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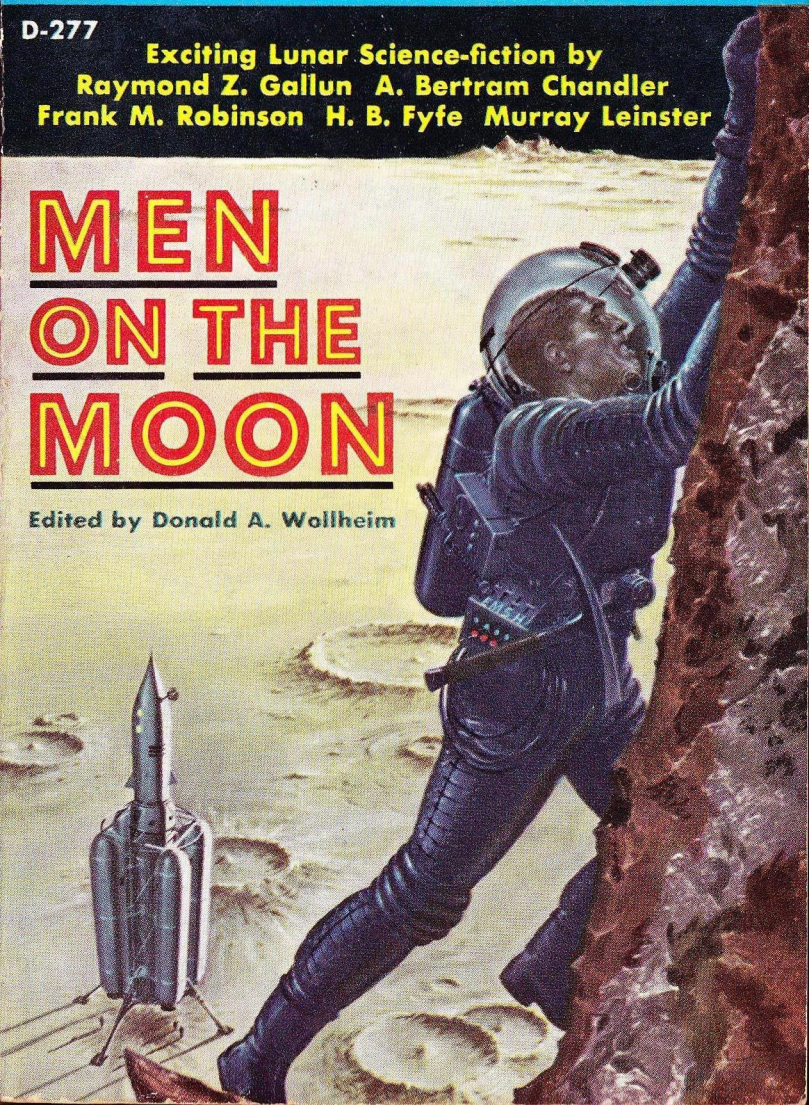
MEN ON THE MOON

Edited by Donald A. Wollheim



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A native New Yorker, he and his wife and young daughter share their home with one of the world's most extensive collections of fantasy books and magazines.

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MEN ON THE MOON

Edited by
DONALD A. WOLLHEIM

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INTRODUCTION

The day on which the first unmanned rocket from Earth will strike the surface of Luna is a matter of week-to-week speculation in the daily newspapers. It is expected momentarily.

If the launching of the first Sputnik was the curtain-raiser for the Space Age, the first man-made object to touch the surface of another world will officially open the first act of the infinite drama of interplanetary travel. Mankind therefore stands before another awesome turning point in human history, one which will eventually result in such changes in our lives as will dwarf all that has ever gone before.

But even as men must learn to crawl before they can walk, and walk before they can run, so the first act of our emergence into space will be relatively simple. The scene—the infertile surface of the moon; the actors—men of our own day and generation; the events—the thrilling yet not too fantastic conquest of our nearest neighbor in space.

Here then is a science-fiction anthology which may in a little while cease entirely to be "science-fiction" and instead become classifiable as a collection of realistic stories about actual events.

—Donald A. Wollheim

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OPERATION PUMICE

By Raymond Z. Gallun

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 glamor 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. Hitch-hiking.

"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 want to hear the kid's way of saying it.

"I had to see Moon Rocket One."

The words fitted Mel Robbins' picture of how it had been, perfectly. 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 space ship.

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' 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 pipe-like servicing tunnels aboard MR-1, which was not a single rocket, but five separate ones, sleeved into each other. The smallest, at the space ship'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 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 newspaper woman 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 talked about, now, 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! An old theory may be right—that the Moon has been drawn out of shape by the constant pull of terrestrial gravity is one direction—it may bulge on the hemisphere which always faces Earth, and be hollowed on the other. All the air may be cupped there. There might be lakes and trees and strange 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' 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 space ship 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 hitch-hiked out from Long Island City."

Robbin'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 light-weight 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 cold, 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 semi-darkness. 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 not only come from the other side of the Earth; it could 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 pulses 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 ultra-violet 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 some 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 space ship 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 was 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 fireborne—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 a 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, like he was supposed to do:

". . . vision dims under high acceleration, but I can still 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 would 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 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 space sickness 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 sunblasted deserts, thumbing to leering motorists who never stopped.

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

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 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 curving behind Luna, now. 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 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 cooled to rigidity.

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 space ships 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 another 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 further. It seemed like a defeat for the kid, for himself of years ago, and for all the naive 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' 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, burnt 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 three thousand miles. That was guts to admire. Grabbed by the cops, he still found appreciation in being near MR-1. He didn't realize the future 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' mind around, making it argue in another direction.

The word "feelings" became a kind of pivot of his ar-

guments. 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 good-intentioned ones had been trying to sell fairness, freedom from prejudice, equality and optimism 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 feel cynical about the whole repetitious business sometimes. 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' 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 the 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.

JETSAM

by A. Bertram Chandler

WITH deceptive ease the rocket drifted down, down, the flare of her exhaust vivid against the black sky, the long, downreaching streamer of incandescent gas stirring the fine pumice dust to a coruscating flurry, then, as she lost still more altitude, fusing the almost impalpable powder to a slag that glowed red, red beneath crusty, thickening gray, for minutes after her passing.

Auxiliary jets flared briefly, fiercely, to kill her lateral drift. Again they flared, and a third time. The rocket was all of ten feet above the almost featureless surface when, suddenly main and auxiliary jets went out like a a snuffed candle. She fell—but with an odd, almost nightmarish slowness. She landed as silently as she had come, tilting heavily at first, then slightly, first one way and then the other as the powerful, fluid-damped springs, not unlike the recoil mechanism of a piece of artillery, took the weight and the shock and, after the preliminary swaying and quivering, allowed her to assume an upright position.

She stood there, then, gleaming in the harsh sunlight, a bright ovoid suspended in to tripod that was her vaned landing gear. She should, perhaps, have looked strange, alien—but she did not. She was as much part of the scheme of things as the plain of pumice dust, as the ring craters, as the serrated ridge of the distant mountain range above which hung, seeming almost to touch the jagged peaks, looming huge in the black, diamond spangled sky, the great, cloudy opal that was

Earth. She was new and bright, her shell plating barely scarred by her swift, screaming passage through the atmosphere of her mother world—but she belonged. She was new, the first of her kind—but the dream was old, old.

She was part of the dream.

Inside the rocket, inside the cramped living cabin that was also the control room, the men pulled their bulky, cumbersome spacesuits on over their thick, porous plastic underwear. The biggest of them all, the Captain, adjusted clips and zippers stolidly, did not so much as glance out of the now unscreened ports on the shadowed side of the rocket. The Pilot, the Radio Technician and the Engineers tried to follow his phlegmatic example. Only the Navigator—his slight body was still almost that of a boy and he had yet to lose his boyish enthusiasm—stood staring out at the Lunar landscape, his fingers fumbling as he stared, groping vaguely and clumsily through the routine of the airtight fastenings, making foolish mistakes that brought a frown to his commander's face.

This was all part of the dream—and he was living it.

"Sparks," said the Captain, "you'd better make sure that the Stargazer has done his suit up properly. Otherwise I don't know how we shall find our way home."

"We can do without *him*, sir," said the Radio Officer. "Earth's too big to miss—at this range."

"That's what the boys of the garrison'll be saying," laughed the Pilot. "*When* we get the launching site established."

"If *they* give us time," said the Engineer.

"Enough of that," said the Captain. "We're here, and that's all that matters just now. We have our job to do—preliminary survey, samples of soil and rock, as much exploration as we have time for. As far as our friends on

the other side of the Curtain are concerned—this is no more than a scientific expedition. Understand?"

"We understand," said the men.

"Hurry up, Stargazer," said the Captain. "It'll all look better outside."

"Yes, sir," said the Navigator, clicking the last fastenings of his suit tight. Then, almost whispering—"But this is all wrong. It should have been what you said, sir—no more than a scientific expedition . . ."

"Don't be a fool!" snapped the Captain. "You told me yourself that this had always been your dream—ever since, as a kid, you used to read those trashy books with the gaudy covers. You've got your dream . . ."

It's been taken from me, thought the Navigator.

"You've got your dream—now quit whining. Helmets on, men. Test your radios."

There was a babble of conversation, tinny, distorted, then once again the sharp, commanding tones of the Captain.

"The first job," he told his crew, "is the marker." He turned to face the unscreened ports, pointed—his arm bloated and ungainly in the sleeve of his spacesuit. "That mound, there. About a mile away."

Two men lifted the big, square box that was the marker. Two of the others opened the hatch to the airlock, scrambled down into the little compartment, stood with outstretched arms to receive the box. They lowered it carefully to the deck.

"All right, Driver," called the Captain. "Come on out. The airlock will hold only two—and I'm being first on the Moon. The Navigator can be second—so stay where you are, Stargazer."

"I set her down, Captain," said the Pilot in a surly voice.

"Aye—and if it weren't for the fact that you can claim

lack of practice I'd have your eagles for the job you made of it. One blast of the auxiliaries should have been sufficient. Thanks to the way you were throwing reaction mass around we may have to lighten ship yet . . . Got the flag, there?"

"Coming down, Captain," called the Engineer, passing the long, cylindrical case to his commander.

"Then close the hatch!"

In the confined space of the airlock the two men, Captain and Navigator, watched the needle of the pressure gauge move jerkily towards the Zero of the scale.

Now, the Navigator was thinking. *Now. At last.* Crazily, selfishly, he thought, *I've only to push him aside when the door opens, and jump . . . And that would mean, he told himself, that I should be the first man on the Moon—and that it'd be my first and only time on the Moon. Besides having twenty years or so in military prison to follow . . .*

"What's wrong, Stargazer?" asked the Captain. "You look like a sick goldfish behind that helmet of yours . . . Open the door, now!"

The Navigator turned the controlling wheel, felt the click of released clamps through his thick, clumsy gloves. The door opened inwards. He stared out through the circular aperture at the glaring white plain, the distant ring craters, the black shadow of the ship. The Captain pushed past him, one bulky arm thrust through the carrying sling of the flag case. The big man lowered himself carefully through the opening, his feet searching for and at last finding the toe holds cut in the nearer of the vanes. Moving slowly, cautiously, he vanished from sight. He called, "Come on. The others can send the marker down."

I could still fall, thought the Navigator. *Accidentally. And be the first . . .*

But he followed the Captain with as much caution as the big man had displayed, pausing for a moment on the ladder while he called to those in the ship, using his radio telephone, to close the outer airlock door by remote control so that the compartment could be repressurized. The last ten feet, however—the Captain was now clear of the ladder, standing arrogantly with wide spread legs—he dropped, feeling as he slowly fell that this was a dream that he had known all his life, a dream that was at last coming true.

With the Captain he stood and watched the door open again, watched the Pilot and Sparks, identified by the colors of their spacesuits, clamber down the ladder. The airlock door had shut again behind them. The four men stood in silence until it opened again and the Engineer stood framed in the orifice.

"Don't forget the marker, Jets!" called the Captain unnecessarily.

The Engineer had not forgotten. Slowly, carefully, he lowered the square box on the end of a piece of line. After the Pilot had received it, unhitched the heavy cord, Jets slowly and carefully pulled up the light gantline, methodically coiling it as he did so.

"Don't bother with that *now!*" called the Captain. "We're all waiting."

At last all five men were standing just clear of the shadow cast by the rocket. It was hot in the sun. The insulation and the cooling arrangements of the suits, thought the Navigator, did not seem to be so efficient as they had been led to believe. Or, perhaps, the effect of heat was psychological rather than physical. In this glaring light, with the sun intolerably bright in the black sky, the mind expected the sensation of heat and would,

unlike the instruments that had been used when the suits were tested, do its best to supply the deficiency if no such sensation were apparent.

The Captain was talking. The Navigator, still philosophizing over objectivity and subjectivity, consciously heard only disjointed phrases of the oration that crackled through his helmet speaker.

". . . take possession . . . in the name of . . ."

The leader of the expedition pulled the flag from its case, drove the sharp ferrule of the staff deep into the powdery soil. For a brief moment the folds of flimsy plastic fluttered free, for less than a second there was a glimpse of the formal, geometric pattern of blue and white and crimson. Then the flag was no more than two yards of colored material hanging limply from an upright stick, the colors seeming already to be fading in the fierce sunlight.

There should be an atmosphere for this sort of thing, thought the Navigator. *An atmosphere, and wind . . .* Abruptly he began to remember the words of the Captain's speech, the words that, like the ceremony of the flag, were symbols of ideas.

Take possession . . . he thought. *Possession. What right have we to take possession, save on behalf of the human race? We built the rocket, and we brought her here, but the ideas, the technology, behind her building and launching and navigation are the common property of all mankind. Science knows no frontiers. And neither does the dream of which we are lucky enough to be the . . . the end result?* He grinned wrily. "The dream," he whispered aloud, "is turning sour."

