he said in a husky voice.

"It is very clear," said Magnus Ridolph. "In fact, it is a logical necessity. You yourself would have arrived at the solution if you had manipulated your thoughts with any degree of order."

Rogge stared at him, anger smoldering in his eyes. "I would be obliged," he said stiffly, "if you would explain what you know of this business."

"With pleasure," said Magnus Ridolph. "In the first place, it was clear that the killings were calculated to obstruct development of Diggings B. It was not the work of a homicidal maniac, for you had changed the entire personnel and still the killings continued. I asked myself, who profited from the abandonment of Diggings B? Clearly the agency cared nothing about Diggings A, for the work progressed smoothly. Then what was the distinction between the diggings?

"At first glance there seemed little. Both were volcanic necks, barren juts of rock, and approximately equal. About the only difference was in your projected disposition of the waste. The rubble from Diggings A was to fill in the bay, that from Diggings B was to fill a wooded canyon. Now"—and Magnus Ridolph surveyed the glowering Rogge—"do the facts presented in this light clarify the problem?"

Rogge chewed at his lips.

"I asked myself," Magnus Ridolph continued softly, "who or what suffers at Diggings B who does not suffer, or profits, at Diggings A? And the answer to my question came instantly—the trees."

"Trees!" barked Rogge.

Magnus Ridolph nodded. "I examined the situation in that light. At Diggings A the trees provided fruit and also erected for you a barrier against the beasts. There was neither fruit nor protection at Diggings B. The trees encouraged Diggings A because removing the volcanic neck and filling the bay would provide at once an added area for the growth and also removal of an obstacle to sunlight. The trees approved."

"But you are assuming intelligence in the trees?" gasped Rogge.

"Of course," said Magnus Ridolph. "What other alternative is there? I warned you not to expect on this planet the same conditions existent on Earth. You saw how the apes buried their comrade under a tree? Undoubtedly they were led to do so by the trees—persuaded, enticed, forced: that is a matter for speculation—in order that the trees might benefit by the enrichment of the soil. In any event, I reasoned that if the trees were intelligent, they very likely would comprehend human speech after seven months of listening to it. In the presence of a tree I recommended that a large area of vegetation be cleared away—a wholesale murder of trees. Naturally I was marked

as a threat, an individual to be removed. The attempt was made this evening."

"But how?" said Rogge. "A tree can't walk into a building and throw a rope around a man's neck!"

"No," said Magnus Ridolph. "But a tree has roots, and every room in the diggings has a drain or a ventilator, some sort of minute crevice. And I strongly suspect the presence of spy cells in the wood panels of every room—small eyes and ears. Not an action escapes the surrounding intelligences. And at this minute I suspect they are preparing to kill us both, by poison gas, possibly, or—"

A splintering crash sounded. A section of the floor broke open, and from the dark gap uncoiled a dull-brown hawserlike object. It threshed, wove, swung toward Rogge and Magnus Ridolph.

"Wait," said Magnus Ridolph calmly. "Wait. You are intelligent beings. Wait, listen to what I have to say to you."

The great root swung toward them with no pause.

"Wait," said Magnus Ridolph calmly. "There will be no clearing, and all rubble will be dumped into the bay."

The root hesitated, wavered in mid-air.

"What malignant creatures!" breathed Rogge.

"Not at all," said Magnus Ridolph. "They are merely the denizens of a world defending their lives. Cooperation can be to our mutual benefit." He addressed himself to the root.

"In the future, if the trees will bar the animals from Diggings B and provide fruit at that location, men will in no way harm the trees. All waste will be transported to the ocean. In addition, other men will come, discover your needs, make known our own desires. We will form a partnership beneficial to both our species. Men can irrigate and enrich sparse soils, curb insect parasites. Trees can locate minerals for man, synthesize complex organic compounds, grow him fruit." He paused a moment. The root lay flaccid on the broken floor.

"If the trees understand and approve, let the root withdraw."

The root shivered, twisted, writhed—pulled itself to the gap in the floor. It was gone.

Magnus Ridolph turned to the frozen superintendent.

"There will be no more trouble."

Rogge seemed to come awake. He glanced at the splintered floor. "But the killings? Is there to be no punishment? The torment I've gone through—"

Magnus Ridolph surveyed him with cool contempt. "Have not your men cut down many trees?"

Rogge shook his head. "There'll be an added expense taking that fill to the bay. I doubt if the diggings will pay. Why, man, with a couple of incinerator tubes and a few bulldozers we could clear off the whole area—" He caught Ridolph's eye.

"In my opinion," said Magnus Ridolph, "you are shortsighted and ruthless. You also flout the law. In fact, you are not a fit administrator for this project."

Rogge knitted his brow. "What law am I flouting?"

"The statute created over thirty years ago for the protection and encouragement of friendly autochthones."

Rogge said nothing.

"You will either cooperate completely, or I will request your removal."

Rogge looked away. "Perhaps you are right," he muttered.

A faint sound came to their ears. Turning, they looked to the gap in the floor. It was fast disappearing. Even as they watched, the splinters, strangely pliant, turned themselves down, knitted to a smooth gleaming surface. Where the gap had been now shone a small gleaming object.

Magnus Ridolph strode forward, lifted it, displayed it wordlessly to Rogge. It was a complex crystal—blood-colored fire—perfectly formed except on one side, where it have been torn away from its matrix.

"A ruby, I believe," said Magnus Ridolph. He looked at the staring superintendent, coolly returned to his inspection of the jewel.

John Berryman

SPACE RATING

The more developed and daring space travel becomes, the greater will be the demands on the astronauts who pilot the spaceships across the interstellar vastnesses. Exploration of the Galaxy will not be all exciting adventures with weird life forms on alien planets. It will also be the dull, repetitive, exacting work of seeing to it that the interstellar vessels get where they are supposed to go, with minimum loss of energy and with the fewest possible accidents. Here is one man's vision of the kind of testing that will be required before a space pilot or navigator can be fully qualified to take over command of a ship—and that will also be essential to ensure his continued efficiency while on the job.

MAJOR PHIL HAWLEY put his notes down, stood up and walked around his desk. Hands clasped behind his back, he rocked precariously on the balls of his feet at the edge of the lecture platform. His ramrod posture and impeccable uniform added height to his scant five-feet-nine.

"The hour is almost up, gentlemen," he said, "and I prefer to start the next topic with a whole lecture period before me, so that this will be all for today."

As thirty uniformed students picked up note pads preparatory to leaving, the major brought them all back to conscientious attention with the words, "There are a few remarks, however, which I might make prior to tomorrow's lecture, with the purpose of acquainting you with the topic and perhaps suggesting a little preparatory reading tonight."

He squared his shoulders and began to pace back and forth before the desk, saying academically: "The theory of navigation at velocities in excess of the speed of light has in the past been a very indefinite body of doctrine. Recently mathematical techniques have been devised to deal with the peculiar difficulties inherent in the case, and definitive results have been secured. The most important point brought out by the definitive solution of problems hitherto regarded as insoluble

mathematically is that most of the presumptions of earlier theory have been borne out. If at all, general conclusions have been altered not in direction but merely in degree."

With an alacrity that suggested he had expected it, Hawley recognized an objecting hand. He called on the student. "Lieutenant Riggs?"

"Sir," the tall, blond objector said, "I've always been under the impression that mathematical methods had never been completed to deal with this problem. Three-dimensional propositions can at best afford only analogies and approximations to problems that by their nature must be solved by four-dimensional techniques. As I understand it, our knowledge of four-dimensional propositions in vector analysis and quantum mechanics is too incomplete to give definitive solutions."

The instructor smiled and leaned against the polished walnut of his desk. "On the contrary, Lieutenant Riggs," he said smoothly, running a hand over his black hair, "as I said before, recent contributions to mathematical theory have given definitive solutions."

Riggs did not bother to raise his hand again, but asked, with arch politeness, "May I quote from the Manual?"

At Hawley's smiling nod, Riggs picked up the thick, blue-bound volume prepared by the scientists of the Space Patrol for classroom use, and riffled its pages before finding his place. He looked up and then read a few lines: "Theorizing on problems of navigation at speeds in excess of that of light can at best give presumptions; strong presumptions, of course, but definitive results are, by the very nature of the problem, unattainable."

He closed the book slowly and stared at the waiting instructor, eyebrows raised in question. The class was utterly silent, watching the latest development in what had long since become a classroom feud between Hawley and his most able pupil.

The major seemed puzzled. "Does the Manual really say that, Lieutenant Riggs?" he asked, his voice slightly touched with anxiety.

"Yes, sir," Riggs replied, trying to keep his voice calm.

The class held its breath, half sensing what was coming. Hawley leaned his head a little to one side, as if considering the statement, and nodded slightly to himself. Then he leaned forward, his black eyes snapping, and winked confidentially at his heckler. "I'll have it changed, Lieutenant," he said softly.

As the classroom burst into laughter, Hawley stepped down off the platform and called, "That's all for today, gentlemen."

Riggs, his face flaming red, rose stiffly from his seat and walked out with the rest.

In the corridor outside, Riggs's roommate joined him. "Going back to the room, Bo?" he asked his still-incandescent companion.

Riggs grunted an affirmative, then walked several paces in silence. "Damn that Hawley, anyway!" he swore suddenly.

Mal Burt laughed. "He does bear down on you a little, Bo," he chuckled. "I thought I'd die when he told you he'd have the Manual changed!"

Riggs's lip curled as he half snarled, "Oh, I suppose he has worked out some fourth-dimensional equations, all right. He's the hottest mathematical theoretician in the Patrol, but he doesn't have to rub it in. How was I to know?" Both lieutenants saluted absently as a brace of passing undergraduate privates snapped hands to foreheads.

Burt continued to laugh as they walked across the paved court toward their barracks. "I guess we all feel the same way about the old boy. He sure lets you know he doesn't think much of your mental capacity."

Riggs flared up again as they turned into the walk leading to the long translucent building where they lived. "Why, hell, it's just his inferiority complex. He feels funny about being short, that's all. That's the only reason he keeps on trying out for his space rating year after year. He likes to wave it in front of us. It makes him think he's better than he knows he is. The dope."

Burt looked over at his roommate. "Well, I don't know. You can't blame him much for being proud of that. He's the oldest man ever to hold a rating. Most pilots are washed out five years before his time. He must be thirty-five by now."

"Sure, sure, I know. It's remarkable for a man to keep his responses, and all that, but it's the way he does it. I know damned well he was baiting me there in class today. He didn't need to start the lecture on supra-light velocities till tomorrow. He knew I'd be the only one in the class who'd challenge the statement about a definite solution. I can just see him now, the smug little martinet, laughing at the way I leaped at it!" He growled disgusted sounds in the back of his throat.

"Well," Burt said, as the two trotted up the steps of the barracks, saluting automatically again, "there's only two more weeks of this. We'll be back on patrol June fifteenth, Bo. I'll be just as glad as you to get Hawley off my back."

Scarcely had the two entered their severe quarters and thrown themselves into chairs when there was a rap on the door. At Riggs's command the one outside entered.

An orderly snapped a smart salute and said tonelessly, "Commander Conklin's compliments, Lieutenant Riggs, and will you report at once to his office."

Riggs nodded and dismissed the sergeant. He looked over at Burt. "What now, Mal?" he asked.

Burt shook his head. "Better snap it up," he advised. "Conk doesn't like to wait."

With one quick glance at his appearance, Riggs left for the office of the base commander, highest military officer at the Patrol's terrestrial base.

He paused at a door marked "Major General Conklin, Base Commander," pulled his chin and stomach in before rapping smartly. He entered at the commander's order and saluted, standing at attention.

Conklin, grizzled veteran of many a patrol, shot him a piercing glance, then said, "Oh, yes, Lieutenant Riggs. At ease, Lieutenant."

Conklin reached over to a basket and picked up several sheets of typed paper. "You're leaving on patrol duty in two weeks," the commander announced. "This is to notify you of your temporary promotion to the rank of captain, for the ninety-day duration of the patrol."

Riggs blinked at the unexpected news and managed to gurgle, "Yes, sir."

Conklin laid the paper down and leaned forward. "This is also to notify you, Captain Riggs, that you have been selected as examiner for your alternate pilot when on patrol. You, of course, know the obligation of keeping this appointment absolutely confidential."

"Yes, sir," Riggs said again.

"You've been promoted, Captain, so that you may be first officer and copilot. You are to observe the technique of your superior officer at the controls and decide whether his space rating should be continued for another year." He looked up at the erect figure before him. "Major Hawley will be in command," he said, noticing Riggs's start as he did so. "I don't need to tell you that your mission will be of more than usual delicacy, and for reasons that I don't have to bring up at this time."

He paused for a moment, while Riggs's whirling mind reflected that

"unusual delicacy" was hardly the epithet. Examiner for Phil Hawley! What an assignment!

"You are to leave on June fifteenth for a patrol of ninety days," Conklin went on, "your activities to consist of servicing thirty robot observatories en route, collecting and examining their plates. You'll be informed of your ship later." The commander handed Riggs's orders across the desk. "That's all, Captain," he said.

Riggs saluted. "Sir," he said diffidently, "may I have a few words with you, off the record?"

"Certainly. Go ahead."

"Well, sir, much as I appreciate this temporary promotion, and a chance to show that I deserve it, I think it only fair to make clear that I may be a rather poor choice for examiner. Major Hawley and I don't get along very well together. To be frank, we don't get along at all, and I'm afraid I would be rather prejudiced."

Conklin leaned back in his swivel chair and laughed. "Well, Riggs," he chuckled, "I don't know whom I could have selected from his classes who would not have felt the same way. Hawley's classroom technique is just a little this side of brutal, but I think you'll find him a very good man to work under on patrol. As a matter of fact, I have reason to believe that Hawley respects you as much as any of his students. I don't think you'll have any undue difficulty. I'm glad you had the honesty to admit your bias, Captain," he said in conclusion.

Riggs saluted. "Thank you, sir," he said. "I'll do my best."

At a nod from Conklin, Riggs turned smartly on his heel and left, exceedingly puzzled by Conklin's tacit statement that Hawley had given him good marks and a good recommendation for his work in navigational theory.

The next two weeks flew by with unwonted rapidity, and Riggs found himself assigned, as he had been informed in advance he would be, to one of the ships in the Service Fleet, or, as it was familiarly known in the Patrol, the "Little Fleet." The name was derived from the fact that each member of the Service Fleet had the adjective "Little" prefixed to his name. Riggs's ship was the *Little Falls,* laden with fuel for the atomic motors of the robot observatories planted on thirty different planets of several nearby suns, and a huge supply of photographic plates to replenish the nearly exhausted magazines of the telescopic cameras.

Placed in many cases on planets where men could not have survived continued existence, the observatories on the planets of the nearer stars were serviced once every three terrestrial years. The exposed plates from the telescopes were removed, developed in the service ship as it sped through the endless wastes of space to its next destination, and run through moving-picture cameras to detect any astronomical occurrences recorded on them.

Since most of the cameras exposed plates only every few days, or, at the most, a small number a day, it was a matter of but little time to run the film at projection speed through a moving-picture projector and look for such novae and comets as were recorded in the interval. The more detailed graphs collected by cosmic-ray detectors, and so on, were brought back to Earth for more careful and detailed scrutiny by specialized experts.

Six days out from Earth found the *Little Falls* decelerating as it approached Rigel VI, its crew of ten protected from instant annihilation by the inertia screens, screens that permit humans to survive accelerations so stupendous that the stars were brought within easy reach of the Solar System. The crew had become acquainted by that time, for all but Hawley and Riggs had been virtual strangers. The general policy of the Patrol was to shift personnel around so that every man became acquainted with as many different duties as possible and, further, so that technical experts such as cosmic-ray specialists should have firsthand knowledge of as many parts of the Galaxy as possible.

In the control room, watching Rigel VI and its four smallish planets loom larger in the visiplate, were the four men responsible for the navigation and piloting of the spaceship: Hawley, commander and pilot; Riggs, first officer and copilot; Art Price, computer, and Tom Mercer, navigator.

Hawley and Riggs sat silently side by side at the dual controls. Mercer and Price, behind the pilots, faced each other across the twin calculators, determining their position by repeated observations through the low-powered telescope and charting their course for landing.

Hawley looked across to Riggs, who was trying to make his twenty-four years look sufficiently dignified to justify his rank. "You take this one," the commander said. "I'm a little stale; I haven't shot a landing in nine months."

"Yes, sir," Riggs replied, wondering whether Hawley would keep pushing the landings off on him. They were approaching the second

planet of the greenish sun, with no atmosphere to complicate the landing. Price and Mercer had already located the observatory, on the light side of the planet, and were calculating their position, both calculating machines alternately clicking and whirring as the coordinates of position were entered and run off.

As the time grew close for him to make his approach, Riggs closed the face plate on the helmet of his spacesuit, which all had donned some time previously as a routine precaution, and said abstractedly, "Riggs testing. One, two, three, four. One, two three, four." The droning voices of the other nine rattled in his headset as the rest of the crew followed suit.

Now less than a hundred kilometers from the smooth and barren surface of their objective, Riggs threw over the landing-rocket switch, cutting in the hydrocarbon steering rockets for the landing. "Okay, Price," he snapped, his voice hollow and strange inside his helmet.

The computer immediately clipped out three figures, designating their position relative to their objective.

The system used for navigating spaceships to a landing had been developed many years previously and had not undergone substantial change as most other techniques improved, since it was a model of simplicity, considering the difficulty of the problem to be solved. All bodies which were ever visited were given an arbitrary north and south pole by the Patrol, determined by comparison of the inclination of the planet's axis to the plane of the ecliptic of the Solar System. With north determined, three coordinates could describe the location of a spaceship relative to any point on a planet's surface, the three points being, respectively, distance north—or south—of the objective, distance east—or west—of the objective, and finally, altitude over the objective.

With motions automatic from long and constant practice, Riggs soon had the *Little Falls* directly over the landing base next to the observatory, lowering the ship vertically in the simplest kind of a landing. Price's voice barked three figures into Riggs's headset every few seconds, but now two of them were always zeros as Riggs kept the ship directly over the field, indicating that there was no north-south or east-west displacement. As they came within hundreds of meters of the surface, velocity almost killed, Riggs laid the ship over on its side and lowered it smoothly on flaring steering rockets, grounding it with scarcely a jar.

The crew carefully snapped off their safety belts and dropped to the lower wall of the control room, looking out the ports.

Hawley glanced at the gauge before he left the board. "You used almost all the fuel allowed for a point Six G landing, Riggs," he noted.

The copilot nodded. "Yes, sir, no sense cutting the first one too fine. Landing is no time to make a mistake."

Hawley smiled archly. "Wise words, Captain," he drawled.

Riggs kept his eyes averted to conceal his ire, mentally kicking himself for the slip. Conklin's words that Hawley was a good man to work under on patrol rang mockingly in his ears. He was thankful that the routine of servicing the observatory kept them apart for the next few minutes, until he had time to cool down.

Hawley remained within the ship as Riggs led Clark, the astronomer, and Cutler, one of the engineers, to the observatory dome. Cutler dragged a small dolly behind him, laden with rolls of unexposed film. The low gravity of the planet made movement easy, despite their bulky spacesuits. Riggs led the way to the lock in the side of the dome, and in a few moments had it open. The other two followed him through the low doorway. Inside, the radium lamps were coming to a slow glow, heating up as the automatic relay connected with the lock turned them on. In the growing light Clark stepped over to the moderate-sized refractor, checking on its lubrication reservoirs, on the condition of the many motors connected with the clockwork. While Riggs checked the observatory clock against the *Little Falls* chronometer, Clark and Cutler quickly removed the film magazines from the delicate cameras and substituted others of unexposed film. One last bit of work removed the rolls of graph paper from the cosmic-ray detectors, and the men were returning to the ship.

As they stepped back to the airlock of the *Little Falls,* a crew under Hawley was just completing the job of filling the fuel tanks of the observatory with the chemically pure water that served as fuel for the atomic motors that powered the whole plant. Scarcely an hour after they had landed, the spaceship raised its nose to the heavens, jets blasting the frozen ground, and rocketed off into space, headed for a far-off sun.

Riggs sat for some minutes beside the commander at the control board, watching him correct their course as Mercer read off the coordinates in Price's place. At last the older man leaned back. "Ah," he breathed, "that ought to get us there."

Riggs nodded silently, not trusting his clumsy tongue to keep off tender ground.

"Say," Hawley wanted to know, "did you adjust the clocks in there?"

"No, sir," Riggs replied. "They were only two-tenths of a second off, and I didn't think that was enough to bother with. I'd as like as not have introduced a larger error in the other direction."

Hawley agreed in silence, then turned to the other two in the control room. "I suppose the boys down below would like a little help developing and printing that film," he said. "What do you say, do we give them a hand?"

The other three stood up and began getting out of their suits as they prepared to follow their commander to the photographic laboratory three decks below, leaving the *Little Falls* to find her prosaic way through the emptiness of interstella space.

Days ran into days as the *Little Falls* alternately accelerated and decelerated as she visited planet after planet. The time-consuming routine of gathering and replenishing film, of developing and inspecting it, left little time for personal contact between Hawley and Riggs. The copilot, ever conscious of his secret mission, made every effort to keep his relations with his superior as impersonal as possible, always fearing an open rupture between them. He was forced to admit, however, that Hawley was apparently all that a pilot should be. After the first landing, which he had wished off on Riggs, the commander alternated on landings with his copilot, making smooth, sound approaches under varying conditions of gravity and atmospheric pressure, never showing the slightest hesitation or confusion.

Riggs secretly permitted himself to wonder, however, just how Hawley would fare should he have to land the ship from any position other than the vertical. The commander had made no "fancy" approaches, always carefully bringing the *Little Falls* directly over their objective before letting down. Riggs, as a matter of policy, had not attempted any angle approaches, afraid that Hawley would look upon them as a personal challenge, and even more afraid of his subtly scornful remarks so delicately concealed beneath routine conversation.

Fifteen of the scheduled stops of the *Little Falls* had been completed before the event occurred for which Riggs had been waiting. The

planetary system of Rigel II was one of extreme interest to terrestrial astronomers, since it was one of the few which did not conform to the usual arrangement of having all the planets in approximately the same plane. The sun's nine planets revolved around it in nine different planes, and even the various moons did not conform to any general plan. This arrangement of planetary bodies, incompatible as it was with the general theory of origin of planetary systems, naturally excited interest, and observatories were located on several of the bodies in the system.

Besides its astronomical interest, the system of Rigel II commanded close observation because its first planet, a huge, deeply atmosphered body of enormous surface temperatures and pressures, manifested evidences of high-temperature life. The physical conditions of its surface made it inaccessible to men, so that a compromise observatory had been erected on its only moon, a body that always faced its parent. This moon, like its planet, was often obscured by clouds, and in just such a time of precipitation Hawley approached it for a landing.

The navigator and computer were unable to get adequate observations on the observatory, with the result that Hawley was forced at the last moment to change his course and attempt an angle approach. Riggs tensed himself as Mercer finally located the observatory, well off to one side—too far to permit a vertical descent.

To the copilot's surprise, Hawley did not ask the computer for an equation to express the optimum course of the *Little Falls* through the moon's atmosphere to the ground. Instead he sat silently at the controls, listening to the coordinates Mercer snapped out from instant to instant. Riggs's mind flew as he tried to work out the equation in his head, as Hawley was undoubtedly doing—the equation which would describe the parabolic curve that they were following through the murk. He marveled at the major's confidence in his mental computations, descending, as he was, to an objective that was completely shrouded in mists. He felt the ship lay over on its side and waited tensely for the crash as it grounded. But Hawley dropped it to the muddy surface with scarcely a jar. In spite of himself, Riggs could not repress an ejaculation of relief and amazement at the landing.

He regretted it in an instant as Hawley shot him a twinkling glance, a glance that made his "Not bad for an old man, eh, Riggs?" completely redundant.

"No, sir," Riggs replied obediently, glad to see the commander lead a small crew out to get the graphs and photographic magazines from the observatory.

Riggs seethed inwardly at Hawley's all too apparent condescension, wishing fitfully that he could talk to somebody about it. The old dope, proud of his mental calculation, was he? Thought he was pretty good, to hear a computer snap out three coordinates every five seconds and to transform them into a fourth-power parabolic equation. Well, there was more than one man in the world who could do it, Riggs reflected. He had kept abreast of Hawley's mental mathematics. If he hadn't known they were making the grade, he would have taken those controls away, major or no major. He stopped his annoyed reflections as Hawley stepped out of the airlock.

"Let's go, Riggs," Hawley snapped, grinning a little.

Riggs climbed silently into his seat behind the board, pressed the take-off warning, and as soon as the others were strapped in, blasted the *Little Falls* savagely off the surface.

Hawley seemed more disposed than previously to talk as they sped toward the second planet of the same sun. Feeling his oats, Riggs reflected; proud of that landing.

"Well, there's one thing about that last place, Riggs," Hawley observed. "It had enough of an atmosphere to look a little like Earth." He swung a leg nonchalantly over the arm of his seat.

"Yes, sir," Riggs got out, "but I've never seen quite so vicious a cloudburst as the one we landed in."

Hawley laughed. "That's one of the places where a live observer would go mad in three months, right?"

"You bet," Riggs replied, drawn into conversation in spite of himself. "Makes you feel kind of queer, do you know it," he went on, "to go from planet to planet and never see a sign of intelligent life? Why, take a look at this system here. At least four of these nine planets could be inhabited, especially if the settlers were willing to do a little selective breeding. They all have oxygen atmospheres, their gravities are close to Earth's, and temperatures and pressure aren't impossible at all. You'd think they'd be inhabited."

Hawley shook his head. "There's too much prejudice against it. They'll have to develop a new race. Those planets won't be colonized from Earth, but as soon as the few colonies that are in existence now get going, they'll start colonizing all over the Galaxy. They'll have a

heritage of pioneering behind them, not so much attachment to the place they live in. That's what's the matter with Earth. Population groups stagnated for so many thousands of years that the attractions of staying home are too great. You really can't blame them."

Although Riggs was pleased to find that his superior could act and talk like an ordinary human being if given chance enough, he retained his resolve to at least equal Hawley's approach on the next landing he shot. Accordingly he approached the second planet of Rigel II at a sharp angle to the surface and, like Hawley, requesting no predetermined equations from the computer, quickly set up a parabolic equation of the fifth power of the potential series to describe the course of the spaceship, and began the necessary mental substitutions and subtractions as he tried to determine how far the *Little Falls* was departing from the course he had set up. Almost subconsciously he could hear Mercer working his calculator while Price called out the coordinates. That meant that Mercer didn't trust him, that the navigator was substituting the coordinates that the *Little Falls* was cutting, in an effort to determine whether Riggs was conforming to any general equation.

In spite of the apparent doubts of the navigator, Riggs successfully landed the *Little Falls* without aid from either the navigator or the computer other than the coordinates that Price called.

Hawley made absolutely no comment on the landing. The rather pointed silence of the computer and navigator, who both were well aware that the two pilots had performed remarkable feats of mental calculation under extreme pressure, made it clear that all four in the control room realized that Riggs had accepted Hawley's challenge. They realized Riggs was willing to match any feats of piloting the older man performed.

The copilot was not to be disappointed. Shooting the next landing, on planet three of Rigel II, Hawley performed the almost impossible feat of using only one steering jet until he laid the ship over on her side for the grounding.

The strain, while hard on the two pilots, was worse on the computer and navigator. After a particularly spectacular exhibition of a spiral approach at high velocity by Hawley on planet seven of Rigel II, Mercer approached Riggs while Hawley was leading the service crew to the observatory.

"Pardon me, Captain," he said, saluting. "Perhaps I'm speaking out

of turn, but this contest between you and Hawley is getting pretty extreme." He stopped and gulped, half expecting a severe reprimand. Riggs grimaced for a moment before he answered the navigator.

"You're right, Mercer," he finally said. "Hawley undoubtedly can do anything any pilot in the Patrol can. I don't think he's run out of tricks yet. I suppose I could match that one of mentally calculating a three-dimensional curve to a blind spot, but I'd like to do it alone, instead of with nine other guys behind me. I think I'll call the whole thing off at the next landing."

"Yes, sir," Mercer murmured. "I hope you don't think I've been impertinent, sir," he half asked.

"Oh, no, Mercer," the copilot answered. "Hell, I don't see how you guys have stood it this long. It's damned lucky that the boys in the back end didn't know what was going on. Some of them who don't have space ratings would have gone nuts."

"That's just it, Captain," Mercer said, a little smile forming at the corners of his mouth. "Price let on that you two were having a sort of contest, and Clark has gone half insane every time one or the other of you tried something harder. It wouldn't have been so bad if you were just filling in coordinates on some curve equation I'd figured out for you, but this stuff of forming your own equation as you landed had them all scared. I don't think I would have spoken if the men below hadn't asked me to."

Riggs began to chuckle. "I thought there was something a little screwy about this, Mercer," he laughed. "You've been around too long to mind a little thing like this race we had. Well, you can pass on the word that it's all over. I don't want Hawley to know, though."

"Oh, sure, Captain," Mercer grinned. "I get it, all right."

Approaching the ninth and last planet of Rigel II, Riggs brought the *Little Falls* in at a sharp angle, as each man had done on the several previous occasions. He could see Hawley watching him with intense interest, trying to determine what kind of a three-dimensional curve Riggs would try to ride down. But the copilot held the *Little Falls* off until he was over the objective, and then lowered straight down, keeping his eyes fixed dead ahead on the visiplate to keep from seeing Hawley's superior smile. The damned show-off, Riggs thought—grandstander. He thinks he's done something. At least I've got enough sense to quit before one of us kills the whole crew.

In spite of his determination not to show his feelings, Riggs all but exploded when the relieved Price offered comment on the landing, the first given since the contest had begun.

"Sweet, Captain," Price said.

Hawley seemed suddenly to choke, and coughed heavily several times, while Riggs knew his neck was turning a gaudy shade of purple.

"Thanks," the copilot finally croaked to the embarrassed Price, who knew he had put his foot in it.

Hawley, realizing that Riggs had quit, made no more fancy approaches on the next several landings. The routine of visiting various suns went on. But a series of events, culminating in the landing on the tiny fifth planet of Bruno, in Aquarius, disturbed Riggs greatly.

The commander had not been his usual lofty, sarcastic self during his previous watch. All of the other three in the control room had been the objects of wrathful flare-ups over trivial occurrences. As the time for the landing on the little planet came closer, his nervousness and tenseness seemed to increase, and by the time the *Little Falls* was dropping toward the surface in its approach, his temper had grown so short that he had practically ceased to speak to the others.

Shooting the landing in his regular turn, Hawley's approach was entirely conventional, dropping straight down from over his objective. But as the *Little Falls* lowered on drumming rockets, the ship swung from line, and the long succession of zeros with which Price had prefixed his altitude figures rapidly became numbers indicating that Hawley had badly botched the approach. Instead of altering his approach into a sharp angle and repeating his performances on the planets of Rigel II, the commander blasted the *Little Falls* back to altitude and started his approach once more, only to become badly confused again. This time he attempted to save the landing by converting it into an angle approach, but the tense Riggs, following the coordinates that Price was barking out, quickly realized that Hawley was still messing the landing.