"What was that, Stargazer?" asked the Captain sharply.

"Nothing, sir," lied the Navigator.

"Careful, now, men," warned the Captain. "No acro-

batics. Shuffle—don't try to jump. You can break a leg or fracture a face plate as easily on the Moon as on Earth."

Sparks and Jets picked up the marker between them, followed the other three men as they trudged slowly and carefully across the plain to the slight mound that the leader had pointed out as the best place for the sign of their safe arrival.

The mound, when they came to it, had more of the appearance of a shallow ring crater. The slope up to its rim was so slight as to be hardly noticeable, but the depression in its center was more pronounced. It was, thought the Navigator, as though some giant had blown hard and steadily down on to the thick pumice dust. *A giant,* he amended, *with very hot breath . . .*For the dust, especially toward the center of the crater, was crusted over with a thin, brittle slag that snapped under the men's heavy boots like an ice crust on snow.

Suddenly the Navigator stopped, fell to his knees in the dust. His thick gloved hands scrabbled for the obstacle that had almost tripped him. The thing, when he dragged it up into the light, was badly damaged—by his hands, his clumsy boot, by the intense heat to which it had been subjected . . . *when?*

The Captain, stooping beside him, swore bitterly.

"See we're not the first! *They* have beaten us to it!"

The Navigator got to his feet, holding the crushed and warped artifact gently.

"They?" he asked. "*They,* Captain? Who are—or were—*they?* This is, or was, some kind of instrument. As far as I can see its case is metal—and neither we nor our friends on the other side of the Curtain can afford to use metal for anything where wood or plastic would serve . . . Look, too, on the side here . . . Operating

instructions? In a script that to any man of Earth would be no more than a meaningless scribble."

"We should have brought along an archaeologist," suggested Sparks, half seriously.

"Can anybody here read Martian?" asked the Pilot.

"Stop that!" snapped the Captain. "This is no laughing matter. It's serious. Somebody has been here before us, may be here now. It is our duty to find out who, and when, and why. You, Sparks and Jets, carry the marker another mile or so to the northward. To that solitary rock. If it *is* a rock. It it turns out to be some other damned artifact let me know at once. The rest of us . . . dig!"

For a while they found nothing further.

They had no tools but their thick-gloved hands. There were, of course, light shovels in the ship but, somehow, nobody thought of going back for them. The odd sense of urgency that now possessed them would have made the short journey to the rocket and back seem a waste of precious and fast-running-out time. They perspired heavily in their suits, soaking the thick underwear that clad them under the armor. If any one of them worked with his back to the sun for more than a minute or so the transparent plastic of his helmet misted over.

Meanwhile, Sparks and Jets had reached the fresh site for the marker. Sparks' voice drifted tinnily through the helmet speakers. "All ready, Captain. Set to throw North, away from you."

"Good. Any further signs of interlopers?"

"No, sir."

"Then start the fuse and come back here."

As by common consent the three diggers straightened their aching backs, watched their two shipmates trudging towards them over the glaring plain. Behind the

jerkily moving figures there was a sudden, brief flare of ruddy light—a flare of light and a dense, black cloud that seemed to spread like, but much faster than, a dribble of ink spilled on clean blotting paper. But it was disappointing, somehow, unspectacular. Against the light blue—or white—or gray-clouded sky of Earth the explosion of the container of finely divided carbon would have had something of drama. Here, with no air to support the particles, it lost most of its effect.

But it will be effective enough back home, thought the Navigator. *Our astronomers will see it. And the others. And then . . .*

"Back to the digging, men," ordered the Captain. "Sparks and Jets—turn to as soon as you get here."

"Sir!" cried the Pilot. "Captain! I've found something! A man!"

It was not a man, of course. It was a spacesuit, not unlike the ones that the explorers were wearing. It had been the property of one who was, by their standards, almost a giant, at least half as tall again as they were. There would have been some justification for the belief that the wearer of the suit was exceptional—but the three others suits turned up beside the first one were equally large.

"Whoever they are," said the Captain at last, "they're big bastards. But humanoid. Two legs, two arms, a head. But big."

"Martians," said the Pilot. "Like I said before."

"How do you make that out, Driver?"

"Well, sir, look at this—I suppose you could call it a crater. Take *our* ship away—and what have you got? The same sort of configuration. The down blast will fuse some of the pumice—and some of it will blow out and away. And if we do have to jettison unessential equip-

ment to lighten ship—it'll be covered over as this was, and we can pick it up on our return."

"But why Martians?" asked the Captain.

"Well, sir, if there are men on Mars, men anything like us, they'll tend to be tall and spindly on account of the feeble gravity. And the men who wore these suits were tall. Furthermore, they'd be more inclined to land on the Moon than Earth. Perhaps their ships, like themselves, were—*are*—too fragile to attempt setting down on a relatively heavy gravity planet. So they came here, and observed, and took photographs maybe—I still think that the thing that the Stargazer found is a camera of some kind—checked up their fuel and found that they couldn't quite reach escape velocity, so dumped all this stuff."

"Ingenious," said the Captain. "But if the Martians are such gangling weaklings as you imply, then these suits are far too heavy for them. Look at them. Look at the way that they've consistently used metal where a light plastic would have done at least as well."

"Perhaps they *are* too heavy," admitted the Pilot grudgingly. Then, "But, sir, they wouldn't be too heavy for them here, on the Moon!"

The Captain laughed. "Almost you convince me, Driver. Anyhow—it's not our friends from the other side of the Curtain. Unless," he laughed again, "their biologists have produced a new breed of man suitable for Lunar conditions. But I wonder how long ago it was that your Martians were here. I wonder when they are coming back."

"They aren't," said the Navigator. "This must have been a one shot affair. Come this way, sir."

The Captain followed him to the center of the little crater, looked curiously as his subordinate fell to his knees, and stirred the pumice dust.

"What are you getting at, Stargazer?"

"Just this, sir. The dust. Look at it. Touch it."

"But what . . . ?"

"Under the dust there's a sort of slag—just the same sort of slag that you'll find directly under our jets. It's thick, solid—not like the thin crust out towards the rim. And there's at least half an inch of dust on top of it. On a world with no air, no wind. Just the slow, slow seepage of microscopic particles from the crater slopes over the . . . centuries? No, not centuries. Millennia, perhaps. Or longer."

"A pity," said the Captain. "I was rather looking forward to meeting the Driver's Martians. But who *were* these people?"

The Navigator moved his head inside his helmet until he found the tube of his little fresh water tank with his lips, took a short, unsatisfying sip before replying. Something—some suspicion, some fear—had made his mouth suddenly dry.

"I don't know, Captain," he said. "I don't *know*."

"But you think."

"Yes, I think. I have a . . . feeling about all this. But I'd sooner keep it to myself until we have more evidence."

"As you say. But we must return to the ship soon. I'm just about dehydrated. Ah, here are Sparks and Jets to bear a hand."

Slowly the pile of salvaged equipment grew. Another, smaller camera, less badly damaged than the first one, metal oxygen—or so the explorers assumed—cylinders, two glass bottles, their labels still intact, still displaying with clarity the queer, unreadable script of those who had left them there. A pair of binoculars, a pile of clothing that crumbled to fine powder when handled, three sheath knives still encased in a dry, brittle integu-

ment that had once been leather, a metal case full of wiring.

It was the Navigator who found the book. A magazine it was, rather a flimsy affair of paper that had once been glossy, of pictures that still retained some faint traces of color. When uncovered it was open—flung down carelessly, perhaps, or, it could be, left that way by the long-dead astronaut who had thumbed with clumsy, gloved hands through its pages.

It was open at the picture of a girl, naked, reclining on what could have been a grassy lawn. There were trees in the background. There was a dog beside his mistress. Under the picture were words in the unknown script.

"Look," said the Navigator. "Here's the proof. No freak of parallel evolution could have produced that woman. Or that dog. Or those trees."

"Proof of *what*, Stargazer?"

"That the people who had to lighten ship before they could return came from the Earth, *our* Earth."

"Hogwash!" exploded the Captain.

"No, sir, it's not. It was, of course, a long time ago."

"So they had rockets, and photography, and printing in the Middle Ages? Is that what you're trying to tell me?"

"No, sir. Not the Middle Ages. Before the Flood."

"Come off it, Stargazer. This is too much, even from you."

"Then how else do you account for all this? Look at it this way, sir. All mythologies—*all*—have a legend of the Deluge, of the Flood that destroyed all life save for a chosen few. Those few may have been favored by the gods, they may have been just lucky. Whatever the way of it was—they were our forebears. And the Flood itself —was it a flood as we know it? A mere abnormally high

tide, a mere bursting by some river of its bounds? Remember, sir, that all people, North and South, East and West, have the Flood in their mythologies. The Flood—and the legend of lost continents . . ."

"Go on."

"There was a Flood, and there *were* continents—populous, highly civilized—that are now lost. It's all part of the same story. A violent, seismic upheaval, as a result of which great land masses went down with all hands, as a result of which new lands rose from the ocean beds."

"These people, if there ever were such people," said the Captain, "were scientists. They had reached at least the same level as we ourselves. One would think that they could have coped with such a disaster."

"Not if they, themselves, caused it. It is reasonable to suppose, Captain, that a certain level of technology produces both the spaceship and the atom bomb. Imagine the effect of say, twenty hydrogen bombs exploded along geological fault lines."

"But it's rather strange," said the Pilot, "that they never came back here. It's odd that this upheaval of yours should have occurred just after the first successful Lunar flight."

"Is it so odd? Perhaps they, like us, had a Curtain with two sides to it. Perhaps they, like us, intended using this world for military purposes—and the radio signal announcing their safe and successful landing on the Moon was detonator for the Big Bang. . . ."

There was silence as all five men stared at the low-hanging Earth.

"All theories," said the Captain at last, heavily. "Pick up what you can of this . . . junk, men, and carry it back to the ship. We're only serving officers of the Empress-Mother doing a job of work—we'll leave the fabri-

cation of fairy stories to the scientists when we get back to Earth."

As he stooped to pick up the pair of binoculars he found one more trifle half buried in the pumice dust. He scooped it up carefully in his gloved hand. It was fragile, mere rubbish, a discarded container that had held something and which was now empty. There was a flimsy, inner box of metal foil, an even flimsier outer box of paper with an external layer of some transparent substance which had preserved the script and the picture of the familiar animals that had once symbolized—*something.*

The Captain stared at it.

"A camel," he said at last, wonderingly. "A camel. I'd like to know what used to be in this packet . . ."

THE RELUCTANT HEROES

By Frank M. Robinson

The very young man sat on the edge of the sofa and looked nervous. He carefully studied his fingernails and ran his hands through his hair and picked imaginary lint off the upholstery.

"I have a chance to go with the first research expedition to Venus," he said.

The older man studied the very young man thoughtfully and then leaned over to his humidor and offered him a cigaret. "It's nice to have the new air units now. There was a time when we had to be very careful about things like smoking."

The very young man was annoyed.

"I don't think I want to go," he blurted. "I don't think I would care to spend two years there."

The older man blew a smoke ring and watched it drift toward the air exhaust vent.

"You mean you would miss it here, the people you've known and grown up with, the little familiar things that have made up your life here. You're afraid the glamor would wear off and you would get to hate it on Venus."

The very young man nodded miserably. "I guess that's it."

"Anything else?"

The very young man found his fingernails extremely fascinating again and finally said, in a low voice, "Yes, there is."

"A girl?"

A nod confirmed this.

It was the older man's turn to look thoughtful. "You know, I'm sure, that psychologists and research men

agree that research stations should be staffed by couples. That is, of course, as soon as it's practical."

"But that might be a long time!" the very young man protested.

"It might be—but sometimes it's sooner than you think. And the goal is worth it."

"I suppose so, but "

The older man smiled. "Still the reluctant heroes," he said, somewhat to himself.

Chapman stared at the radio key.

Three years on the Moon and they didn't want him to come back.

Three years on the Moon and they thought he'd be glad to stay for more. Just raise his salary or give him a bonus, the every-man-has-his-price idea. They probably thought he liked it there.

Oh, sure he loved it. Canned coffee, canned beans, canned pills, and canned air until your insides felt as though they were plated with tin. Life in a cramped, smelly little hut where you could take only ten steps in any direction. Their little scientific home of tomorrow with none of the modern conveniences, a charming place where you couldn't take a shower, couldn't brush your teeth, and your kidneys didn't work right.

And for double his salary they thought he'd be glad to stay for another year and a half. Or maybe three. He should probably be glad he had the opportunity.

The key started to stutter again, demanding an answer.

He tapped out his reply: *"No!"*

There was a silence and then the key stammered once more in a sudden fit of bureaucratic rage. Chapman stuffed a rag under it and ignored it. He turned to the hammocks, strung against the bulkhead on the other side of the room.

The chattering of the key hadn't awakened anybody, they were still asleep, making the animal noises that people usually make in slumber. Dowden, half in the bottom hammock and half on the floor, was snoring peacefully. Dahl, the poor kid who was due for stopover, was mumbling to himself. Julius Klein, with that look of ineffable happiness on his face, looked as if he had just squirmed under the tent to his personal idea of heaven. Donley and Benig were lying perfectly still, their covers not mussed, sleeping very lightly.

Lord, Chapman thought, I'll be happy when I can see some other faces.

"What'd they want?" Klein had one eyelid open and a questioning look on his face.

"They wanted me to stay until the next relief ship lands," Chapman whispered back.

"What did you say?"

He shrugged. "No."

"You kept it short," somebody else whispered. It was Donley, up and sitting on the side of his hammock. "If it had been me, I would have told them just what they could do about it."