The commander shook his head savagely and swore. He took his hands from the controls and snarled, "Take over!" to Riggs, who elected to blast back to altitude and try a straight approach rather than to straighten out Hawley's extremely incorrect position.

The silence that reigned in the control room after Riggs grounded the ship made those that had regularly occurred during the landings on

the planets of Rigel II seem trifling. All four carefully kept their eyes averted, to prevent what each knew would be the exchange of a knowing glance. Hawley made matters no easier by remaining in a surly and disgruntled mood, obviously disturbed over his clumsy mistake.

The next landing was, by the tacit arrangement to alternate approaches, Riggs's. He found himself hoping that he would mess it slightly, and in spite of himself dropped the *Little Falls* somewhat heavily to the ground. Hawley did not seem cheered by this, but rather insulted. He said nothing, however, merely speared his unhappy copilot with a venomous eye.

Contrary to what Riggs had expected, Hawley's next approach was excellent, in spite of the fact that it was made under extremely unfavorable conditions of gravity and visibility. He had half expected Hawley to become confused again, remembering how easy it was to lose that keen edge of self-confidence and instantaneous, doubt-free response necessary to land a spaceship on her rockets. The commander, while rather sullen, grounded the ship perfectly, and repeated the performance three times thereafter in his turn.

Long before they headed back for Earth, the copilot found himself worrying what he would report to the board of examiners. One bad landing was usually enough to cause at least a complete examination of the case, Riggs knew, even in the case of young pilots, and in Hawley's instance, he felt sure, any report of loss of confidence might suffice to cost the aging pilot his space rating.

The bad approach had quite completely broken down what camaraderie had grown up between the two pilots, and Hawley rarely spoke to Riggs outside the line of duty. Shortly before they headed back for Earth, however, the two were together in the projection room, eyes riveted to the screen, as a roll of film exposed at the observatory last visited was run through the projector.

The two sat in silence as the screen indicated the fixed positions of the stars in space and the irregular zigzagging of the three planets of the same sun as caught by the robot eye of the telescope. Suddenly a tiny point of light appeared where none had been before, instantly noted by both men, trained observers as they were.

"Nova," they said in quick unison.

Riggs cut the motor and backed the film up, running it through one frame at a time. "There it is," he said. "First photographically detectable one hundred and four days after that observatory was serviced."

He started the projector again, and the two watched the image of the nova grow rapidly, then fade with astounding suddenness.

"Umph," Hawley grunted. "That was a quickie. How long did it last?"

Riggs was reading the date on the frame. "Four hundred and twenty terrestrial days between appearance and disappearance, photographically, but it was really quicker than that. It had sunk to the twentieth magnitude in two hundred days, more or less. Sort of looks like Hunter's hypothesis might be correct, doesn't it?"

Hawley shook his head slowly as the rest of the reel ran through the projector without event. "I don't know. I'm not up on nova theory. I stick fairly close to home with navigational theory. That's my chief interest." He switched on the lights in the tiny projection room. "I suppose I'll be teaching twelve months in the year pretty soon," he observed, not looking at Riggs.

The copilot jumped a little. That was dangerous talk. He said nothing, playing safe.

"What d'ya think about that?" Hawley demanded, his black eyes snapping at Riggs.

"Why, I don't know, sir," he replied. "If you like teaching that well, I'm sure it's the thing to do."

"Don't play dumb, Riggs," Hawley snapped. "You know what I'm talking about. They may take my space rating away."

Again the copilot kept a reserved silence.

"Well," the commander demanded, "don't you think they will?"

Riggs shook his head and swallowed before answering. "I couldn't say, sir. I thought that was all up to the examiner. I see no reason—" he started to say, then cut it off.

Hawley smiled nastily at him. "You aren't kidding me, Riggs," he said. "I know you're the examiner here. What you report will decide what the board of examiners does. Isn't that right?"

Riggs said nothing.

"Oh, all right, I know you can't say anything, but you don't fool me a minute. Conklin is about as subtle as a crutch. He picked you because I gave you the highest marks in theory. That doddering old walrus." He laughed a little bitterly. "Well, I suppose it had to come sometime. I had visions of keeping that rating till I was forty. I'd only have to pass four more," he said, almost pleading.

Riggs still made no comment, packing the film into its cans.

"I can't understand what went wrong with that landing," the older man said. "I must have been thinking about something else. After all, I never had a bit of trouble with all those angle shots on Rigel II." He looked inquiringly at Riggs, but the copilot gave him no encouragement.

"All right, all right," Hawley said wearily, "be a good little soldier." He walked to the door, leaving Riggs standing by the projector. "But don't you try to kid me," Hawley said, hand on the knob. "I know you've been laying for me ever since we started this patrol. You're still hot about the way I treated you in class, aren't you? Sure you are, you ungrateful pup!" He yanked the door open and stepped through it before Riggs could deny the accusation.

Riggs stood beside the projector, automatically disconnecting the leads, half glad that he hadn't had a chance to deny Hawley's charge of carrying a grudge. He wasn't quite sure that it wasn't true, after all. He still didn't know what he should do about his report as examiner. Hawley had undoubtedly badly botched a landing. He had become confused, what was worse, and given up. But on the other side was the fact that he had successfully completed several extremely difficult approaches prior to his poor one, and made several good routine landings after it. It *was* a problem.

Back an Earth, with the *Little Falls* patrol completed without further incident or further conversation with Hawley, Riggs had two days to complete his report before the meeting of the board of examiners. He went before the board, finally, with very mixed emotions, and very uncertain of his decision.

The three members of the tribunal sat in solemn dignity at a long table at one end of the chamber. Hawley had arrived before Riggs, and he showed no surprise when his copilot entered. Riggs tried to compose himself, mentally dreading the moment he would have to stand up, now a mere second lieutenant, and hold typewritten sheets of paper in his hand as he read his report. He cursed his trembling fingers, knowing they would reveal themselves in the fluttering of his papers as he tried to read.

Major General Conklin, officiating for the board, cleared his throat and rumbled, "Lieutenant Riggs, please take the floor."

Riggs stood up, leaning against the edge of the table to conceal his shaking knees. "Yes, sir," he said, trying to mask the quaver in his

voice. Out of the corner of his eye he could see Major Hawley's superior smile.

Commander Conklin growled again, "As examiner aboard the *Little Falls,* will you please give your report on any members of the crew who were up for their space ratings?"

Riggs saluted wordlessly and steeled himself to begin. "Besides myself there was only one other pilot aboard the *Little Falls,* sir," he said, "and that was Major Hawley. Major Hawley demonstrated to my satisfaction his complete understanding of all the details of piloting a rocketship and his excellent theoretical knowledge of the piloting of the same."

He could hear a sigh of expelled breaths as every man present noted his slight emphasis of the word theoretical. Dictaphones hummed softly as his words were recorded.

"However," Riggs continued, "Major Hawley, in spite of performing what amounted to feats of piloting ability, became badly confused on one landing, so confused, in fact, that he turned the controls over to me. Subsequently he landed five times perfectly. Gentlemen," he said, "I am unable to account for Major Hawley's sudden lapse. Considerations of his advanced age, as far as piloting goes, make it seem likely that he might be expected to experience difficulty, progressively more difficulty as he gets older. However, his ability to handle the ship with no apparent effort on all other occasions, and the fact that he did not seem to lose confidence in himself after his unsuccessful approach, seem to indicate further examination by this board.

"I feel morally certain that Major Hawley's lapse was due to some temporary physiological difficulty which passed unnoticed by him and which is either very unlikely to recur, or can be simply corrected. Therefore, instead of recommending that Major Hawley show cause why he should not be deprived of his rating, as might seem indicated, I recommend that he be given a complete physical and psychological examination by the board, and that if nothing is found wrong, his rating be extended another year."

Riggs sat down, feeling a little better about his report. It had gone off rather well, he thought, and he was sure he was right. Hawley wasn't through yet. Maybe next year, or the year after, but not this year.

Commander Conklin made no comment on Riggs's report other than to send an orderly to pick up the typed sheets. He "harrumphed" again and slowly said, "Major Hawley, your report, please."

This was a complete surprise to Riggs. He had expected at the most that Hawley would be given a chance to defend himself against any detrimental evidence presented by Riggs, but a report from his former commander was unexpected.

The small man stood up, very straight and martial in appearance, his black eyes snapping, his face otherwise expressionless. "I report that the board's original ideas with regard to Lieutenant Riggs were completely justified. Besides showing great native ability as a pilot, he has shown great tact in handling a delicate situation, and a levelheadedness that compels me to recommend him for the promotion you gentlemen had in mind." He sat down, likewise not giving his erstwhile companion a glance.

Riggs, overjoyed at Hawley's report, felt that his cup was running over. He expected Conklin to mumble an acceptance of the reports, but to his great surprise the commander suddenly called his name again. Riggs stood up.

"In view of certain extenuating circumstances known to the board," Conklin began, almost self-consciously, "we find it necessary to reject your report in the form it now stands. Major Hawley is hereby certified for a space rating for one year without further examination. Meeting adjourned."

Bo Riggs got stiffly to his feet, the bottom of his stomach apparently somewhere near his knees as he struggled to walk out with an unconcerned air. Hawley got up, too, and walked out at his side.

As they reached the corridor, but before the examiners had begun to file out, Hawley tapped his junior on the shoulder. "Look here, Riggs," he said, smiling a genuine smile at last. "You've got most of the makings of a good officer. There's only one thing you'll have to combat."

"Yes, sir," Riggs said wretchedly, knowing nothing else to say in his confusion.

"Yes, sir," mimicked Hawley. "The trouble with you, Riggs," he went on, "is that you're too damned naïve. I'm almost insulted to think that you believed I really botched that landing that badly. Don't you know a put-up job when you see one?"

He grinned evilly and walked away, while the incipient Captain Riggs alternately knifed him mentally in the back and blessed the day he was born.

Katherine MacLean

CONTAGION

One of the major hazards man will have to face on strange worlds, particularly where the planetary ecology seems to be such that he could live there without spacesuit and oxygen tank, will be the native viruses, bacteria, fungi, and other unknown and probably poisonous micro-elements that he will encounter. Even on Earth, the introduction of a new disease producer such as the syphilis microorganism into a society theretofore free of it has nearly eliminated whole populations unprepared for it by the development of bodily immunities or adequate prophylactic or preventive measures.

This story sets forth the strangest of all "diseases" ever described in science fiction, a disease to which the Earthian explorers are automatically susceptible. It is a thoroughly upsetting concept.

IT WAS like an Earth forest in the fall, but it was not fall. The forest leaves were green and copper and purple and fiery red, and a wind sent patches of bright greenish sunlight dancing among the leaf shadows.

The hunt party of the *Explorer* filed along the narrow trail, guns ready, walking carefully, listening to the distant, half-familiar cries of strange birds.

A faint crackle of static in their earphones indicated that a gun had been fired.

"Got anything?" asked June Walton. The helmet intercom carried her voice to the ears of the others without breaking the stillness of the forest.

"Took a shot at something," explained George Barton's cheerful voice in her earphones. She rounded a bend of the trail and came upon Barton standing peering up into the trees, his gun still raised. "It looked like a duck."

"This isn't Central Park," said Hal Barton, his brother, coming into sight. His green spacesuit struck an incongruous note against the bronze and red forest. "They won't all look like ducks," he said soberly.

"Maybe some will look like dragons. Don't get eaten by a dragon, June," came Max's voice quietly into her earphones. "Not while I still

love you." He came out of the trees carrying the blood-sample kit, and touched her glove with his, the grin on his ugly beloved face barely visible in the mingled light and shade. A patch of sunlight struck a greenish glint from his fish-bowl helmet.

They walked on. A quarter of a mile back, the spaceship *Explorer* towered over the forest like a tapering skyscraper, and the people of the ship looked out of the viewplates at fresh winds and sunlight and clouds, and they longed to be outside.

But the likeness to Earth was danger, and the cool wind might be death, for if the animals were like Earth animals, their diseases might be like Earth diseases, alike enough to be contagious, different enough to be impossible to treat. There was warning enough in the past. Colonies had vanished, and traveled spaceways drifted with the corpses of ships which had touched on some plague planet.

The people of the ship waited while their doctors, in airtight spacesuits, hunted animals to test them for contagion.

The four medicos, for June Walton was also a doctor, filed through the alien, homelike forest, walking softly, watching for motion among the copper and purple shadows.

They saw it suddenly, a lighter moving copper patch among the darker browns. Reflex action swung June's gun into line, and behind her someone's gun went off with a faint crackle of static and made a hole in the leaves beside the specimen. Then for a while no one moved.

This one looked like a man, a magnificently muscled, leanly graceful, humanlike animal. Even in its calloused bare feet it was a head taller than any of them. Red-haired, hawk-faced, and darkly tanned, it stood breathing heavily, looking at them without expression. At its side hung a sheath knife, and a crossbow was slung across one wide shoulder.

They lowered their guns.

"It needs a shave," Max said reasonably in their earphones, and he reached up to his helmet and flipped the switch that let his voice be heard. "Something we could do for you, Mac?"

The friendly drawl was the first voice that had broken the forest sounds. June smiled suddenly. He was right. The strict logic of evolution did not demand beards; therefore a nonhuman would not be wearing a three-day growth of red stubble.

Still panting, the tall figure licked dry lips and spoke. "Welcome to Minos. The mayor sends greetings from Alexandria."

"English?" gasped June.

"We were afraid you would take off again before I could bring word to you. . . . It's three hundred miles. . . . We saw your scout plane pass twice, but we couldn't attract its attention."

June looked in stunned silence at the stranger leaning against the tree. Thirty-six light-years—thirty-six times six trillion miles of monotonous space travel—to be told that the planet was already settled! "We didn't know there was a colony here," she said. "It is not on the map."

"We were afraid of that," the tall bronze man answered soberly. "We have been here three generations and yet no traders have come."

Max shifted the kit strap on his shoulder and offered a hand. "My name is Max Stark, M.D. This is June Walton, M.D., Hal Barton, M.D., and George Barton, Hal's brother, also M.D."

"Patrick Mead is the name," smiled the man, shaking hands casually. "Just a hunter and bridge carpenter myself. Never met any medicos before."

The grip was effortless, but even through her airproofed glove June could feel that the fingers that touched hers were as hard as padded steel.

"What—what is the population of Minos?" she asked.

He looked down at her curiously for a moment before answering. "Only one hundred and fifty." He smiled. "Don't worry, this isn't a city planet yet. There's room for a few more people." He shook hands with the Bartons quickly. "That is—you are people, aren't you?" he asked startlingly.

"Why not?" said Max with a poise that June admired.

"Well, you are all so—so—" Patrick Mead's eyes roamed across the faces of the group. "So varied."

They could find no meaning in that, and stood puzzled.

"I mean," Patrick Mead said into the silence, "all these—interesting different hair colors and face shapes and so forth—" He made a vague wave with one hand as if he had run out of words or was anxious not to insult them.

"Joke?" Max asked, bewildered.

June laid a hand on his arm. "No harm meant," she said to him over the intercom. "We're just as much of a shock to him as he is to us."

She addressed a question on outside sound to the tall colonist. "What should a person look like, Mr. Mead?"

He indicated her with a smile. "Like you."

June stepped closer and stood looking up at him, considering her own description. She was tall and tanned, like him; had a few freckles, like him; and wavy red hair, like his. She ignored the brightly humorous blue eyes.

"In other words," she said, "everyone on the planet looks like you and me?"

Patrick Mead took another look at their four faces and began to grin. "Like me, I guess. But I hadn't thought of it before. I did not think that people could have different-colored hair or that noses could fit so many ways onto faces. I was judging by my own appearance, but I suppose any fool can walk on his hands and say the world is upside down!" He laughed and sobered. "But then why wear spacesuits? The air is breathable."

"For safety," June told him. "We can't take any chances on plague."

Pat Mead was wearing nothing but a loincloth and his weapons, and the wind ruffled his hair. He looked comfortable, and they longed to take off the stuffy spacesuits and feel the wind against their own skins. Minos was like home, like Earth. . . . But they were strangers.

"Plague," Pat Mead said thoughtfully. "We had one here. It came two years after the colony arrived and killed everyone except the Mead families. They were immune. I guess we look alike because we're all related, and that's why I grew up thinking that it is the only way people can look."

Plague. "What was the disease?" Hal Barton asked.

"Pretty gruesome, according to my father. They called it the 'melting sickness.' The doctors died too soon to find out what it was or what to do about it."

"You should have trained for more doctors or sent to civilization for some." A trace of impatience was in George Barton's voice.

Pat Mead explained patiently, "Our ship, with the power plant and all the books we needed, went off into the sky to avoid the contagion, and never came back. The crew must have died." Long years of hardship were indicated by that statement, a colony with electric power gone and machinery stilled, with key technicians dead and no way to replace them. June realized then the full meaning of the primitive sheath knife and bow.

"Any recurrence of melting sickness?" asked Hal Barton.

"No."

"Any other diseases?"

"Not a one."

Max was eying the bronze redheaded figure with something approaching awe. "Do you think all the Meads look like that?" he said to June on the intercom. "I wouldn't mind being a Mead myself!"

Their job had been made easy by the coming of Pat. They went back to the ship laughing, exchanging anecdotes with him. There was nothing now to keep Minos from being the home they wanted, except the melting sickness, and, forewarned against it, they could take precautions.

The polished silver and black column of the *Explorer* seemed to rise higher and higher over the trees as they neared it. Then its symmetry blurred all sense of specific size as they stepped out from among the trees and stood on the edge of the meadow, looking up.

"Nice!" said Pat. "Beautiful!" The admiration in his voice was warming.

"It was a yacht," Max said, still looking up, "second-hand, an old-time beauty without a sign of wear. Synthetic diamond-studded control board, and murals on the walls. It doesn't have the new speed drives, but it brought us thirty-six light-years in one and a half subjective years. Plenty good enough."

The tall tanned man looked faintly wistful, and June realized that he had never had access to a full library, never seen a movie, never experienced luxury. He had been born and raised on Minos.

"May I go aboard?" Pat asked hopefully.

Max unslung the specimen kit from his shoulder, laid it on the carpet of plants that covered the ground, and began to open it.

"Tests first," Hal Barton said. "We have to find out if you people still carry this so-called melting sickness. We'll have to de-microbe you and take specimens before we let you on board. Once on, you'll be no good as a check for what the other Meads might have."

Max was taking out a rack and a stand of preservative bottles and hypodermics.

"Are you going to jab me with those?" Pat asked with interest.

"You're just a specimen animal to me, bud!" Max grinned at Pat Mead, and Pat grinned back. June saw that they were friends already, the tall pantherish colonist and the wry, black-haired doctor. She felt a stab of guilt because she loved Max and yet could pity him for being smaller and frailer than Pat Mead.

"Lie down," Max told him, "and hold still. We need two spinal-fluid

samples from the back, a body-cavity one in front, and another from the arm."

Pat lay down obediently. Max knelt and, as he spoke, expertly swabbed and inserted needles with the smooth speed that had made him a fine nerve surgeon on Earth.

High above them the scout helioplane came out of an opening in the ship and angled off toward the west, its buzz diminishing. Then, suddenly, it veered and headed back, and Reno Ulrich's voice came tinnily from their earphones:

"What's that you've got? Hey, what are you docs doing down there?" He banked again and came to a stop, hovering fifty feet away. June could see his startled face looking through the glass at Pat.

Hal Barton switched to a narrow radio beam, explained rapidly, and pointed in the direction of Alexandria. Reno's plane lifted and flew away over the odd-colored forest.

"The plane will drop a note on your town, telling them you got through to us," Hal Barton told Pat, who was sitting up watching Max dexterously put the blood and spinal fluid into the right bottles without exposing them to air.

"We won't be free to contact your people until we know if they still carry melting sickness," Max added. "You might be immune, so it doesn't show on you, but still carry enough germs—if that's what caused it—to wipe out a planet."

"If you do carry melting sickness," said Hal Barton, "we won't be able to mingle with your people until we've cleared them of the disease."

"Starting with me?" Pat asked.

"Starting with you," Max told him ruefully, "as soon as you step on board."

"More needles?"

"Yes, and a few little extras thrown in."

"Rough?"

"It isn't easy."

A few minutes later, standing in the stalls for spacesuit decontamination, being buffeted by jets of hot disinfectant, bathed in glares of sterilizing ultraviolet radiation, June remembered that and compared Pat Mead's treatment to theirs.

In the *Explorer,* stored carefully in sealed tanks and containers, was the ultimate, multipurpose cure-all. It was a solution of enzymes so

like the key catalysts of the human cell nucleus that it caused chemical derangement and disintegration in any nonhuman cell. Nothing could live in contact with it but human cells; any intruder alien to the body would die. Nucleocat Cure-all was its trade name.

But the cure-all alone was not enough for complete safety. Plagues had been known to slay too rapidly and universally to be checked by human treatment. Doctors are not reliable; they die. Therefore spaceways and interplanetary health laws demanded that ship equipment for guarding against disease be totally mechanical in operation, rapid, and efficient.

Somewhere near them, in a series of stalls which led around and around like a rabbit maze, Pat was being herded from stall to stall by peremptory mechanical voices, directed to soap and shower, ordered to insert his arm into a slot which took a sample of his blood, given solutions to drink, bathed in germicidal ultraviolet, shaken by sonic blasts, drowned in air thick with sprays of germicidal mists, directed to put his arms into other slots where they were anesthesized and injected with various immunizing solutions.

Finally he would be put in a room of high temperature and extreme dryness and instructed to sit for half an hour while more fluids were dripped into his veins through long thin tubes.

All legal spaceships were built for safety. No chance was taken of allowing a suspected carrier to bring an infection on board with him.

June stepped from the last shower stall into the locker room, zipped off her spacesuit with a sigh of relief, and contemplated herself in a wall mirror. Red hair, dark-blue eyes, tall . . .

"I've got a good figure," she said thoughtfully.

Max turned at the door. "Why this sudden interest in your looks?" he asked suspiciously. "Do we stand here and admire you, or do we finally get something to eat?"

"Wait a minute." She went to a wall phone and dialed it carefully, using a combination from the ship's directory. "How're you doing, Pat?"

The phone picked up a hissing of water or spray. There was a startled chuckle. "Voices, too! Hello, June. How do you tell a machine to go jump in the lake?"

"Are you hungry?"

"No food since yesterday."

"We'll have a banquet ready for you when you get out," she told Pat, and hung up, smiling. Pat Mead's voice had a vitality and enjoyment which made shipboard talk sound like sad artificial gaiety in contrast.

They looked into the nearby small laboratory where twelve squealing hamsters were each protestingly submitting to a small injection of Pat's blood. In most of them the injection was followed by one of antihistaminics and adaptives. Otherwise the hamster defense system would treat all nonhamster cells as enemies, even the harmless human blood cells, and fight back against them violently.

One hamster, the twelfth, was given an extra-large dose of adaptive, so that if there were a disease, he would not fight it or the human cells, and would thus succumb more rapidly.

"How ya doing, George?" Max asked.

"Routine," George Barton grunted absently.

On the way up the long spiral ramps to the dining hall, they passed a viewplate. It showed a long scene of mountains in the distance on the horizon, and between them, rising step by step as they receded into the distance, the low rolling hills, bronze and red with patches of clear green where there were fields.

Someone was looking out, standing very still, as if she had been there a long time—Bess St. Clair, a Canadian woman. "It looks like Winnipeg," she told them as they paused. "When are you doctors going to let us out of this blithering barber pole? Look—" She pointed. "See that patch of field on the south hillside, with the brook winding through it? I've staked that hillside for our house. When do we get out?"

Reno Ulrich's tiny scout plane buzzed slowly in from the distance and began circling lazily.

"Sooner than you think," Max told her. "We've discovered a castaway colony on the planet. They've done our tests for us by just living here. If there's anything here to catch, they've caught it."

"People on Minos?" Bess's handsome ruddy face grew alive with excitement.

"One of them is down in the medical department," June said. "He'll be out in twenty minutes."

"May I go see him?"

"Sure," said Max. "Show him the way to the dining hall when he gets out. Tell him we sent you."

"Right!" she turned and ran down the ramp like a small girl going to a fire. Max grinned at June and she grinned back. After a year and a half of isolation in space, everyone was hungry for the sight of new faces, the sound of unfamiliar voices.

They climbed the last two turns to the cafeteria and entered to a rich subdued blend of soft music and quiet conversations. The cafeteria was a section of the old dining room, left when the rest of the ship had been converted to living and working quarters, and it still had the original finely grained wood of the ceiling and walls, the sound-absorbency, the soft music spools, and the intimate small light at each table where people leisurely ate and talked.

They stood in line at the hot-foods counter, and behind her June could hear a girl's voice talking excitedly through the murmur of conversation.

"—new man, honest! I saw him through the viewplate when they came in. He's down in the medical department. A real frontiersman."

The line drew abreast of the counters, and she and Max chose three heaping trays, starting with hydroponic mushroom steak, raised in the growing-trays of water and chemicals; sharp salad bowl with rose tomatoes and aromatic peppers; tank-grown fish with special sauce; four different desserts, and assorted beverages.

Presently they had three tottering trays successfully maneuvered to a table. Brant St. Clair came over. "I beg your pardon, Max, but they are saying something about Reno carrying messages to a colony of savages, for the medical department. Will he be back soon, do you know?"

Max smiled up at him, his square face affectionate. Everyone liked the shy Canadian. "He's back already. We just saw him come in."

"Oh, fine." St. Clair beamed. "I had an appointment with him to go out and confirm what looks like a nice vein of iron to the northeast. Have you seen Bess? Oh—there she is." He turned swiftly and hurried away.

A very tall man with fiery red hair came in, surrounded by an eagerly talking crowd of ship people. It was Pat Mead. He stood in the doorway, alertly scanning the dining room. Sheer vitality made him seem even larger than he was. Sighting June, he smiled and began to thread toward their table.

"Look!" said someone. "There's the colonist!" Shelia, a pretty, jeweled woman, followed and caught his arm. "Did you *really* swim across a river to come here?"

Overflowing with goodwill and curiosity, people approached from all directions. "Did you actually walk three hundred miles? Come, eat with us. Let me help choose your tray."

Everyone wanted him to eat at his table, everyone was a specialist and wanted data about Minos. They all wanted anecdotes about hunting wild animals with a bow and arrow.

"He needs to be rescued," Max said. "He won't have a chance to eat."

June and Max got up firmly, edged through the crowd, captured Pat, and escorted him back to their table. June found herself pleased to be claiming the hero of the hour.

Pat sat in the simple, subtly designed chair and leaned back almost voluptuously, testing the way it gave and fitted itself to him. He ran his eyes over the bright tableware and heaped plates. He looked around at the rich grained walls and soft lights at each table. He said nothing, just looking and feeling and experiencing.

"When we build our town and leave the ship," June explained, "we will turn all the staterooms back into the lounges and ballrooms and cocktail bars that used to be inside."

"Oh, I'm not complaining," Pat said negligently. He cocked his head to the music and tried to locate its source.

"That's big of you," said Max with gentle irony.

They fell to, Pat beginning the first meal he had had in more than a day.

Most of the other diners finished when they were halfway through and began walking over, diffidently at first, then in another wave of smiling faces, handshakes, and introductions. Pat was asked about crops, about farming methods, about rainfall and floods, about farm animals and plant breeding, about the compatibility of imported Earth seeds with local ground, about mines and strata.

There was no need to protect him. He leaned back in his chair and drawled answers with the lazy ease of a panther; where he could think of no statistic, he would fill the gap with an anecdote. It developed that he enjoyed spinning campfire yarns and especially being the center of interest.

Between bouts of questions, he ate with undiminished and glowing relish.

June noticed that the female specialists were prolonging the questions more than they needed, clustering around the table and laughing

at his jokes, until presently Pat was almost surrounded by pretty faces, eager questions, and chiming laughs. Shelia the beautiful laughed most chimingly of all.

June nudged Max, and Max shrugged indifferently. It wasn't anything a man would pay attention to, perhaps. But June watched Pat for a moment more, then glanced uneasily back to Max. He was eating and listening to Pat's answers and did not feel her gaze. For some reason Max looked to her almost shrunken. He was shorter than she had realized; she had forgotten that he was only the same height as herself. She was dimly aware of the clear lilting chatter of female voices increasing at Pat's end of the table.

"That guy's a menace," Max said, and laughed to himself, cutting another slice of hydroponic mushroom steak. "What's eating you?" he added, glancing aside at her when he noticed her sudden stillness.

"Nothing," she said hastily, but she did not turn back to watching Pat Mead. She felt disloyal. Pat was only a superb animal. Max was the man she loved. Or—was he? Of course he was, she told herself angrily. They had gone colonizing together because they wanted to spend their lives together; she had never thought of marrying any other man. Yet the sense of dissatisfaction persisted, and along with it a feeling of guilt.

Len Marlow, the protein-tank-culture technician responsible for the mushroom steaks, had wormed his way into the group and asked Pat a question. Now he was saying, "I don't dig you, Pat. It sounds like you're putting the people into the tanks instead of the vegetables!" He glanced at them, looking puzzled. "See if you two can make anything of this. It sounds medical to me."

Pat leaned back and smiled, sipping a glass of hydroponic Burgundy. "Wonderful stuff. You'll have to show us how to make it."

Len turned back to him. "You people live off the country, right? You hunt and bring in steaks and eat them, right? Well, say I have one of those steaks right here and I want to eat it, what happens?"

"Go ahead and eat it. It just wouldn't digest. You'd stay hungry."

"Why?" Len was aggrieved.

"Chemical differences in the basic protoplasm of Minos. Different amino linkages, left-handed instead of right-handed molecules in the carbohydrates, things like that. Nothing will be digestible here until you are adapted chemically by a little test-tube evolution. Till then you'd starve to death on a full stomach."

Pat's side of the table had been loaded with the dishes from two trays, but it was almost clear now and the dishes were stacked neatly to one side. He started on three desserts, thoughtfully tasting each in turn.

"Test-tube evolution?" Max repeated. "What's that? I thought you people had no doctors."

"It's a story." Pat leaned back again. "Alexander P. Mead, the head of the Mead clan, was a plant geneticist, a very determined personality and no man to argue with. He didn't want us to go through the struggle of killing off all Minos plants and putting in our own, spoiling the face of the planet and upsetting the balance of its ecology. He decided that he would adapt our genes to this planet or kill us trying. He did it, all right."

"Did which?" asked June, suddenly feeling a sourceless prickle of fear.

"Adapted us to Minos. He took human cells—"

She listened intently, trying to find a reason for fear in the explanation. It would have taken many human generations to adapt to Minos by ordinary evolution, and that only at a heavy toll of death and hunger which evolution exacts. There was a shorter way: Human cells have the ability to return to their primeval condition of independence —hunting, eating, and reproducing alone.