The others were awake now, with the exception of Dahl who had his face to the bulkhead and a pillow over his head.

Dowden rubbed his eyes sleepily. "Sore, aren't you?"

"Kind of. Who wouldn't be?"

"Well don't let it throw you. They've never been here on the Moon. They don't know what it's like. All they're trying to do is get a good man to stay on the job a while longer."

"*All* they're trying to do," Chapman said sarcastically. "They've got a fat chance."

"They think you've found a home here," Donley said.

"Why the hell don't you guys shut up until morning?"

Dahl was awake, looking bitter. "Some of us still have to stay here, you know. Some of us aren't going back today."

No, Chapman thought, some of us aren't going back. You aren't. And Dixon's staying, too. Only Dixon isn't ever going back.

Klein jerked his thumb toward Dahl's bunk, held a finger to his lips, and walked noiselessly over to the small electric stove. It was his day for breakfast duty.

The others started lacing up their bunks, getting ready for their last day of work on the Moon. In a few hours they'd be relieved by members of the Third research group and they'd be on their way back to Earth.

And that includes me, Chapman thought. I'm going home. I'm finally going home.

He walked silently to the one small, quartz window in the room. It was morning—the Moon's "morning"—and he shivered slightly. The rays of the Sun were just striking the far rim of the crater and long shadows shot across the crater floor. The rest of it was still blanketed in a dark jumble of powdery pumice and jagged peaks that would make the Black Hills of Dakota look like paradise.

A hundred yards from the research bunker he could make out the small mound of stones and the forlorn homemade cross, jury-rigged out of small condensed milk tins slid over crossed iron bars. You could still see the footprints in the powdery soil where the group had gathered about the grave. It had been more than eighteen months ago, but there was no wind to wear those tracks away. They'd be there forever.

That's what happened to guys like Dixon, Chapman thought. On the Moon, one mistake could use up your whole quota of chances.

Klein came back with the coffee. Chapman took a cup, gagged, and forced himself to swallow the rest of it. It

had been in the can for so long you could almost taste the glue on the label.

Donley was warming himself over his cup, looking thoughtful. Dowden and Bening were struggling into their suits, getting ready to go outside. Dahl was still sitting on his hammock, trying to ignore them.

"Think we ought to radio the space station and see if they've left there yet?" Klein asked.

"I talked to them on the last call," Chapman said. "The relief ship left there twelve hours ago. They should get here"—he looked at his watch—"in about six and a half hours."

"Chap, you know, I've been thinking," Donley said quietly. "You've been here just twice as long as the rest of us. What's the first thing you're going to do once you get back?"

It hit them, then. Dowden and Bening looked blank for a minute and blindly found packing cases to sit on. The top halves of their suits were still hanging on the bulkhead. Klein lowered his coffee cup and looked grave. Even Dahl glanced up expectantly.

"I don't know," Chapman said slowly. "I guess I was trying not to think of that. I suppose none of us have. We've been like little kids who have waited so long for Christmas that they just can't believe it when it's finally Christmas Eve."

Klein nodded in agreement. "I haven't been here three years like you have, but I think I know what you mean." He warmed up to it as the idea sank in. "Just what the hell *are* you going to do?"

"Nothing very spectacular," Chapman said, smiling. "I'm going to rent a room over Times Square, get a recording of a rikky-tik piano, and drink and listen to the

music and watch the people on the street below. Then I think I'll see somebody."

"Who's the somebody?" Donley asked.

Chapman grinned. "Oh, just somebody. What are you going to do, Dick?"

"Well, I'm going to do something practical. First of all, I want to turn over all my geological samples to the government. Then I'm going to sell my life story to the movies and then—why, then, I think I'll get drunk!"

Everybody laughed and Chapman turned to Klein. "How about you, Julius?"

Klein looked solemn. "Like Dick, I'll first get rid of my obligations to the expedition. Then I think I'll go home and see my wife."

They were quiet. "I thought all members of the groups were supposed to be single," Donley said.

"They are. And I can see their reasons for it. But who could pass up the money the Commission was paying?"

"If I had to do it all over again? Me," said Donley promptly.

They laughed. Somebody said: 'Go play your record, Chap. Today's the day for it."

The phonograph was a small, wind-up model that Chapman had smuggled in when he had landed with the First group. The record was old and the shellac was nearly worn off, but the music was good.

The roads are the dustiest,
The winds are the gustiest
The gates are the rustiest,
The pies are the crustiest,
The songs are the lustiest,
The friends the trustiest,
*Way back home.**

They ran through it twice.

They were beginning to feel it now, Chapman thought. They were going to go home in a little while and the idea was just starting to sink in.

"You know, Chap," Donley said, "it won't seem like the same old Moon without you on it. Why, we'll look at it when we're out spooning or something and it just won't have the same old appeal."

"Like they say in the army," Bening said, "you never had it so good. You found a home here."

The others chimed in and Chapman grinned. Yesterday or a week ago they couldn't have done it. He had been there too long and he had hated it too much.

The party quieted down after a while and Dowden and Bening finished getting into their suits. They still had a section of the sky to map before they left. Donley was right after them. There was an outcropping of rock that he wanted a sample of and some strata he wished to investigate.

And the time went faster when you kept busy.

Chapman stopped them at the lock. "Remember to check your suits for leaks," he warned. "And check the valves of your oxygen tanks."

Donley looked sour. "I've gone out at least five hundred times," he said, "and you check me each time."

"And I'd check you five hundred more," Chapman said. "It takes only one mistake. And watch out for blisters under the pumice crust. You go through one of those and that's it, brother."

Donley sighed. "Chap, you watch us like an old mother hen. You see we check our suits, you settle our arguments, you see that we're not bored and that we stay healthy and happy. I think you'd blow our noses for us if we caught cold. But some day, Chap old man, you're

gonna find out that your little boys can watch out for themselves!"

But he checked his suit for leaks and tested the valve of his tank before he left.

Only Klein and Chapman were left in the bunker. Klein was at the work table, carefully labeling some lichen specimens.

"I never knew you were married," Chapman said.

Klein didn't look up. "There wasn't much sense in talking about it. You just get to thinking and wanting—and there's nothing you can do about it. You talk about it and it just makes it worse."

"She let you go without any fuss, huh?"

"No, she didn't make any fuss. But I don't think she liked to see me go, either." He laughed a little. "At least I hope she didn't."

They were silent for a while. "What do you miss most, Chap?" Klein asked. "Oh, I know what we said a little while ago, but I mean seriously."

Chapman thought a minute. "I think I miss the sky," he said quietly. "The blue sky and the green grass and trees with leaves on them that turn color in the Fall. I think, when I go back, that I'd like to go out in a rain storm and strip and feel the rain on my skin."

He stopped, feeling embarrassed. Klein's expression was encouraging. "And then I think I'd like to go downtown and just watch the shoppers on the sidewalks. Or maybe go to a burlesque house and smell the cheap perfume and the popcorn and the people sweating in the dark."

He studied his hands. "I think what I miss most is people—all kinds of people. Bad people and good people and fat people and thin people and people I can't understand. People who wouldn't know an atom from an

artichoke. And people who wouldn't give a damn. We're a quarter of a million miles from nowhere, Julius, and to make it literary, I think I miss my fellow man more than anything."

"Got a girl back home?" Klein asked almost casually.

"Yes."

"You're not like Dahl. You've never mentioned it."

"Same reason you didn't mention your wife. You get to thinking about it."

Klein flipped the lid on the specimen box. "Going to get married when you get back?"

Chapman was at the port again, staring out at the bleak landscape. "We hope to."

"Settle down in a small cottage and raise lots of little Chapmans, eh?"

Chapman nodded.

"That's the only future," Klein said.

He put away the box and came over to the port. Chapman moved over so they both could look out.

"Chap." Klein hesitated a moment. "What happened to Dixon?"

"He died," Chapman said. "He was a good kid, all wrapped up in science. Being on the Moon was the opportunity of a lifetime. He thought so much about it that he forgot a lot of little things—like how to stay alive. The day before the Second group came, he went out to finish some work he was interested in. He forgot to check for leaks and whether or not the valve on his tank was all the way closed. We couldn't get to him in time."

"He had his walkie-talkie with him?"

"Yes. It worked fine, too. We heard everything that went through his mind at the end."

Klein's face was blank. "What's your real job here, Chap? Why does somebody have to stay for stopover?"

"Hell, lots of reasons, Julius. You can't get a whole re-

lief crew and let them take over cold. They have to know where you left off. They have to know where things are, how things work, what to watch out for. And then, because you've been here a year and a half and know the ropes, you have to watch them to see that they stay alive in spite of themselves. The Moon's a new environment and you have to learn how to live in it. There's a lot of things to learn—and some people just never learn."

"You're nursemaid, then."

"I suppose you could call it that."

Klein said, "You're not a scientist, are you?"

"No, you should know that. I came as the pilot of the first ship. We made the bunker out of parts of the ship so there wasn't anything to go back on. I'm a good mechanic and I made myself useful with the machinery. When it occurred to us that somebody was going to have to stay over, I volunteered. I thought the others were so important that it was better they should take their samples and data back to Earth when the first relief ship came."

"You wouldn't do it again, though, would you?"

"No, I wouldn't."

"Do you think Dahl will do as good a job as you've done here?"

Chapman frowned. "Frankly, I hadn't thought of that. I don't believe I care. I've put in my time; it's somebody else's turn now. He volunteered for it. I think I was fair in explaining all about the job when you talked it over among yourselves."

"You did, but I don't think Dahl's the man for it. He's too young, too much of a kid. He volunteered because he thought it made him look like a hero. He doesn't have

the judgment that an older man would have. That you have."

Chapman turned slowly around and faced Klein.

"I'm not the indispensable man," he said slowly, "and even if I was, it wouldn't make any difference to me. I'm sorry if Dahl is young. So was I. I've lost three years up here. And I don't intend to lose any more."

Klein held up his hands. "Look, Chap, I didn't mean you should stay. I know how much you hate it and the time you put in up here. It's just—" His voice trailed away. "It's just that I think it's such a damn important job."

Klein had gone out in a last search for rock lichens and Chapman enjoyed one of his relatively few moments of privacy. He wandered over to his bunk and opened his barracks bag. He checked the underwear and his toothbrush and shaving kit for maybe the hundredth time and pushed the clothing down farther in the canvas. It was foolish because the bag was already packed and had been for a week. He remembered stalling it off for as long as he could and then the quiet satisfaction about a week before, when he had opened his small gear locker and transferred its meager belongings to the bag.

He hadn't actually needed to pack, of course. In less than twenty-four hours he'd be back on Earth where he could drown himself in toothpaste and buy more tee shirts than he could wear in a lifetime. He could leave behind his shorts and socks and the outsize shirts he had inherited from—who was it? Driesbach?—of the First group. Dahl could probably use them or maybe one of the boys in the Third.

But it wasn't like going home unless you packed. It was part of the ritual, like marking off the last three weeks in pencil on the gray steel of the bulkhead beside

his hammock. Just a few hours ago, when he woke up, he had made the last check mark and signed his name and the date. His signature was right beneath Dixon's.

He frowned when he thought of Dixon and slid back the catch on the top of the bag and locked it. They should never have sent a kid like Dixon to the Moon.

He had just locked the bag when he heard the rumble of the airlock and the soft hiss of air. Somebody had come back earlier than expected. He watched the inner door swing open and the spacesuited figure clump in and unscrew its helmet.

Dahl. He had gone out to help Dowden on the Schmidt telescope. Maybe Dowden hadn't needed any help, with Bening along. Or more likely, considering the circumstances, Dahl wasn't much good at helping anybody today.

Dahl stripped off his suit. His face was covered with light beads of sweat and his eyes were frightened.

He moistened his lips slightly. "Do—do you think they'll ever have relief ships up here more often than every eighteen months, Chap? I mean, considering the advance of—"

"No," Chapman interrupted bluntly. "I don't. Not at least for ten years. The fuel's too expensive and the trip's too hazardous. On freight charges alone you're worth your weight in platinum when they send you here. Even if it becomes cheaper, Bob, it won't come about so it will shorten stopover right away." He stopped, feeling a little sorry for Dahl. "It won't be too bad. There'll be new men up here and you'll pass a lot of time getting to know them."

"Well, you see," Dahl started, "that's why I came back early. I wanted to see you about stopover. It's that—well, I'll put it this way." He seemed to be groping for an easy way to say what he wanted to. "I'm engaged back home.

Really nice girl, Chap, you'd like her if you knew her." He fumbled in his pocket and found a photograph and put it on the desk. "That's a picture of Alice, taken at a picnic we were on together." Chapman didn't look. "She —we—expected to be married when I got back. I never told her about stopover, Chap. She thinks I'll be home tomorrow. I kept thinking, hoping, that maybe somehow—"

He was fumbling it badly, Chapman thought.

"You wanted to trade places with me, didn't you, Bob? You thought I might stay for stopover again, in your place?"

It hurt to look in Dahl's eyes. They were the eyes of a man who was trying desperately to stop what he was about to do, but just couldn't help himself.

"Well, yes, more or less. Oh, God, Chap, I know you want to go home! But I couldn't ask any of the others; you were the only one who could, the only one who was qualified!"

Dahl looked as though he was going to be sick. Chapman tried to recall all he knew about him. Dahl, Robert. Good mathematician. Graduate from one of the Ivy League schools. Father was a manufacturer of stoves or something.

It still didn't add, not quite. "You know I don't like it here any more than you do," Chapman said slowly. "I may have commitments at home, too. What made you think I would change my mind?"

Dahl took the plunge. "Well, you see," he started eagerly, too far gone to remember such a thing as pride, "you know my father's pretty well fixed. We would make it worth your while, Chap." He was feverish. "It would mean eighteen more months, Chap, but they'd be well-paid months!"