Alexander P. Mead took human cells and made them into phagocytes. He put them through the hard savage school of evolution—a thousand generations of multiplication, hardship, and hunger, with the alien indigestible food always present, offering its reward of plenty to the cell that reluctantly learned to absorb it.

"Leucocytes can run through several thousand generations of evolution in six months," Pat Mead finished. "When they reached a point where they would absorb Minos food, he planted them back in the people he had taken them from."

"What was supposed to happen then?" Max asked, leaning forward.

"I don't know exactly how it worked. He never told anybody much about it, and when I was a little boy he had gone loco and was wandering ha-ha-ing around waving a test tube. Fell down a ravine and broke his neck at the age of eighty."

"A character," Max said.

Why was she afraid? "It worked, then?"

"Yes. He tried it on all the Meads the first year. The other settlers didn't want to be experimented on until they saw how it worked out. It worked. The Meads could hunt and plant while the other settlers were still eating out of hydroponics tanks."

"It worked," said Max to Len. "You're a plant geneticist and a tank-culture expert. There's a job for you."

"Unh-*unh!*" Len backed away. "It sounds like a medical problem to me. Human cell control—right up your alley."

"It is a one-way street," Pat warned. "Once it is done, you won't be able to digest ship food. I'll get no good from this protein. I ate it just for the taste."

Hal Barton appeared quietly beside the table. "Three of the twelve test hamsters have died," he reported, and turned to Pat. "Your people carry the germs of melting sickness, as you call it. The dead hamsters were injected with blood taken from you before you were de-infected. We can't settle here unless we de-infect everybody on Minos. Would they object?"

"We wouldn't want to give you folks germs," Pat smiled. "Anything for safety. But there'll have to be a vote on it first."

The doctors went to Reno Ulrich's table and walked with him to the hangar, explaining. He was to carry the proposal to Alexandria, mingle with the people, be persuasive, and wait for them to vote before returning. He was to give himself shots of cure-all every two hours on the hour, or run the risk of disease.

Reno was pleased. He had dabbled in sociology before retraining as a mechanic for the expedition. "This gives me a chance to study their mores." He winked wickedly. "I may not be back for several nights." They watched through the viewplate as he took off, and then went over to the laboratory for a look at the hamsters.

Three were alive and healthy, munching lettuce. One was the control; the other two had been given shots of Pat's blood before he entered the ship, but with no additional treatment. Apparently a hamster could fight off melting sickness easily if left alone. Three were still feverish and ruffled, with a low red blood count, but recovering. The three dead ones had been given strong shots of adaptive and antihistaminics, so their bodies had not fought back against the attack.

June glanced at the dead animals hastily and looked away again. They lay twisted with a strange semifluid limpness, as if ready to dis-

solve. The last hamster, which had been given the heaviest dose of adaptive, had apparently lost all its hair before death. It was hairless and pink, like a stillborn baby.

"We can find no microorganisms," George Barton said. "None at all. Nothing in the body that should not be there. Leucosis and anemia. Fever only for the ones that fought it off." He handed Max some temperature charts and graphs of blood counts.

June wandered out into the hall. Pediatrics and obstetrics were her field; she left the cellular research to Max and just helped him with laboratory routine. The strange mood followed her out into the hall, then abruptly lightened.

Coming toward her, busily telling a tale of adventure to the gorgeous Shelia Davenport, was a tall, redheaded, magnificently handsome man. It was his handsomeness which made Pat such a pleasure to look upon and talk with, she guiltily told herself, and it was his tremendous vitality. . . . It was like meeting a movie hero in the flesh, or a hero out of the pages of a book—Deerslayer, John Clayton, Lord Greystoke.

She waited in the doorway to the laboratory and made no move to join them, merely acknowledged the two with a nod and a smile and a casual lift of the hand. They nodded and smiled back.

"Hello, June," said Pat, and continued telling his tale, but as they passed he lightly touched her arm.

"Oh, pioneer!" she said mockingly and softly to his passing profile, and knew that he had heard.

That night she had a nightmare. She was running down a long corridor looking for Max, but every man she came to was a big bronze man with red hair and bright-blue eyes who grinned at her.

The pink hamster! She woke suddenly, feeling as if alarm bells had been ringing, and listened carefully, but there was no sound. She had had a nightmare, she told herself, but alarm bells were still ringing in her unconscious. Something was wrong.

Lying still and trying to preserve the images, she groped for a meaning, but the mood faded under the cold touch of reason. Damn intuitive thinking! A pink hamster! Why did the unconscious have to be so vague? She fell asleep again and forgot.

They had lunch with Pat Mead that day, and after it was over Pat delayed June with a hand on her shoulder and looked down at her

for a moment. "I want you, June," he said and then turned away, answering the hails of a party at another table as if he had not spoken. She stood shaken and then walked to the door where Max waited.

She was particularly affectionate with Max the rest of the day, and it pleased him. He would not have been if he had known why. She tried to forget Pat's blunt statement.

June was in the laboratory with Max, watching the growth of a small tank culture of the alien protoplasm from a Minos weed and listening to Len Marlow pour out his troubles.

"And Elsie tags around after that big goof all day, listening to his stories. And then she tells me I'm just jealous, I'm imagining things!" He passed his hand across his eyes. "I came away from Earth to be with Elsie. . . . I'm getting a headache. Look, can't you persuade Pat to cut it out, June? You and Max are his friends."

"Here, have an aspirin," June said. "We'll see what we can do."

"Thanks." Len picked up his tank culture and went out, not at all cheered.

Max sat brooding over the dials and meters at his end of the laboratory, apparently sunk in thought. When Len had gone, he spoke almost harshly.

"Why encourage the guy? Why let him hope?"

"Found out anything about the differences in protoplasm?" she evaded.

"Why let him kid himself? What chance has he got against that hunk of muscle and smooth talk?"

"But Pat isn't after Elsie," she protested.

"Every scatterbrained woman on this ship is trailing after Pat with her tongue hanging out. Brant St. Clair is in the bar right now. He doesn't say what he is drinking about, but do you think Pat is resisting all these women crowding down on him?"

"There are other things besides looks and charm," she said, grimly trying to concentrate on a slide under her binocular microscope.

"Yeah, and whatever they are, Pat has them, too. Who's more competent to support a woman and a family on a frontier planet than a handsome bruiser who was born here?"

"I meant," June spun around on her stool with unexpected passion, "there is old friendship, and there's fondness, and memories, and loyalty!" She was half shouting.

"They're not worth much on the second-hand market," Max said. He was sitting slumped on his lab stool, looking dully at his dials. "Now *I'm* getting a headache!" He smiled ruefully. "No kidding, a real headache. And over other people's troubles yet!"

Other people's troubles . . . She got up and wandered out into the long curving halls. "I want you, June," Pat's voice repeated in her mind. Why did the man have to be so overpoweringly attractive, so glaring a contrast to Max? Why couldn't the Universe manage to run on without generating troublesome love triangles?

She walked up the curving ramps to the dining hall where they had eaten and drunk and talked yesterday. It was empty except for one couple talking forehead to forehead over cold coffee.

She turned and wandered down the long easy spiral of corridor to the pharmacy and dispensary. It was empty. George was probably in the test lab next door, where he could hear if he was wanted. The automatic vendor of harmless euphorics, stimulants, and opiates stood in the corner, brightly decorated in pastel abstract designs, with its automatic tabulator graph glowing above it.

Max had a headache, she remembered. She recorded her thumbprint in the machine and pushed the plunger for a box of aspirins, trying to focus her attention on the problem of adapting the people of the ship to the planet Minos. An aquarium tank with a faint solution of histamine would be enough to convert a piece of human skin into a community of voracious, active phagocytes individually seeking something to devour, but could they eat enough to live away from the rich sustaining plasma of human blood?

After the aspirins, she pushed another plunger for something for herself. Then she stood looking at it, a small box with three pills in her hand—theobromine, a heart strengthener and a confidence-giving euphoric all in one, something to steady shaky nerves. She had used it before only in emergency. She extended a hand and looked at it. It was trembling. Damn triangles!

While she was looking at her hand there was a click from the automatic drug vendor. It summed the morning use of each drug in the vendors throughout the ship and recorded it in a neat addition to the end of each graph line. For a moment she could not find the green line for anodynes and the red line for stimulants, and then she saw that they went almost straight up.

There were too many being used—far too many to be explained by

jealousy or psychosomatic peevishness. This was an epidemic, and only one disease was possible!

The disinfecting of Pat had not succeeded. Nucleocat Cure-all, killer of all infections, had not cured! Pat had brought melting sickness into the ship with him!

Who had it?

The drugs vendor glowed cheerfully, uncommunicative. She opened a panel in its side and looked in on restless interlacing cogs, and on the inside of the door saw printed some directions. ". . . To remove or examine records before reaching end of the reel—"

After a few fumbling minutes she had the answer. In the cafeteria at breakfast and lunch, thirty-eight men out of the forty-eight aboard ship had taken more than his norm of stimulant. Twenty-one had taken aspirin as well. The only woman who had made an unusual purchase was herself!

She remembered the hamsters that had thrown off the infection with a short, sharp fever, and checked back in the records to the day before. There was a short rise in aspirin sales to women at late afternoon. The women were safe.

It was the men who had melting sickness!

Melting sickness killed in hours, according to Pat Mead. How long had the men been sick?

As she was leaving, Jerry came into the pharmacy, recorded his thumbprint, and took a box of aspirin from the machine.

She felt all right. Self-control was working well, and it was pleasant still to walk down the corridor smiling at the people who passed. She took the emergency elevator to the control room and showed her credentials to the technician on watch.

"Medical Emergency." At a small control panel in the corner was a large red button, precisely labeled. She considered it and picked up the control-room phone. This was the hard part, telling someone, especially someone who had it—Max.

She dialed, and when the click on the end of the line showed he had picked the phone up, she told Max what she had seen.

"No women, just the men," he repeated. "That right?"

"Yes."

"Probably it's chemically alien, inhibited by one of the female sex hormones. We'll try sex-hormone shots, if we have to. Where are you calling from?"

She told him.

"That's right. Give Nucleocat Cure-all another chance. It might work this time. Push that button."

She went to the panel and pushed the large red button. Through the long height of the *Explorer,* bells woke to life and began to ring in frightened clangor, emergency doors thumped shut, mechanical apparatus hummed into life, and canned voices began to give rapid, urgent directions.

A plague had come.

She obeyed the mechanical orders, went out into the hall, and walked in line with the others. The captain walked ahead of her, and the gorgeous Shelia Davenport fell into step beside her. "I look like a positive hag this morning. Does that mean I'm sick? Are we all sick?"

June shrugged, unwilling to say what she knew.

Others came out of all rooms into the corridor, thickening the line. They could hear each room lock as the last person left it, and then, faintly, the hiss of disinfectant spray. Behind them, on the heels of the last person in line, segments of the ship slammed off and began to hiss.

They wound down the spiral corridor until they reached the medical treatment section again, and there they waited in line.

"It won't scar my arms, will it?" asked Shelia apprehensively, glancing at her smooth, lovely arms.

The mechanical voice said, "Next. Step inside, please, and stand clear of the door."

"Not a bit," June reassured Shelia, and stepped into the cubicle.

Inside, she was directed from cubicle to cubicle and given the usual buffeting by sprays and radiation, had blood samples taken, and was injected with Nucleocat and a series of other protectives. At last she was directed through another door into a tiny cubicle with a chair.

"You are to wait here," commanded the recorded voice metallically. "In twenty minutes the door will unlock and you may then leave. All people now treated may visit all parts of the ship which have been protected. It is forbidden to visit any quarantined or unsterile part of the ship without permission from the medical officers."

Presently the door unlocked and she emerged into bright lights again, feeling slightly battered.

She was in the clinic. A few men sat on the edges of beds and

looked sick. One was lying down. Brant and Bess St. Clair sat near each other, not speaking.

Approaching her was George Barton, reading a thermometer with a puzzled expression.

"What is it, George?" she asked anxiously.

"Some of the women have slight fever, but it's going down. None of the fellows have any—but their white count is way up, their red count is way down, and they look sick to me."

She approached St. Clair. His usually ruddy cheeks were pale, his pulse was light and too fast, and his skin felt clammy. "How's the headache? Did the Nucleocat treatment help?"

"I feel worse, if anything."

"Better set up beds," she told George. "Get everyone back into the clinic."

"We're doing that," George assured her. "That's what Hal is doing."

She went back to the laboratory. Max was pacing up and down, absently running his hands through his black hair until it stood straight up. He stopped when he saw her face and scowled thoughtfully. "They are still sick?' It was more a statement than a question.

She nodded.

"The Cure-all didn't cure this time," he muttered. "That leaves it up to us. We have melting sickness, and according to Pat and the hamsters, that leaves us less than a day to find out what it is and learn how to stop it."

Suddenly an idea for another test stuck him, and he moved to the work table to set it up. He worked rapidly, though an occasional uncoordinated movement betrayed his usual efficiency.

It was strange to see Max troubled and afraid.

She put on a laboratory smock and began to work. She worked in silence. The mechanicals had failed. Hal and George Barton were busy staving off death from the weaker cases and trying to gain time for Max and her to work. The problem of the plague had to be solved by the two of them alone. It was in their hands.

Another test, no results. Another test, no results. Max's hands were shaking, and he stopped a moment to take stimulants.

She went into the ward for a moment, found Bess, and warned her quietly to tell the other women to be ready to take over if the men became too sick to go on. "But tell them calmly. We don't want to

frighten the men." She lingered in the ward long enough to see the word spread among the women in a widening wave of paler faces and compressed lips; then she went back to the laboratory.

Another test. There was no sign of a microorganism in anyone's blood, merely a growing horde of leucocytes and phagocytes prowling as if mobilized to repel invasion.

Len Marlow was wheeled in unconscious, with Hal Barton's written comments and conclusions pinned to the blanket.

"I don't feel so well myself," the assistant complained. "The air feels thick. I can't breathe."

June saw that his lips were blue. "Oxygen short," she told Max.

"Low red corpuscle count," Max answered. "Look into a drop and see what's going on. Use mine; I feel the same way he does." She took two drops of Max's blood. The count was low, falling too fast.

Breathing is useless without the proper minimum of red corpuscles in the blood. People below that minimum die of asphyxiation although their lungs are full of pure air. The red corpuscle count was falling too fast. The time she and Max had to work in was too short.

"Pump some more CO_2 into the air system," Max said urgently over the phone. "Get some into the men's end of the ward."

She looked through the microscope at the live sample of blood. It was a dark, clear field, and bright moving things spun and swirled through it, but she could see nothing that did not belong there.

"Hal," Max called over the general speaker system, "cut the other treatments, check for accelerating anemia. Treat it like monoxide poisoning—CO_2 and oxygen."

She reached into a cupboard under the work table, located two cylinders of oxygen, cracked the valves, and handed one to Max and one to the assistant. Some of the bluish tint left the assistant's face as he breathed, and he went over to the patient with reawakened concern.

"Not breathing, Doc!"

Max was working at the desk, muttering equations of hemoglobin catalysis.

"Len's gone, Doc," the assistant said more loudly.

"Artificial respiration, and get him into a regeneration tank," said June, not moving from the microscope. "Hurry! Hal will show you how. The oxidation and mechanical heart action in the tank will keep him going. Put anyone in a tank who seems to be

dying. Get some women to help you. Give them Hal's instructions."

The tanks were ordinarily used to suspend animation in a nutrient bath during the regrowth of any diseased organ. It could preserve life in an almost totally destroyed body during the usual disintegration and regrowth treatments for cancer and old age, and it could encourage healing as destruction continued . . . but it could not prevent ultimate death as long as the disease was not conquered.

The drop of blood in June's microscope was a great dark field, and in the foreground, brought to gargantuan solidity by the stereo effect, drifted neat saucer shapes of red blood cells. They turned end for end, floating by the humped, misty mass of a leucocyte which was crawling on the cover glass. There were not enough red corpuscles, and she felt that they grew fewer as she watched.

She fixed her eye on one, not blinking, in fear that she would miss what might happen. It was a tidy red button, and it spun as it drifted, the current moving it aside in a curve as it passed by the leucocyte.

Then, abruptly, the cell vanished.

June stared numbly at the place where it had been.

Behind her, Max was calling over the speaker system again: "Dr. Stark speaking. Any technician who knows anything about the life tanks, start bringing more out of storage and set them up. Emergency."

"We may need forty-seven," June said quietly.

"We may need forty-seven," Max repeated to the ship in general. His voice did not falter. "Set them up along the corridor. Hook them in on extension lines."

His voice filtered back from the empty floors above in a series of dim echoes. What he had said meant that every man on board might be on the point of heart stoppage.

June looked blindly through the binocular microscope, trying to think. Out of the corner of her eyes she could see that Max was wavering and breathing more and more frequently of the pure, cold, burning oxygen of the cylinders. In the microscope she could see that there were fewer red cells left alive in the drop of his blood. The rate of fall was accelerating.

She didn't have to glance at Max to know how he would look—skin pale, black eyebrows and keen brown eyes slightly squinted in thought, a faint ironical grin twisting the bluing lips. Intelligent, thin, sensi-

tive, his face was part of her mind. It was inconceivable that Max could die. He couldn't die. He couldn't leave her alone.

She forced her mind back to the problem. All the men of the *Explorer* were at the same point, wherever they were.

Moving to Max's desk, she spoke into the intercom system: "Bess, send a couple of women to look through the ship, room by room, with a stretcher. Make sure all the men are down here." She remembered Reno. "Sparks, heard anything from Reno? Is he back?"

Sparks replied weakly, after a lag, "The last I heard from Reno was a call this morning. He was raving about mirrors, and Pat Mead's folks not being real people, just carbon copies, and claiming he was crazy; and I should send him the psychiatrist. I thought he was kidding. He didn't call back."

"Thanks, Sparks." Reno was lost.

Max dialed and spoke to the bridge over the phone. "Are you okay up there? Forget about engineering controls. Drop everything and head for the tanks while you can still walk."

June went back to the work table and whispered into her own phone. "Bess, send up a stretcher for Max. He looks pretty bad."

There had to be a solution. The life tanks could sustain life in a damaged body, encouraging it to regrow more rapidly, but they merely slowed death as long as the disease was not checked. The postponement could not last long, for destruction could go on steadily in the tanks, until the nutritive solution would hold no life except the triumphant microscopic killers that caused melting sickness.

There were very few red blood corpuscles in the microscope field now, incredibly few. She tipped the microscope and they began to drift, spinning slowly. A lone corpuscle floated through the center. She watched it as the current swept it in an arc past the dim off-focus bulk of the leucocyte. There was a sweep of motion and it vanished.

For a moment it meant nothing to her; then she lifted her head from the microscope and looked around. Max sat at his desk, head in hand, his rumpled short black hair sticking out between his fingers at odd angles. A pencil and a pad scrawled with formulas lay on the desk before him. She could see his concentration in the rigid set of his shoulders. He was still thinking; he had not given up.

"Max, I just saw a leucocyte grab a red blood corpuscle. It was unbelievably fast."

"Leukemia," muttered Max without moving. "Galloping leukemia

yet! That comes under the heading of cancer. Well, that's part of the answer. It might be all we need." He grinned feebly and reached for the speaker set. "Anybody still on his feet in there?" he muttered into it, and the question was amplified to a booming voice throughout the ship. "Hal, are you still going? Look, Hal, change all the dials, change the dials, set them to deep melt and regeneration. One week. This is like leukemia. Got it? This is like leukemia."

June rose. It was time for her to take over the job. She leaned across his desk and spoke into the speaker system. "Doctor Walton talking," she said. "This is to the women. Don't let any of the men work any more; they'll kill themselves. See that they all go into the tanks right away. Set the tank dials for deep regeneration. You can see how from the ones that are set."

Two exhausted and frightened women clattered in the doorway with a stretcher. Their hands were scratched and oily from helping to set up tanks.

"That order includes you," she told Max sternly, and caught him as he swayed.

Max saw the stretcher-bearers and struggled upright. "Ten more minutes," he said clearly. "Might think of an idea. Something not right in this setup. I have to figure how to prevent a relapse, how the thing started."

He knew more bacteriology than she did; she had to help him think. She motioned the bearers to wait, fixed a breathing mask for Max from a cylinder of CO_2 and the opened one of oxygen. Max went back to his desk.

She walked up and down, trying to think, remembering the hamsters. The melting sickness, it was called. Melting. She struggled with an impulse to open a tank which held one of the men. She wanted to look in, see if that would explain the name.

Melting sickness . . .

Footsteps came, and Pat Mead stood uncertainly in the doorway. Tall, handsome, rugged, a pioneer. "Anything I can do?" he asked.

She barely looked at him. "You can stay out of our way. We're busy."

"I'd like to help," he said.

"Very funny." She was vicious, enjoying the whip of her words. "Every man is dying because you're a carrier, and you want to help."

He stood nervously clenching and unclenching his hands. "A guinea pig, maybe. I'm immune. All the Meads are."

"Go away." God, why couldn't she think? What makes a Mead immune?

"Aw, let 'im alone," Max muttered. "Pat hasn't done anything." He went waveringly to the microscope, took a tiny sliver from his finger, suspended it in a slide, and slipped it under the lens with detached habitual dexterity. "Something funny going on," he said to June. "Symptoms don't feel right."

After a moment he straightened and motioned for her to look. "Leucocytes, phagocytes—" He was bewildered. "My own—"

She looked in and then looked back at Pat in a growing wave of horror. "They're not your own, Max!" she whispered.

Max rested a hand on the table to brace himself, put his eye to the microscope, and looked again. June knew what he saw. Phagocytes, leucocytes, attacking and devouring his tissues in a growing incredible horde, multiplying insanely.

Not his phagocytes! Pat Mead's! The Meads' evolved cells had learned too much. They were contagious. And not Pat Mead's . . . How much alike *were* the Meads? . . . Mead cells contagious from one to another, not a disease attacking or being fought, but acting as normal leucocytes in whatever body they were in! The leucocytes of tall, redheaded people finding no strangeness in the blood streams of any of the tall, redheaded people. No strangeness . . . A toti-potent leucocyte finding its way into cellular wombs.

The womblike life tanks. For the men of the *Explorer,* a week's cure with deep melting to de-differentiate the leucocytes and turn them back to normal tissue, then regrowth and re-forming from the cells that were there. From the cells that *were* there. *From the cells that were there . . .*

"Pat—"

"I know." Pat began to laugh, his face twisted with sudden understanding. "I understand. I get it. I'm a contagious personality. That's funny, isn't it?"

Max rose suddenly from the microscope and lurched toward him, fists clenched. Pat caught him as he fell, and the bewildered stretcher-bearers carried him out to the tanks.

For a week June tended the tanks. The other women volunteered to help, but she refused. She said nothing, hoping her guess would not be true.

"Is everything all right?" Elsie asked her anxiously. "How is Jerry coming along?" Elsie looked haggered and worn, like all the women, from doing the work that the men had always done.

"He's fine," June said tonelessly, shutting tight the door of the tank room. "They're all fine."

"That's good," Elsie said, but she looked more frightened than before.

June firmly locked the tank-room door and the girl went away.

The other women had been listening, and now they wandered back to their jobs, unsatisfied by June's answer but not daring to ask for the actual truth. They were there whenever June went into the tank room, and they were still there—or relieved by others; June was not sure—when she came out. And always some one of them asked the unvarying question for all the others, and June gave the unvarying answer. But she kept the key. No woman but herself knew what was going on in the life tanks.

Then the day of completion came. June told no one of the hour. She went into the room as on the other days, locked the door behind her, and there was the nightmare again. This time it was reality, and she wandered down a path between long rows of coffinlike tanks, calling, "Max! Max!" silently and looking into each one as it opened.

But each face she looked at was the same. Watching them dissolve and regrow in the nutrient solution, she had only been able to guess at the horror of what was happening. Now she knew.

They were all the same lean-boned, blond-skinned face, with a pinfeather growth of reddish down on cheeks and scalp. All horribly—and handsomely—the same.

A medical kit lay carelessly on the floor beside Max's tank. She stood near the bag. "Max," she said, and found her throat closing. The canned mechanical voice mocked her, speaking glibly about waking and sitting up. "I'm sorry, Max. . . ."

The tall man with rugged features and bright-blue eyes sat up sleepily and lifted an eyebrow at her and ran his hand over his red-fuzzed head in a gesture of bewilderment.

"What's the matter, June?" he asked drowsily.

She gripped his arm. "Max—"

He compared the relative size of his arm with her hand and said wonderingly, "You shrank."

"I know, Max. I know."

He turned his head and looked at his arms and legs, pale blond arms and legs with a down of red hair. He touched the thick left arm, squeezed a pinch of hard flesh. "It isn't mine," he said, surprised. "But I can feel it."

Watching his face was like watching a stranger mimicking and distorting Max's expressions. Max in fear. Max trying to understand what had happened to him, looking around at the other men sitting up in their tanks. Max feeling the terror that was in herself and all the men as they stared at themselves and their friends and saw what they had become.

"We're all Pat Mead," he said harshly. "All the Meads are Pat Mead. That's why he was surprised to see people who didn't look like himself."

"Yes, Max."

"Max," he repeated. "It's me, all right. The nervous system didn't change." His new blue eyes held hers. "My love didn't, either. Did yours? Did it, June?"

"No, Max." But she couldn't know yet. She had loved Max with the thin, ironic face, the rumpled black hair, and the twisted smile that never really hid his quick sympathy. Now he was Pat Mead. Could he also be Max? "Of course I still love you, darling."

He grinned. It was still the wry smile of Max, though fitting strangely on the handsome new blond face. "Then it isn't so bad. It might even be pretty good. I envied him this big muscular body. If Pat or any of these Meads so much as looks at you, I'm going to knock his block off. Understand?"

She laughed and couldn't stop. It wasn't that funny. But it was still Max, trying to be unafraid, drawing on humor. Maybe the rest of the men would also be their old selves, enough so that the women would not feel that their men were strangers.

Behind her, male voices spoke characteristically. She did not have to turn to know which was which: "This is one way to keep a guy from stealing your girl"; that was Len Marlow. "I've got to write down all my reactions"; Hal Barton. "Now I can really work that hillside vein of metal"; St. Clair. Then others complaining, swearing, laughing bitterly at the trick that had been played on them and their flirting, tempted women. She knew who they were. Their women would know them apart, too.

"We'll go outside," Max said. "You and I. Maybe the shock won't be so bad to the women after they see me." He paused. "You didn't tell them, did you?"

"I couldn't. I wasn't sure. I—was hoping I was wrong."

She opened the door and closed it quickly. There was a small crowd on the other side.

"Hello, Pat," Elsie said uncertainly, trying to look past them into the tank room before the door shut.

"I'm not Pat, I'm Max," said the tall man with the blue eyes and the fuzz-reddened skull. "Listen—"

"Good heavens, Pat, what happened to your hair?" Shelia asked.

"I'm Max," insisted the man with the handsome face and the sharp blue eyes. "Don't you get it? I'm Max Stark. The melting sickness is Mead cells. We caught them from Pat. They adapted us to Minos. They also changed us all into Pat Mead."

The women stared at him, at one another. They shook their heads.

"They don't understand," June said. "I couldn't have if I hadn't seen it happening, Max."

"It's Pat," said Shelia, dazedly stubborn. "He shaved off his hair. It's some kind of joke."

Max shook her shoulders, glaring down at her face. "I'm Max. Max Stark. They all look like me. Do you hear? It's funny, but it's not a joke. Laugh for us, for God's sake!"

"It's too much," said June. "They'll have to see."

She opened the door and let them in. They hurried past her to the tanks, looking at forty-six identical blond faces, beginning to call in frightened voices:

"Jerry!"

"Harry!"

"Lee, where are you sweetheart—"

June shut the door on the voices that were growing hysterical, the women terrified and helpless, the men shouting to let the women know who they were.

"It isn't easy," said Max, looking down at his own thick muscles. "But you aren't changed and the other girls aren't. That helps."

Through the muffled noise and hysteria, a bell was ringing.

"It's the airlock," June said.

Peering in the viewplate were nine Meads from Alexandria. To all

appearances, eight of them were Pat Mead at various ages from fifteen to fifty, and the other was a handsome, leggy, redheaded girl who could have been his sister.

Regretfully, they explained through the voice tube that they had walked over from Alexandria to bring news that the plane pilot had contracted melting sickness there and had died.

They wanted to come in.

June and Max told them to wait and returned to the tank room. The men were enjoying their new height and strength, and the women were bewilderedly learning that they could tell one Pat Mead from another by voice, by gesture of face or hand. The panic was gone. In its place was a dull acceptance of the fantastic situation.

Max called for attention. "There are nine Meads outside who want to come in. They have different names, but they're all Pat Mead."

They frowned or looked blank, and George Barton asked, "Why didn't you let them in? I don't see any problem."

"One of them," said Max soberly, "is a girl. *Patricia* Mead. The girl wants to come in."

There was a long silence while the implication settled to the fear center of the women's minds. Shelia the beautiful felt it first. She cried, "No! Please don't let her in!" There was real fright in her tone, and the women caught it quickly.

Elsie clung to Jerry, begging, "You don't want me to change, do you, Jerry? You like me the way I am! Tell me you do!"

The other girls backed away. It was illogical, but it was human. June felt terror rising in herself. She held up her hand for quiet and presented the necessity to the group.

"Only half of us can leave Minos," she said. "The men cannot eat ship food; they've been conditioned to this planet. We women can go, but we would have to go without our men. We can't go outside without contagion, and we can't spend the rest of our lives in quarantine inside the ship. George Barton is right—there is no problem."

"But we'd be changed!" Shelia shrilled. 'I don't want to become a Mead! I don't want to be somebody else!"

She ran to the inner wall of the corridor. There was a brief hesitation, and then one by one the women fled to that side, until there were only Bess, June, and four others left.

"See!" cried Shelia. "A vote! We can't let the girl in!"

No one spoke. To change, to be someone else—the idea was strange

and horrifying. The men stood uneasily glancing at one another, as if looking into mirrors, and against the wall of the corridor the women watched in fear and huddled together, staring at the men. One man in forty-seven poses. One of them made a beseeching move toward Elsie, and she shrank away.

"No, Jerry! I won't let you change me!"

Max stirred restlessly, the ironic smile that made his new face his own unconsciously twisting into a grimace of pity. "We men can't leave, and you women can't stay," he said bluntly. "Why not let Patricia Mead in? Get it over with!"

June took a small mirror from her belt pouch and studied her own face, aware of Max talking forcefully, the men standing silent, the women pleading. Her face . . . her own face with its dark-blue eyes, small nose, long mobile lips . . . the mind and the body are inseparable; the shape of a face is part of the mind. She put the mirror back.

"I'd kill myself!" Shelia was sobbing. "I'd rather die!"