Chapman felt tired. The good feeling he had about going home was slowly evaporating.

"If you have any report to make, I think you had better get at it," he cut in, keeping all the harshness he felt out of his voice. "It'll be too late after the relief ship leaves. It'll be easier to give the captain your report than try to radio it back to Earth from here."

He felt sorrier for Dahl than he could ever remember having felt for anybody. Long after going home, Dahl would remember this. It would eat at him like a cancer.

Cowardice is the one thing for which no man ever forgives himself.

Donley was eating a sandwich and looking out the port, so, naturally, he saw the ship first. "Well, whaddya know!" he shouted. "We got company!" He dashed for his suit. Dowden and Bening piled after him and all three started for the lock.

Chapman was standing in front of it. "Check your suits," he said softly. "Just be sure to check."

"Oh, what the hell, Chap!" Donley started angrily. Then he shut up and went over his suit. He got to his tank and turned white. Empty. It was only half a mile to the relief rocket, so somebody would probably have got to him in time, but . . . He bit his lips and got a full tank.

Chapman and Klein watched them dash across the pumice, making the tremendous leaps they used to read about in the Sunday supplements. The port of the rocket had opened and tiny figures were climbing down the ladder. The small figures from the bunker reached them and did a short jig of welcome. Then the figures linked arms and started back. Chapman noticed one—it was probably Donley—pat the ship affectionately before he started back.

They were in the lock and the air pumped in and then they were in the bunker, taking off their suits. The newcomers were impressed and solemn, very much aware of the tremendous responsibility that rested on their shoulders. Like Donley and Klein and the members of the Second group had been when they had landed. Like Chapman had been in the First.

Donley and the others were all over them.

How was it back on Earth? Who had won the series? Was so-and-so still teaching at the university? What was the international situation?

Was the sky still blue, was the grass still green, did the leaves still turn color in the autumn, did people still love and cry and were there still people who didn't know what an atom was and didn't give a damn?

Chapman had gone through it all before. But was Ginny still Ginny?

Some of the men in the Third had their luggage with them. One of them—a husky, red-faced kid named Williams—was opening a box about a foot square and six inches deep. Chapman watched him curiously.

"Well, I'll be damned!" Klein said. "Hey, guys, look what we've got here!"

Chapman and the others crowded around and suddenly Donley leaned over and took a deep breath. In the box, covering a thick layer of ordinary dirt, was a plot of grass. They looked at it, awed. Klein put out his hand and laid it on top of the grass.

"I like the feel of it," he said simply.

Chapman cut off a single blade with his fingernail and put it between his lips. It had been years since he had seen grass and had the luxury of walking on it and lying on its cool thickness during those sultry summer nights when it was too hot to sleep indoors.

Williams blushed. "I thought we could spare a little water for it and maybe use the ultraviolet lamp on it some of the time. Couldn't help but bring it along; it seemed sort of like a symbol . . ." He looked embarrassed.

Chapman sympathized. If he had had any sense, he'd have tried to smuggle something like that up to the Moon instead of his phonograph.

"That's valuable grass," Dahl said sharply. "Do you realize that at current freight rates up here, it's worth about ten dollars a blade?"

Williams looked stricken and somebody said, "Oh, shut up, Dahl."

One of the men separated from the group and came over to Chapman. He held out his hand and said, "My name's Eberlein. Captain of the relief ship. I understand you're in charge here?"

Chapman nodded and shook hands. They hadn't had a captain on the First ship. Just a pilot and crew. Eberlein looked every inch a captain, too. Craggy face, gray hair, the firm chin of a man who was sure of himself.

"You might say I'm in charge here," Chapman said.

"Well, look, Mr. Chapman, is there any place where we can talk together privately?"

They walked over to one corner of the bunker. "This is about as private as we can get, captain," Chapman said. "What's on your mind?"

Eberlein found a packing crate and made himself comfortable. He looked at Chapman.

"I've always wanted to meet the man who's spent more time here than anybody else," he began.

"I'm sure you wanted to see me for more reasons than just curiosity."

Eberlein took out a pack of cigarets. "Mind if I smoke?"

Chapman jerked a thumb toward Dahl. "Ask him. He's in charge now."

The captain didn't bother. He put the pack away. "You know we have big plans for the station," he said.

"I hadn't heard of them."

"Oh, yes, *big plans*. They're working on unmanned, open-side rockets now that could carry cargo and sheet steel for more bunkers like this. Enable us to enlarge the unit, have a series of bunkers all linked together. Make good laboratories and living quarters for you people." His eyes swept the room. "Have a little privacy for a change."

Chapman nodded. "They could use a little privacy up here."

The captain noticed the pronoun. "Well, that's one of the reasons why I wanted to talk to you, Chapman. The Commission talked it over and they'd like to see you stay. They feel if they're going to enlarge it, add more bunkers and have more men up here, that a man of practical experience should be running things. They figure that you're the only man who's capable and who's had the experience."

The captain vaguely felt the approach was all wrong.

"Is that all?"

Eberlein was ill at ease. "Naturally you'd be paid well. I don't imagine any man would like being here all the time. They're prepared to double your salary—maybe even a bonus in addition—and let you have full charge. You'd be Director of the Luna Laboratories."

All this and a title too, Chapman thought.

"That's it?" Chapman asked.

Eberlein frowned. "Well, the Commission said they'd

be willing to consider anything else you had in mind, if it was more money or . . ."

"The answer is no," Chapman said. "I'm not interested in more money for staying because I'm not interested in staying. Money can't buy it, captain. I'm sorry, but I'm afraid that you'd have to stay up here to appreciate that.

"Bob Dahl is staying for stopover. If there's something important about the project or impending changes, perhaps you'd better tell him before you go."

He walked away.

Chapman held the letter in both hands, but the paper still shook. The others had left the bunker, the men of the Second taking those of the Third in hand to show them the machinery and apparatus that was outside, point out the deadly blisters underneath the pumic covering, and show them how to keep out of the Sun and how to watch their air supply.

He was glad he was alone. He felt something trickle down his face and tasted salt on his lips.

The mail had been distributed and he had saved his latest letter until the others had left so he could read it in privacy. It was a short letter, very short.

It started: "Dear Joel: This isn't going to be a nice letter, but I thought it best that you should know before you came home."

There was more to it, but he hadn't even needed to read it to know what it said. It wasn't original, of course. Women who change their minds weren't exactly an innovation, either.

He crumpled the paper and held a match to it and watched it burn on the steel floor.

Three years had been a long time. It was too long a time to keep loving a man who was a quarter of a million miles away. She could look up in the night sky when

she was out with somebody else now and tell him how she had once been engaged to the Man in the Moon.

It would make good conversation. It would be funny. A joke.

He got up and walked over to his phonograph and put the record on. The somewhat scratchy voice sang as if nothing had happened.

The home food's the spreadiest,
The old wine's the headiest,
The old pals the readiest,
The home gal's the steadiest,
The love the liveliest,
The life the loveliest,
Way back home.

The record caught and started repeating the last line.

He hadn't actually wanted to play it. It had been an automatic response. He had played it lots of times before when he had thought of Earth. Of going home.

He crossed over and threw the record across the bunker and watched it shatter on the steel wall and the pieces fall to the floor.

The others came back in the bunker and the men of the Second started grabbing their bags and few belongings and getting ready to leave. Dahl sat in a corner, a peculiar expression on his face. He looked as if he wanted to cry and yet still felt that the occasion was one for rejoicing.

Chapman walked over to him. "Get your stuff and leave with the others, Dahl." His voice was quiet and hard.

Dahl looked up, opened his mouth to say something, and then shut up. Donley and Bening and Dowden were already in the airlock, ready to leave. Klein caught the

conversation and came over. He gripped Chapman's arm.

"What the hell's going on, Chap? Get your bag and let's go. I know just the bistro to throw a whing-ding when we get—"

"I'm not going back," Chapman said.

Klein looked annoyed, not believing him. "Come on, what's the matter with you? You suddenly decide you don't like the blue sky and trees and stuff? Let's go!"

The men in the lock were looking at them questioningly. Some members of the Third looked embarrassed, like outsiders caught in a family argument.

"Look, Julius, I'm not going back," Chapman repeated dully. "I haven't anything to go back for."

"You're doing a much braver thing than you may think," a voice cut in. It belonged to Eberlein.

Chapman looked at him. Eberlein flushed, then turned and walked stiffly to the lock to join the others.

Just before the inner door of the lock shut, they could hear Chapman, his hands on his hips, breaking in the Third on how to be happy and stay healthy on the Moon. His voice was ragged and strained and sounded like a top-sergeant's.

Dahl and Eberlein stood in the outer port of the relief ship, staring back at the research bunker. It was half hidden in the shadows of a rocky overhang that protected it from meteorites.

"They kidded him a lot this morning," Dahl said. "They said he had found a home on the Moon."

"If we had stayed an hour or so more, he might have changed his mind and left, after all," Eberlein mused, his face a thoughtful mask behind his air helmet.

"I offered him money," Dahl said painfully. "I was a coward and I offered him money to stay in my place." His face was bitter and full of disgust for himself.

Eberlein turned to him quickly and automatically told him the right thing.

"We're all cowards once in a while," he said earnestly. "But your offer of money had nothing to do with his staying. He stayed because he had to stay, because we made him stay."

"I don't understand," Dahl said.

"Chapman had a lot to go home for. He was engaged to be married." Dahl winced. "We got her to write him a letter breaking it off. We knew it meant that he lost one of his main reasons for wanting to go back. I think, perhaps, that he still would have left if we had stayed and argued him into going. But we left before he could change his mind."

"That—was a lousy thing to do!"

"We had no choice. We didn't use it except as a last resort."

"I don't know of any girl who would have done such a thing, no matter what your reasons, if she was in love with a guy like Chapman," Dahl said.

"There was only one who would have," Eberlein agreed. "Ginny Dixon. She understood what we were trying to tell her. She had to; her brother had died up here."

"Why was Chapman so important?" Dahl burst out. "What could he have done that I couldn't have done—would have done if I had had any guts?"

"Perhaps you could have," Eberlein said. "But I doubt it. I don't think there were many men who could have. And we couldn't take the chance. Chapman knows how to live on the Moon. He's like a trapper who's spent all his time in the forests and knows it like the palm of his hand. He never makes mistakes, he never fails to check things. And he isn't a scientist. He would never become so preoccupied with research that he'd fail to make

checks. And he can watch out for those who do make mistakes. Ginny understood that all too well."

"How did you know all this about Chapman?" Dahl asked.

"The men in the First told us some of it. And we had our own observer with you here. Bening kept us pretty well informed."

Eberlein stared at the bunker thoughtfully.

"It costs a lot of money to send ships up here and establish a colony. It will cost a lot to expand it. And with that kind of investment, you don't take chances. You have to have the best men for the job. You get them even if they don't want to do it."

He gestured at the small, blotchy globe of blue and green that was the Earth, riding high in the black sky.

"You remember what it was like five years ago, Dahl? Nations at each other's throats, re-arming to the teeth? It isn't that way now. We've got the one lead that nobody can duplicate or catch up on. Nobody has our technical background. I know, this isn't a military base. But it could become one."

He paused.

"But these aren't even the most important reasons, Dahl. We're at the beginnings of space travel, the first bare, feeble start. If this base on the Moon succeeds, the whole human race will be Outward Bound." He waved at the stars. "You have your choice—a frontier that lies in the stars, or a psychotic little world that tries and fails and spends its time and talents trying to find better methods of suicide.

"With a choice like that, Dahl, you can't let it fail. And personal lives and viewpoints are expendable. But it's got to be that way. There's too much at stake."

Eberlein hesitated a moment and when he started

again, it was on a different track. "You're an odd bunch of guys, you and the others in the groups, Dahl. Damn few of you come up for the glamor, I know. None of you like it and none of you are really enthusiastic about it. You were all reluctant to come in the first place, for the most part. You're a bunch of pretty reluctant heroes, Dahl."

The captain nodded soberly at the bunker. "I, personally, don't feel happy about that. I don't like having to mess up other people's lives. I hope I won't have to again. Maybe somehow, someway, this one can be patched up. We'll try to."

He started the mechanism that closed the port of the rocket. His face was a study of regret and helplessness. He was thinking of a future that, despite what he had told Dahl, wasn't quite real to him.

"I feel like a cheap son of a bitch," Eberlein said.

The very young man said, "Do they actually care where they send us? Do they actually care what we think?"

The older man got up and walked to the window. The bunkers and towers and squat buildings of the research colony glinted in the sunlight. The colony had come a long way; it housed several thousands now.

The Sun was just rising for the long morning and farther down shadows stabbed across the crater floor. Tycho was by far the most beautiful of the craters, he thought.

It was nice to know that the very young man was going to miss it. It had taken the older man quite a long time to get to like it. But that was to be expected—he hadn't been on the Moon.

"I would say so," he said. "They were cruel, that way, at the start. But then they had to be. The goal was too

important. And they made up for it as soon as they could. It didn't take them too long to remember the men who had traded their future for the stars."

The very young man said, "Did you actually think of it that way when you first came up here?"

The older man thought for a minute. "No," he admitted. "No, we didn't. Most of us were strictly play-for-pay men. The Commission wanted men who wouldn't fall apart when the glamor wore off and there was nothing left but privation and hard work and loneliness. The men who fell for the glamor were all right for quick trips, but not for an eighteen-month stay in a research bunker. So the Comission offered high salaries and we reluctantly took the jobs.

"Oh, there was the idea behind the project, the vision the Commission had in mind. But it took a while for that to grow."

A woman came in the room just then, bearing a tray with glasses on it. The older man took one and said, "Your mother and I were notified yesterday that you had been chosen to go. We would like to see you go, but of course the final decision is up to you."

He sipped his drink and turned to his wife: "It has its privations, but in the long run we've never regretted it, have we, Ginny?"

MOONWALK

by H. B. Fyfe

THE radio operator stopped sending out his call and slumped back in the folding chair of canvas and aluminum. Concern showed through the impassivity of his broad, Mexican features.

The footsteps in the corridor outside the radio room pattered lightly because of the Lunar gravity, but with a haste that suggested urgency. Two men entered. Like the operator, they wore dungarees and heavy sweaters, but the gray-haired man had an air of authority.

"Dr. Burney wanted to check with you himself, Mike," said the youth with him.

The operator shrugged.

"Tractor One is okay, Doctor," he reported, "but as Joey must have told you, we've lost Two."

"When was the last time they called in?" asked Burney.

Mike gestured at the map on the side wall, and the elder man stepped over to study it. The area shown was that surrounding the fifty-mile-wide crater of Archimedes.

"The blue line is One and the red is Two," said Mike. "I guess you know the planned routes. Well, the little *x*'s show the positions reported and the times."

Burney glanced briefly at the blue line. From the black square near the northern side of the crater that represented the first major base on Luna, it climbed slantingly over the ringwall. After zig-zagging down the broken outer slope and skirting a ridge of vein mountains, the line swept in a wide curve north of Aristillus and Auto-

lycus, the next largest craters of the region, and moved into that sub-region of the *Mare Imbrium* whimsically christened "Misty Swamp." Thereafter, the blue trail led toward possible passes through the Lunar Apennines to the *Mare Serenitatis.*

"I could expect to lose One," muttered the operator, "in spite of our tower here. But Two shouldn't be blocked by anything yet."

The red line was more direct. Parting from the blue north of the ringwall of Archimedes, it pushed out across the level plain, avoiding isolated mountain ridges and the seven-mile craters of Kirch and Piazza Smyth. After something like three hundred miles, it passed the towering lonely Mt. Pico and probed a dotted delta of possible routes up the ringwall of Plato. This route was *x*'ed almost to Pico.

"They were supposed to report before attempting the descent," mused Burney. "Maybe the depression of the *Mare Imbrium* isn't quite what we estimated. The normal curvature would put a lot of rock between us, in that case. An awful lot of rock."

"Maybe they went over the ringwall in a hurry," suggested Joey.

Burney considered that in a short silence. He ran a hand absently over his balding temple. His lean face became a mask of lines as he puckered up his eyes in thought.

"Number Two has Hansen driving, hasn't it? And Groswald, the mechanic . . . Van Ness, the astronomer . . . and who else?"

"Fernandez from Geology," said Joey.

The entire personnel of the base numbered scarcely fifty. They were just beginning their surface exploration projects after completing the low domes of their buildings. With such scanty resources, Burney was naturally

worried about four men and one of the precious tractors.

"They were with us an hour ago," said Mike, fingering his microphone. "Their set must have gone sour."

When no one replied, he hitched around to face his own controls.

"Or else, they're in trouble—"

On the ledge atop the ringwall of Plato, Hansen teetered and tried to maintain his balance by pressing a gauntleted hand against an outcropping of gray Lunar rock. The thermal-eroded surface crumbled slightly beneath the metal-tipped mitten.

In his bulky spacesuit, he found it difficult to lean very far forward, but he could not bear not seeing. The landship tumbled down the inner slope of the ringwall with horrible deliberation.

"I told them 'Don't move her till I find a way down!'" Hansen muttered. "I told them, I *told* them!"

He was hardly conscious of speaking aloud. Somewhere in the churning mass was the vacuum tractor in which he had driven from Archimedes. Inside, unless it had already been split open, were Van Ness, Groswald, and Fernandez.

The collection of loose rock and dust passed out of sight for a moment over the edge of a terrace. It reappeared further down. Once, Hansen thought he saw a glint of bright metal, but the slide almost immediately plunged down another sheer drop.

The phase of Luna being closer to "new" than to "first quarter," the sun was far too low on the horizon to light the floor of the crater, or even the three mountain peaks on the ringwall to Hansen's right front. The light from the gibbous Earth, however, was bright enough for him to see quite clearly the surface around him.

The slide finally reached the bottom, at this point near-

ly 3,000 feet below the man's precarious position. He breathed deeply and tried to straighten the ache from his shoulders.

"Must have taken five minutes," he murmured, realizing that he had frozen in a cramped position as he stared.

It had seemed more like an hour. In the dim shadows of the crater floor, the dust settled rapidly because of the lack of air, but the debris remained heaped at an angle much steeper than would have been possible on Earth. Even the slight vibration Hansen had felt through his boots ceased.

He was alone in the dead silence of a world for eons dead.

He stood there, a spot of color in the chrome yellow of the protective chafing suit. The transparent faceplate of his unpainted helmet revealed a blond young man, perhaps twenty-six, with a lean, square-jawed face. Against the tanned skin, his eyebrows were ludicrously light, but the gray eyes under them were wide with horror.

He was of medium height, but the bulkiness of the suit hit his welterweight trimness; and the pack of oxygen tank and batteries for powering radio heat pads, and air-circulator increased the appearance of stubbiness.

The quiet hiss of the air being circulated through his suit finally aroused him. With painstaking care, he climbed from the ledge to the level terrace on which the tractor was to have remained while he scouted the route down. A hundred yards away, a great bite seemed to have been snapped out of the ridge.

"All the way from Archimedes, and we didn't even get a look at the floor," he whispered.

For a moment, following the raw scar of the slide with his eye, he considered climbing all the way down and

venturing out onto the crater floor to examine the ground. For centuries, the floor of Plato had been reported by Earth observers to darken with the rising sun until at noon it was nearly black. Occasionally, there were stories of misty clouds obscuring the surface, and of shifts in the pattern of light streaks and spots.

One of the expedition's first assignments, therefore, had been the investigation of Plato, to check the unlikely possibility that there might be some primitive, airless form of life present. But the present sortie was clearly ended.

"Not one damn' chance," Hansen told himself as he squinted downward. "None of them had a suit on when I got out."

On a terrace about a third of the way down lay an object with an oddly regular shape. It gleamed in the blue-green earthlight, and Hansen peered more intently. It looked like one of the spare oxygen cylinders that had been carried on top of the tractor.

Hansen abruptly became sensitive about the supply of his suit tank. Before he did anything, even sitting down to think the situation over, he wanted to get down there and find out if the cylinder was full.

Despite his eagerness, he held back until he thought he had spied a reasonable path. It involved going two or three hundred feet out of his way, but Hansen managed to work his way down to the lower level without serious difficulty. Once or twice, he slithered a few feet when loose rock shaled off under his grip, but even with his suit and equipment, he weighed little over forty pounds. As long as he did not drop very far, he could always stop himself one-handed.

He walked back along the level strip which was about fifty yards wide at this point, until he approached the

path of the landslip. Near it, apparently having been scraped off as the tractor rolled, lay the cylinder.

He checked it hurriedly.

"Whew! Well, that's some help, anyway," he told himself, discovering that the tank had not been tapped.

He left the cylinder and walked over to the inner limit of the level band. Scanning the steep slope and the debris of the slide, he thought he could pick out two or three scraps of twisted metal. There was nothing to be done.

"I'd better get back up and think this out," he decided.

He took the broken chain that had held the tank to the tractor and hooked a broken link through it to make a sling. For the time being, he contented himself with using it as a handle to drag the lucky supply of oxygen after him.

After regaining his original position, the going was easier to the top of the ringwall. They had come over one of the several passes crossing the southern part of the cliffs, and Hansen walked through in a few minutes. The thickness of the ringwall here was only a mile or so, although at the base it probably approached ten miles.

He came out onto a little plateau, and the dim plain of the *Mare Imbrium* spread out before him. Hansen suddenly felt tiny, lost, and insignificant.

"What am I gonna do?" he asked himself.

For the first time, he had admitted his predicament to himself. His gauntlet crept up to his chest where the switch of his radio protruded through the chafing suit.

"Hello Base! Tractor Two to Base! Tractor Two to Base! Over."

He waited several minutes, and repeated the call five

or six times. He screwed his eyes shut to throw every ounce of concentration into listening.

No human voice broke into the quiet hissing of the earphones. Hansen sighed.

"Never reach them, of course!" he grumbled. "This set is made to reach about your arm's length."

He remembered that Van Ness had complained about the reception the last time they had called in, and asked Hansen to maneuver to the top of a ridge of vein mountains near the hulking silhouette of Pico. Hansen was higher now, but also much farther from home.

"Mike Ramirez and Joe Friedman aren't the kind to miss a call," he muttered. "It seems to me, Paul E. Hansen, my boy . . . that you are . . . on your own!"

The radio had been but a faint hope, inspired by his height and tales of freak reception. He was not too disappointed. Looking down the rough outer slope of the ringwall, he saw that it was not by any means as steep as the inner, and that fact settled it.

"Guess I'd better see how far I can get," Hansen decided. "When they don't get the regular report over the tractor radio, they'll probably send out another crew to follow the trail. If I can meet them out a way, maybe even as far as Pico, it'll save that much time."

After considerable fumbling, he balanced the large cylinder on his back atop the other equipment with the chain sling across his chest. He started along the series of gentle slopes the tractor had climbed earlier. Deliberately, he pushed to the back of his mind the possibility he would have to face sometime: Base might decide the crew had been too eager to negotiate the ringwall to call back before being blanked out by the mass of rock.

He had to restrain a temptation to rush headlong

down to the plain across miles of rough grades. Even with his tremendous load of equipment, he might still travel in twenty-foot bounds in Lunar gravity; but he had no desire to plunge all the way to the bottom with one misstep.

"It'll be easy enough going down," he murmured. "And after that, I can judge the direction well enough from Earth."

He looked up at the brightness of the planet. Earth was rather high in the Lunar sky, although not overhead because of his position far north. It would indicate roughly his southerly course towards Archimedes. As he looked, he noticed that much of the eastern coast of North America, which to his view was almost centered on the hemisphere, was blanketed in clouds.

"Wish I was there right now," he sighed. "Rain and all!"

He wondered about the next step as he worked his way around ridges radiating from the sizable minor craterlet in Plato's ringwall. He still had a good view of the gray plain at the foot of the heights. Although reasonably flat—probably leveled by the colossal flow of lava that had formed the *Mare Imbrium*, filling older craters and melting down or inundating existing mountains until merely their crests showed—it contained many hills and irregularities that would be even more apparent to a man on foot than from the tractor.

He worked past the craterlet, leaving it to his right. Whenever he struck a reasonably level stretch, he moved at a bounding trot. The first time he tried this, he tumbled head over heels and gave himself a fright lest he rupture the spacesuit on a projecting rock. Thereafter, he was more careful until he got used to being so top-heavy because of the huge oxygen tank.

Finally, scrambling down the last ridges of old debris, he found himself on the level floor of the "Sea of Showers," in the region between Plato and the jutting, lonely Mt. Pico. Off to his right, an extension of the ringwall behind him thrust out to point at the group of other peaks known as the Teneriffe Mountains, which were somewhat like a flock of lesser Picos. The ground on which he stood had perhaps once been part of another crater, twin in size to Plato; but now only detectable by faint outlines and vein mountains. In the past, some astronomers had called it Newton, before deciding upon a more worthy landmark for Sir Isaac.

It had taken Hansen nearly half an hour, and he paused now to catch his breath.

"I feel pretty good," he exclaimed with relief. "I'm carrying quite a lot to go at that speed, but I don't seem to get tired." He thought a moment, and warned himself, "You'd better not, either!"

He turned partly to look at the ringwall towering behind him. It loomed grimly, scored with deep shadows of cracks into which the rays of Earth, seventy times brighter than moonlight it received from Luna, could not penetrate.

Hansen turned away hastily. The mountainous mass made him uneasy; he remembered how easily a landslip had started on the inner slope.

"I'd better get moving!"

He struck out at a brisk, bounding pace, a trot on Luna without the effort of a normal trot. The ground was fairly level, and he congratulated himself upon making good time. Once or twice, he staggered a little, having overbalanced; but he soon got into the rhythm of the pace and the load on his back ceased to bother

him. He bore slightly to the right, toward the jutting point of the ringwall.

The footing was like powdery gray sand. Alternating extremes of temperature during the two-week Lunar day or night had cracked the rock surface until successive expansions and contractions had affected the crystalline structure of the top layers. When these had flaked off, the powder had formed an insulating layer, but the result as far as Hansen was concerned was that he trotted on a sandy footing. When he looked back, he could see the particles kicked up his last few steps still above the surface. They fell rather neatly, there being no air to whirl them about.

Gradually, he realized that the unobstructive noises of his spacesuit had risen a notch in tone. The clever little machines were laboring to dispel the effects of his faster breathing. He dropped down to an easy walk, which was still a goodly pace in the light gravity.

"Guess I'm sweating more, too," he told himself. "Now that I think of it, my mouth's a little dry."

He twisted his neck until he could get his lips on the thin rubber hose sticking up to the left of his chin. He closed teeth on the clamp, and sucked up a few swallows of water from his tank. It was not particularly tasty, but at least it was cool. It would have been a lot colder if carried uninsulated, he reflected. The night temperature of Luna was something like minus one-fifty Centigrade, and it dropped like a shot as soon as the surface was shaded from the sun.

Refreshed, he started out again at a bounding run, exhilarating in his strength. He felt as if he were just jogging along, but the ground rolled back under his feet swiftly. Had he been on such a bleak desert on Earth, he knew he would be slogging ankle-deep in sand—if he

could move at all. His own weight was between a hundred and fifty and a hundred and sixty pounds. With what he was wearing and carrying, he was probably close to three hundred. It did not bother him here.