"You won't die," Max was saying. "Can't you see there's only one solution—"

They were looking at Max. June stepped silently out of the tank room and then turned and went to the airlock. She opened the valves that would let in Pat Mead's sister.

Clifford D. Simak

LIMITING FACTOR

One of the strangest of all worlds—yet perhaps, as we look around at our own fantastically increasing technological complexities, one of the more inevitable in a highly advanced civilization. In this story a gigantic super-advanced society is completely characterized by an artifact which it has abandoned.

FIRST, there were two planets looted of their ores, mined and gutted and left there naked for the crows of space to pick.

Then there was a planet with a faery city, a place that made one think of cobwebs with the dew still on them, a place of glass and plastic so full of wondrous beauty that it hurt one's throat to look.

But there was just this one city. There was no other sign of habitation on the entire planet. And the city was deserted. Perfect in its beauty but hollow as a laugh.

Finally, there was a metal planet, third outward from the Sun. Not a lump of metallic ore, but a planet with a surface—or a roof—of fabricated metal burnished to the polish of a bright steel mirror. And it shone, by reflected light, like another Sun.

"I can't get over the conviction," said Duncan Griffith, "that this place is no more than a camp."

"I think you're crazy," Paul Lawrence told him sharply. He wiped his forehead with his sleeve.

"It may not look like a camp," said Griffith doggedly, "but it meets the definition."

It looks like a city to me, Lawrence told himself. It always has, from the first moment that I saw it, and it always will. Big and vital, despite its faery touch—a place to live and dream and find the strength and courage to put the dreams to work. Great dreams, he told himself. Dreams to match the city—such a city as would take man a thousand years to build.

"What I can't understand," he said aloud, "is why it is deserted. There is no sign of violence. No sign of death at all."

"They voluntarily left it," Griffith told him. "They up and went

away. And they did it because it wasn't really home to them. It was just a camp, and it held no traditions and no legends. As a camp, it had no emotional value for the ones who built it."

"A camp," said Lawrence stubbornly, "is just a stopping place. A temporary habitation that you sling together and make as comfortable as you can with the things at hand."

"So?" asked Griffith.

"These folks did more than stop here," Lawrence said. "That city wasn't slapped together. It was planned with foresight and built with loving care."

"On a human basis, yes," said Griffith. "You're dealing here with non-human values and an alien viewpoint."

Lawrence squatted and plucked at a grass stem, stuck it between his teeth, and chewed on it thoughtfully. He squinted across the brilliant blaze of noonday sun at the silent, empty city.

Griffith hunkered down beside him.

"Don't you see, Paul," he said, "that it has to be a temporary habitation. There is no sign of any previous culture on the planet. No artifact. King and his gang went over it, and there wasn't anything. Nothing but the city. Think of it—an absolutely virgin planet with a city that would take a race a million years of living just to dream. First there'd be a tree to huddle under when it rained. Then a cave to huddle in when night came down. After that there'd be a tent or a wigwam or a hut. Then three huts, and you had a village."

"I know," Lawrence said. "I know."

"A million years of living," Griffith said relentlessly. "Ten thousand centuries before a race could build a fairyland of glass and plastics. And that million years of living wasn't done on this planet. A million years of living leaves scars upon a planet. And there aren't any scars. This planet is brand-new."

"You're convinced they came from somewhere else, Dunc?"

Griffith nodded. "They must have."

"From Planet Three, perhaps."

"We can't know that. Not yet."

"Maybe never," Lawrence said.

He spat out the blade of grass.

"This system," he said, "is like a pulp whodunit. Everywhere you turn you stumble on a clue, and every clue is haywire. Too many mysteries, Dunc. This city here, the metal planet, the looted planets—

it's just too much to swallow. It would be our luck to stumble on a place like this."

"I have a feeling there's a tie between it all," said Griffith.

Lawrence grunted.

"It's a sense of history" Griffith said. "A feeling for the fitness of things. Given time, all historians acquire it."

A footstep crunched behind them and they came to their feet, turning toward the sound.

It was Doyle, the radioman, hurrying toward them from the lifeboat camp.

"Sir," he said to Lawrence, "I just had Taylor out on Planet Three. He asks if you won't come. It seems they've found a door."

"A door!" said Lawrence. "A door into the planet. What did they find inside?"

"He didn't say, sir."

"He didn't say!"

"No. You see, sir, they can't budge the door. There's no way to open it."

The door wasn't much to look at.

There were twelve holes in the planet's surface, grouped in four groups of three each, as if they might be handholds for a thing that had three fingers.

And that was all. You could not tell where the door began or where it ended.

"There is a crack," said Taylor, "but you can just barely see it with a glass. Even under magnification it's no more than a hairline. The door's machined so perfectly that it's practically one piece with the surface. For a long time we didn't even know it was a door. We sat around and wondered what the holes were for.

"Scott found it. Just skating around and saw those holes. You could have looked until your eyes fell out and you'd never have found it except by accident."

"And there's no way to open it?" asked Lawrence.

"None that we have found. We tried lifting it sticking our fingers in the holes and heaving. You might as well have tried to lift the planet. And anyhow, you can't get much purchase here. Can't keep your feet under you. This stuff's so slick you can scarcely walk on it. You don't walk, in fact; you skate. I'd hate to think what would

happen if some of the boys got to horsing around and someone gave someone else a shove. It would take us a week to run them down."

"I know," said Lawrence. "I put the lifeboat down as easy as I could, and we skidded forty miles or more."

Taylor chuckled. "I've got the big job stuck on with all the magnetics that we have and even then she wabbles if you lean on her. Ice is positively rough alongside this stuff."

"About this door," said Lawrence. "It occurred to you it might be a combination?"

Taylor nodded. "Sure, we thought of that. And if it is, we haven't got a ghost. Take the element of chance, multiply it by the unpredictability of an alien mind."

"You checked?"

"We did," said Taylor. "We stuck a camera tentacle down into those holes and we took all kinds of shots. Nothing. Absolutely nothing. Eight inches deep or so. Wider at the bottom than the top. But smooth. No bumps. No ridges. No keyholes.

"We managed to saw out a hunk of metal so that we could test it. Used up three blades getting it out. Basically it's steel, but it's alloyed with something Mueller can't tie a tag onto, and the molecular structure has him going nuts."

"Stumped," said Lawrence.

"Yeah. I skated the ship over to the door and we hooked up a derrick and heaved with everything we had. The ship swung like a pendulum and the door stayed put."

"We might look for other doors," said Lawrence, whistling past the graveyard. "They might not be all alike."

"We looked," said Taylor. "Crazy as it sounds, we did. Each man jack of us, creeping on our shinbones. We mapped the area off in sectors and crawled on our hands and knees for miles, squinting and peering. We almost put our eyes out, what with the sun glaring from the metal and our images staring back at us as if we were crawling on a mirror."

"Come to think of it," said Lawrence, "they probably wouldn't have built doors very close together. Every hundred miles, say—or maybe every thousand."

"You're right," said Taylor. "It might be a thousand."

"There's just one thing to do," Lawrence told him.

"Yeah, I know," said Taylor. "but I hate to do it. We got a problem

here. Something we should work out. And if we blast, we've failed at the first equation."

Lawrence stirred uneasily. "I know how you feel," he said. "If they beat us on the first move, we haven't got a chance at the second or the third."

"We can't just sit around," said Taylor.

"No," said Lawrence. "No, I guess we can't."

"I hope it works," said Taylor.

It did.

The blast ripped the door free and hurled it into space. It came down a mile away and rolled like a crazy, jagged wheel across the ice-slick surface.

Half an acre or so of the surface itself peeled up and back and hung twisted like a question mark that sparkled in the sun.

The unmanned lifeboat, clamped to the metal by its weak magnetics, like a half-licked stamp, came unstuck when the blast let loose. It danced a heavy-footed skater's waltz for a good twelve miles before it came to rest.

The metal of the surface was a mere fourteen inches thick, a paper-thin covering when one considered that the sphere was the size of Earth.

A metal ramp, its upper ten feet twisted and smashed by the explosive force, wound down into the interior like a circular staircase.

Nothing came out of the hole. No sound or light or smell.

Seven men went down the ramp to see what they could find. The others waited topside, sweating them out.

Take a trillion sets of tinker toys.

Turn loose a billion kids.

Give them all the time they need and don't tell them what to do.

If some of them are nonhuman, that makes it better yet.

Then take a million years to figure out what happened.

A million years, mister, won't be long enough. You'll never do it—not in a million years.

It was machinery, of course. It could be nothing else.

But it was toy machinery, something you'd expect a kid to throw together from sheer exuberance the morning after he got a real expensive set.

There were shafts and pools and disks and banks of shining crystal cubes that might have been tubes, although one couldn't quite be sure.

There were cubic miles of it, and it glistened like a silvery Christmas tree in the fanning of the helmet lights, as if it had been polished no more than an hour before. But when Lawrence leaned over the side of the ramp and ran gloved fingers along a shining shaft, the fingers came back dusty—with a dust as fine as flour.

They had come down, the seven of them, twisting along the ramp until they had grown dizzy, and always there was the machinery stretching away on every side as far as the lights could penetrate the darkness.

Machinery that was motionless and still—and it seemed, for no reason that anyone could voice, that it had been still for many countless ages.

And machinery that was the same, repeating over and over again the senseless array of shafts and spools and disks and the banks of shining crystal cubes.

Finally the ramp had ended on a landing, and the landing ran on every side as far as the lights could reach, with the spidery machinery far above them for a roof, and furniture—or what seemed to be furniture—arranged upon the metal floor.

They stood together in a tight-packed group, and their lights stabbed out defiantly, and they were strangely quiet in the darkness and the silence and the ghost of another time and people.

"An office," said Duncan Griffith, finally.

"Or a control room," said Ted Buckley, the mechanical engineer.

"It might be their living quarters," Taylor said.

"A machine shop, perhaps," suggested Jack Scott, the mathematician.

"Have you gentlemen considered," asked Herbert Anson, the geologist, "that it might be none of these? It might be something which is not allied with anything we know."

"All we can do," said Spencer King, the archaeologist, "is to translate it as best we can in the terms we know. My guess is that it could be a library."

Lawrence thought: There were seven blind men, and they chanced to come upon an elephant.

He said, "Let's look. If we don't look, we'll never know."

They looked.

And still they didn't know.

Take a filing cabinet, now. It's a handy thing to have.

You take some space and you wrap some steel around it and you have your storage space. You put in sliding drawers and you put nice, neat folders in the drawers and you label the folders and arrange them alphabetically. Then when you want a certain paper you almost always find it.

Two things are basic—space and something to enclose it—to define it from other space so that you can locate your designated storage space at a moment's notice.

The drawers and the alphabetically filed folders are refinements. They subdivide the space so you can put your fingers instantly on any required sector of it.

That's the advantage of a filing cabinet over just heaving everything you want to save into a certain corner of the room.

But suppose someone built a filing cabinet without any drawers.

"Hey," said Buckley, "this thing is light. Someone give me a hand."

Scott stepped forward quickly, and between them they lifted the cabinet off the floor and shook it. Something rattled inside of it.

They put it down again.

"There's something in there," said Buckley breathlessly.

"Yes," said King. "A receptacle. No doubt of that. And there's something in it."

"Something that rattles," said Buckley.

"Seems to me," declared Scott, "it was more like a rustle than a rattle."

"It won't do us much good," said Taylor, "if we can't get at it. You can't tell much about it by just listening to it while you fellows shake it."

"That's easy," said Griffith. "It's fourth dimensional. You say the magic words and reach around a corner somewhere and fish out what you want."

Lawrence shook his head. "Cut out the humor, Dunc. This is serious business. Any of you got an idea how the thing is made?"

"It couldn't be made," wailed Buckley. "It simply wasn't made. You can't take a sheet of metal and make a cube of it and not have any seams."

"Remember the door up on the surface," Anson reminded him. "We couldn't see anything there, either, until we got a magnifier on it.

That cabinet opens somehow. Someone or something opened it at one time—to put in whatever rattled when you shook it."

"And they wouldn't put something in there," said Scott, "if there was no way to get it out."

"Maybe," said Griffith, "it was something they wanted to get rid of."

"We could rip it open," said King "Get a torch."

Lawrence stopped him. "We've done that once already. We had to blast the door."

"There's half a mile of those cabinets stretched out here," said Buckley. "All standing in a row. Let's shake some more of them."

They shook a dozen more.

There wasn't any rattle.

There was nothing in them.

"Cleaned out," said Buckley sadly.

"Let's get out of here," said Anson. "This place gives me the creeps. Let's go back to the ship and sit down and talk it over. We'll go loony batting out our brains down here. Take those control panels over there."

"Maybe they aren't control panels," Griffith reminded him. "We must be careful not to jump at what seem obvious conclusions."

Buckley snapped up the argument. "Whether they are or not," he said, "they have some functional purpose. Control panels fill the bill better than anything I can think of at the moment."

"But they have no markings," Taylor broke in. "A control setup would have dials or lights or something you could see."

"Not necessarily something that a human could see," said Buckley. "To some other race we might qualify no better than stone-blind."

"I have a horrible feeling," said Lawrence, "that we are getting nowhere."

"We took a licking on the door," said Taylor. "And we've taken a licking here."

King said, "We'll have to solve some orderly plan of exploration. We must map it out. Take first things first."

Lawrence nodded. "We'll leave a few men on the surface, and the rest of us will come down here and set up camp. We'll work in groups and we'll cover the situation as swiftly as we can—the general situation. After that we can fill in the details."

"First things first," said Taylor. "What comes first?"

"I wouldn't know," said Lawrence. "What ideas have the rest of you?"

"Let's find out what we have," suggested King. "A planet or a planetary machine."

"We'll have to find more ramps," said Taylor. "There must be other ramps."

Scott spoke up. "We should try to find out how extensive this machinery is. How much space it covers."

"And find if the machine's running," said Buckley.

"What we saw wasn't," Lawrence told him.

"What we saw," Buckley declared, "may be no more than one corner of a vast machine. All of it might not work at once. Once in a thousand years or so a certain part of the machine might be used and then only for a few minutes or maybe even seconds. Then it might be idle for another thousand years. But it would have to be there for the once in a thousand years that it might be needed."

"Somehow," said Griffith, "we should try to make at least an educated guess what the machinery's for. What it does. What it produces."

"But keep your hands off it," warned Buckley. "No pushing this and pulling that just to see what happens. Lord knows what it might do. Just keep your big paws off it until you know what you are doing."

It was a planet, all right.

They found the planetary surface—twenty miles below. Twenty miles through the twisting maze of shining, dead machinery.

There was air, almost as good as Earth's, and they established camp on the lower levels, glad to get rid of space gear and live as normal beings.

But there was no light, and there was no life. Not even an insect, not one crawling, creeping thing.

Although life had once been there.

The ruined cities told the story of that life. A primitive culture, King had said. A culture not much better than twentieth-century earth.

Duncan Griffith squatted beside the small atomic stove, hands spread out to its welcome glow.

"They moved to Planet Four," he was saying smugly. "They didn't have the room to live here, so they went out there and camped."

"And mined two other planets," Taylor said, "to get the ore they needed."

Lawrence hunched forward dejectedly. "What bothers me," he said, "is the drive behind this thing—the sheer, unreasoning urge, the spirit that would drive an entire race from their home to another planet, that would enable them to spend centuries to turn their own planet into one vast machine."

He turned his head to Scott. "There isn't much doubt, is there," he asked, "that it's nothing but machinery?"

Scott shook his head. "We haven't seen it all, of course. That would take years, and we haven't years to spend. But we are fairly certain it's all one machine—a world covered by machinery to the height of twenty miles."

"And dead machinery," said Griffith. "Dead because they stopped it. They shut the machinery down and took all their records and all their tools and went away and left an empty shell. Just as they left the city out on Planet Four."

"Or were driven away," said Taylor.

"Not driven away," Griffith declared flatly. "We've found no sign of violence anywhere in this entire system. No sign at all of haste. They took their time and packed, and they didn't leave a single thing behind. Not a single clue. Somewhere there must be blueprints. You couldn't build and you couldn't run a place like this without some sort of road map. Somewhere there must be records—records that kept tally on the results or the production of this world-machine. But we haven't found them? Because they were taken away when the people left."

"We haven't looked everywhere," said Taylor.

"We found repositories where they logically would be kept," said Griffith, "and they weren't there. There was nothing there."

"Some of the cabinets we couldn't get into. Remember? Those we found the first day on the upper level."

"There were thousands of other places that we could and did get into," Griffith declared. "But we didn't find a tool or a single record or anything to hint anything ever had been there."

"Those cabinets up on the last level," said Taylor. "They are the logical place."

"We shook them," said Griffith, "and they all were empty."

"All but one," said Taylor.

"I'm inclined to believe you're right, Dunc," Lawrence said. "This world was abandoned, stripped, and left to rust. We should have known that when we found it undefended. They would have had some sort of defenses—automatic, probably—and if anyone had wanted to keep us out, we'd never have gotten in."

"If we'd come around when this world was operating," Griffith said, "we'd have been blown to dust before we even saw it."

"They must have been a great race," Lawrence said. "The economics, alone, of this place are enough to scare you. It must have required the total manpower of the entire race many centuries to build it, and after that many other centuries to keep it operating. That means they spent a minimum of time in getting food, in manufacturing the million things that a race would need to live."

"They simplified their living and their wants," said King, "to the bare necessities. That in itself, alone, is a mark of greatness."

"And they were fanatics," said Griffith. "Don't forget that for a moment. Only the sheer, blind, one-track purpose of an obsessed people could do a job like this."

"But why?" asked Lawrence. "Why did they build the thing?"

No one spoke.

Griffith chuckled thinly. "Not even a guess?" he asked. "Not one educated guess."

Slowly a man came to his feet from the shadows outside the tiny circle of light cast by the shining stove.

"I have a guess," he said. "In fact, I think I know."

"Let's have it, Scott," said Lawrence.

The mathematician shook his head. "I have to have some proof. You'd think that I was crazy."

"There is no proof," said Lawrence. "There is no proof for anthing."

"I know of a place where there might be proof—just might."

They sat stock-still, all of them, in the tight stove circle.

"You remember that cabinet," said Scott. "The one Taylor was talking about just now. The one we shook and something rattled in it. The one we couldn't open."

"We still can't open it."

"Give me some tools," said Scott, "and I will get it open."

"We did that once," said Lawrence. "We used bull strength and awkwardness to open up the door. We can't keep on using force to solve

this problem. It calls for more than force. It calls for understanding."

"I think I know," said Scott, "what it was that rattled."

Lawrence was silent.

"Look," said Scott. "If you have something valuable, something you don't want someone else to steal, what do you do with it?"

"Why," said Lawrence, "I put it in a safe."

Silence whistled down the long, dead stretches of the vast machine above them.

"There could be no safer place," said Scott, "than a cabinet that had no way of being opened. Those cabinets held something that was important. They left one thing, something, behind—something that they overlooked."

Lawrence came slowly to his feet.

"Let's get the tools," he said.

It was an oblong card, very ordinary-looking, and it had holes punched in it in irregular patterns.

Scott held it in his hand, and his hand was shaking.

"I trust," said Griffith bitterly, "that you're not disappointed."

"Not at all," said Scott. "It's exactly what I thought we'd find."

They waited.

"Would you mind?" asked Griffith finally.

"It's a computation card," said Scott. "An answer to some problem fed into a differential calculator."

"But we can't decipher it," said Taylor. "We have no way of knowing what it means."

"We don't need to decipher it," Scott told him. "It tells us what we have. This machine—this whole machine—is a calculator."

"Why, that's crazy," Buckley cried. "A mathematical—"

Scott shook his head. "Not mathematical. At least not purely mathematical. It would be something more than that. Logic, more than likely. Maybe even ethics."

He glanced around at them and read the disbelief that still lingered on their faces.

"It's there for you to see," he cried. "The endless repetition, the monotonous sameness of the whole machine. That's what a calculator is—hundreds or thousands or millions or billions of integrators, whatever number you would need to have to solve a stated question."

"But there would be a limiting factor," snapped Buckley.

"The human race," said Scott, "has never paid too much attention to limiting factors. They've gone ahead and licked them. Apparently this race didn't pay too much attention to them, either."

"There are some," said Buckley stubbornly, "that you just can't ignore."

A brain has limitations.

It won't apply itself.

It forgets too easily, and too many things, and the wrong things—always.

It is prone to worry—and in a brain, that's partial suicide.

If you push it too hard, it escapes into insanity.

And, finally, it dies. Just when it's getting good, it dies.

So you build a mechanical brain—a big one that covers an Earth-size planet for the depth of twenty miles—a brain that will tend to business and will not forget and will not go insane for it cannot know frustration.

Then you up and leave it—and that's insanity compounded.

"The speculation," said Griffith, "is wholly without point, for there is no way of knowing what they used it for. You persist in regarding the people of this system as humanoids, when they probably weren't."

"They could not have been so different from us," Lawrence said. "That city out on Four might have been a human city. Here on this planet they face the same technical problems the human race would face if we tried a similar project, and they carried it out in much the same manner that we would."

"You overlook," said Griffith, "the very thing that you yourself have pointed out so often—the fanatic drive that made them sacrifice everything to one great idea. A race of humans could not cooperate that closely or that fanatically. Someone would blunder, and someone would cut someone else's throat, and then someone would suggest there ought to be an investigation, and the pack would be off, howling down the wind."

"They were thorough," he said. "Terrifyingly thorough. There's no life here. None that we could find. Not even an insect. And why not, do you think? Perhaps because a bug might get itself entangled in a gear or something and bollix up the works. So the bugs must go."

Griffith wagged his head. "In fact, they suggest the thinking of a bug itself. An ant, say. A colony of ants. A soulless mutual society that goes ahead in blind but intelligent obedience toward a chosen goal. And if that were so, my friend, your theory that they used the calculator to work out economic and social theories is so much poppycock."

"It's not my theory," Lawrence said. "It was only one of several speculations. Another equally as valid might be that they were trying to work out an answer to the Universe, why it is and what it is and where it might be going."

"And how," said Griffith.

"You're right. And how. And if they were, I feel sure it was no idle wondering. There must have been a pressure of some sort, some impelling reason why they felt that they must do it."

"Go on," said Taylor. "I can hardly wait. Carry out the fairy tale to its bitter end. They found out about the Universe and—"

"I don't think they did," Buckley said quietly. "No matter what it was, the chances are against their finding the final answer to the thing they sought."

"For my part," said Griffith, "I would incline to think they might have. Why else would they go away and leave this great machine behind? They found the thing they wanted, so they had no further use for the tool that they had built."

"You're right," said Buckley. "They had no further use for it, but not because it had done everything that it could do and that wasn't quite enough. They left it because it wasn't big enough, because it couldn't work the problem they wanted it to work."

"Big enough!" cried Scott. "Why, all they had to do was add another tier all around the planet."

Buckley shook his head. "Remember what I said about limiting factors? Well, there's one that you can't beat. Put steel under fifty thousand pounds per square inch pressure and it starts to flow. The metal used in this machine must have been able to withstand much greater pressure, but there was a limit beyond which it was not safe to go. At twenty miles above the planet's surface, they had reached that limit. They had reached dead end."

Griffith let out a long breath. "Obsolete," he said.

"An analytical machine is a matter of size," said Buckley. "Each integrator corresponds to a cell in the human brain. It has a limited

function and capacity. And what one cell does must be checked by two other cells. The 'tell me thrice' principle of making sure that there is no error."

"They could have cleared it and started over again," said Scott.

"Probably they did," said Buckley. "Many, many times. Although there always would have been an element of chance that each time it was cleared it might not be—well, rational or moral. Clearing on a machine this size would be a shock, like corrective surgery on the brain.

"Two things might have happened. They might have reached a clearance limit. Too much residual memory clinging to the tubes—"

"Subconscious," said Griffith. "It would be interesting to speculate if a machine could develop a subconscious."

"Or," continued Buckley, "they might have come to a problem that was so complicated, a problem with so many facets, that this machine, despite its size, was not big enough to handle it."

"So they went off to hunt a bigger planet," said Taylor, not quite believing it. "Another planet small enough to live and work on, but enough bigger so they could have a larger calculator."

"It would make sense," said Scott reluctantly. "They'd be starting fresh, you see, with the answers they had gotten here. And with improved designs and techniques."

"And now," said King, "the human race takes over. I wonder what we'll be able to do with a thing like this? Certainly not what its builders intended it should be used for."

"The human race," said Buckley, "won't do a thing for a hundred years, at least. You can bet on that. No engineer would dare to turn a single wheel of this machine until he knew exactly what it's all about, how it's made and why. There are millions of circuits to be traced, millions of tubes to check, blueprints to be made, technicians to be trained."

Lawrence said sharply, "That's not our problem, King. We are the bird dogs. We hunt out the quail and flush it, and our job is done, and we go on to something else. What the race does with the things we find is something else again."

He lifted a pack of camp equipment off the floor and slung it across his shoulder.

"Everyone set to go?" he asked.

Ten miles up, Taylor leaned over the guard rail of the ramp to look down into the maze of machinery below him.

A spoon slid out of his carelessly packed knapsack and went spinning down.

They listened to it for a long time, tinkling as it fell.

Even after they could hear it no longer, they imagined that they could.

Samuel Merwin Jr.

EXIT LINE

Here is the unlikely "super-life" form par excellence*—the nearest thing to a "BEM" (see the Introduction) in this book. Unlike most ordinary BEMs, however, the 'lorum has charm, humor, and shrewdness; he is one of the likable type, very rare in science fiction.*

THE 'lorum lay in its scooped-out pit, basking comfortably in the rays of the system's twin suns. It looked down upon the two Earth children, Martin and Julie, amiably if warily from its upper quarter of lavender eyes. For a moment, as Martin gravely tossed a rubber ball toward it, the 'lorum toyed with the notion of keeping the children here on the yellow planet.

With swiftness beyond the following power of the human eye, the 'lorum stretched out a pseudopod and batted the ball back in a soaring arc that rebounded from the distant courtyard wall. With a quick cry of joy Martin fielded the rebound and came up with the rubber sphere, his feet in position to throw again.

The 'lorum signaled that it had had enough of such play, and Martin looked disappointed and bounced the ball down on the floor of the courtyard.

"Gee, Uncle 'Lorum," said the boy, his face contorting in disappointment, "it's our last chance to play together." He glanced over his shoulder at the metal frame of the tall launching tower in which the huge gleaming hull of the spaceship stood erect.

"We still have a little time, Uncle 'Lorum," said Julie. "Tell us a story—you must know just one more."

The 'lorum activated another brain. Yes, it was going to miss them—but as they had been and were, not as they must grow. "Very well," it said. "I'll tell you a story." It never lacked stories to tell, being able to plumb the minds of the adults of the expedition at will.

Thanks to its universal semantic understanding, it had been able easily to translate Earthly fantasies into terms understandable to these space-born children in terms of the only planetary environment they had ever known. Goldilocks's three bears, for instance, became a

family of grullahs, the strange chrysanthemum-like, three-legged creatures who inhabited the crystal forest beyond the plain.

Giants, of course, were Ardigans, the lumpish silicon creatures that could tear great stones out of the far cliffs with ease, but melted like sand at the stream from an Earthchild's water pistol.

Dragons were easy. They were simply mangards—the menace that always lurked just beyond the compound walls, ready to overwhelm the now-vast structures of the Earth creatures and annihilate all life within.

If no Earth creature had ever seen or could see the mangards—well, no one, to judge from the Earth creatures' minds, had ever actually seen a dragon.

But they were real enough. The 'lorum knew. It was the mangards that were at last forcing the Earth creatures to leave this planet after two long years. It was six years by their count, and the children had grown amazingly for this slower life cycle.

"Very well, Julie," it said. "I shall tell you one more story." It plumbed the minds of the adults in other parts of the compounds, found a thought that caused the slit-like mouth under the lower battery of eyes to twitch in approximation of a smile. Martin came over and sat down beside Julie.

"There was once a very great king in a very great kingdom, a ruler of exceedingly ambitious and inquisitive mind," it began. It did not actually speak the words, for it had neither larynx or vocal cords, but its telepathic communication was of universal application.

"Not a fairy story, Uncle 'Lorum," said Martin, his head a little to one side. "Tell us a story of real adventure."

"And have a girl in it and a handsone hero." said Julie.

"Mush!" said Martin rudely. "Nothing but silly old mush."

Yes, thought the 'lorum, the children were growing up. It was a pity they did not want to hear the story about the ambitious king. It had an application to the situation here in the compound which was absolutely delicious. But perhaps it was just as well.

The Earth thing from whose mind it had plucked the fairy tale must have been dangerously close to uncomfortable truth. It would be too bad if there were trouble now.

"No story now," it told the children. "The mangards are making ready for another attack."

Using its telepathic powers, the 'lorum summoned the seven men

and four women who, with the children, made up the Earth party. They came quickly, pale of face and glancing over their shoulders, leaving the preparations for departure at which they had been busy during the past four days—twenty-three days in Earth time.

They came and sat around the foreportion of the 'lorum's body—that portion they called its "head." The 'lorum lifted its upper pseudopods and extended them enough to make a sort of umbrella about the visitors from Earth. Then it caused the purple force to vibrate between their tips in meshlike flashes.

"I hope it's the last time," said Della Lawrence, Martin's mother, as she leaned against her husband and shivered in fright.

Harold Lawrence tightened his arm about her and glanced at his son, who was regarding the events with the boredom of familiarity.

There was a thunderous crash against the screen. The air beneath it acquired a smoky, acrid tinge, as of great unfelt heat, and there was a brilliant flare of light on its outer surface. He blinked and cowered.

If only the mangards were something they could see, could use Earth weapons against! But they were as invisible as the boojum in Lewis Carroll's "The Hunting of the Snark"—and as deadly. He himself had seen one of the huge and terrifying Ardigans disintegrate like a dream monster just beyond the compound walls.

The 'lorum had been in pitiful shape when first they set jets down on this planet—first beyond the Proxima Centauri group to feel the step of man. It had been fighting the mangards alone, and its huge rumpled form had reminded Della of the cockalorum bird from *Davy and the Goblin,* which she had been reading to Martin and Julie. They had given it the name—and with suitable shortening it had stuck.

Communication had not proved difficult, thanks to the strange creature's telepathy. It had explained that it, too, was alien to this planet, having traveled in ovoid form from a planet in the Boötes group.

It had warned them against the mangards, had protected them from the first attack of these fantastic invisible entities. In return, they had reared the compound according to its directions for a mangard-proof defense, adding bizarre bastions as the 'lorum directed.

But the mangards and the Ardigans, to a lesser degree, had licked them. So much time had to be spent in reinforcing the compounds against the recurring attacks of the mangards that there was small

chance to rear a productive, peaceful community. Instead of improving with the years, conditions had grown steadily worse.

Julie's father, Patrick Aloysius O'Hare, one of the most brilliant rough-and-ready field biologists in the system, had spent two years seeking the answer to the ever-present threat of the mangards.

"They've got to have some substance," he said ruefully to Harold Lawrence over a highball (synthetic) one evening.

"But you can't spot it?" Lawrence had asked him.

"Not yet," said O'Hare, shaking his head sadly. "I can't dig it out. I've put them through the entire spectrum. I'm beginning to believe in some other dimension."

"You sure you're feeling okay, Pat?" Lawrence had asked.

Even the 'lorum couldn't see mangards. But its extrasensory talents enabled it to have some understanding of them without sight and, more important, to sense when they were about to attack.

Aware of its vast intelligence and experience, Earth people had built the serpentine compounds in accord with its telepathic suggestions. It was, the 'lorum had told them, the only possible hope of foiling the mangards. They were, it seemed, allergic to certain shapes, especially those in S-curves.

"It is at variance with their molecular structure," the 'lorum had said.

And for a while it had seemed to work. For more than six Earth months there had been no attack at all. But of late the attacks had increased in both frequency and intensity. The gardens had gone to seed, lacking the constant cultivation the climate demanded. Supplies had begun to run dangerously low.

Harold Lawrence, along with the other members of the expedition, could sense the 'lorum's growing fatigue under the onsets of the hordes of mangard attackers. Sooner or later they would overwhelm the strange huge creature that had appointed itself the guardian of the would-be colonizers from distant Earth. The Lawrence-Cardenas Expedition was going to have to return all the way to Earth or starve slowly out here on an alien planet.

The attack subsided at last, and the 'lorum retracted its screen and lay there, a huge and pitiable object of fatigue, its every pseudopod aquiver.

It was then that Lawrence broached the suggestion, "'Lorum," he said, "we can make room for you in our spaceship."

The 'lorum's thoughts were weak but clear. "I am grateful for your concern, for your wish to take me away from the planet of the mangards. But when you are gone I may again be able to live in peace with them."

"You had best come with us," said O'Hare. There was a trace, just a trace, of suspicion underlying the tones of the biologist.

The 'lorum knew then against whom it had to guard, and at once extended its thought powers to blanket the suspicion in the Irishman's mind.

"I had best stay here—where I am suited. A change might not be for the better," said the 'lorum. It thanked them and bade them complete their preparations quickly. Only the children lingered.

They took off late in that same long day, leaving the 'lorum to its own devices on the planet that had been their home for a half-dozen Earth years. Della Lawrence actually cried a little.

"The poor helpless thing—just sitting there, waiting for those horrible creatures we enraged," she sobbed. It was the first time her nerves had given way.

"I know," said her husband soothingly. "But the 'lorum is pretty smart in its own way. It will take care of itself."

There was doubt in his tone, however, and his son was quick to spot it. The little boy said:

"Don't worry about Uncle 'Lorum. It told us to tell you everything was—what does jim-dandy mean, Daddy?"

"Yes, what does jim-dandy mean, Mr. Lawrence?" asked Julie.

"Why—it's archaic Earth slang for fine," said Harold Lawrence. He glanced at his wife and smiled. "Did Uncle 'Lorum have anything else to tell you that you think we should know?"

"Well—yes, Daddy," said Martin. He glanced sheepishly at O'Hare, who had drifted up from his cabin. "It was like a fairy story but it didn't *feel* like a fairy story."

"What did Uncle 'Lorum say—what was it?" O'Hare's voice was sharp with suddenly reawakened suspicion. It was little Julie who broke the silence.

"He told us a story about an ambitious king who wanted a suit of clothes like no other suit in the world," she parroted. "His tailors couldn't make good enough ones for him, so he cut off their heads. Finally a man came along and said he could make the suit so different that nobody could even see it. . . ."

"Good heavens!" It was O'Hare, and there was dawning comprehension in his green Irish eyes. " 'The Emperor's New Suit'!" He gazed at the others, almost pleading. "Funny," he added, "I was thinking of it just before the attack."

"You mean the one about the king who thought he was wearing an invisible suit until the little boy pointed out that he was stark naked?" said Harold Lawrence, frowning.

They took the elevator to the control room and adjusted the remote-control scanner on the planet they had just left, now a full three thousand miles behind them.

"Good heavens!" said Lawrence. "Something's happened to the 'lorum. It's spread out all over the compound!"

"I see," said O'Hare sourly. Then, suddenly, he lashed into an outburst of colorful Gaelic profanity.

"Take it easy," said Lawrence. "What's it all about, anyway?"

"Can't you see?" asked the biologist, pointing again toward the scanner screen. "Can't you understand that we've spent six years being the original suckers of the spaceways?"

"Come again?" said Lawrence.

"I'm not crazy," said O'Hare soberly. "Put it together—the 'lorum, the compound, the invisible monsters."

Comprehension dawned slowly in Lawrence's light-blue eyes. "Then you mean—"

"I mean the mangards never were," O'Hare replied. "I've been suspecting it more and more lately."

"And now the 'lorum has assumed its natural shape since we are gone."

"Exactly," said O'Hare. "For six long Earth years we have been spending the bulk of our time giving the 'lorum a home to fit its true relaxed shape. During all that time it has remained in defense position, its body balled like that of an armadillo.

"And whenever we began to get at our real work it would stage another mangard attack," said O'Hare, bitter now that full understanding had come to him. " 'The Emperor's New Clothes'!"

"But the attacks," protested Harold Lawrence. "Surely—"

"Pfui!" said O'Hare rudely. "There were no attacks. Our friend simply put on a fireworks show to frighten us whenever it thought we needed a spur."

"But I myself saw it destroy an Ardigan with a bolt of electricity," said Lawrence. "Why should it need walls to protect itself from the other life on the planet?"

O'Hare swore again. "When I think of the way we swallowed that hooey about the S-shape being contrary to the mangards' molecular makeup! The reason it wanted all those S-shaped bastions was so it could stretch out in comfort. Gentlemen, when bigger suckers are made, we'll be them."

"I'm beginning to understand," said Lawrence. "Our 'lorum is lazy—perhaps the laziest creature of its intelligence in the cosmos. So lazy that it is willing to sit in an unnatural position for two of its years and put on occasional electric shows to keep us building walls to save it in future from having to exert energy to blast wandering Ardigans."

"We can't let it get away with this," said O'Hare.

"We've been had," said Lawrence. "But I don't think we had better *do* anything about it."

"We could plant an A-pellet right in the middle of that thing's patio," said O'Hare, eyes still on the scanner.

"Somehow," said Lawrence thoughtfully, "I don't think any such measures would work. No creature of the 'lorum's intelligence and telepathic powers would remain long in ignorance of our weapons—and it must by this time have devised its defense."

"Aye, you're right, Harry," said O'Hare sadly. "And the nerve of the creature, leaving word with the children to tell us we've been hoaxed!"

"There's a lot of ham in the 'lorum," said Lawrence, moving forward to check the control settings. "What an exit line!"

James H. Schmitz

SECOND NIGHT OF SUMMER

With this tale we encounter in full bloom the notion of a highly advanced interstellar civilization quietly and efficiently run by an enormous but unobtrusive technological bureaucracy which, in this particular instance, however, plays but a subdued background part in the actual development of the narrative. Along with it, we also meet the concept that many of the planets in the Galaxy will be of the Earthian sort and will either have developed essentially human life forms or will have been colonized by Earth people. Not all of the civilizations found on these planets will be on the same level of development, of course.

These are some of the commonplaces of modern science fiction. What is not commonplace in this particular story is the unique struggle against a fantastic extra-Galactic invasion with which it deals.

ON THE night after the day that brought summer officially to the land of Wend, on the planet of Noorhut, the shining lights were seen again in the big hollow at the east end of Grimp's father's farm.

Grimp watched them for more than an hour from his upstairs room. The house was dark, but an occasional murmur of voices floated up to him through the windows below. Everyone in the farmhouse was looking at the lights.

On the other farms around and in the village, which was over a hill and another two miles up the valley, every living soul who could get within view of the hollow was probably doing the same. For a time, the agitated yelling of the Village Guardian's big pank-hound had sounded clearly over the hill, but he had quieted down then very suddenly—or had *been* quieted down, more likely, Grimp suspected. The Guardian was dead set against anyone's making a fuss about the lights —and that included the pank-hound, too.

There was some excuse for the pank-hound's excitement, though. From the window Grimp could see there were a lot more lights tonight than had turned up in previous years—big, brilliant blue bubbles, drifting and rising and falling silently all about the hollow. Sometimes one would lift straight up for several hundred feet, or move off over

the edge of the hollow for about the same distance, and hang there suspended for a few minutes before floating back to the others. That was as far as they ever went away from the hollow.

There was, in fact, no need for the Halpa detector-globes to go any farther than that to get the information wanted by those who had sent them out and who were listening now to the steady flow of brief reports, in some Halpa equivalent of human speech-thought, coming back to them through the globes:

"No signs of hostile activity in the vicinity of the break-through point. No weapons or engines of power within range of detection. The area shows no significant alterations since the last investigation. Sharp curiosity among those who observe us consciously—traces of alarm and suspicion. But no overt hostility."

The reports streamed on without interruption, repeating the same bits of information automatically and incessantly, while the globes floated and dipped soundlessly above and about the hollow.

Grimp continued to watch them, blinking sleepily now and then, until a spreading glow over the edge of the valley announced that Noorhut's Big Moon was coming up slowly, like a Planetary Guardian, to make its own inspection of the lights. The globes began to dim out then, just as they always had done at moonrise in the preceding summers; and even before the top rim of the Big Moon's yellow disk edged over the hills, the hollow was completely dark.

Grimp heard his mother starting up the stairs. He got hurriedly into bed. The show was over for the night and he had a lot of pleasant things to think about before he went to sleep.

Now that the lights had showed up, his good friend Grandma Erisa Wannattel and her patent-medicine trailer were sure to arrive, too. Sometime late tomorrow afternoon, the big draft trailer would come rolling up the valley road from the city. For that was what Grandma Wannattel had done the past four summers—ever since the lights first started appearing above the hollow—for the few nights they were to be seen there each year. And since four years were exactly half of Grimp's whole life, that made Grandma's return a mathematical certainty for him.

Other people, of course, such as the Village Guardian, might have a poor opinion of Grandma, but just hanging around her and the trailer and the gigantic, exotic-looking rhinocerine pony that pulled it was, in Grimp's opinion, a lot better even than going to the circus.

And vacations started the day after tomorrow! The whole future just now, in fact, looked like one good thing after another, extending through a vista of summery infinities.

Grimp went to sleep happily.

At about the same hour, though at a distance greater than Grimp's imagination had stretched as yet, eight large ships came individually out of the darkness between the stars that was their sea and began to move about Noorhut in a carefully timed pattern of orbits. They stayed much too far out to permit any instrument of space-detection to suspect that Noorhut might be their common center of interest.

But that was what it was. Though the men who crewed the eight ships bore the people of Noorhut no ill will, hardly anything could have looked less promising for Noorhut than the cargo they had on board.

Seven of them were armed with a gas which was not often used any more. A highly volatile, lethal catalyst, it sank to the solid surface of a world over which it was freed and spread out swiftly there to the point where its presence could no longer be detected by any chemical means. However, its effect of drawing the final breath almost imperceptibly out of all things that were oxygen-breathing was not noticeably reduced by diffusion.

The eighth ship was equipped with a brace of torpedoes which were normally released some hours after the gas carriers dispersed their invisible death. They were quite small torpedoes, since the only task remaining for them would be to ignite the surface of the planet that had been treated with the catalyst.

All those things might presently happen to Noorhut. But they would happen only if a specific message was flashed from it to the circling squadron—the message that Noorhut already was lost to a deadly foe who must, at any cost now, be prevented from spreading out from it to other inhabited worlds.

Next afternoon, right after school, as Grimp came expectantly around the bend of the road at the edge of the farm, he found the village policeman sitting there on a rock, gazing tearfully down the road.

"Hello, Runny," said Grimp, disturbed. Considered in the light of gossip he'd overhead in the village that morning, this didn't look so good for Grandma. It just didn't look good.

The policeman blew his nose on a handkerchief he carried tucked into the front of his uniform, wiped his eyes, and gave Grimp an annoyed glance.

"Don't *you* call me Runny, Grimp!" he said, replacing the handkerchief. Like Grimp himself and most of the people on Noorhut, the policeman was brown-skinned and dark-eyed, normally a rather good-looking young fellow. But his eyes were swollen and red-rimmed now; and his nose, which was a bit larger than average anyway, was also red and swollen and undeniably runny. He had hay fever.

Grimp apologized and sat down thoughtfully on the rock beside the policeman, who was one of his numerous cousins, most of the families of Noorhut being somehow related. He was about to mention that he had overheard Vellit using the expression when she and the policeman came through the big leeth-flower orchard above the farm the other evening—at a much less leisurely rate than was their custom there. But he thought better of it. Vellit was the policeman's girl for most of the year, but she broke their engagement regularly during hay-fever season and called him cousin instead of dearest.

"What are you doing here?" Grimp asked bluntly instead.

"Waiting," said the policeman.

"For what?" said Grimp with a sinking heart.

"Same individual you are, I guess," the policeman told him, hauling out the handkerchief again. He blew. "This year she's going to go right back where she came from or get pinched."

"Who says so?" scowled Grimp.

"The Guardian, that's who," said the policeman. "That good enough for you?"

"He can't do it!" Grimp said hotly. "It's our farm, and she's got all her licenses."

"He's had a whole year to think up a new list she's got to have," the policeman informed him. He fished in the breast pocket of his uniform, pulled out a folded paper, and opened it. "He put thirty-four items down here I got to check—she's bound to miss on one of them."

"It's a dirty trick!" said Grimp, rapidly scanning as much as he could see of the list.

"Let's us have more respect for the Village Guardian, Grimp!" the policeman said warningly.

"Uh-huh," muttered Grimp. "Sure . . ." If Runny would just move his big thumb out of the way. But what a list! Trailer; rhinocerine

pony (beast, heavy draft, imported); patent medicines; household utensils; fortunetelling; pets; herbs; miracle healing—

The policeman looked down, saw what Grimp was doing, and raised the paper out of his line of vision. "That's an official document," he said, warding Grimp off with one hand and tucking the paper away with the other. "Let's us not get our dirty hands on it."

Grimp was thinking fast. Grandma Wannattel did have framed licenses for some of the items hanging around inside the trailer, but certainly not thirty-four of them.

"Remember that big skinless werret I caught last season?" he asked.

The policeman gave him a quick glance, looked away again, and wiped his eyes thoughtfully. The season on werrets would open the following week, and he was as ardent a fisherman as anyone in the village—and last summer Grimp's monster werret had broken a twelve-year record in the valley.

"Some people," Grimp said idly, staring down the valley road to the point where it turned into the woods, "would sneak after a person for days who's caught a big werret, hoping he'd be dumb enough to go back to that pool."

The policeman flushed and dabbed the handkerchief gingerly at his nose.

"Some people would even sit in a haystack and use spyglasses, even when the hay made them sneeze like crazy," continued Grimp quietly.

The policeman's flush deepened. He sneezed.

"But a person isn't that dumb," said Grimp. "Not when he knows there's anyway two werrets there six inches bigger than the one he caught."

"*Six inches?*" the policeman repeated a bit incredulously—eagerly.

"Easy," nodded Grimp. "I had a look at them again last week."

It was the policeman's turn to think. Grimp idly hauled out his slingshot, fished a pebble out of his small-pebble pocket, and knocked the head off a flower twenty feet away. He yawned negligently.

"You're pretty good with that slingshot," the policeman remarked. "You must be just about as good as the culprit that used a slingshot to ring the fire-alarm signal on the defense-unit bell from the top of the schoolhouse last week."

"That'd take a pretty good shot," Grimp admitted.

"And who then," continued the policeman, "dropped pepper in his trail, so the pank-hound near coughed off his head when we started to

track him. The Guardian," he added significantly, "would like to have a clue about that culprit, all right."

"Sure, sure," said Grimp, bored. The policeman, the Guardian, and probably even the pank-hound knew exactly who the culprit was; but they wouldn't be able to prove it in twenty thousand years. Runny just had to realize first that threats weren't going to get him anywhere near a record werret.

Apparently he had; he was settling back for another bout of thinking. Grimp, interested in what he would produce next, decided just to leave him to it. . . .

Then Grimp jumped up suddenly from the rock.

"There they are!" he yelled, waving the slingshot.

A half mile down the road Grandma Wannattel's big silvery trailer had come swaying out of the woods behind the rhinocerine pony and turned up toward the farm. The pony saw Grimp, lifted its head, which was as long as a tall man, and bawled a thunderous greeting. Grandma Wannattel stood up on the driver's seat and waved a green silk handkerchief.

Grimp started sprinting down the road.

The werrets should turn the trick—but just the same he'd better get Grandma informed about recent developments here, before she ran into Runny.

Grandma Wannattel flicked the pony's horny rear with the reins just before they reached the policeman, who was waiting at the side of the road with the Guardian's checklist unfolded in his hand.

The pony broke into a lumbering trot, and the trailer swept past Runny and up around the bend of the road, where it stopped well within the boundaries of the farm. They climbed down and Grandma quickly unhitched the pony. It waddled, grunting, off the road and down into the long marshy meadow above the hollow. It stood still there, cooling its feet.

Grimp felt a little better. Getting the trailer off community property gave Grandma a technical advantage. Grimp's people had a favorable opinion of her, and they were a sturdy lot who enjoyed telling off the Guardian any time he didn't actually have a law to back up his orders. But on the way to the farm she had confessed to Grimp that, just as he'd feared, she didn't have anything like thirty-four licenses. And now the policeman was coming up around the bend of the road after them, blowing his nose and frowning.

"Just let me handle him alone," Grandma told Grimp out of the corner of her mouth.

He nodded and strolled off into the meadow to pass the time with the pony. She'd had a lot of experience in handling policemen.

"Well, well, young man," he heard her greeting his cousin behind him. "That looks like a bad cold you've got."

The policeman sneezed.

"Wish it were a cold," he said resignedly. "It's hay fever. Can't do a thing with it. Now, I've got a list here—"

"Hay fever?" said Grandma. "Step up into the trailer a moment. We'll fix that."

"About this list—" began Runny, and stopped. "You think you got something that would fix it?" he asked skeptically. "I've been to I don't know how many doctors, and they didn't help any."

"Doctors!" said Grandma. Grimp heard her heels click up the metal steps that led into the back of the trailer. "Come right in, won't take a moment."

"Well—" said Runny doubtfully, but he followed her inside.

Grimp winked at the pony. The first round went to Grandma.

"Hello, pony," he said.

His worries couldn't reduce his appreciation of Grandma's fabulous draft animal. Partly, of course, it was just that it was such an enormous beast. The long, round barrel of its body rested on short legs with wide flat feet which were settled deep in the meadow's mud by now. At one end was a spiky tail and at the other a very big, wedge-shaped head with a blunt, badly chipped horn set between nose and eyes. From nose to tail and all around it was covered with thick, rectangular, horny plates, a mottled green-brown in color. It weighed as much as a long-extinct terrestrial elephant, but that was because it was only a pony.

Grimp patted its rocky side affectionately. He loved the pony most for being the ugliest thing that had ever showed up on Noorhut. According to Grandma, she had bought it from a bankrupt circus which had imported it from a planet called Treebel; and Treebel was supposed to be a world full of hot swamps, inexhaustibly explosive volcanoes, and sulphurous stenches.

One might have thought that after wandering around melting lava and under rainfalls of glowing ashes for most of its life, the pony would have considered Noorhut pretty tame. But though there wasn't

much room for expression around the solid slab of bone supporting the horn, which was the front of its face, Grimp thought it looked thoroughly contented, with its feet sunk out of sight in Noorhut's cool mud.

"You're a big fat pig!" he told it fondly.

The pony slobbered out a long purple tongue and carefully parted his hair.

"Cut it out!" said Grimp. "Ugh!"

The pony snorted, pleased, curled its tongue about a huge clump of weeds, pulled them up, and flipped them into its mouth, roots, mud, and all. It began to chew.

Grimp glanced at the sun and turned anxiously to study the trailer. If she didn't get rid of Runny soon, they'd be calling him back to the house for supper before he and Grandma got around to having a good talk. And they weren't letting him out of doors these evenings, while the shining lights were here.

He gave the pony a parting whack, returned quietly to the road, and sat down out of sight near the back door of the trailer, where he could hear what was going on.

". . . so about the only thing the Guardian could tack on you now," the policeman was saying, "would be a public menace charge. If there's any trouble about the lights this year, he's likely to try that. He's not a bad Guardian, you know, but he's got himself talked into thinking you're sort of to blame for the lights' showing up here every year."

Grandma chuckled. "Well, I try to get here in time to see them every summer," she admitted. "I can see how that might give him the idea."

"And of course," said the policeman, "we're all trying to keep it quiet about them. If the news got out, we'd be having a lot of people coming here from the city, just to look. No one but the Guardian minds your being here, only you don't want a lot of city people tramping around your farms."

"Of course not," agreed Grandma. "And I certainly haven't told anyone about them myself."

"Last night," the policeman added, "everyone was saying there were twice as many lights this year as last summer. That's what got the Guardian so excited."

Chafing more every minute, Grimp had to listen then to an extended polite argument about how much Runny wanted to pay Grandma for her hay-fever medicines, while she insisted he didn't owe her anything

at all. In the end Grandma lost and the policeman paid up—much too much to take from any friend of Grimp's folks, Grandma protested to the last. And then, finally, that righteous minion of the law came climbing down the trailer steps again, with Grandma following him to the door.

"How do I look, Grimp?" he beamed cheerfully as Grimp stood up.

"Like you ought to wash your face some time," Grimp said tactlessly, for he was fast losing patience with Runny. But then his eyes widened in surprise.

Under a coating of yellowish grease, Runny's nose seemed to have returned almost to the shape it had out of hay-fever season, and his eyelids were hardly puffed at all! Instead of flaming red, those features, furthermore, now were only a delicate pink in shade. Runny, in short, was almost handsome again.

"Pretty good, eh?" he said. "Just one shot did it. And I've only got to keep the salve on another hour. Isn't that right, Grandma?"

"That's right," smiled Grandma from the door, clinking Runny's money gently out of one hand into the other. "You'll be as good as new then."

"Permanent cure, too," said Runny. He patted Grimp benevolently on the head. "And next week we go werret fishing, eh, Grimp?" he added greedily.

"I guess so," Grimp said, with a trace of coldness. It was his opinion that Runny could have been satisfied with the hay-fever cure and forgotten about the werrets.

"It's a date!" nodded Runny happily, and took his greasy face whistling down the road. Grimp scowled after him, half minded to reach for the slingshot then and there and let go with a medium stone at the lower rear of the uniform. But probably he'd better not.

"Well, that's that," Grandma said softly.

At that moment, up at the farmhouse, a cow horn went whoop-whoop! across the valley.

"Darn," said Grimp. "I knew it was getting late, with him doing all that talking! Now they're calling me to supper." There were tears of disappointment in his eyes.

"Don't let it fuss you, Grimp," Grandma said consolingly. "Just jump up in here a moment and close your eyes."

Grimp jumped up into the trailer and closed his eyes expectantly.

"Put out your hands," Grandma's voice told him.

He put out his hands, and she pushed them together to form a cup. Then something small and light and furry dropped into them, caught hold of one of Grimp's thumbs with tiny, cool fingers, and chittered.

Grimp's eyes popped open.

"It's a lortel!" he whispered, overwhelmed.

"It's for you!" Grandma beamed.

Grimp couldn't speak. The lortel looked at him from a tiny, black, human face with large blue eyes set in it, wrapped a long furry tail twice around his wrist, clung to his thumb with its fingers, and grinned and squeaked.

"It's wonderful!" gasped Grimp. "Can you really teach them to talk?"

"Hello," said the lortel.

"That's all it can say so far," Grandma said. "But if you're patient with it, it'll learn more."

"I'll be patient," Grimp promised, dazed. "I saw one at the circus this winter, down the valley at Laggand. They said it could talk, but it never said anything while I was there."

"Hello!" said the lortel.

"Hello!" gulped Grimp.

The cow horn whoop-whooped again.

"I guess you'd better run along to supper, or they might get mad," said Grandma.

"I know," said Grimp. "What does it eat?"

"Bugs and flowers and honey and fruit and eggs, when it's wild. But you just feed it whatever you eat yourself."

"Well, good-by," said Grimp. "And golly—thanks, Grandma."

He jumped out of the trailer. The lortel climbed out of his hand, ran up his arm, and sat on his shoulder, wrapping its tail around his neck.

"It knows you already," Grandma said. "It won't run away."

Grimp reached up carefully with his other hand and patted the lortel.

"I'll be back early tomorrow," he said. "No school . . . They won't let me out after supper as long as those lights keep coming around."

The cow horn whooped for the third time, very loudly. This time it meant business.

"Well, good-by," Grimp repeated hastily. He ran off, the lortel hanging on to his shirt collar and squeaking.

Grandma looked after him and then at the sun, which had just touched the tops of the hills with its lower rim.

"Might as well have some supper myself," she remarked, apparently to no one in particular. "But after that I'll have to run out the go-buggy and create a diversion."

Lying on its armor-plated belly down in the meadow, the pony swung its big head around toward her. Its small yellow eyes blinked questioningly.

"What makes you think a diversion will be required?" its voice asked into her ear. The ability to produce such ventriloquial effects was one of the talents that made the pony well worth its considerable keep to Grandma.

"Weren't you listening?" she scolded. "That policeman told me the Guardian's planning to march the village's defense unit up to the hollow after supper and start them shooting at the Halpa detector-globes as soon as they show up."

The pony swore an oath meaningless to anyone who hadn't been raised on the planet Treebel. It stood up, braced itself, and began pulling its feet out of the mud in a succession of loud, sucking noises.

"I haven't had an hour's straight rest since you talked me into tramping around with you eight years ago!" it complained.

"But you've certainly been seeing life, as I promised," Grandma smiled.

The pony slopped in a last, enormous tongueful of wet weeds. "That I have!" it said with emphasis.

It came chewing up to the road.

"I'll keep a watch on things while you're having your supper," it told her.

As the uniformed twelve-man defense unit marched in good order out of the village on its way to assume a strategic position around the hollow on Grimp's father's farm, there was a sudden small explosion not very far off.

The Guardian, who was marching in the lead with a gun over his shoulder and the slavering pank-hound on a leash, stopped short. The unit broke ranks and crowded up behind him.

"What was that?" the Guardian inquired.

Everybody glanced questioningly around the rolling green slopes of the valley, already darkened with evening shadows. The pank-hound

sat down before the Guardian, pointed its nose at the even darker shadows in the woods ahead of them, and growled.

"Look!" a man said, pointing in the same direction.

A spark of bright green light had appeared on their path just where it entered the woods. The spark grew rapidly in size, became as big as a human head—then bigger! Smoky green streamers seemed to be pouring out of it. . . .

"I'm going home right now," someone announced at that point, sensibly enough.

"Stand your ground!" the Guardian ordered, conscious of the beginnings of a general withdrawal movement behind him. He was an old soldier. He unslung his gun, cocked and pointed it. The pank-hound got up on his six feet and bristled.

"Stop!" the Guardian shouted at the green light.

It expanded promptly to the size of a barrel, new streamers shooting out from it and fanning about like hungry tentacles.

He fired.

"*Run!*" everybody yelled then. The pank-hound slammed backward against the Guardian's legs, upsetting him, and streaked off after the retreating unit. The green light had spread outward jerkily into the shape of something like a many-armed, writhing starfish, almost the size of the trees about it. Deep, hooting sounds came out of it as it started drifting down the path toward the Guardian.

He got up on one knee and, in a single drum roll of sound, emptied all thirteen charges remaining in his gun into the middle of the starfish. It hooted more loudly, waved its arms more wildly, and continued to advance.

He stood up quickly then, slung the gun over his shoulder, and joined the retreat. By the time the unit reached the first houses of the village he was well up in the front ranks again. And a few minutes later he was breathlessly organizing the local defenses, employing the tactics that had shown their worth in the raids of the Laggand bandits nine years before.

The starfish, however, was making no attempt to follow up the valley people's rout. It was still on the path at the point where the Guardian had seen it last, waving its arms about and hooting menacingly at the silent trees.

"That should do it, I guess," Grandma Wannattel said. "Before the first projection fizzles out, the next one in the chain will start up

where they can see it from the village. It ought to be past midnight before anyone starts bothering about the globes again. Particularly since there aren't going to be any globes around tonight—that is, if the Halpa attack schedule has been correctly estimated."

"I wish we were safely past midnight right now," the rhinocerine pony worriedly informed her. Its dark shape stood a little up the road from the trailer, outlined motionlessly like a ponderous statue against the red evening sky. Its head was up; it looked as if it were listening. Which it was, in its own way—listening for any signs of activity from the hollow.

"No sense getting anxious about it," Grandma remarked. She was perched on a rock at the side of the road a short distance from the pony, with a small black bag slung over her shoulder. "We'll wait here another hour till it's good and dark and then go down to the hollow. The break-through might begin a couple of hours after that."

"It *would* have to be us again!" grumbled the pony. In spite of its size, its temperament was on the nervous side; and any companion of Grandma's was bound to run regularly into situations that were far from soothing. She belonged to a powerful human organization whose activities extended throughout most of those sections of the Galaxy where Terra's original colonies, and their branch colonies, and branches of the branches had grown down the centuries into new and independent civilizations. The role of the organization was that of watchdog for the safety of all, without regard for the often conflicting rulings and aims of individual governments; and sometimes that wider view made it necessary to take some very grim risks locally. Unfortunately, this was one of the times.

"I'd feel a lot better myself if Headquarters hadn't picked us for this particular operation," Grandma admitted. "Us and Noorhut . . ."

Because, by what was a rather singular coincidence, considering how things stood there tonight, the valley was also Grandma's home. She had been born, quite some while before, a hundred and eighty miles farther inland at the foot of the dam of the great river Wend, which had given its name to the land and nowadays supplied it with almost all its required power.

Erisa Wannattel had done a great deal of traveling since she first became aware of the fact that her varied abilities and adventuresome nature needed a different sort of task to absorb them than could be found on Noorhut, which was progressing placidly up into the final stages of

a rounded and balanced planetary civilization. But she still liked to consider the valley of the Wend as her home and headquarters, to which she returned as often as her work would permit. Her exact understanding of the way people there thought about things and did things also made them easy for her to manipulate; and on occasion that could be very useful.

In most other places, the means she had employed to turn the Guardian and his troop back from the hollow probably would have started a panic or brought armed ships and radiation guns zooming up for the kill within minutes. But the valley people had considered it just another local emergency. The bronze alarm bell in the village had pronounced a state of siege, and cow horns passed the word up to the outlying farms. Within minutes, the farmers were pelting down the roads to the village with their families and guns; and very soon afterward everything quieted down again. Guard lines had been set up by then, with the women and children quartered in the central buildings while the armed men had settled down to watching Grandma's illusion projections—directional video narrow beams—from the discreet distance marked by the village boundaries.