"It isn't bad at all," he thought with satisfaction. "Feels like jogging around the track in school, warming up for a race. One . . . two . . . three . . . four—still got pretty good form! Not even breathing hard!"

It occurred to him that it resembled a footrace in one other particular. He was deliberately putting off consideration of the finish while he still felt good.

"Oh, I'll meet them somewhere along the way," he said aloud, despite a momentary doubt that he was talking too much to himself. "Pretty soon, I'll cross the tractor trail. I'll follow it out maybe as far as Pico and wait for them to pick me up. The relief crew can't miss a landmark like that. It's damn' near nine thousand feet high, straight up out of the flat plain."

He slowed down somewhat to scrutinize a ridge ahead. It turned out to be an easy grade and he skimmed over it easily. Otherwise, however, he was beginning to lose his recent feeling of satisfaction. Now that he had moved out into the flat, empty plain, the essential grimness of Lunar landscape was more apparent than when disguised by the majesty of the view from atop of the ringwall. It was a study in gray and black, the powdery sand and the deep shadows groping toward him as he trotted into the earthshine. Above was the deep black of an airless sky, lit by the bright Earth and chilly stars.

Gray, black, green, white—and all of it cold and inhospitable.

"I feel like I'm not wanted here," Hansen thought. "Well, that makes it mutual, I guess!"

He looked back, and was amazed at the distance he had covered. Already, Plato looked more like a range of towering mountains than it did like a barrier of cliffs.

"This won't take so long," he reassured himself. "I must have covered five miles, running like this. Maybe almost ten."

He circled a tiny craterlet, or "bead," a few hundred yards across. In the precise center, it had a tiny peak, corresponding to the central mountain masses found in nearly half the craters of Luna. For the first time, Hansen regretted the camera that had gone down with the tractor.

"Too busy driving to take any pix on the way," he growled, "and now that I come across a perfect miniature, I have no camera. A fine spare photographer for an expedition this size!"

He diverted himself for a few minutes by considering what a fool he was to come to Luna in the first place. He had not really wanted to, and he was sure there were plenty of others who would have been better qualified and better pleased at the opportunity. Still, it was strange sometimes how a man would do things he did not want to because someone else was doing them.

He glanced up at Earth, and kept moving southward with the shining globe on his left front.

Mike and Joey sat before their radio, on folding chairs and empty crate respectively, maintaining whenever not directly addressed an almost sullen silence. Their tiny cubicle was becoming entirely too crowded to suit them.

Dr. Burney paced up and down before the wall map of the *Mare Imbrium*. Opposite him, the lower section of the radiomen's double bunk—canvas and aluminum like their single chair—had collected an overload of three.

Dr. Sherman, the chief astronomer, sat between Bucky O'Neil and Emil Wohl. Besides heading the geologists, Wohl was Burney's second in command; and O'Neil was present in case it was decided to send out a rocket to photograph the Plato region.

"Ya'd think they could use their own rooms," Joey whispered into Mike's ear. "All but Bucky got singles. How we gonna catch an incoming call with all this racket?"

The "racket" at the moment consisted mostly of sighs, finger-drumming, and a tortured semi-whistle from where Sherman sat staring at the map with his chin cupped in one hand.

"There's little doubt of the general location," repeated Burney, once more reaching a familiar impasse. "But I hate to hold up the other work to send out a crew when we cannot with any certainty agree that something has gone wrong."

"Let's see," said Wohl, "there was some difficulty, was there not, the last time they communicated?"

When no one answered, Mike finally repeated his previous testimony.

"Van Ness said they drove up a sort of mountain to get us. Complained a little about reception. He might've been getting to the limit."

"Then," said Wohl, "there is really no reason for alarm, is there? They could just as well have decided that continuing the mission was more important than running around looking for a good radio position, couldn't they?"

Mike considered that glumly.

"It's funny they didn't back up far enough to make *one* call to let me know they were going out of reach," he grumbled. "The speed they make in that rig, it wouldn'ta taken them long."

"That would have been the proper action," admitted

Burney, "but we must not demand perfect adherence to the rules when a group is in the field and may have perfectly good reasons for disregarding them. No, I think we had best— Who's that coming?"

Bucky O'Neil bounded up from the end of the bunk and stuck his head out the door. When he looked around, his freckled face was unhappy.

"Johnny Pierce from the map section," he announced. "He's got Louise with him. I guess you don't need me any more."

He edged out the door as two others of the Base staff came in. The one who acted as if he had business there was a lean, bespectacled man who managed to achieve a vaguely scholarly air despite rough clothing.

Trailing him was a girl who looked as if the heating economy that necessitated the standard costume of the Base also had the effect of cheating the male personnel of a brightening influence. The shapeless clothing, however, did not lessen the attractiveness of her lightly tanned features or lively black eyes. She wore her dark hair tucked into a knit cap that on Earth probably would have been donned only as a joke.

"We've looked at the photo maps," Pierce reported in a dry, husky voice. "They might very well be out of range. Lots of curvature in that distance, even with the depression caused by a mass of lava like that *Mare Imbrium.*"

Burney accepted this with an expression of relief.

"I heard them talking about the Plato crew," the girl put in. "What's going on?"

Her voice was warm and, like a singer's, stronger than her petite outline would have suggested.

"Oh . . . just checking the radio reception," said Burney. "You can get the details from Mike, I suppose,

if you have time off from the observatory. The rest of us are through here."

Mike scowled, and the girl looked puzzled; but Burney, Wohl, and Sherman crowded through the door as if intent upon some new project. Sherman muttered something about the problem of erecting a transparent dome for direct observations, and the voices receded down the corridor. Pierce slipped out after them.

"Did I say something?" inquired Louise. "I only thought there might be news."

"I guess they're just busy, Louise," Mike said. He turned to the radio, unplugged the speaker, and donned a set of earphones. "You know how it is. Why don't you catch Bucky? *He's* got nothing to do for a while."

Louise had started to show her even white teeth in a smile which now faded. Joey picked up his empty crate and busily moved it around to the other side of the radio set-up.

"Sorry," said the girl, her dark eyes beginning to smolder. "I'll ask somebody else."

They listened to her footsteps as they faded away in the corridor. Mike looked at Joey and shrugged.

"What was I gonna tell her?" he asked. "That her husband either forgot to call in—or got himself quick-frozen when something in his tractor popped?"

Joey shook his head sympathetically. "Tough on her."

"Dunno why she had to come to Luna in the first place," Mike complained. "I can see a nurse like Jean doin' it, and a typewriter pusher like old Edna oughta be classed expendable. But a babe like Louise!"

"It's her science," said Joey. "She wants to see the stars better."

"We got enough astronomers now. She's a smart girl, all right—can't take that away from her. But if she was *my* woman, she wouldn'ta come up here!"

"If she was mine," countered Joey, "I wouldn'ta taken a second-rate job just to follow her up here either! But you're dreaming about the past, Boss."

"*Uh-unh,*" grunted Mike, plugging in the speaker again. "I just believe in equal rights for men. How'd you like to be married to a dame like that and have to trail her to a place where there's three women to forty-eight men?"

"Ask me how I'd like to be married to a dame like that period!" Joey invited him.

Mike adjusted the shade on the light so as to shadow half the room. He straightened the blanket where the three visitors had sat, appropriated the one from the upper bunk to cover himself, and lay down.

"Your watch," he announced coldly. "Wake me up if anything comes in!"

The rope lacing of the canvas creaked as he settled himself; then Joey was left with only the quiet hiss of the radio. He leaned back in the folding chair and relaxed.

Hansen paused and turned to survey the ground he had covered in the past half hour. The hiss of his air-circulator and the whine of the tiny motors within his suit were a comfort in the face of his bleak surroundings.

He had found himself trotting along at such an easy pace that he had kept going past Mt. Pico. Now he wondered if he ought to stop.

"Might as well go on," he muttered. "Now that I've picked up the tractor trail from Archimedes, I can hardly be missed by the relief crew."

He eyed the twin tracks in the gray sand. Flanked by his own wide-spaced footprints, they stretched away into the dim distance. As a sign that man had passed, they did little but accentuate the coldness of the scene.

"Maybe I'll stop at the big triple peak," Hansen planned. "That's about thirty-five or forty miles . . . they ought to be along by then if they started right away."

Careful not to admit to himself that relief might be slow in starting from Archimedes, he took a last look at Pico. Rearing starkly upward, it projected a lonely, menacing grandeur, like a lurking iceburg or an ancient monument half-buried in the creeping sands of a desert. In the light of the nearly full Earth, it was a pattern of gray angles and inky black patches—not a hospitable sight.

"Come on, come on!" Hansen reproved himself. "Let's get moving! You want to turn into a monument too?"

He had stopped just before reaching Pico to replenish his suit tank from the big cylinder, and still felt good at having managed the valves without the mishap he had feared. He did not feel like a man who had traveled seventy miles.

"Why, on Earth," he thought, "that would be a good three-day march! I feel it a little, but not to the point of being tired."

He looked up at Earth as he started out again. The cloudy eastern coast of North America had moved around out of sight in the narrow dark portion. Hansen guessed that he had been on the move for at least four or five hours.

"I'd like to see their faces when they meet me way out here," he chuckled.

It occurred to him that he might be more tired than he thought, and as he went on he tried to save himself by holding his pace to a brisk walk. He found that if he got up on his toes a bit, he could still bound along that way.

The gray sand flowed under his feet, relieved oc-

casionally by a stretch of yellowish ground. Hansen kept his eyes on his path and avoided the empty waste. When he did glance into the distance, he felt a twinge of loneliness. It was like the wide plainsland of the western United States, but grimly bare of anything so living as a wheat field.

He tried to remember as he moved along where it was that they had driven the tractor up a mountain ridge. He decided that he would rather avoid the climb, and kept an eye open for the chain of vein mountains beyond Pico.

"It ought to be faster to go around the end of them," he thought. "I can always pick up the tracks again."

When he finally sighted the rise ahead, he bore to his right. He remembered from the maps he had studied that the mountains curved somewhat toward another isolated peak, and he watched for that. As far as he knew, it had no name, but although only half the height of Pico, it was an unmistakable landmark.

The mountains on his left gradually dwindled into ragged hills and sank beneath the layer of lava. Hansen turned toward the last outcroppings as the triple mountain he sought came into sight. He climbed onto a broad rock and started to sit down.

The end of the big cylinder slung across his back clanged on the back of his helmet. Hansen lost his balance and tumbled over the side of the rock. Under his groping hands, the heat-tortured surface of it flaked away, and he bounced once on the ground before sprawling full length.

"Goddamn!" he grunted. "When'll I learn to watch my balance with this load?"

He picked himself up and unslung the tank. Then, allowing for the normal bulk of his back pack of tank

and batteries, he backed against the outcropping until he was resting at a comfortable angle.

"Maybe I ought to relax a few minutes," he told himself. "Give the air-circulator time to filter out some of the sweat. Then, too, I don't want to get tired and miss them when they come along."

He idly scanned the arc between the peak toward which he was heading and Mt. Pico, still easily visible off to his right. The northern part of the *Mare Imbrium* drew his gaze coaxingly into the distance until he felt an insane desire to thrust his head forward. It almost seemed that if he could get beyond double glass of his insulated faceplate, if he could escape from the restraint of his helmet, he might perceive his bleak surroundings with a better, more real sense of proportion.

There was nothing out there, of course, he forced himself to realize. Except for shadows of craterlets that looked like low mountains, there was nothing to see for fifty miles, and nothing even then more noteworthy than a couple of minor craters.

"Then what the hell are you looking for?" Hansen snapped. "You want it to get on your nerves? And quit talking to yourself!"

He suppressed, however, the sudden urge to spring up and break into a run. Instead, he hitched around to stare along the ridge at whose end he sat.

He was far enough south to be able to see the side lit by earth-light. The ridge climbed higher the further it went, like the back of some sea monster rising from placid waters. Several miles away, a spur seemed to project out to the south; and Hansen thought he could remember a mile-wide crater on the maps.

He was a bit more comfortable inside his suit by now. He shifted his position to expedite the drying of the

coveralls he wore under the spacesuit. Then he raised his arms and tried to clasp his hands behind his neck, but found that his garb was not that flexible.

"Shouldn't kick, I guess," he thought. "Without plenty of springs in the joints, I wouldn't be able to bend anything, considering the pressure difference."

He spent a minute admiring the construction of the suit that alone stood between him and instant extinction. That led him to think of the marvelous mechanism of the vacuum tractor that had carried him so comfortably —though he had not appreciated it at the time—across the Lunar plain. That, logically, recalled the men who had come with him and now were buried beneath one of Plato's many landslips.

"Talk about borrowed time!" he thought. "I wonder how long I'll stay lucky? Any little thing might do it—"

He had already taken three or four tumbles, or was it more? On any one of them, had he rolled the wrong way perhaps, he might have cracked that faceplate on a projecting rock. It was made as tough as possible, true, but if he even cracked the outer pane, the insulating sheet of air would spurt out to leave him with a slow leak. The inner plate would lose heat and cloud up from his breath, so that he would end up without even knowing where he was dying.

Or if he had slid over a surface jagged enough to tear through his yellow chafing suit, and then to rip the tough material of the inner suit—

A puncture here would be a real blowout!

He reminded himself to be careful about stepping into shadows, especially if they were more or less straight-edged. He did not remember encountering on the way out any of the canyon-like rills that ran like long cracks straight through all other surface features of Luna—except occasional small craters slammed into the rock after

the rill had been formed—but there was always the chance that he might step into some other kind of a hole.

Fortunately, the earthlight shone into his face so that he should be able to tell a shadow resulting from some elevation ahead of him.

"I'm getting the jitters squatting here," Hansen thought. "It won't do any harm to move on a little way. At least out past that mountain, where I'll have a good view towards Archimedes."

He arose and slung the big cylinder over his back again, jiggling on the toes of his boots to jockey it into place. With one last look over his shoulder at the trail of his footprints splotched in the ashy sand, he started off.

He was surprised to discover that the rest had stiffened him slightly, but that soon worked out. As soon as he was warmed up, he moved out in a brisk walk which on Luna sent him bounding along with fifteen-foot strides. Swinging his arms to keep his balance, he concentrated upon the footing ahead of him. Once more he was alone with the hissing and humming of his suit and the sound of his own breathing, undisturbed by either memory or anticipation.

Mike Ramirez stirred on his bunk with the change of the quiet hissing of the radio. Something more than the occasional crackle or creak of Joey's chair or footfall in the corridor brought him up with eyes still half-closed. To his sleep-drugged mind, it seemed that nothing had existed until a second ago, when a faint, dreamlike voice had started to speak.

He started to push back his blanket—Joe's blanket—and said, "Joe! You got a call!"

". . . *to Archimedes Base. Hello Base! Over.*"

"I hear him, Goddammit!" snarled Joey. "Go back to sleep!"

He pushed his switch and the rushing noise that had partly muffled the weak voice gave way before the surge of his own transmitter.

"Archimedes Base to Tractor One!" Joey answered, and Mike leaned back on one elbow and sighed.

He did not listen while Joey took the message, but swung his feet to the floor and sat up. Wiggling his toes uncomfortably, he wished he had taken off his shoes; but he had expected to lie down only half an hour or so. Until the call came in, he had been sound asleep.

Joey acknowledged the message and turned to Mike after dropping his pencil.

"The *Serenitatis* bunch," he said. "They left two of them at Linné to take photos and poke around while the other pair brought the tractor back through between the Apennines and Caucasus to call in."

"Everything okay?"

"Yeah, they're on the way back already, but they say Linné didn't look as if it was ever a volcano after all."

"Very true if interesting," said Mike. "Okay, take it to Burney. I'll bend an ear a while."

He tossed the blanket back onto the upper bunk and walked over to the chair. He stretched, and sat down as Joey's footsteps departed down the corridor.

He sat there, staring moodily at the softly lighted dials of the radio, wishing he had a cigarette. That was one habit he had had to cut off short when joining the expedition.

"I think I'm getting over it some," he congratulated himself. He looked up at the sound in the corridor, thinking that Joe had made good time to Burney's compartment and back. He raised an eyebrow as Louise entered.

"I just saw Joey go by," she announced hastily. "Did some news come in?"

"Tractor One reported—just routine. What are you doing, picketing this dive?"

"I—I just happened to be passing the Junction, and I saw the paper in Joey's hand."

"Uh-huh," grunted Mike.

What the members of the expedition had come to call the "Junction" was an intermediate dome equipped with the main airlock. The other buildings connected with it through safety doors so as to localize any danger or air loss in the event of a rupture in one of the domes. It was, in effect, the front hall of the whole Base.

And if you stand there long enough, thought Mike, *everyone you know on Luna will pass by, and you'll find out everything that's going on.*

"Where is number Two now?" demanded Louise quietly.

Scared, thought Mike, noting the over-controlled tenseness of her voice.

"I don't know for sure," he answered, not looking at her. "It's time they were inside Plato, and we can't expect to hear them from in there."

Louise walked jerkily to the bunk and sat on the foot of the lower section. She crossed her legs. Seeing the nervous manner in which she twitched her foot, Mike turned to his radio.

After a moment, she spoke again, and his shoulders quivered at the agonized harshness of her tone.

"Don't string me along, Mike! I want to know! You were worried about them hours ago, weren't you?"

Mike licked his lips.

"That don't mean anything," he muttered.

"The others backtracked to report, didn't they? To

call in, I mean. Something happened to number Two, didn't it?"

"Now, take it easy, Louise!" Mike squirmed in his chair, then forced himself to sit still. It was not the sort of furniture that would stand much squirming. "Burney kinda considered that as a possibility, but in the end they decided things were probably okay."

"Then why did they have Bucky in here?" she demanded.

"Just in case they thought it worth the trouble of scouting the Plato region. Nothing special."

Louise bounced up from the bunk. She stood beside it, stiff, with her little fists clenched tightly at her sides.

"They wouldn't let this long a time go by without calling in and you know it!" she declared. "Even if they did, there ought to be a tractor on the way to check."

"You might have a point there," admitted Mike.

"It could always be called back."

"It's probably been thought of," said Mike. "Look, Louise, why don't you calm down and let the worryin' get done by the people supposed to do it?"

She did not look at him. The darkness of her eyes surprised him, and he realized how she had paled beneath her tan.

"I can't help it," she said. "It's my fault, in a way. He only came along because I got so excited about the expedition I couldn't stay down on Earth. He didn't want to come, and now he's out there—"

Mike rose and shoved his chair aside with his foot. He thought the girl was going to faint. Watching her narrowly, he reached out to put his hand on her arm.

He sighed with relief as he heard Joey whistling outside. Louise straightened and moved away from his hand as the younger operator entered.

"Why don't you go see Burney?" suggested Mike. "He'll explain how he figures the odds; or if you want to argue, it's more sense to do it with him than me. I got nothing to do with it."

The girl pulled herself together with a visible effort.

"I know, Mike. Thanks for listening, anyway."

"Joey, go along with her to Burney's quarters!"

"That's all right," said Louise. "I can find my way further than that."

They watched her leave, and Joey turned to his chief with a cynical glance.

"You looked pretty chummy there, when I come in!" he kidded Mike. "Don't you even wait till the bodies get cold?"

"Ah, shut up!" grunted Mike, jerking his thumb at the radio as he walked over to the bunk.

He added a profane order for a rather startling procedure.

"Can't," grinned Joey good-humoredly. "I ain't a contortionist."

Once more, he took the chair before the set and the pair of them sat in glum silence. The ventilation system came to life in one of its efforts to homogenize the Base atmosphere, and its sigh partly drowned out the hiss of the radio.

"You know something, Joey?" grunted Mike.

"What?"

"I got a feelin' we're not gonna see those guys again."

"Hope you're wrong," said Joey. "It's awful tough digging around here, after the first few inches."

Hansen trotted along steadily with the four thousand foot mountain rising in a sheer sweep out of the lava "sea" over to his right. There were three distinct peaks, he knew, but they ran in a line away from him so that

the whole thing appeared one towering mass to him. Most of it, from his position, was black with the deepness of Lunar shadows, although he was gradually reaching a location where he could see the splashes of earthlight on the tortured rocks.

"Pretty soon I'll be out in the real flat, with nothing but a scattering of little craters to steer by," he reflected. "If I don't want to stop, how had I better head?"

Just in case the problem should arise, he began to estimate the direction he should take and the sort of ground he would find.

The first thing would be to bear slightly left until he picked up the trail of the tractor once more. Then he could expect a region of fairly frequent craterlets, leading up to Kirch, a modest but respectable seven miles in diameter. If he passed to the right of Kirch, he would be kept from wandering aimlessly out into the *Mare Imbrium* by a range of vein mountains. He might go farther astray by passing Kirch to the left, but there the going would probably be easier.

"Then what?" he murmured, trying to recall the map and the journey in the tractor.

There was another open area, he seemed to remember, and then the forty-mile string of peaks called the Kirch Mountains, bordered on the right by an even longer ridge of vein mountains which might once have been part of the range.

And then, another thirty miles or so would bring him to the ringwall of Archimedes!

Hansen shook his head.

"That would be going a little too far," he muttered.

His voice sounded husky to his own ears, and he paused to suck up a few swallows of water through the hose. He must have been half-hypnotized by the steady streaming of the gray surface under his feet, for he

suddenly realized that he had gone considerably beyond the triple peak.

Without his steady forward speed, he found it difficult for a moment to stand erect. He braced against the movement of the big tank on his back, and turned around to look back.

He stared at the dark, earthlit ground over which he had been trotting. With the looming mountain in the foreground, and the upthrust ringwalls of smaller craterlets here and there above the level, aseptic frigidity of the plain, it was a scene of complete desolation. It was more naked of life or any kind of softness than any desert on Earth; yet to Hansen, it did not really seem like a desert. There was some further overtone plucking at the fringe of his consciousness.

Then it came to him.

"It's like an *ocean!*" he exclaimed. "There's something about it that's like . . . like a cold, gray, winter sea smashing in on a rocky coast!"

There was the same monstrous, chilling power, the same effect upon the beholder that here was a massive, half-sentient entity against whose callous strength and cruelty nothing human could stand. It was a *thing* to observe from a safe distance, to cower from lest it somehow become aware of the puny structure of bone, blood, and flesh spying upon it. Then there would be no escape, no withstanding the crushing force of its malice. But he was on no safe cliff. He was down *in* the sea.

He looked around. Gray everywhere, mottled with inky shadows. Gray ash underfoot, gray-and-black lumps thrusting up from the surface like colossal vertebrae, gray distance in all directions.

"Been going for hours," he thought, "and there's no

sign, really, that I'll ever get anywhere! I might as well be in the middle of the far side of Pluto!"

The huge mountain towered behind him, like a hulking beast from some alien world stalking the only object in all its frozen world that dared to move. Hansen suddenly could not bear to have his back turned to it. He faced it and edged clumsily away. The helmet that reduced his field of vision was his prison. If that black-shadowed mass of rock chose to topple over, it would easily reach him, and more. He would be ground under countless tons of weight, mangled and frozen in one instant—

Hansen whirled about and bolted.

On his first stride, he caught the toe of his right foot in the sand and sprawled forward with flailing arms. He plowed into the ground, throwing up spurts of sand like a speedboat tossing spray.

Somehow, he was up immediately, running in long, wobbling, forty-foot bounds. His eyes bulged and the breath rasped between his lips as he strove desperately to keep his balance.

It was like running in a dream, the nightmare come true. More than once, until he adapted to the pace, he found himself churning two or three steps at the zenith of his trajectory, too impatient to wait for the touch of boot on sand. There was sudden, dynamic power in his tiring muscles. All his joints felt loose.

His chest began to labor and he stumbled slightly. With a quick spasm, he blew his lungs and sucked in a deeper breath. After a few repetitions, he felt a trifle easier. In a minute he began to get his second wind. All this came like a half-perceived process of instinct, while he concentrated narrowly upon speeding ahead.

He flew up a slight grade and took off in a soaring leap to the next crest of an undulating stretch of pale

yellow ash. The next thing he knew, he was rushing upon a long shadow that barred his path.

A hasty glance each way warned him there was no use trying to skirt it, for the shadow or hole or whatever it was ran for hundreds of yards right and left. Hansen stamped hard at the near edge and kicked off for at least sixty feet. Something seemed to snap in his right knee, but he came down all right and kept running, well clear of the shadow.

How long he ran, dodging this way and that to avoid hills and shadows obstructing his path, he did not know. In the end, the tiny motors of his suit fell behind the rate at which he consumed oxygen and gave off carbon dioxide and copious moisture.

When he began to feel like an underwater swimmer reaching his limit with writhing chest, Hansen gave up. He stopped.

That felt worse. He moved on at a gentle walk, accomplishing it mostly by motion from the ankles down. Amid the stifling warmth and stickiness inside his spacesuit, it was borne in upon him how badly he had lost his head.

He looked back, panting. Where was the mountain? Then, following the trail of isolated scars on the surface beyond where they faded into the gray distance, he saw a small knob of gray against the star-dotted black of the horizon.

"I guess . . . I've . . . really been traveling!" he panted. "Twenty minutes or half an hour—wonder how fast I went to put a mountain out of sight? Of course . . . I was well past when I started."

That reminded him of his bolt, and he closed his eyes in a paroxysm of shame.

The sweat beading his forehead began to trickle down his cheekbones or nose. Now and then, a drop rolled into

his eye, despite efforts to shake his head inside the confines of the helmet. It stung, but he was too blown to get excited over that.

"Why did I have to go and do that?" he groaned inwardly.

He remembered how level-headed he had been in the first minutes of the catastrophe. Calmly, he had judged the odds of there being any survivors; calmly, he had climbed down for the prime requisite, the tank of oxygen; calmly, he had started off by a well-chosen route that led him accurately to landmarks so plain that they could be spotted from Earth with a good pair of field glasses.

He had intended to go only as far as Pico, or perhaps the triple peak. Or had he?"

Somewhere back there, he remembered, he had begun planning a further march. There could be no reason for that except—

Except that he was secretly aware that he could count upon no help to reach him in time!

"Why should they send anybody out yet?" he asked himself. "For all they know, we're still inside Plato, camping on the nice level lava floor. I *must* have been thinking that, underneath, when I was figuring which side to pass Kirch."

He had been skating on thin ice and should have expected a crack-up. For a moment, he considered the possibility that it would have been better had he broken down on the spot. But then he might have quit while still on the ringwall of the great crater.

"As it is," he said aloud, "I'll at least get the most possible mileage out of this suit. If I live long enough, I might even walk in on them at Base, for a surprise."

He grinned a bit as he considered that pleasant fantasy:

"Hi, Paul; where you been?"
"Oh, just out for a little walk on the moon."
"And where did you go on your little moon walk?"
"Took a turn around Plato. Pretty boring but 'toujour gai, whatthehell whatthehell!' "

He managed a deeper breath as his equipment caught up somewhat to his physical needs. The half-grin on his lean features faded, and he stepped up his plodding pace.

"Like hell!" he snorted. "Why kid myself? I'm just about scared senseless! And I've got a right to be!"