If nothing else happened, the people would just stay there till morning and then start a cautious investigation. After seeing mysterious blue lights dancing harmlessly over Grimp's farm for four summers, this section of Wend was pretty well conditioned to fiery apparitions. But even if they got too adventurous, they couldn't hurt themselves on the projections, which were designed to be nothing but very effective visual displays.

What it all came to was that Grandma had everybody in the neighborhood rounded up and immobilized where she wanted them.

In every other respect the valley presented to the eye an exceptionally peaceful twilight scene. There was nothing to show that it was the only present point of contact between forces engaged in what was probably a war of inter-Galactic proportions—a war made wraithlike but doubly deadly by the circumstance that, in over a thousand years, neither side had found out much more about the other than the merciless and devastating finality of its forms of attack. There never had been any actual battles between mankind and the Halpa, only alternate and very thorough massacres—all of them, from mankind's point of view, on the wrong side of the fence.

The Halpa alone had the knowledge that enabled them to reach

their human adversary. That was the trouble. But apparently they could launch their attacks only by a supreme effort, under conditions that existed for periods of less than a score of years, and about three hundred years apart as mankind measured time.

It was hard to find any good in them other than the virtue of persistence. Every three hundred years they punctually utilized that brief period to execute one more thrust, carefully prepared and placed and carried out with a dreadfully complete abruptness, against some new point of human civilization—and this time the attack was going to come through on Noorhut.

"Something's starting to move around in that hollow!" the pony announced suddenly. "It's not one of their globe-detectors."

"I know," murmured Grandma. "That's the first of the Halpa themselves. They're going to be right on schedule, it seems. But don't get nervous. They can't hurt anything until their Transmitter comes through and revives them. We've got to be particularly careful now not to frighten them off. They seem to be even more sensitive to emotional tensions in their immediate surroundings than the globes."

The pony made no reply. It knew what was at stake and why eight big ships were circling Noorhut somewhere beyond space-detection tonight. It knew, too, that the ships would act only if it was discovered that Grandma had failed. But—

The pony shook its head uneasily. The people on Treebel had never become civilized to the point of considering the possibility of taking calculated risks on a planetary scale—not to mention the fact that the lives of the pony and of Grandma were included in the present calculation. In the eight years it had been accompanying her on her travels, it had developed a tremendous respect for Erisa Wannattel's judgment and prowess. But just the same, frightening the Halpa off, if it still could be done, seemed like a very sound idea right now to the pony.

As a matter of fact, as Grandma well knew, it probably could have been done at this stage by tossing a small firecracker into the hollow. Until they had established their planetary foothold, the Halpa took extreme precautions. They could spot things in the class of radiation weapons a hundred miles away, and either that or any suggestion of local aggressiveness or of long-range observation would check the invasion attempt on Noorhut then and there.

But one of the principal reasons she was here tonight was to see that

nothing *did* happen to stop it. For this assault would only be diverted against some other world then, and quite probably against one where the significance of the spying detector-globes wouldn't be understood before it was too late. The best information system in the Galaxy couldn't keep more than an insignificant fraction of its populations on the alert for dangers like that—

She bounced suddenly to her feet and, at the same instant, the pony swung away from the hollow toward which it had been staring. They both stood for a moment then, turning their heads about like a baffled hounds trying to fix a scent on the wind.

"It's Grimp!" Grandma exclaimed.

The rhinocerine pony snorted faintly. "Those are his thought images, all right," it agreed. "He seems to feel you need protection. Can you locate him?"

"Not yet," said Grandma anxiously. "Yes, I can. He's coming up through the woods on the other side of the hollow, off to the left. The little devil!" She was hustling back to the trailer. "Come on, I'll have to ride you there. I can't even dare use the go-buggy this late in the day."

The pony crouched beside the trailer while she quickly snapped on its saddle from the top of the back steps. Six metal rings had been welded into the horny plates of its back for this purpose, so it was a simple job. Grandma clambered aloft, hanging on to the saddle's handrails.

"Swing wide of the hollow," she warned. "Grimp came just as I suggested to him mentally. You needn't worry about making noise. The Halpa don't notice noise as such—it has to have emotional content for them to hear it—and the quicker Grimp spots us, the easier it will be to find him."

The pony already was rushing down into the meadow at an amazing rate of speed—it took a lot of muscle to drive a body like that through the gluey swamps of Treebel, and there were none here to impede it. It swung wide of the hollow and of what it contained, crossed a shallow bog farther down the meadow with a sound like a charging torpedo boat, and reached the woods.

It had to slow down then to avoid brushing off Grandma.

"Grimp's down that slope somewhere," Grandma said. "He's heard us. . . ."

"They're making a lot of noise," Grimp's thought reached them suddenly and clearly. He seemed to be talking to someone. "But we're not scared of them, are we?"

"Bang-bang!" another speech-thought came excitedly.

"That was the lortel," Grandma said. "They're very good for giving children courage. Much better than teddy bears."

"That's the stuff," Grimp resumed approvingly. "We'll slingshot them all if they don't watch out. But we'd better find Grandma soon."

"Grimp!" shouted Grandma. The pony backed her up with a roaring call.

"Hello?" came the lortel's thought.

"Wasn't that the pony?" Grimp asked it, getting only another "hello" in reply. "All right, we'll go that way," he added, as though they had reached a joint decision.

"Here we come, Grimp!" Grandma shouted, and the pony descended the steep side of a ravine with the straightforward technique of a rock slide.

"That's Grandma!" thought Grimp. "Grandma!" he yelled. "Look out, there's monsters all around!"

"What you missed!" yelled Grimp, dancing around the pony as Grandma Wannattel scrambled down from the saddle. "The monsters have the village surrounded, and the Guardian killed one, and I slingshot another till he fizzled out, and I was coming to find you—"

"Your mother will be worried," said Grandma as they rushed into each other's arms.

"No," grinned Grimp. "All the kids are supposed to be sleeping in the schoolhouse, and she won't look there till morning, and the teacher said the monsters were all holynations—ho-lucy-nations. But he wouldn't go look when the Guardian said they'd show him one. He stayed right in bed! But the Guardian's all right—he killed one, and I slingshot another one, and the lortel learned a new word. Say 'bang-bang,' lortel!"

"Hello!" squeaked the lortel.

"Aw, he's scared," said Grimp disappointedly. "He can say it, though. And I've come to take you to the village so the monsters don't chase after you. Hello, pony!"

"Bang-bang," said the lortel distinctly.

"See?" cried Grimp. "He wasn't scared, after all—he's a real brave

lortel! If we see some monsters, don't you get scared, either, because I've got my slingshot," he said, waving it bloodthirstily, "and two back pockets all full of real big stones. I just hope my pants stay up. But that doesn't matter—the way to do it is to kill them all."

"It sounds like a pretty good idea, Grimp," Grandma agreed. "But you're awfully tired now."

"No, I'm not!" Grimp said, surprised. His right eye sagged shut and then his left. He opened them both with an effort and looked at Grandma. "I can stay awake all night, I bet," he argued drowsily. "I am—"

"In fact," said Grandma, "you're asleep."

"No, I'm n—" objected Grimp. Then he sagged toward the ground, and Grandma caught him firmly.

"In a way, I hate to do it," she panted, wrestling him aboard the pony, which had hunkered down and flattened itself as much as it could to make the job easier. "He'd probably enjoy it. But we can't take a chance. He's a husky little devil, too," she groaned, giving a final boost, "and those ammunition pockets don't make him any lighter." She clambered up again behind him and noticed that the lortel had transferred itself to her coat collar.

The pony stood up cautiously.

"Now what?" it asked.

"Might as well go straight to the hollow," said Grandma, breathing hard. "We'll probably have to wait around there a few hours, but if we're careful it won't do any harm."

"Did you find a good deep pond?" Grandma asked the pony a little later as it came squishing up softly through the meadow behind her to rejoin her at the edge of the hollow.

"Yes," said the pony. "About a hundred yards back. That should be close enough. How much more waiting do you think we'll have to do?"

Grandma shrugged carefully. She was sitting in the grass with what, by daylight, would have been a good view of the hollow below. Grimp was asleep with his head on her knees. The lortel, after catching a few bugs in the grass and eating them, had settled down on her shoulder and dozed off, too.

"I don't know," she said. "It's still three hours till Big Moonrise, and it's bound to be some time before then. Now that you've found a water-

hole, we'll just stay here together and wait. The one thing to remember is not to let yourself start getting excited about them."

The pony stood huge and chunky beside her, staring down, its forefeet on the edge of the hollow. Muddy water trickled from its knobby flanks. It had brought the warm mud smells of a summer pond back with it to hang in a cloud about them.

There was vague, dark, continuous motion at the bottom of the hollow, a barely noticeable stirring in the single big pool of darkness that filled it.

"If I were alone," the pony said, "I'd get out of here! I know when I ought to be scared. But you've taken psychological control of my reactions, haven't you?"

"Yes," said Grandma. "It'll be easier for me, though, if you help along as much as you can. There's really no danger until their Transmitter has come through."

"Unless," objected the pony, "they've worked out some brand-new tricks in the past few hundred years."

"There's that chance," Grandma admitted. "But they've never tried changing their tricks on us yet. If it were *us* doing the attacking, we'd vary our methods each time as much as we could. But the Halpa don't seem to think the way we do about anything. They wouldn't still be so careful if they didn't realize they were very vulnerable at this point."

"I hope they're right about that!" the pony said anxiously.

Its head moved then, following the motion of something that sailed flutteringly out of the depths of the hollow, circled along its far rim, and descended again. The beings of Treebel had a much deeper range of night vision than Grandma Wannattel, but she was also aware of that shape.

"They're not much to look at," the pony remarked. "Like a big, dark rag of leather, almost."

"Their physical structure is believed to be quite simple," Grandma agreed slowly.

The pony was tensing up again, and she realized that it was best to go on talking to it about almost anything at all. That always helped, even though the pony knew her much too well by now to be really fooled by such tricks.

"Many very efficient life forms aren't physically complicated, you know," she went on, letting the sound of her voice ripple steadily into its mind. "Parasitical types, particularly. It's pretty certain, too, that

the Halpa have the hive-mind class of intelligence, so what goes for the nerve systems of most of the ones they send through to us might be nothing much more than secondary reflex transmitters. . . ."

Grimp stirred in his sleep at that point and grumbled. Grandma looked down at him. "You're sound asleep!" she told him severely, and he was again.

"You've got plans for that boy, haven't you?" said the pony without shifting its gaze from the hollow.

"I've had my eye on him," Grandma admitted, "and I've already recommended him to the organization for observation. That's if we beat off the Halpa this time—and Grimp will be pretty important in deciding that. If we do, we'll let him develop with only a little help here and there. We'll see what he picks up naturally from the lortel, for instance, in the way of telepathic communication and sensory extensions. I think Grimp's the kind we can use."

"He's all right," the pony agreed absently. "A bit murderous, though, like most of you . . ."

"He'll grow out of it!" Grandma said a little annoyedly, for the subject of human aggressiveness was one she and the pony argued about frequently. "You can't hurry developments like that along too much. All of Noorhut should grow out of that stage, as a people, in another few hundred years. They're about at the turning point right now—"

Their heads came up together then, as something very much like a big, dark rag of leather came fluttering up from the hollow and hung in the dark air above them. The representatives of the opposing powers that were facing each other on Noorhut that night took quiet stock of one another for a few moments.

The Halpa was about six feet long and two feet wide and considerably less than an inch thick. It held its position in the air with a steady, rippling motion, like a bat the size of a man, and then suddenly it extended itself with a snap, growing taut as a curved sail.

The pony snorted involuntarily. The apparently featureless shape in the air turned toward it and drifted a few inches closer. When nothing more happened, it turned again and fluttered quietly back down into the hollow.

"Could it tell I was scared?" the pony asked uneasily.

"You reacted just right," Grandma soothed. "Startled suspicion at first, and then just curiosity, and then another start when it made that jump. It's about what they'd expect from creatures that would be

hanging around the hollow now. We're like cows to them. They can't tell what things are by their looks, as we do."

But her tone was thoughtful, and she was more shaken than she would have cared to let the pony notice. There had been something indescribably menacing and self-assured in the Halpa's attitude. Almost certainly it had only been trying to draw a reaction of hostile intelligence from them, probing, perhaps, for the presence of weapons that might be dangerous to its kind.

But there was a chance—a tiny but appalling chance—that the things *had* developed some drastically new form of attack since their last break-through and that they already were in control of the situation.

In which case, neither Grimp nor anyone else on Noorhut would be doing any more growing up after tomorrow.

Each of the eleven hundred and seventeen planets that had been lost to the Halpa so far still traced a fiery, forbidding orbit through space—torn back from the invaders only at the cost of depriving it, by humanity's own weapons, of the natural conditions that any known form of life could tolerate.

The possibility that that might also be Noorhut's future had loomed as an ugly enormity before her for the past four years. But of the nearly half a hundred worlds which the Halpa were found to be investigating through their detector-globes as possible invasion points for this assault period, Noorhut finally had been selected by Headquarters as the one where local conditions were most suited to meet them successfully. That meant in a manner that must include the destruction of their only real invasion weapon, the fabulous and mysterious Halpa Transmitter. Capable as they undoubtedly were, they had shown in the past that they were able or willing to employ only one of those instruments for each period of attack. Destroying the Transmitter meant, therefore, that humanity would gain a few more centuries to figure out a way to get back at the Halpa before a new invasion attempt was made.

So on all planets but Noorhut, the detector-globes had been shrewdly encouraged to send back reports of a dangerously alert and well-armed population. On Noorhut, however, they had been soothed along . . . and just as her home planet had been chosen as the most favorable point of encounter, so was Erisa Wannattel herself selected as the agent most suited to represent humanity's forces under the conditions that existed there.

Grandma sighed gently and reminded herself again that Headquarters was as unlikely to miscalculate the over-all probability of success as it was to select the wrong person to achieve it. There was only the tiniest, the most theoretical, of chances that something might go wrong and that she would end her long career with the blundering murder of her own home world—

But there was that chance. It meant the lives of people whose ancestors she had known, an entire world she loved and hoped to retire to some day. Worse yet, it meant relying on a small, helpless, untrained child—who might, after all, not be the instrument she should have chosen.

"There seem to be more down there every minute!" the pony was saying.

Grandma drew a deep breath.

"Must be several thousand by now," she acknowledged. "It's getting near break-through time, all right—but that's only the advance forces." She added, "Do you notice anything like a glow of light down there, toward the center?"

The pony stared a moment. "Yes," it said. "But I would have thought that was way under the red for you. Can you see it?"

"No," said Grandma. "I get a kind of feeling, like heat. That's the Transmitter beginning to come through. I think we've got them!"

The pony shifted its bulk slowly from side to side.

"Yes," it said resignedly, "or they've got us."

"Don't think about that," Grandma ordered sharply, and clamped one more mental lock shut on the foggy, dark terrors that were curling and writhing under her conscious thoughts, trying to emerge and paralyze her actions.

She had opened her black bag and was unhurriedly fitting together something composed of a few pieces of wood and wire and a rather heavy, stiff spring. . . .

"Just be ready," she added.

"I've been ready for an hour," said the pony, shuffling its feet.

"I mean Grimp," she explained, looking down intently at the sleeping boy. "A child is more perceptive than an adult, and his time sense is sharper because he lives at a much faster rate."

"Then his time sense should be faster, too," the pony said.

"It's like slow-motion film," Grandma told him. "The faster the camera goes, the more pictures it takes, and the slower the action. A

child is like that. Our time sense speeds up as we grow older and our life processes slow down. You might say we take fewer pictures than a child does."

"Makes sense," the pony agreed. "But what does it lead to?"

"Grimp," said Grandma, her face very close to the boy's, "is going to feel the critical moment of the break-through and let us know. He'll tell by the static tension in the air, the way a child becomes cranky when an electrical storm is getting ready to happen. We can't respond like that . . . even trained perceptives like us . . . and not, certainly, in awareness of fractions of a second."

The pony stared at Grimp with new respect. "He can?"

Grandma took in a breath that sounded like the fluttering of agitated strips of paper. "I hope so," she said. "It can't be just any child, though all of them are more sensitive than any adult. It has to be a hypersensitive child."

"Then you're not sure he is."

"No," Grandma confessed reluctantly. "I can't be sure until it's too late."

They did no more talking after that. All the valley had become quiet about them. But slowly the hollow below was filling up with a black, stirring, slithering tide. Bits of it fluttered up now and then like strips of black smoke, hovered a few yards above the mass, and settled again.

Suddenly, down in the center of the hollow, there was something else.

The rhinocerine pony had seen it first, Grandma Wannattel realized. It had been staring in that direction for almost a minute before she grew able to distinguish something that might have been a group of graceful miniature spires. Semitransparent in the darkness, four small domes showed at the corners, with a larger one in the center. The central one was about twenty feet high and very slender.

The whole structure began to solidify swiftly. . . .

The Halpa Transmitter's appearance of crystalline slightness was perhaps the most mind-chilling thing about it. For it brought instantly a jarring sense of what must be black distance beyond all distances, reaching back unimaginably to its place of origin. In that unknown somewhere, a prodigiously talented and determined race of beings had labored for human centuries to prepare and point some stupendous gun . . . and were able then to bridge the vast interval with

nothing more substantial than this dark sliver of glass that had come to rest suddenly in the valley of the Wend.

But, of course, the Transmitter was all that was needed; its deadly poison lay in a sluggish, almost inert, mass about it. Within minutes from now it would waken to life, as similar Transmitters had wakened on other nights on those lost and burning worlds. And in much less than minutes after that, the Halpa invaders would be hurled by their slender machine to every surface section of Noorhut—no longer inert, but quickened into a ravening, almost indestructible form of vampiric life, dividing and subdividing in its incredibly swift cycle of reproducton, fastening to feed anew, growing again—

Spreading, at that stage, much more swiftly than it could be exterminated by anything but the ultimate weapons!

The pony stirred suddenly, and she felt the wave of panic rolling up in it.

"It's the Transmitter, all right," Grandma's thought reached it quickly. "We've had two descriptions of it before. But we can't be sure it's *here* until it begins to charge itself. Then it lights up—first at the edges and then at the center. Once the central spire lights up, it will be energized too much to let them pull it back again. At least, they couldn't pull it back after that the last time they were observed." She touched the sleeping boy anxiously. "Grimp will have to tell us when that exact instant is."

The pony had been told all that before. But as it listened it was quieting down again.

"And you're to go on sleeping!" Grandma Wannattel's thought instructed Grimp next. "Your perception and time sense are to be alert, but you'll sleep on and remember nothing until I wake you."

Light surged suddenly up in the Transmitter—first into the four outer spires, and a moment later into the big central one, in a sullen red glow. It lit the hollow with a smoky glare. The pony took two startled steps backward.

"Don't fail us, Grimp!" whispered Grandma's thought.

She reached again into her black bag and took out a small plastic ball. It reflected the light from the hollow in dull crimson gleamings. She let it slip down carefully inside the shaftlike frame of the gadget she had put together of wood and wire. It clicked into place there against one end of the compressed spring.

But she didn't take her eyes off the boy. He was stirring restlessly,

his breathing growing quicker and more difficult. His little hands twitched from time to time, though he remained asleep.

"Watch the Halpa," she told the pony tensely. "I don't know if Grimp will sense the moment exactly. I'm not sure we can handle it then, but . . ."

Down below, they lay now in a blanket fifteen feet thick over the wet ground, like big, black, waterlogged leaves swept up in circular piles about the edges of the hollow. The tops and sides of the piles were fluttering and shivering and beginning to slide down toward the Transmitter. She felt tension growing, but she couldn't trust her own age-dulled perception. If the child failed, all Noorhut would fall to the Halpa.

Grimp twisted in Grandma's arms abruptly, like a caught and fighting werret, and a strangled cry that was almost a sob came from him.

It was what Grandma had been waiting for. She raised the wooden catapult to her shoulder. The pony shook its blunt-horned head violently from side to side, made a loud bawling noise, surged forward and plunged down the steep slope of the hollow in a thundering rush.

Grandma aimed carefully and let go.

There was no explosion. The blanket of dead-leaf creatures was lifting into the air ahead of the pony's ground-shaking approach in a weightless, silent swirl of darkness which instantly blotted both the glowing Transmitter and the pony's shape from sight. The pony roared once as the blackness closed over it. A second later there was a crash like the shattering of a hundred-foot mirror. At approximately the same moment, Grandma's plastic ball exploded somewhere in the center of the swirling storm of lethal life.

Cascading fountains of white fire filled the whole of the hollow. Within the fire, a dense mass of shapes fluttered and writhed frenziedly, like burning rags. From down where the fire boiled fiercest rose contained sounds of brittle substances suffering enormous violence. The pony was trampling the Transmitter, making sure of its destruction.

"Better get out of it!" Grandma shouted anxiously. "What's left of that will all melt now, anyway!"

She didn't know whether it heard her or not, but a few seconds later it came pounding up the side of the hollow again. Blazing from nose to rump, it tramped past Grandma, plunged through the meadow behind her, shedding white sheets of fire that exploded the marsh

grass in its tracks, and hurled itself headlong into the pond it had selected previously. There was a great splash, accompanied by sharp hissing noises. Pond and pony vanished together under billowing clouds of steam.

"That was pretty hot!" its thought came to Grandma.

"Hot as anything that ever came out of a volcano!" she affirmed. "If you'd played around in it much longer, you'd have provided the village with roasts for a year."

"I'll just stay here for a while till I've cooled off a bit," said the pony. "And I'd like to forget that last remark of yours, too. Civilized cannibals, that's what people are!"

Grandma found something strangling her then, and discovered it was the lortel's tail. She unwound it carefully. But the lortel promptly reanchored itself with all four hands in her hair. She decided to leave it there. It seemed badly upset.

Grimp, however, relaxed suddenly and slept on. It was going to take a little maneuvering to get him back into the village undetected before morning, but she would figure that out by and by. A steady flow of cool night air was now being drawn past them into the hollow and rising out of it again in boiling, vertical columns of invisible heat. At the bottom of the de luxe blaze she'd lit down there, things still seemed to be moving about—but very slowly. The Halpa were tough organisms, all right, though not nearly so tough, when you heated them up with a really good incendiary, as the natives of Treebel.

She would have to make a final check of the hollow around dawn, of course, when the ground should have cooled off enough to permit it—but her century's phase of the Halpa War did seem to be over. The defensive part of it, at any rate.

Wet munching sounds from the pond indicated the pony felt comfortable enough by now to take an interest in the parboiled vegetation it found floating about it.

"You picked the right child, after all," the pony's thought remarked to her.

"Yes, Grimp worked out fine," Grandma said a little proudly.

"I was pretty worried for a while."

"I won't say I was exactly easy myself. I thought Grimp was reacting slowly, and I was getting ready to hurl the incendiary."

"But you didn't," the pony pointed out, chewing loudly.

"No. I suspected my perception might be too fast. It turned out to be almost two minutes off."

The rhinocerine pony stopped munching, and she felt the shiver of fear that went through its mind. "As much as that? You'd have caught the Transmitter before it was matter. Nothing would have happened . . . except the Halpa would have swarmed through when the Transmitter materialized. We couldn't have stopped them."

"Grimp had the crisis down to the micro-second," she said happily. "Why fret about what might have happened?"

"You're right, of course," the pony agreed, but its enormous appetite seemed suddenly to have disappeared.

Grandma settled down carefully to sleep in the long marsh grass without disturbing Grimp's position too much. She appeared calm, but her sleep was more of a faint than untroubled slumber.

By sunrise, Grandma Wannattel's patent-medicine trailer was nine miles from the village and rolling steadily southward up the valley road through the woods. As usual, she was departing under an official cloud.

Grimp and the policeman had showed up early to warn her. The Guardian was making use of the night's various unprecedented disturbances to press through a vote on a public menace charge against Grandma in the village. Since everybody still felt rather excited and upset, he had a good chance just now of getting a majority.

Grimp had accompanied her far enough to explain that this state of affairs wasn't going to be permanent. He had it all worked out: Runny's new immunity to hay fever had brought him and the pretty Vellit to a fresh understanding overnight; they were going to get married five weeks from now. As a married man, Runny would then be elibible for the post of Village Guardian at the harvest elections. Between Grimp's cousins and Vellit's cousins, Runny's backers would just about control the vote. So when Grandma got around to visiting the valley again next summer, she needn't worry any more about police interference or official disapproval. . . .

Grandma had nodded approvingly. That was about the kind of neighborhood politics she'd begun to play herself at Grimp's age. She was pretty sure by now that Grimp was the one who eventually would become her successor as guardian of Noorhut as well as of the star

system to which Noorhut belonged and perhaps of a good many other star systems besides. With careful schooling, he ought to be just about ready for the job by the time she was willing, finally, to retire.

An hour after he had started back to the farm, looking suddenly a little forlorn, the trailer swung off the valley road into a narrow forest path. Here the pony lengthened its stride, and less than five minutes later they entered a curving ravine, at the far end of which lay something that Grimp would have recognized instantly, from his one visit to the nearest port city, as a small spaceship.

A large round door in its side opened soundlessly as they approached. The pony came to a stop. Grandma got down from the driver's seat and unhitched it. The pony walked into the airlock, and the trailer picked its wheels off the ground and floated in behind it. Grandma Wannattel walked in last, and the lock closed quietly.

The ship lay still a moment longer. Then it was suddenly gone. Dead leaves went dancing for a while about the ravine, disturbed by the breeze of its departure.

In a place very far away—so far that neither Grimp nor his parents nor anyone in the village except the schoolteacher had ever heard of it—a set of instruments began signaling for attention. Somebody answered them.

Grandma's voice announced distinctly:

"This is Agent Wannattel's report on the successful conclusion of the Halpa operation on Noorhut—"

High above Noorhut's skies, eight great ships swung instantly out of their watchful orbits about the planet and flashed off again into the blackness of space that was their sea and their home.

Arthur C. Clarke

A WALK IN THE DARK

No matter how enormous, how successful, and how brilliant the spread of civilization across the Galaxy, there still will always remain those basic fears which mankind brought up with him from the days of his savagery aeons ago in the jungles of Earth. Even during those future triumphal days of conquest, man on an alien planet may still be the victim of his own instinctive fears, his own primitive hallucinations.

. . . Or were they really hallucinations?

ROBERT ARMSTRONG had walked just over two miles, as far as he could judge, when his torch failed. He stood still for a moment, unable to believe that such a misfortune could really have befallen him. Then, half maddened with rage, he hurled the useless instrument away. It landed somewhere in the darkness, disturbing the silence of this little world. A metallic echo came ringing back from the low hills. Then all was quiet again.

This, thought Armstrong, was the ultimate misfortune. Nothing more could happen to him now. He was even able to laugh bitterly at his luck, and resolved never again to imagine that the fickle goddess had ever favored him. Who would have believed that the only tractor at Camp IV would have broken down when he was just setting off for Port Sanderson? He recalled the frenzied repair work, the relief when the second start had been made—and the final debacle when the caterpillar track had jammed hopelessly.

It was no use then regretting the lateness of his departure: he could not have foreseen these accidents, and it was still a good four hours before the *Canopus* took off. He *had* to catch her, whatever happened: no other ship would be touching at this world for another month. Apart from the urgency of his business, four more weeks on this out-of-the-way planet were unthinkable.

There had been only one thing to do. It was lucky that Port Sanderson was little more than six miles from the camp—not a great distance, even on foot. He had been forced to leave all his equipment

behind, but it could follow on the next ship and he could manage without it. The road was poor, merely stamped out of the rock by one of the Board's hundred-ton crushers, but there was no fear of going astray.

Even now he was in no real danger, though he might well be too late to catch the ship. Progress would be slow, for he dare not risk losing the road in this region of canyons and enigmatic tunnels that had never been explored. It was, of course, pitch dark. Here at the edge of the Galaxy the stars were so few and scattered that their light was negligible. The strange crimson sun of this lonely world would not rise for many hours, and although five of the little moons were in the sky, they could barely be seen by the unaided eye. Not one of them could even cast a shadow.

Armstrong was not the man to bewail his luck for long. He began to walk slowly along the road, feeling its texture with his feet. It was, he knew, fairly straight except where it wound through Carver's Pass. He wished he had a stick or something to probe the way before him, but he would have to rely for guidance on the feel of the ground.

It was terribly slow at first, until he gained confidence. He had never known how difficult it was to walk in a straight line. Although the feeble stars gave him his bearings, again and again he found himself stumbling among the virgin rocks at the edge of the crude roadway. He was traveling in long zigzags that took him to alternate sides of the road. Then he would stub his toes against the bare rock and grope his way back onto the hard-packed surface once again.

Presently it settled down to a routine. It was impossible to estimate his speed; he could only struggle along and hope for the best. It should be easy enough unless he lost his way. But he dared not think of that.

Once he had mastered the technique, he could afford the luxury of thought. He could not pretend that he was enjoying the experience, but he had been in much worse positions before. As long as he remained on the road he was perfectly safe. He had been hoping that as his eyes became adapted to the starlight he would be able to see the way, but he now knew that the whole journey would be blind. The discovery gave him a vivid sense of his remoteness from the heart of the Galaxy. On a night as clear as this, the skies of almost any other planet would have been blazing with stars. Here at this outpost of the Universe the sky held perhaps a hundred faintly gleaming points of

lights, as useless as the five ridiculous moons on which no one had ever bothered to land.

A slight change in the road interrupted his thoughts. Was there a curve here, or had he veered off to the right again? He moved very slowly along the invisible and ill-defined border. Yes, there was no mistake: the road was bending to the left. He tried to remember its appearance in the daytime, but he had seen it only once before. Did this mean that he was nearing the Pass? He hoped so, for the journey would then be half completed.

He peered ahead into the blackness, but the ragged line of the horizon told him nothing. Presently he found that the road had straightened itself again, and his spirits sank. The entrance to the Pass must still be some way ahead: there were at least four more miles to go.

Four miles! How ridiculous the distance seemed! How long would it take the *Canopus* to travel four miles? He doubted if man could measure so short an interval of time. And how many trillions of miles had he, Robert Armstrong, traveled in his life? It must have reached a staggering total by now, for in the last twenty years he had scarcely stayed more than a month at a time on any single world. This very year he had twice made the crossing of the Galaxy, and that was a notable journey even in these days of the phantom drive.

He tripped over a loose stone, and the jolt brought him back to reality. It was no use, here, thinking of ships that could eat up the light-years. He was facing Nature, with no weapons but his own strength and skill.

It was strange that it took him so long to identify the real cause of his uneasiness. The last four weeks had been very full, and the rush of his departure, coupled with the annoyance and anxiety caused by the tractor's breakdowns, had driven everything else from his mind. Moreover, he had always prided himself on his hardheadedness and lack of imagination. Until now, he had forgotten all about that first evening at the base when the crews had regaled him with the usual tall yarns concocted for the benefit of newcomers.

It was then that the old base clerk had told the story of his walk by night from Port Sanderson to the camp, and of what had trailed him through Carver's Pass, keeping always beyond the limit of his torchlight.

Armstrong, who had heard such tales on a score of worlds, had paid it little attention at the time. This planet, after all, was known to be

uninhabited. But logic could not dispose of the matter as easily as that. Suppose, after all, there was some truth in the old man's fantastic tale?

It was not a pleasant thought, and Armstrong did not intend to brood upon it. But he knew that if he dismissed it out of hand, it would continue to prey on his mind. The only way to conquer imaginary fears was to face them boldly: he would have to do that now.

His strongest argument was the complete barrenness of this world, and its utter desolation, though against that one could set many counterarguments, as indeed the old clerk had done. Man had lived on this planet for only twenty years, and much of it was still unexplored. No one could deny that the tunnels out in the wasteland were rather puzzling, but everyone believed them to be volcanic vents. Though, of course, life often crept into such places. With a shudder he remembered the giant polyps that had snared the first explorers of Vargon III.

It was all very inconclusive. Suppose, for the sake of argument, one granted the existence of life here. What of that?

The vast majority of life forms in the Universe were completely indifferent to man. Some, of course, like the gas-beings of Alcoran or the roving wave-lattices of Shandaloon, could not even detect him, but passed through or around him as if he did not exist. Others were merely inquisitive, some embarrassingly friendly. There were few indeed that would attack unless provoked.

Nevertheless, it was a grim picture that the old stores clerk had painted. Back in the warm, well-lighted smoking room, with the drinks going round, it had been easy enough to laugh at it. But here in the darkness, miles from any human settlement, it was very different.

It was almost a relief when he stumbled off the road again and had to grope with his hands until he found it once more. This seemed a very rough patch, and the road was scarcely distinguishable from the rocks around. In a few minutes, however, he was safely on his way again.

It was unpleasant to see how quickly his thoughts returned to the same disquieting subject. Clearly it was worrying him more than he cared to admit.

He drew consolation from one fact: it had been quite obvious that no one at the base had believed the old fellow's story. Their questions and banter had proved that. At the time he had laughed as loudly as any of them. After all, what *was* the evidence? A dim shape, just seen

in the darkness, that might well have been an oddly formed rock. Anyone could imagine such shapes at night if they were sufficiently overwrought. If it had been hostile, why hadn't the creature come any closer?

"Because it was afraid of my light," the old chap had said.

Well, that was plausible enough; it would explain why nothing had ever been seen in the daytime. Such a creature might live underground, only emerging at night. Hang it, why was he taking the old idiot's ravings so seriously! Armstrong got control of his thoughts again. If he went on this way, he told himself angrily, he would soon be seeing and hearing a whole menagerie of monsters.

There was, of course, one factor that disposed of the ridiculous story at once. It was really very simple; he felt sorry he hadn't thought of it before. What would such a creature live on? There was not even a trace of vegetation on the whole of the planet. He laughed to think that the bogy could be disposed of so easily—and in the same instant felt annoyed with himself for not laughing aloud. If he was so sure of his reasoning, why not whistle, or sing, or do anything to keep up his spirits? He put the question fairly to himself as a test of his manhood. Half ashamed, he had to admit that he was still afraid—afraid because "there *might* be something in it, after all." But at least his analysis had done him some good.

It would have been better if he had left it there and remained half convinced by his argument. But a part of his mind was still busily trying to break down his careful reasoning. It succeeded only too well, and when he remembered the plant-beings of Xantil Major, the shock was so unpleasant that he stopped dead in his tracks.

Now, the plant-beings of Xantil were not in any way horrible; they were, in fact, extremely beautiful creatures. But what made them appear so distressing now was the knowledge that they could live for indefinite periods with no food whatsoever. All the energy they needed for their strange lives they extracted from cosmic radiation—and that was almost as intense here as anywhere else in the Universe.

He had scarcely thought of one example before others crowded into his mind and he remembered the life form on Trantor Beta, which was the only one known capable of directly utilizing atomic energy. That, too, had lived on an utterly barren world very much like this. . . .

Armstrong's mind was rapidly splitting into two distinct portions,

one half trying to convince the other and neither wholly succeeding. He did not realize how far his morale had gone until he found himself holding his breath lest it conceal any sound in the darkness about him. Angrily he cleared his mind of the rubbish that had been gathering there and turned once more to the immediate problem.

There was no doubt that the road was slowly rising, and the silhouette of the horizon seemed much higher in the sky. The road began to twist, and suddenly he was aware of great rocks on either side of him. Soon only a narrow ribbon of sky was still visible, and the darkness became, if possible, even more intense.

Somehow, he felt safer with the rock walls surrounding him. It meant that he was protected except in two directions. Also, the road had been leveled more carefully and it was easy to keep to it. Best of all, he knew now that the journey was more than half completed.

For a moment his spirits began to rise. Then, with maddening perversity, his mind went back into the old grooves again. He remembered that it was on the far side of Carver's Pass that the old clerk's adventure had taken place, if it had ever happened at all.

In half a mile he would be out in the open again, out of the protection of these sheltering rocks. The thought seemed doubly horrible now, and he felt already a sense of nakedness. He could be attacked from any direction, and he would be utterly helpless.

Until now, he had still retained some self-control. Very resolutely he had kept his mind away from the one fact that gave some color to the old man's tale—the single piece of evidence that had stopped the banter in the crowded room back at the camp and brought a sudden hush upon the company. Now, as Armstrong's will weakened, he recalled again the words that had struck a momentary chill even in the warm comfort of the base building.

The little clerk had been very insistent on one point. He had never heard any sound of pursuit from the dim shape sensed, rather than seen, at the limit of his light. There was no scuffling of claws or hooves on rock, nor even the clatter of displaced stones. It was as if, so the old man had declared in that solemn manner of his, "as if the thing that was following could see perfectly in the darkness, and had many small legs or pads so that it could move swiftly and easily over the rock, like a giant caterpillar or one of the carpet-things of Kralkor II."

Yet although there had been no noise of pursuit, there had been one sound that the old man had caught several times. It was so unusual

that its very strangeness made it doubly ominous. It was a faint but horribly persistent *clicking*.

The old fellow had been able to describe it very vividly—much too vividly for Armstrong's liking now.

"Have you ever listened to a large insect crunching its prey?" he said. "Well, it was just like that. I imagine that a crab makes exactly the same noise with its claws when it clashes them together. It was a—what's the word? A *chitinous* sound."

At this point, Armstrong remembered laughing loudly. (Strange, how it was all coming back to him now.) But no one else had laughed, though they had been quick to do so earlier. Sensing the change of tone, he had sobered at once and asked the old man to continue his story.

It had been quickly told. The next day a party of skeptical technicians had gone into the no man's land beyond Carver's Pass. They were not skeptical enough to leave their guns behind, but they had no cause to use them, for they found no trace of any living thing. There were the inevitable pits and tunnels, glistening holes down which the light of the torches rebounded endlessly until it was lost in the distance, but the planet was riddled with them.

Though the party found no sign of life, it discovered one thing it did not like at all. Out in the barren and unexplored land beyond the Pass they had come upon a tunnel even larger than the rest. Near the mouth of that tunnel was a massive rock half embedded in the ground. And the sides of that rock had been worn away, as if it had been used as an enormous whetstone!

No less than five of those present had seen this disturbing rock. None of them could explain it satisfactorily as a natural formation, but they still refused to accept the old man's story. Armstrong had asked them if they had ever put it to the test. There had been an uncomfortable silence. Then big Andrew Hargraves had said, "Hell, who'd walk out to the Pass at night just for fun!" and had left it at that.

Indeed, there was no other record of anyone's walking from Port Sanderson to the camp by night, or for that matter by day. During the hours of light, no unprotected human being could live in the open beneath the rays of the enormous, lurid sun that seemed to fill half the sky. And no one would walk six miles, wearing radiation armor, if the tractor was available.

Armstrong felt that he was leaving the Pass. The rocks on either

side were falling away, and the road was no longer as firm and well packed as it had been. He was coming out into the open plain once more, and somewhere not far away in the darkness was that enigmatic pillar that might have been used for sharpening monstrous fangs or claws. It was not a reassuring thought.

Feeling distinctly worried now, Armstrong made a great effort to pull himself together. He would try and be rational again: he would think of business, the work he had done at the camp—anything but this infernal place. For a while he succeeded quite well. But presently, with a maddening persistence, every train of thought came back to the same point. He could not get out of his mind the picture of that inexplicable rock and its appalling possibilities.

The ground was quite flat again, and the road drove on straight as an arrow. There was one gleam of consolation: Port Sanderson could not be much more than two miles away. Armstrong had no idea how long he had been on the road. Unfortunately, his watch was not illuminated and he could only guess at the passage of time. With any luck, the *Canopus* should not take off for another two hours at least. But he could not be sure, and now another fear began to enter his mind, the dread that he might see a vast constellation of lights rising swiftly into the sky ahead and know that all this agony of mind had been in vain.

He was not zigzagging so badly now, and seemed to be able to anticipate the edge of the road before stumbling off it. It was probable, he cheered himself by thinking, that he was traveling almost as fast as if he had a light. If all went well, he might be nearing Port Sanderson in thirty minutes, a ridiculously small space of time. How he would laugh at his fears when he strolled into his already reserved stateroom in the *Canopus* and felt that peculiar quiver as the phantom drive hurled the great ship far out of this system, back to the clustered star-clouds near the center of the Galaxy, back toward Earth itself, which he had not seen for so many years.

One day, he told himself, he really must visit Earth again. All his life he had been making the promise, but always there had been the same answer—lack of time. Strange, wasn't it, that such a tiny planet should have played so enormous a part in the development of the Universe, should even have come to dominate worlds far wiser and more intelligent than itself!

Armstrong's thoughts were harmless again, and he felt calmer. The

knowledge that he was nearing Port Sanderson was immensely reassuring, and he deliberately kept his mind on familiar, unimportant matters. Carver's Pass was already far behind, and with it that thing he no longer intended to recall. One day, if he ever returned to this world, he would visit the Pass in the daytime and laugh at his fears. In twenty minutes, now, they would have joined the nightmares of his childhood.

It was almost a shock, though one of the most pleasant he had ever known, when he saw the lights of Port Sanderson come up over the horizon. The curvature of this little world was very deceptive: it did not seem right that a planet with a gravity almost as great as Earth's should have a horizon so close at hand. One day someone would have to discover what lay at this world's core to give it so great a density.

Perhaps the many tunnels would help. It was an unfortunate turn of thought, but the nearness of his goal had robbed it of terror now. Indeed, the thought that he might really be in danger seemed to give his adventure a certain piquancy and heightened interest. Nothing could happen to him now, with ten minutes to go and the lights of the port in sight.

A few minutes later his feelings changed abruptly when he came to the sudden bend in the road. He had fogotten the chasm that caused this detour and added half a mile to the journey. Well, what of it? An extra half mile would make no difference now—another ten minutes at the most.

It was very disappointing when the lights of the city vanished. Armstrong had not remembered the hill which the road was skirting: perhaps it was only a low ridge, scarcely noticeable in the daytime. But by hiding the lights of the port it had taken away his chief talisman and left him again at the mercy of his fears.

Very unreasonably, his intelligence told him, he began to think how horrible it would be if anything happened now, so near the end of the journey. He kept the worst of his fear at bay for a while, hoping desperately that the lights of the city would soon reappear. But as the minutes dragged on he realized that the ridge must be longer than he imagined. He tried to cheer himself by the thought that the city would be all the nearer when he saw it again, but somehow logic seemed to have failed him now. For presently he found himself doing something he had not stooped to do even out in the waste by Carver's Pass.

He stopped, turned slowly round, and with bated breath listened until his lungs were nearly bursting.

The silence was uncanny, considering how near he must be to the port. There was certainly no sound from behind him. Of course there wouldn't be, he told himself angrily. But he was immensely relieved. The thought of that faint and insistent clicking had been haunting him for the last hour.

So friendly and familiar was the noise that did reach him at last that the anticlimax almost made him laugh aloud. Drifting through the still air from a source clearly not more than a mile away came the sound of a landing-field tractor, perhaps one of the machines loading the *Canopus* itself. In a matter of seconds, thought Armstrong, he would be around this ridge, with the port only a few hundred yards ahead. The journey was nearly ended. In a few moments this evil plain would be no more than a fading nightmare.

It seemed terribly unfair: so little time, such a small fraction of a human life, was all he needed now. But the gods have always been unfair to man, and now they were enjoying their little jest. For there could be no mistaking the rattle of monstrous claws in the darkness ***ahead of him.***

Poul Anderson

THE HELPING HAND

The Interstellar Empire of Earthians, in full-dress uniform and with all its faults exposed like open sores. This story highlights one of the major themes of modern science fiction dealing with man's expansion among the stars. Though he may be technically ready for such advances, will he be ready for them sociologically, ethically? Can as rambunctious, self-satisfied, and arrogant a race as ours be considered fit to govern justly, and in their own best interests, the peoples of other worlds in the Galaxy? That is the silent question which this story asks. What the answer will be, we may have to wait five thousand years to learn.

A MELLOW bell tone was followed by the flat voice of the roboreceptionist: "His Excellency Valka Vahino, Special Envoy from the League of Cundaloa to the Commonwealth of Sol."

The Earthlings rose politely as he entered. Despite the heavy gravity and dry chill air of terrestrial conditions, he moved with the flowing grace of his species, and many of the humans were struck anew by what a handsome people his race was.

People—yes, the folk of Cundaloa were humanoid enough, mentally and physically, to justify the term. Their differences were not important; they added a certain charm, the romance of alienness, to the comforting reassurance that there was no really basic strangeness.

Ralph Dalton let his eyes sweep over the ambassador. Valka Vahino was typical of his race—humanoid mammal, biped, with a face that was very manlike, differing only in its beauty of finely chiseled features, high cheekbones, great dark eyes. A little smaller, more slender than the Earthlings, with a noiseless, feline ease of movement. Long shining blue hair swept back from his high forehead to his slim shoulders, a sharp and pleasing contrast to the rich golden skin color. He was dressed in the ancient ceremonial garb of Luai on Cundaloa—shining silvery tunic, deep-purple cloak from which little sparks of glittering metal swirled like fugitive stars, gold-worked boots of soft leather. One slender six-fingered hand held the elaborately carved staff

of office which was all the credentials his planet had given him.

He bowed, a single rippling movement which had nothing of servility in it, and said in excellent Terrestrial, which still retained some of the lilting, singing accent of his native tongue: "Peace on your houses! The Great House of Cundaloa sends greetings and many well-wishings to his brothers of Sol. His unworthy member Valka Vahino speaks for him in friendship."

Some of the Earthlings shifted stance, a little embarrassed. It did sound awkward in translation, thought Dalton. But the language of Cundaloa was one of the most beautiful sounds in the Galaxy.

He replied with an attempt at the same grave formality. "Greetings and welcome. The Commonwealth of Sol receives the representative of the League of Cundaloa in all friendship. Ralph Dalton, Premier of the Commonwealth, speaking for the people of the Solar System."

He introduced the others then—cabinet ministers, technical advisers, military staff members. It was an important assembly. Most of the power and influence in the Solar System was gathered here.

He finished: "This is an informal preliminary conference on the economic proposals recently made to your gov . . . to the Great House of Cundaloa. It has no legal standing. But it is being televised, and I daresay the Solar Assembly will act on a basis of what is learned at these and similar hearings."

"I understand. It is a good idea." Vahino waited until the rest were seated before taking a chair.

There was a pause. Eyes kept going to the clock on the wall. Vahino had arrived punctually at the time set, but Skorrogan of Skontar was late, thought Dalton. Tactless, but then the manners of the Skontarans were notoriously bad. Not at all like the gentle deference of Cundaloa, which in no way indicated weakness.

There was aimless conversation, of the "How do you like it here?" variety. Vahino, it developed, had visited the Solar System quite a few times in the past decade. Not surprising, in view of the increasingly close economic ties between his planet and the Commonwealth. There were a great many Cundaloan students in Earthian universities, and before the war there had been a growing tourist traffic from Sol to Avaiki. It would probably revive soon—especially if the devastation were repaired and—

"Oh, yes," smiled Vahino. "It is the ambition of all young *anamai,* men on Cundaloa, to come to Earth, if only for a visit. It is not mere

flattery to say that our admiration for you and your achievements is boundless."

"It's mutual," said Dalton. "Your culture, your art and music, your literature—all have a large following in the Solar System. Why, many men, and not just scholars, learn Luaian simply to read the *Dvanagoa-Epai* in the original. Cundaloan singers, from concert artists to night-club entertainers, get more applause than any others." He grinned. "Your young men here have some difficulty keeping our terrestrial coeds off their necks. And your few young women here are besieged by invitations. I suppose only the fact that there cannot be issue has kept the number of marriages as small as it has been."

"But seriously," persisted Vahino, "we realize at home that your civilization sets the tone for the known Galaxy. It is not just that Solarian civilization is the most advanced technically, though that has, of course, much to do with it. *You* came to *us,* with your spaceships and atomic energy and medical science and all else—but, after all, we can learn that and go on with you from there. It is, however, such acts as . . . well, as your present offer of help: to rebuild ruined worlds light-years away, pouring your own skill and treasure into our homes, when we can offer you so little in return—it is that which makes you the leading race in the Galaxy."

"We have selfish motives, as you well know," said Dalton a little uncomfortably. "Many of them. There is, of course, simple humanitarianism. We could not let races very like our own know want when the Solar System and its colonies have more wealth than they know what to do with. But our own bloody history has taught us that such programs as this economic-aid plan redound to the benefit of the initiator. When we have built up Cundaloa and Skontar, got them producing again, modernized their backward industry, taught them our science—they will be able to trade with us. And our economy is still, after all these centuries, primarily mercantile. Then, too, we will have knitted them too closely together for a repetition of the disastrous war just ended. And they will be allies for us against some of the really alien and menacing cultures in the Galaxy, planets and systems and empires against which we may one day have to stand."

"Pray the High One that that day never comes," said Vahino soberly. "We have seen enough of war."

The bell sounded again, and the robot announced in its clear inhuman tones: "His Excellency Skorrogan Valthak's son, Duke of

Kraakahaym, Special Envoy from the Empire of Skontar to the Commonwealth of Sol."

They got up again, a little more slowly this time, and Dalton saw the expressions of dislike on several faces, expressions which smoothed into noncommittal blankness as the newcomer entered. There was no denying that the Skontarans were not very popular in the Solar System just now, and partly it was their own fault. But most of it they couldn't help.

The prevailing impression was that Skontar had been at fault in the war with Cundaloa. That was plainly an error. The misfortune was that the suns Skang and Avaiki, forming a system about half a light-year apart, had a third companion which humans usually called Allan, after the captain of the first expedition to the system. And the planets of Allan were uninhabited.

When terrestrial technology came to Skontar and Cundaloa, its first result had been to unify both planets—ultimately—both systems into rival states which turned desirous eyes on the green new planets of Allan. Both had had colonies there, clashes had followed, ultimately the hideous five years' war which had wasted both systems and ended in a peace negotiated with terrestrial help. It had been simply another conflict of rival imperialisms, such as had been common enough in human history before the Great Peace and the formation of the Commonwealth. The terms of the treaty were as fair as possible, and both systems were exhausted. They would keep the peace now, especially when both were eagerly looking for Solarian help to rebuild.

Still—the average human liked the Cundaloans. It was almost a corollary that he should dislike the Skontarans and blame them for the trouble. But even before the war they had not been greatly admired. Their isolationism, their clinging to outmoded traditions, their harsh accent, their domineering manner, even their appearance told against them.

Dalton had had trouble persuading the Assembly to let him include Skontar in the invitation to economic-aid conferences. He had finally persuaded them that it was essential—not only would the resources of Skang be a material help in restoration, particularly their minerals, but the friendship of a potentially powerful and hitherto aloof empire could be gained.

The aid program was still no more then a proposal. The Assembly would have to make a law detailing who should be helped, and how

and how much, and then the law would have to be embodied in treaties with the planets concerned. The initial informal meeting here was only the first step. But—crucial.

Dalton bowed formally as the Skontaran entered. The envoy responded by stamping the butt of his huge spear against the floor, leaning the archaic weapon against the wall, and extending his holstered blaster handle first. Dalton took it gingerly and laid it on the desk. "Greeting and welcome," he began, since Skorrogan wasn't saying anything. "The Commonwealth—"

"Thank you." The voice was a hoarse bass, somehow metallic, and strongly accented. "The Valtam of the Empire of Skontar sends greetings to the Premier of Sol by Skorrogan Valthak's son, Duke of Kraakahaym."

He stood out in the room, seeming to fill it with his strong, forbidding presence. In spite of coming from a world of higher gravity and lower temperature, the Skontarans were a hugh race, over two meters tall and so broad that they seemed stocky. They could be classed as humanoid, in that they were bipedal mammals, but there was not much resemblance beyond that. Under a wide, low forehead and looming eyebrow ridges, the eyes of Skorrogan were fierce and golden, hawk's eyes. His face was blunt-snouted, with a mouthful of fangs in the terrific jaws; his ears were blunt and set high on the massive skull. Short brown fur covered his muscular body to the end of the long restless tail, and a ruddy mane flared from his head and throat. In spite of the, to him, tropical temperature, he wore the furs and skins of state occasions at home, and the acrid reek of his sweat hung about him.

"You are late," said one of the ministers with thin politeness. "I trust you were not detained by any difficulties."

"No, I underestimated the time needed to get here," answered Skorrogan. "Please to excuse me." He did not sound at all sorry, but lowered his great bulk into the nearest chair and opened his portfolio. "We have business now, my sirs?"

"Well . . . I suppose so." Dalton sat down at the head of the long conference table. "Though we are not too concerned with facts and figures at this preliminary discussion. We want simply to agree on general aims, matters of basic policy."

"Naturally, you will wish a full account of the available resources of Avaiki and Skang, as well as the Allanian colonies," said Vahino in his soft voice. "The agriculture of Cundaloa, the mines of Skontar,

will contribute much even at this early date, and, of course, in the end there must be economic self-sufficiency."

"It is a question of education, too," said Dalton. "We will send many experts, technical advisers, teachers—"

"And, of course, some question of military resources will arise—" began the Chief of Staff.

"Skontar have own army," snapped Skorrogan. "No need of talk there yet."

"Perhaps not," agreed the Minister of Finance mildly. He took out a cigarette and lit it.

"Please, sir!" For a moment Skorrogan's voice rose to a bull roar. "No smoke. You know Skontarans allergic to tobacco—"

"Sorry!" The Minister of Finance stubbed out the cylinder. His hand shook a little and he glared at the envoy. There had been little need for concern, the air-conditioning system swept the smoke away at once. And in any case—you don't shout at a cabinet minister. Especially when you come to ask him for help—

"There will be other systems involved," said Dalton hastily, trying with a sudden feeling of desperation to smooth over the unease and tension. "Not only the colonies of Sol. I imagine your two races will be expanding beyond your own triple system, and the resources made available by such colonization—"

"We will have to," said Skorrogan sourly. "After treaty rob us of all fourth planet— No matter. Please to excuse. Is bad enough to sit at same table with enemy without being reminded of how short time ago he *was* enemy."

This time the silence lasted a long while. And Dalton realized, with a sudden feeling almost of physical illness, that Skorrogan had damaged his own position beyond repair. Even if he suddenly woke up to what he was doing and tried to make amends—and who ever heard of a Skontaran noble apologizing for anything—it was too late. Too many millions of people, watching their telescreens, had seen his unpardonable arrogance. Too many important men, the leaders of Sol, were sitting in the same room with him, looking into his contemptuous eyes and smelling the sharp stink of unhuman sweat.

There would be no aid to Skontar.

With sunset, clouds piled up behind the dark line of cliffs which lay to the east of Geyrhaym, and a thin, chill wind blew down over the

valley with whispers of winter. The first few snowflakes were borne on it, whirling across the deepening purplish sky, tinted pink by the last bloody light. There would be a blizzard before midnight.

The spaceship came down out of darkness and settled into her cradle. Beyond the little spaceport, the old town of Geyrhaym lay wrapped in twilight, huddling together against the wind. Firelight glowed ruddily from the old peak-roofed houses, but the winding cobbled streets were like empty canyons, twisting up the hill on whose crest frowned the great castle of the old barons. The Valtam had taken it for his own use, and little Geyrhaym was now the capital of the Empire. For proud Skirnor and stately Thruvang were radioactive pits, and wild beasts howled in the burned ruins of the old palace.

Skorrogan Valthak's son shivered as he came out of the airlock and down the gangway. Skontar was a cold planet. Even for its own people it was cold. He wrapped his heavy fur cloak more tightly about him.

They were waiting near the bottom of the gangway, the high chiefs of Skontar. Under an impassive exterior, Skorrogan's belly muscles tightened. There might be death waiting in that silent, sullen group of men. Surely disgrace—and he couldn't answer—

The Valtam himself stood there, his white mane blowing in the bitter wind. His golden eyes seemed luminous in the twilight, hard and fierce, a deep sullen hate smoldering behind them. His oldest son, the heir apparent, Thordin, stood beside him. The last sunlight gleamed crimson on the head of his spear; it seemed to drip blood against the sky. And there were the other mighty men of Skang, counts of the provinces on Skontar and the other planets, and they all stood waiting for him. Behind them was a line of imperial household guards, helmets and corselets shining in the dusk, faces in shadow, but hate and contempt like a living force radiating from them.

Skorrogan strode up to the Valtam, grounded his spear butt in salute, and inclined his head at just the proper degree. There was silence then, save for the whimpering wind. Drifting snow streamed across the field.

The Valtam spoke at last, without ceremonial greeting. It was like a deliberate slap in the face: "So you are back again."

"Yes, sire." Skorrogan tried to keep his voice stiff. It was difficult to do. He had no fear of death, but it was cruelly hard to bear this

weight of failure. "As you know, I must regretfully report my mission unsuccessful."

"Indeed. We receive telecasts here," said the Valtam acidly.

"Sire, the Solarians are giving virtually unlimited aid to Cundaloa. But they refused any help at all to Skontar. No credits, no technical advisers—nothing. And we can expect little trade and almost no visitors."

"I know," said Thordin. "And *you* were sent to get their help."

"I tried, sire." Skorrogan kept his voice expressionless. He had to say something—*but be forever damned if I'll plead!* "But the Solarians have an unreasonable prejudice against us, partly related to their wholly emotional bias toward Cundaloa and partly, I suppose, due to our being unlike them in so many ways."

"So they do," said the Valtam coldly. "But it was not great before. Surely the Mingonians, who are far less human then we, have received much good at Solarian hands. They got the same sort of help that Cundaloa will be getting and that we might have had.

"We desire nothing but good relations with the mightiest power in the Galaxy. We might have had more than that. I know, from first-hand reports, what the temper of the Commonwealth was. They were ready to help us, had we shown any cooperativeness at all. We could have rebuilt, and gone farther than that—" His voice trailed off into the keening wind.

After a moment he went on, and the fury that quivered in his voice was like a living force: "I sent you as my special delegate to get that generously offered help. You, whom I trusted, who I thought was aware of our cruel plight—Arrrgh!" He spat. "And you spent your whole time there being insulting, arrogant, boorish. You, on whom all the eyes of Sol were turned, made yourself the perfect embodiment of all the humans think worst in us. No wonder our request was refused! You're lucky Sol didn't declare war!"

"It may not be too late," said Thordin. "We could send another—"

"No." The Valtam lifted his head with the inbred iron pride of his race, the haughtiness of a culture where for all history face had been more important than life. "Skorrogan went as our accredited representative. If we repudiated him, apologized for—not for any overt act but for bad manners!—if we crawled before the Galaxy—no! It isn't worth that. We'll just have to do without Sol."

The snow was blowing thicker now, and the clouds were covering the sky. A few bright stars winked forth in the clear portions. But it was cold, cold.

"And what a price to pay for honor!" said Thordin wearily. "Our folk are starving—food from Sol could keep them alive. They have only rags to wear—Sol would send clothes. Our factories are devastated, are obsolete, our young men grow up in ignorance of Galactic civilization and technology—Sol would send us machines and engineers, help us rebuild. Sol would send teachers, and we could become great— Well, too late, too late." His eyes searched through the gloom, puzzled, hurt. Skorrogan had been his friend. "But why did you do it? Why did you do it?"

"I did my best," said Skorrogan stiffly. "If I was not fitted for the task, you should not have sent me."

"But you were," said Valtam. "You were our best diplomat. Your wiliness, your understanding of extra-Skontaran psychology, your personality—all were invaluable to our foreign relations. And then, on this simple and most tremendous mission— No more!" His voice rose to a shout against the rising wind. "No more will I trust you. Skontar will know you failed."

"Sire—" Skorrogan's voice shook suddenly. "Sire, I have taken words from you which from anyone else would have meant a death duel. If you have more to say, say it. Otherwise let me go."

"I cannot strip you of your hereditary titles and holdings," said the Valtam. "But your position in the imperial government is ended, and you are no longer to come to court or to any official function. Nor do I think you will have many friends left."

"Perhaps not," said Skorrogan. "I did what I did, and even if I could explain further, I would not after these insults. But if you ask my advice for the future of Skontar—"

"I don't," said the Valtam. "You have done enough harm already."

". . . then consider three things." Skorrogan lifted his spear and pointed toward the remote glittering stars. "First, those suns out there. Second, certain new scientific and technological developments here at home—such as Dyrin's work on semantics. And last—look about you. Look at the houses your fathers built, look at the clothes you wear, listen, perhaps, to the language you speak. And then come back in fifty years or so and beg my pardon!"

He swirled his cloak about him, saluted the Valtam again, and went with long steps across the field and into the town. They looked after him with incomprehension and bitterness in their eyes.

There was hunger in the town. He could almost feel it behind the dark walls, the hunger of ragged and desperate folk crouched over their fires, and wondered whether they could survive the winter. Briefly he wondered how many would die—but he didn't dare follow the thought out.

He heard someone singing and paused. A wandering bard, begging his way from town to town, came down the street, his tattered cloak blowing fantastically about him. He plucked his harp with thin fingers, and his voice rose in an old ballad that held all the harsh ringing music, the great iron clamor of the old tongue, the language of Naarhaym on Skontar. Mentally, for a moment of wry amusement, Skorrogan rendered a few lines into Terrestrial:

Wildly the winging
War birds, flying
wake the winter-dead
wish for the sea-road.
Sweetheart, they summon me,
singing of flowers
fair for the faring.
Farewell, I love you.

It didn't work. It wasn't only that the metallic rhythm and hard barking syllables were lost, the intricate rhyme and alliteration, though that was part of it—but it just didn't make sense in Terrestrial. The concepts were lacking. How could you render, well, such a word as *vorkansraavin* as "faring" and hope to get more than a multilated fragment of meaning? Psychologies were simply too different.

And there, perhaps, lay his answer to the high chiefs. But they wouldn't know. They couldn't. And he was alone, and winter was coming again.

Valka Vahino sat in his garden and let sunlight wash over his bare skin. It was not often, these days, that he got a chance to *aliacaui*—What was that old Terrestrial word? "Siesta"? But that was wrong. A resting Cundaloan didn't sleep in the afternoon. He sat or lay outdoors, with the sun soaking into his bones or a warm rain like a

benediction over him, and he let his thoughts run free. Solarians called that daydreaming, but it wasn't, it was, well—they had no real word for it. Psychic recreation was a clumsy term, and the Solarians never understood.

Sometimes it seemed to Vahino that he had never rested, not in an eternity of years. The grinding urgencies of wartime duty, and then his hectic journeys to Sol—and since then, in the past three years, the Great House had appointed him official liaison man at the highest level, assuming that he understood the Solarians better than anyone else in the League.

Maybe he did. He'd spent a lot of time with them and liked them as a race and as individuals. But—by all the spirits, how they worked! How they drove themselves! As if demons were after them.

Well, there was no other way to rebuild, to reform the old obsolete methods and grasp the dazzling new wealth which only lay waiting to be created. But right now it was wonderfully soothing to lie in his garden, with the great golden flowers nodding about him and filling the summer air with their drowsy scent, with a few honey insects buzzing past and a new poem growing in his head.

The Solarians seemed to have some difficulty in understanding a whole race of poets. When even the meanest and stupidest Cundaloan could stretch out in the sun and make lyrics—well, every race has its own peculiar talents. Who could equal the gadgeteering genius which the humans possessed?

The great soaring, singing lines thundered in his head. He turned them over, fashioning them, shaping every syllable, and fitting the pattern together with a dawning delight. This one would be—good! It would be remembered, it would be sung a century hence, and they wouldn't forget Valka Vahino. He might even be remembered as a masterversemaker— *Alia Amaui cauianriho, valana, valana, vro!*

"Pardon, sir." The flat metal voice shook in his brain, he felt the delicate fabric of the poem tear and go swirling off into darkness and forgetfulness. For a moment there was only the pang of his loss; he realized dully that the interruption had broken a sequence which he would never quite recapture.

"Pardon, sir, but Mr. Lombard wishes to see you."

It was a sonic beam from the roboreceptionist which Lombard himself had given Vahino. The Cundaloan had felt the incongruity of installing its shining metal among the carved wood and old tapestries

of his house, but he had not wanted to offend the donor—and the thing was useful.

Lombard, head of the Solarian reconstruction commission, the most important human in Avaikian System. Just now Vahino appreciated the courtesy of the man's coming to him rather than simply sending for him. Only—why did he have to come exactly at this moment?

"Tell Mr. Lombard I'll be there in a minute."

Vahino went in the back way and put on some clothes. Humans didn't have the completely casual attitude toward nakedness of Cundaloa. Then he went into the forehall. He had installed some chairs there for the benefit of Earthlings, who didn't like to squat on a woven mat—another incongruity. Lombard got up as Vahino entered.

The human was short and stocky, with a thick bush of gray hair above a seamed face. He had worked his way up from laborer through engineer to High Commissioner, and the marks of his struggle were still on him. He attacked work with what seemed almost a personal fury, and he could be harder than tool steel. But most of the time he was pleasant, he had an astonishing range of interests and knowledge, and, of course, he had done miracles for the Avaikian System.

"Peace on your house, brother," said Vahino.

"How do you do," clipped the Solarian. As his host began to signal for servants, he went on hastily: "Please, none of your ritual hospitality. I appreciate it, but there just isn't time to sit and have a meal and talk cultural topics for three hours before getting down to business. I wish . . . well, you're a native here and I'm not, so I wish you'd personally pass the word around—tactfully, of course—to discontinue this sort of thing."

"But . . . they are among our oldest customs—"

"That's just it! Old—backward—delaying progress. I don't mean to be disparaging, Mr. Vahino. I wish we Solarians had some customs as charming as yours. But—not during working hours. Please."

"Well . . . I dare say you're right. It doesn't fit into the pattern of a modern industrial civilization. And that is what we are trying to build, of course." Vahino took a chair and offered his guest a cigarette. Smoking was one of Sol's characteristic vices, perhaps the most easily transmitted and certainly the most easily defensible. Vahino lit up with the enjoyment of the neophyte.

"Quite. Exactly. And that is really what I came here about, Mr. Vahino. I have no specific complaints, but there has accumulated a

whole host of minor difficulties which only you Cundaloans can handle for yourselves. We Solarians can't and won't meddle in your internal affairs. But you must change some things, or we won't be able to help you at all."

Vahino had a general idea of what was coming. He'd been expecting it for some time, he thought grayly, and there was really nothing to be done about it. But he took another puff of smoke, let it trickle slowly out, and raised his eyebrows in polite inquiry. Then he remembered that Solarians weren't used to interpreting nuances of expression as part of a language, and said aloud, "Please say what you like. I realize no offense is meant, and none will be taken."

"Good." Lombard leaned forward, nervously clasping and unclasping his big work-scarred hands. "The plain fact is that your whole culture, your whole psychology, is unfitted to modern civilization. It can be changed, but the change will have to be drastic. You can do it—pass laws, put on propaganda campaigns, change the educational system, and so on. But it *must* be done.

"For instance, just this matter of the siesta. Right now, all through this time zone on the planet, hardly a wheel is turning, hardly a machine is tended, hardly a man is at his work. They're all lying in the sun making poems or humming songs or just drowsing. There's a whole civilization to be built, Vahino! There are plantations, mines, factories, cities abuilding—you just can't do it on a four-hour working day."

"No. But perhaps we haven't the energy of your race. You are a hyperthyroid species, you know."

"You'll just have to learn. Work doesn't have to be backbreaking. The whole aim of mechanizing your culture is to release you from physical labor and the uncertainty of dependence on the land. And a mechanical civilization can't be cluttered with as many old beliefs and rituals and customs and traditions as yours is. There just isn't time. Life is too short. And it's too incongruous. You're still like the Skontarans, luging their silly spears around after they've lost all practical value."

"Tradition *makes* life—the meaning of life—"

"The machine culture has its own tradition. You'll learn. It has its own meaning, and I think that is the meaning of the future. If you insist on clinging to outworn habits, you'll never catch up with history. Why, your currency system—"

"It's practical."

"In its own field. But how can you trade with Sol if you base your credits on silver and Sol's are an abstract actuarial quantity? You'll have to convert to our system for purpose of trade—so you might as well change over at home, too. Similarly, you'll have to learn the metric system if you expect to use our machines or make sense to our scientists. You'll have to adopt . . . oh, everything!

"Why, your very society— No wonder you haven't exploited even the planets of your own system when every man insists on being buried at his birthplace. It's a pretty sentiment, but it's no more than that, and you'll have to get rid of it if you're going to reach the stars.

"Even your religion . . . excuse me . . . but you must realize that it has many elements which modern science has flatly disproved."

"I'm an agnostic," said Vahino quietly. "But the religion of Mauiroa means a lot to many people."

"If the Great House will let us bring in some missionaries, we can convert them to, say, Neopantheism. Which I, for one, think has a lot more personal comfort and certainly more scientific truth than your mythology. If your people are to have faith at all, it must not conflict with facts which experience in a modern technology will soon make self-evident."

"Perhaps. And I suppose the system of familial bonds is too complex and rigid for modern industrial society. . . . Yes, yes—there is more than a simple conversion of equipment involved."

"To be sure. There's a complete conversion of minds," said Lombard. And then, gently, "After all, you'll do it eventually. You were building spaceships and atomic-power plants right after Allan left. I'm simply suggesting that you speed up the process a little."

"And language—"

"Well, without indulging in chauvinism, I think all Cundaloans should be taught Solarian. They'll use it at some time or other in their lives. Certainly all your scientists and technicians will have to use it professionally. The languages of Laui and Muara and the rest are beautiful, but they just aren't suitable for scientific concepts. Why, the agglutination alone— Frankly, your philosophical books read to me like so much gibberish. Beautiful, but almost devoid of meaning. Your language lacks—*precision*."

"Aracles and Vranamaui were always regarded as models of crystal thought," said Vahino wearily. "And I confess to not quite grasping your Kant and Russell and even Korzybski—but then, I lack training

in such lines of thought. No doubt you are right. The younger generation will certainly agree with you.

"I'll speak to the Great House and may be able to get something done now. But in any case you won't have to wait many years. All our young men are striving to make themselves what you wish. It is the way to success."

"It is," said Lombard; and then, softly, "Sometimes I wish success didn't have so high a price. But you need only look at Skontar to see how necessary it is."

"Why—they've done wonders in the last three years. After the great famine they got back on their feet, they're rebuilding by themselves, they've even sent explorers looking for colonies out among the stars." Vahino smiled wryly. "I don't love our late enemies, but I must admire them."

"They have courage," admitted Lombard. "But what good is courage alone? They're struggling in a tangle of obsolescence. Already the overall production of Cundaloa is three times theirs. Their interstellar colonizing is no more than a feeble gesture of a few hundred individuals. Skontar can live, but it will always be a tenth-rate power. Before long it'll be a Cundaloan satellite state.

"And it's not that they lack resources, natural or otherwise. It's that, having virtually flung our offer of help back in our faces, they've taken themselves out of the main stream of Galactic civilization. Why, they're even trying to develop scientific concepts and devices we knew a hundred years ago, and are getting so far off the track that I'd laugh if it weren't so pathetic. Their language, like yours, just isn't adapted to scientific thought, and they're carrying chains of rusty tradition around. I've seen some of the spaceships they've designed themselves, for instance, instead of copying Solarian models, and they're ridiculous. Half a hundred different lines of approach, trying desperately to find the main line we took long ago. Spheres, ovoids, cubes—I hear someone even thinks he can build a tetrahedral spaceship!"

"It might just barely be possible," mused Vahino. "The Riemannian geometry on which the interstellar drive itself is based would permit—"

"No, no! Earth tried that sort of thing and found it didn't work. Only a crank—and, isolated, the scientists of Skontar are becoming a race of cranks—would think so.

"We humans were just fortunate, that's all. Even we had a long history before a culture arose with the mentality appropriate to a scientific

civilization. Before that, technological progress was almost at a standstill. Afterward, we reached the stars. Other races can do it, but first they'll have to adopt the proper civilization, the proper mentality—and without our guidance, Skontar or any other planet isn't likely to evolve that mentality for many centuries to come.

"Which reminds me—" Lombard fumbled in a pocket. "I have a journal here, from one of the Skontaran philosophical societies. A certain amount of communication still does take place, you know; there's no official embargo on either side. It's just that Sol has given Skang up as a bad job. Anyway"—he fished out a magazine—"there's one of their philosophers, Dyrin, who's doing some new work on general semantics which seems to be arousing quite a furor. You read Skontaran, don't you?"

"Yes," said Vahino. "I was in military intelligence during the war. Let me see—" He leafed through the journal to the article and began translating aloud:

"The writer's previous papers show that the principle of nonelementalism is not itself altogether a universal, but must be subject to certain psychomathematical reservations arising from consideration of the *broganar*—that's a word I don't understand—field, which couples to electronic wave-nuclei and—"

"What is that jabberwocky?" exploded Lombard.

"I don't know," said Vahino helplessly. "The Skontaran mind is as alien to me as to you."

"Gibberish," said Lombard. "With the good old Skontaran to-hell-with-you dogmatism thrown in." He threw the magazine on the little bronze brazier, and fire licked at its thin pages. "Utter nonsense, as anyone with any knowledge of general semantics, or even an atom of common sense, can see." He smiled crookedly, a little sorrowfully, and shook his head. "A race of cranks!"

"I wish you could spare me a few hours tomorrow," said Skorrogan.

"Well—I suppose so." Thordin XI, Valtam of the Empire of Skontar, nodded his thinly maned head. "Though next week would be a little more convenient."

"Tomorrow—please."

The note of urgency could not be denied. "All right," said Thordin. "But what will be going on?"

"I'd like to take you on a little jaunt over to Cundaloa."

"Why there, of all places? And why must it be tomorrow, of all times?"

"I'll tell you—then." Skorrogan inclined his head, still thickly maned though it was quite white now, and switched off his end of the telescreen.

Thordin smiled in some puzzlement. Skorrogan was an odd fellow in many ways. But . . . well . . . we old men have to stick together. There is a new generation, and one after that, pressing on our heels.

No doubt thirty-odd years of living in virtual ostracism had changed the old joyously confident Skorrogan. But it had, at least, not embittered him. When the slow success of Skontar had become so plain that his own failure could be forgotten, the circle of his friends had very gradually included him again. He still lived much alone, but he was no longer unwelcome wherever he went. Thordin, in particular, had discovered that their old friendship could be as alive as ever before, and he was often over to the Citadel of Kraakahaym, or Skorrogan to the palace. He had even offered the old noble a position back in the High Council, but it had been refused, and another ten years—or was it twenty?—had gone by with Skorrogan fulfilling no more than his hereditary duties as duke. Until now, for the first time, something like a favor was being asked. . . . Yes, he thought, I'll go tomorrow. To blazes with work. Monarchs deserve holidays, too.

Thordin got up from his chair and limped over to the broad window. The new endocrine treatments were doing wonders for his rheumatism, but their effect wasn't quite complete yet. He shivered a little as he looked at the wind-driven snow sweeping down over the valley. Winter was coming again.

The geologists said that Skontar was entering another glacial epoch. But it would never get there. In another decade or so the climate engineers would have perfected their techniques and the glaciers would be driven back into the north. But meanwhile it was cold and white outside, and a bitter wind hooted around the palace towers.

It would be summer in the southern hemisphere now, fields would be green, and smoke would rise from freeholders' cottages into a warm blue sky. Who had headed that scientific team?—Yes, Aesgayr Haasting's son. His work on agronomics and genetics had made it possible for a population of independent smallholders to produce enough food for the new scientific civilization. The old freeman, the backbone of Skontar in all her history, had not died out.

Other things had changed, of course. Thordin smiled wryly as he reflected just how much the Valtamate had changed in the last fifty years. It had been Dyrin's work in general semantics, so fundamental to all the sciences, which had led to the new psychosymbological techniques of government. Skontar was an empire in name only now. It had resolved the paradox of a libertarian state with a nonelective and efficient government. All to the good, of course, and really it was what past Skontaran history had been slowly and painfully evolving toward. But the new science had speeded up the process, compressed centuries of evolution into two brief generations. As physical and biological science had accelerated beyond belief— But it was odd that the arts, music, literature had hardly changed, that handicraft survived, that the old High Naarhaym was still spoken.

Well, so it went. Thordin turned back toward his desk. There was work to be done. Like that matter of the colony on Aesric's Planet— You couldn't expect to run several hundred thriving interstellar colonies without some trouble. But it was minor. The empire was safe. And it was growing.

They'd come a long way from that day of despair fifty years ago, and from the famine and pestilence and desolation which followed. A long way— Thordin wondered if even he realized just how far.

He picked up the microreader and glanced over the pages. His mind training came back to him and he arrished the material. He couldn't handle the new techniques as easily as those of the younger generation, trained in them from birth, but it was a wonderful help to arrish, complete the integration in his subconscious, and indolate the probabilities. He wondered how he had ever survived the old days of reasoning on a purely conscious level.

Thordin came out of the warp just outside Kraakahaym Citadel. Skorrogan had set the point of emergence there, rather than indoors, because he liked the view. It was majestic, thought the Valtam, but dizzying—a wild swoop of gaunt gray crags and wind-riven clouds down to the far green valley below. Above him loomed the old battlements, with the black-winged kraakar which had given the place its name hovering and cawing in the sky. The wind roared and boomed about him, driving dry white snow before it.

The guards raised their spears in salute. They were unarmed other-

wise, and the vortex guns on the castle walls were corroding away. No need for weapons in the heart of an empire second only to Sol's dominions. Skorrogan stood waiting in the courtyard. Fifty years had not bent his back much or taken the fierce golden luster from his eyes. It seemed to Thordin today, though, that the old being wore an air of taut and inwardly blazing eagerness: he seemed somehow to be looking toward the end of a journey.

Skorrogan gave conventional greeting and invited him in. "Not now, thanks," said Thordin. "I really am very busy. I'd like to start the trip at once."

The duke murmured the usual formula of polite regret, but it was plain that he could hardly wait, that he could ill have stood an hour's dawdling indoors. "Then please come," he said. "My cruiser is all set to go."

It was cradled behind the looming building, a sleek little roboship with the bewildering outline of all tetrahedral craft. They entered and took their seats at the center, which, of course, looked directly out beyond the hull.

"Now," said Thordin, "perhaps you'll tell me why you want to go to Cundaloa today?"

Skorrogan gave him a sudden look in which an old pain stirred.

"Today," he said slowly, "it is exactly fifty years since I came back from Sol."

"Yes—?" Thordin was puzzled and vaguely uncomfortable. It wasn't like the taciturn old fellow to rake up that forgotten score.

"You probably don't remember," said Skorrogan, "but if you want to vargan it from your subconscious, you'll perceive that I said to them, then, that they could come back in fifty years and beg my pardon."

"So now you want to vindicate yourself." Thordin felt no surprise —it was typically Skontaran psychology—but he still wondered what there was to apologize for.

"I do. At that time I couldn't explain. Nobody would have listened, and in any case I was not perfectly sure myself that I had done right." Skorrogan smiled, and his thin hands set the controls. "Now I am. Time has justified me. And I will redeem what honor I lost then by showing you, today, that I didn't really fail.

"Instead, I succeeded. You see, I alienated the Solarians on purpose."

He pressed the main-drive stud, and the ship flashed through half a

light-year of space. The great blue shield of Cundaloa rolled majestically before them, shining softly against a background of a million blazing stars.

Thordin sat quietly, letting the simple and tremendous statement filter through all the levels of his mind. His first emotional reaction was a vaguely surprised realization that, subconsciously, he had been expecting something like this. He hadn't ever really believed, deep down inside himself, that Skorrogan could be an incompetent.

Instead—no, not a traitor. But—what, then? What had he meant? Had he been mad, all these years, or—

"You haven't been to Cundaloa much since the war, have you?" asked Skorrogan.

"No—only three times, on hurried business. It's a prosperous system. Solar help put them on their feet again."

"Prosperous . . . yes, yes, they are." For a moment a smile tugged at the corners of Skorrogan's mouth, but it was a sad little smile, it was as if he were trying to cry but couldn't quite manage it. "A bustling, successful little system, with all of three colonies among the stars."

With a sudden angry gesture he slapped the short-range controls and the ship warped down to the surface. It landed in a corner of the great spaceport at Cundaloa City, and the robots about the cradle went to work, checking it in and throwing a protective forcedome about it.

"What—now?" whispered Thordin. He felt, suddenly, dimly afraid; he knew vaguely that he wouldn't like what he was going to see.

"Just a little stroll through the capital," said Skorrogan. "With perhaps a few side trips around the planet. I wanted us to come here unofficially, incognito, because that's the only way we'll ever see the real world, the day-to-day life of living beings which is so much more important and fundamental than any number of statistics and economic charts. I want to show you what I saved Skontar from." He smiled again, wryly. "I gave my life for my planet, Thordin. Fifty years of it, anyway—fifty years of loneliness and disgrace."

They emerged into the clamor of the great steel and concrete plain and crossed over the gates. There was a steady flow of beings in and out, a never-ending flux, the huge restless energy of Solarian civilization. A large proportion of the crowd was human, come to Avaiki on business or pleasure, and there were some representatives of other races. But the bulk of the throng was, naturally, native Cundaloans. Sometimes one had a little trouble telling them from the humans. After

all, the two species looked much alike, and with the Cundaloans all wearing Solarian dress—

Thordin shook his head in some bewilderment at the roar of voices. "I can't understand," he shouted to Skorrogan. "I know Cundaloan, both Laui and Muara tongues, but—"

"Of course not," answered Skorrogan. "Most of them here are speaking Solarian. The native languages are dying out fast."

A plump Solarian in shrieking sports clothes was yelling at an impassive native storekeeper who stood outside his shop. "Hey, you boy, gimme him fella souvenir chop-chop—"

"Pidgin Solarian," grimaced Skorrogan. "It's on its way out, too, what with all young Cundaloans being taught the proper speech from the ground up. But tourists never learn." He scowled, and for a moment his hand shifted to his blaster.

But no—times changed. You did not wipe out someone who simply happened to be personally objectionable, not even on Skontar. Not any more.

The tourist turned and bumped him. "Oh, so sorry," he exclaimed, urbanely enough. "I should have looked where I was going."

"Is no matter," shrugged Skorrogan.

The Solarian dropped into a struggling and heavily accented High Naarhaym: "I really must apologize, though. May I buy you a drink?"

"No matter," said Skorragan, with a touch of grimness.

"What a Planet! Backward as . . . as Pluto! I'm going on to Skontar from here. I hope to get a business contract—you know how to do business, you Skontarans!"

Skorrogan snarled and swung away, fairly dragging Thordin with him. They had gone half a block down the motilator before the Valtam asked, "What happened to your manners? He was trying hard to be civil to us. Or do you just naturally hate humans?"

"I like most of them," said Skorrogan. "But not their tourists. Praise the Fate, we don't get many of that breed on Skontar. Their engineers and businessmen and students are all right. I'm glad that relations between Sol and Skang are close, so we can get many of that sort. But keep out the tourists!"

"Why?"

Skorrogan gestured violently at a flashing neon poster. "That's why." He translated the Solarian:

SEE THE ANCIENT MAUIROA
CEREMONIES!

COLORFUL! AUTHENTIC! THE
MAGIC OF OLD CUNDALOA!

AT THE TEMPLE OF THE HIGH ONE
ADMISSION REASONABLE

"The religion of Mauiroa meant something, once," said Skorrogan quietly. "It was a noble creed, even if it did have certain unscientific elements. Those could have been changed— But it's too late now. Most of the natives are either Neopantheists or unbelievers, and they perform the old ceremonies for money. For a show."

He grimaced. "Cundaloa hasn't lost all its picturesque old buildings and folkways and music and the rest of its culture. But it's become conscious that they are picturesque, which is worse."

"I don't quite see what you're so angry about," said Thordin. "Times have changed. But they have on Skontar, too."

"Not in this way. Look around you, man! You've never been in the Solar System, but you must have seen pictures from it. Surely you realize that this is a typical Solarian city—a little backward, maybe, but typical. You won't find a city in the Avaikian System which isn't essentially—*human*.

"You won't find significant art, literature, music here any more—just cheap imitations of Solarian products, or else an archaistic clinging to outmoded native traditions, romantic counterfeiting of the past. You won't find science that isn't essentially Solarian, you won't find machines basically different from Solarian, you'll find fewer homes every year which can be told from human houses. The old society is dead; only a few fragments remain now. The familial bond, the very basis of native culture, is gone, and marriage relations are as casual as on Earth itself. The old feeling for the land is gone. There are hardly any tribal farms left; the young men are all coming to the cities to earn a million credits. They eat the products of Solarian-type food factories, and you can only get native cuisine in a few expensive restaurants.

"There are no more handmade pots, no more handwoven cloths.

They wear what the factories put out. There are no more bards chanting the old lays and making new ones. They look at the telescreen now. There are no more philosophers of the Araclean or Vranamauian schools, there are just second-rate commentaries on Aristotle versus Korzybski or the Russell theory of knowledge—"

Skorrogan's voice trailed off. Thordin said softly, after a moment, "I see what you're getting at. Cundaloa has made itself over into the Solarian pattern."

"Just so. It was inevitable from the moment they accepted help from Sol. They'd *have* to adopt Solar science, Solar economics, ultimately the whole Solar culture. Because that would be the only pattern which would make sense to the humans who were taking the lead in reconstruction. And, since that culture was obviously successful, Cundaloa adopted it. Now it's too late. They can never go back. They don't even want to go back.

"It's happened before, you know. I've studied the history of Sol. Back before the human race even reached the other planets of its system, there were many cultures, often radically different. But ultimately one of them, the so-called Western society, became so overwhelmingly superior technologically that . . . well, no others could coexist with it. To compete, they had to adopt the very approach of the West. And when the West helped them from their backwardness, it necessarily helped them into a Western pattern. With the best intentions in the world, the West annihilated all other ways of life."

"And you wanted to save us from that?" asked Thordin. "I see your point, in a way. Yet I wonder if the sentimental value of old institutions was equal to some millions of lives lost, to a decade of sacrifice and suffering."

"It was more than sentiment!" said Skorrogan tensely. "Can't you see? Science is the future. To amount to anything, we *had* to become scientific. But was Solarian science the only way? Did we have to become second-rate humans to survive—or could we strike out on a new path, unhampered by the overwhelming helpfulness of a highly developed but essentially alien way of life? I thought we could. I thought we would have to.

"You see, no nonhuman race will ever make a really successful human. The basic psychologies—metabolic rates, instincts, logical patterns, *everything*—are too different One race *can* think in terms of

another's mentality, but never too well. You know how much trouble there's been in translating from one language to another. And all thought is in language, and language reflects the basic patterns of thought. The most precise, rigorous, highly thought out philosophy and science of one species will never quite make sense to another race. Because they are making somewhat different abstractions from the same great basic reality.

"I wanted to save us from becoming Sol's spiritual dependents. Skang was backward. It *had* to change its ways. But—why change them into a wholly alien pattern? Why not, instead, force them rapidly along the natural path of evolution—our own path?"

Skorrogan shrugged. "I did," he finished quietly. "It was a tremendous gamble, but it worked. We saved our own culture. It's *ours*. Forced by necessity to become scientific on our own, we developed our own approach.

"You know the result. Dyrin's semantics was developed—Solarian scientists would have laughed it to abortion. We developed the tetrahedral ship, which human engineers said was impossible, and now we can cross the Galaxy while an old-style craft goes from Sol to Alpha Centauri. We perfected the spacewarp, the psychosymbology of our own race—not valid for any other—the new agronomic system which preserved the freeholder who is basic to our culture—everything! In fifty years Cundaloa has been revolutionized, Skontar has revolutionized itself. There's a universe of difference.

"And we've therefore saved the intangibles which are our own, the art and handicrafts and essential folkways, music, language, literature, religion. The *élan* of our success is not only taking us to the stars, making us one of the great powers in the Galaxy, but it is producing a renaissance in those intangibles equaling any Golden Age in history.

"And all because we remained ourselves."

He fell into silence, and Thordin said nothing for a while. They had come into a quieter side street, an old quarter where most of the buildings antedated the coming of the Solarians, and many ancient-style native clothes were still to be seen. A party of human tourists was being guided through the district and had clustered about an open pottery booth.

"Well?" said Skorrogan after a while. "Well?"

"I don't know." Thordin rubbed his eyes, a gesture of confusion.

"This is all so new to me. Maybe you're right. Maybe not. I'll have to think a while about it."

"I've had fifty years to think about it," said Skorrogan bleakly. "I suppose you're entitled to a few minutes."

They drifted up to the booth. An old Cundaloan sat in it among a clutter of goods, brightly painted vases and bowls and cups. Native work. A woman was haggling over one of the items.

"Look at it," said Skorrogan to Thordin. "Have you ever seen the old work? This is cheap stuff made by the thousands for the tourist trade. The designs are corrupt, the workmanship's shoddy. But every loop and line in those designs had meaning once."

Their eyes fell on one vase standing beside the old boothkeeper, and even the unimpressionable Valtam drew a shaky breath. It glowed, that vase. It seemed almost alive; in a simple shining perfection of clean lines and long smooth curves, someone had poured all his love and longing into it. Perhaps he had thought: This will live when I am gone.

Skorrogan whistled. "That's an authentic old vase," he said. "At least a century old—a museum piece! How'd it get in this junk shop?"

The clustered humans edged a little away from the two giant Skontarans, and Skorrogan read their expressions with a wry inner amusement: They stand in some awe of us. Sol no longer hates Skontar; it admires us. It sends its young men to learn our science and language. But who cares about Cundaloa any more?

But the woman followed his eyes and saw the vase glowing beside the old vendor. She turned back to him: "How much?"

"No sell," said the Cundaloan. His voice was a dusty whisper, and he hugged his shabby mantle closer about him.

"You sell." She gave him a bright artificial smile. "I give you much money. I give you ten credits."

"No sell."

"I give you hundred credits. Sell!"

"This mine. Fambly have it since old days. No sell."

"Five hundred credits!" She waved the money before him.

He clutched the vase to his thin chest and looked up with dark liquid eyes in which the easy tears of the old were starting forth. "No sell. Go 'way. No sell*oamaui.*"

"Come on," mumbled Thordin. He grabbed Skorrogan's arm and pulled him away. "Let's go. Let's get back to Skontar."

"So soon?"

"Yes. Yes. You were right, Skorrogan. You were right, and I am going to make public apology, and you are the greatest savior of history. But let's get home!"

They hurried down the street. Thordin was trying hard to forget the old Cundaloan's eyes. But he wondered if he ever would.

GROFF CONKLIN's personal enthusiasm for good writing in the field of science fiction has been in part responsible for the tremendous growth of interest in and appreciation of this relatively new type of entertainment reading. Readers of this book will find equally good stories in Mr. Conklin's earlier anthologies, *The Best of Science Fiction, A Treasury of Science Fiction,* and *The Big Book of Science Fiction.*

Mr. Conklin has been concerned with writing, editing, and publishing in the twenty-odd years since his graduation from Columbia. During the war he worked for the Office of Strategic Services. Among the magazines in which his articles have appeared are *Harper's, Woman's Home Companion, Better Homes and Gardens, Look,* etc.

THE VANGUARD PRESS, Inc.
424 Madison Avenue, New York 17, N. Y.

CONTENTS

Part One: The Solar System

RAYMOND Z. GALLUN: Operation Pumice 2
ROBERT A. HEINLEIN: The Black Pits of Luna 15
A. E. VAN VOGT: Enchanted Village 29
MALCOLM JAMESON: Lilies of Life 44
RAY BRADBURY: Asleep in Armageddon 65
ISAAC ASIMOV: Not Final! 79
FRANK BELKNAP LONG: Cones 96
D. L. JAMES: Moon of Delirium 113
THEODORE STURGEON: Completely Automatic 130
NELSON S. BOND: The Day We Celebrate 148
MARGARET ST. CLAIR: The Pillows 165
HAL CLEMENT: Proof 177

Part Two: The Galaxy

MURRAY LEINSTER: Propagandist 194
H. B. FYFE: In Value Deceived 213
JACK VANCE: Hard-Luck Diggings 225
JOHN BERRYMAN: Space Rating 238
KATHERINE MacLEAN: Contagion 257
CLIFFORD D. SIMAK: Limiting Factor 286
SAMUEL MERWIN, JR.: Exit Line 302
JAMES H. SCHMITZ: Second Night of Summer 309
ARTHUR C. CLARKE: A Walk in the Dark 337
POUL ANDERSON: The Helping Hand 347

THE VANGUARD PRESS, INC.
424 Madison Avenue • New York 17, N.Y.