Bucky O'Neil, as the pilot who was to take the scouting rocket, occupied the only extra chair in Dr. Burney's headquarters room. Burney sat across from him at the folding table and circled the proposed search area continuously with the butt of his pencil. Both men eyed the map reflectively. Burney looked as if he were trying to guess the precise location of his tractor crew. O'Neil, tracing his route with a blunt forefinger, was obviously attempting to estimate where he would have to punch his flare release in order to have his camera working by the time he whipped across Plato.

"Just to save us the wait," said Burney, leaning back in the silent, crowded room, "report by radio as soon as you look back. Have you checked your set with Mike?"

The radio operator, standing to the rear of the little group, spoke up, "Joey's checking with the field now."

"Good!" approved Burney. "Does anyone have anything to add?"

He looked about. Sherman whistled quietly and tone-

lessly. Wohl shook his head. Johnny Pierce hovered, waiting to get his hands on his photomap again. Louise leaned against one wall near the door, worrying a pencil end between her white teeth.

"All right, then," said Burney, "you can go get into your suit, Bucky. Good luck!"

The gathering broke up. Burney signaled for Wohl and Dr. Sherman to stay behind, and forestalled Johnny's move to reappropriate the map.

"We may want to consider further," he offered as an excuse, and Pierce left with Mike.

Outside, they watched Louise follow Bucky in the opposite direction.

"Wonder how it feels to have her man out there and maybe not coming back?" murmured Johnny.

His long face looked sat.

"What do you think their chances are?" he persisted after a brief pause as they turned a corner in the corridor.

Mike shrugged.

"Tractor One is starting back already," he said simply.

Hurrying along the other end of the corridor, Bucky was unable to shake off the following footsteps without putting on an obvious burst of speed. It sounded like Louise, and he wanted to think about this flight plan.

Finally, as he passed through the safety door—a double mounting that could be used in an emergency as an airlock—he had to pause long enough to ackowledge her presence.

"Do you mind if I ask you something, Bucky?" Louise inquired.

"Of course not, but I have to—"

"I know; I won't take more than a minute. The thing I don't like is that they just want you to photograph Plato."

Bucky released the door which swung shut automatically. He looked puzzled.

"Don't you think it's worth doing?" he asked.

"Oh, yes! Yes, I do. But how about all the other places?"

The pilot fidgeted.

"I can't take shots of the whole *Mare Imbrium,* Louise."

"You might take a few of the section this side of Plato, though. How do we know they ever reached the crater? If tracks show up on your pictures, we'll know how far they got."

"That's a good point," admitted Bucky, scratching his head. "But why didn't you bring it up in the meeting?"

Louise looked away. She shrugged slightly.

"Well, maybe Burney would have talked you out of it," Bucky conceded. "We all know you're worried."

"I know what everybody thinks," Louise replied. "I'm getting excited because one of the four happens to be my husband. I'm not thinking calmly about what's best for the Base as a whole, whether it's worth taking people off other jobs to play hide and seek out on the surface. I probably shouldn't have come to Luna in the first place."

Bucky looked around, but there was no one passing through the Junction. Louise stepped closer and put a trembling hand on his arm.

"All right, Bucky, it's true enough. I'm frightened. I wish I'd never thought of coming here and making Paul feel he had to trail along! Are you married, Bucky, or engaged?"

"Well, there's a little blonde waiting down there for me—I hope. She'd better wait."

"How would you like it if *she* were out there?"

"Ummm," murmured the pilot. "I see what you mean."

He saw more than that. He saw how close she was to losing her grip, how she was keeping back the tears with an effort, trying to use every ounce of self-discipline so as to keep from being ignored as hysterical. Getting a few little things done, like influencing him to take extra photos, was all she could do at the moment to look out for her man. He remembered hearing from Pierce that Burney had refused her offer to take out a tractor herself.

"Well . . ." he yielded, "I'll see if I have a chance. I figure to cover the approaches to the ringwall anyway; maybe I can get a shot out around Pico, or thereabouts."

She did not thank him, but hid her face against his shoulder for a second. Bucky looked around again, touched her lightly on the head with one big, freckled hand, and disengaged himself gently.

When he glanced back over his shoulder, Louise was opening the safety door to go back.

"Heading for Mike and the radio, I bet," he thought. "Wonder when she slept last?"

He reminded himself that he had a job to do which involved delicate judgments at high speed, and he had no business going into it with hindering worries on his mind. If that girl did not watch herself, she would wind up under the care of Jean and "M. D." McLeod.

"I'm liable to, myself," he muttered, "if I don't snap out of it now! I wonder who'll pick me up if I zig out there when I ought to zag?"

He stopped at a phone connection and called the field control dome to learn if they were ready for him.

Dazzling glints of light flashed here and there from that part of the Pacific Ocean still in bright sunlight as Hansen came in sight of Kirch. The coast of California had faded into the darkness and Asia was partly in view.

He estimated that he had been moving for nearly eight hours.

His pace was still a rhythmic lope, but the feeling of having vigorous reserves of strength had worn off. Hansen knew that he must rest soon. In traversing the flat, crater-speckled plain since his panic, he had paused only once when he took a few minutes to recharge the oxygen tank of his suit.

"But I'm due for a good half hour off my feet," he decided.

His legs, he noticed, had lost some of their snap, so that his bounding trot was less exuberant. On the other hand, this resulted in his getting slightly better control of his stride; he no longer broke his rhythm by bouncing too high. The thing that bothered him most was the growing ache across the small of his back.

He skirted the ringwall of the last of a series of small craters and saw the shadowed side of the seven-mile wall. He was approaching the left curve of it, for he had hours ago decided to abandon the tractor tracks when he had crossed them again.

"No use running up the right and getting into the Kirch Mountains," he had muttered. "I'd have to zig-zag through them and I doubt I'll feel like making any extra distance by then."

His guess now, from the angle of Earth in the starry sky, was that he was heading a shade left of his generally southerly route. He reminded himself that he must change after rounding Kirch.

"I'll keep going till I'm past," he promised himself. "Then I'll sit down and relax a while."

He could not see much point in making another few miles out into the empty wasteland beyond Kirch. The crater was a natural goal to mark a section of his journey. About halfway between Plato and Archimedes, it

was further than he had dreamed of going. Even now, after he had seen how fast he could travel in the light gravity, it struck him as almost unbelievable that he would have covered such a distance. It was nearly a hundred and fifty miles.

Yet here he was, not in bad shape at all. He glanced at the outer slope of the ringwall on his right, and mentally catalogued his various irritations. There was, of course, the general clamminess that resulted from spending hours in a spacesuit, plus the fact that his bladder was beginning to bother him and there was nothing he could do about it. The overheating due to his exertions had been partially adjusted when he had discovered during his last halt that he could regulate the heating unit by a small dial in his battery pack, which discovery left him slightly aggrieved at not having had the finer points of the care and handling of spacesuits more exhaustively explained to him.

"But then," he reflected, "I was probably expected to spend a lot of time in the darkroom as a spare photographer."

He could not say he was hungry, although he supposed that sooner or later he would discover feelings of weakness. His suit seemed to be functioning as well as could be expected, except for something that had given way in the right knee on that one leap. He wondered if a spring were working loose.

"That could end up giving me a beautiful limp," he thought. "With fourteen pounds inside, and no air at all outside, it'd be tough to bend a joint without some mechanical help."

By now, he could see light-streaks along the ringwall, and knew that he was rounding it. The lighting gradually increased as he continued, until when he began to move

out into the open plain some time later, the walls were mostly gray with earthlight. Kirch had a "new" appearance, as craters went. Its floor was not lava-filled, nor its ringwall seemingly as long exposed to thermal erosion, so that the probability was that it had been formed after the "sea" around it.

Hansen began to keep an eye out for a suitable place to sit down. Presently, he located a rock the size of an auto.

"Time for a drink, and then I'll pick out a good spot." He sighed.

The second he stopped to grope with his lips for the little hose, he knew he was really tired.

The water, cool from being only partly surrounded by heating coils to protect it from the exterior cold, refreshed him but slightly. The running had left a thick taste in his mouth.

Hansen unslung the big cylinder he had carried on his back and set it down beside a comfortable indentation in the rock. He then unfastened his back pack of tank and batteries. The metal-covered connection protecting the hose and wires was long enough to permit the pack to be set at his side.

He lowered himself to the fine sand and leaned his back against the rock with a sigh of relief. He squirmed into a more comfortable position.

"Wish I hadn't drunk all that water," he growled.

He leaned the back of his neck against the neckpiece of his suit. It was not uncomfortable except that he found himself staring directly into the light of Earth.

"I'm getting used to it all right, if I think that's too bright," he thought. "Bet my pupils are big as a cat's now."

Ironically, his feet had not started to hurt until his weight was off them. It felt as if he were developing

blisters. The coveralls he wore under the spacesuit, moreover, had begun to chafe in a few places—around the armpits as he swung his arms, behind his right knee, on the inside of his thighs.

He also was reminded of the sweat that had trickled around or into his eyes, for the lids felt sore.

"I want a different view," he grunted, picking himself up. "Facing the other way, maybe I can rest my eyes."

Carrying his back-pack, he started around the rock, then prudently went back for his big oxygen cylinder. He could think of no good reason for dragging this with him, but he somehow felt more comfortable with it beside him.

The other face of the rock was blackly shadowed, and he was forced to find a convenient spot by groping about. With a sigh, he settled down, squirmed again into an easy position, and found himself contemplating the ringwall of Kirch a few miles away. The regular sough of air through his suit and the quiet hum of the mechanisms that were keeping him alive were so familiar by now that he hardly noticed them. It was the cessation of movement, not any diminishment of the normal sounds, that lent an impression of quiet to the scene.

He looked at the ringwall, squinting against the sting in his eyes that caused them to water occasionally. The left extremity was dim in the distance, but to the right, he could clearly see the slope of the wall as it curved to meet the plain. There was no feeling of a towering, insecurely balanced mass like that of the mountain.

"Although a crater at a distance does look like a mountain range," he thought. "Not so close as this; it goes up too steeply."

In a way, it was almost like looking at the skyscrapers

of a big city, like looking at Manhattan from across the Hudson River. Except that there were no lights.

He closed his eyes for a moment and tried to visualize the sharp peak a little to his left atop the wall as it might look with a thousand lighted windows gleaming white and yellow.

It was hard to do. The stark fact was that there was only Lunar dimness, relieved by earthlight but tending to be uniform in intensity without the rays of the sun. If the silhouette of Kirch was like that of a city, the metropolis it resembled was a dead one.

A dead city in the midst of a cold, frozen sea of lava. A ghost city that had never lived, yet rose up from the gray sea over which no ship had sailed and whispered and whined ghostly warnings. "Stay with me, Man! I am dry and lonely. There are not people to warm me with light and sound . . . there is none to see my massive strength and, by seeing, making it into reality . . . stay where you are, Man!"

"But it's dead," thought Hansen. "More than dead—sterile!"

"But you, Man, you too are dead. You are already turning cold. You will slowly congeal . . . become solid . . . a monument . . . a symbol of the tribute brought by folly and life to the sea of coldness and gray death— No, do not shake your head . . . it is too late . . . my shadows are about you . . . you have no light . . . all your prayers and wishes will not turn on a single light. The shadows reach you . . . touch you . . . the pain in your leg is the cold of space . . . you will sit there forever . . . drowned in the gray sea of frozen lava . . . imagining lights for me in the blackness . . . imagining life in me in the noon glare . . . but now there is no light unless you have the force to see it . . . but you are cold . . . cold . . . cold . . . cold . . .

The sky flared with flickering light. It turned black while the image of light still remained in Hansen's eyes. Then a new light, tinier and higher streaked overhead. Hansen awoke with the hairs tingling on his neck and leaped to his feet with a hoarse shout.

"A rocket!"

In the stillness of the radio room, the incoming call from Bucky' rocket made Mike jump in his chair before the set. Hastily, he turned down the volume he had kept in hope of picking up faint calls from Plato.

When he had answered and relayed the message by phone to the landing area, he turned to the others in the room.

Joey had been sleeping in the upper bunk. Louise had asked to stay and Mike had offered his bunk for her to sit on. She had not slept, as far as he knew; but he had turned to the radio and maintained a lengthy silence.

"Maybe I ought to talk to her," he thought, "but what is there to say? Four good guys; but they're awful late checking in."

But when he looked around, they were both watching him; and he had to tell them.

"Bucky's coming in," he said.

"Did he find anything?" demanded Louise.

"Don't know yet," Mike told her. "He said he took a snap of Plato coming and going and three more on the way back."

Louise moved toward the door.

"Thanks a lot, Mike," she said.

Joey slipped down from the bunk as she disappeared into the corridor.

"Never mind," advised Mike. "With Louise and Bucky in that hole they call a darkroom, dodging the photog-

rapher's elbows every time he breaths in, they won't have any place for you but up on a shelf."

"I just thought I'd—"

"We'll get told. Now, stay with me, kid, an' make sure *I* don't go wanderin' off to have a look too!"

Hansen stood stiffly by the rock and painfully tried his neck muscles. He searched the sky, but nothing moved among the stars.

"Now, *did* I see something?" he asked himself slowly. "Or was I still dreaming?"

He grimaced, and raised a hand to the back of his head before he remembered that he was still in his spacesuit. His neck was stiff and sore from lying across the rigid neckpiece of his suit, and he was chilled to the bone.

"Must have been asleep quite a while," he thought. "Maybe I ought to turn up the heating again—or should I just warm up as I walk?"

He paused a moment to stare in open-mouthed amazement at the ringwall of Kirch, rearing up three thousand feet toward the stars.

"When am I going to do something right?" he asked. "Why couldn't I stay where I was, facing Earth, and go to sleep dreaming I was home?"

He went on to wish that he had not gone to sleep at all. The aches that were irritations were now centers of agony.

He was sure he had blisters, and the chafed places under the suit jabbed little warnings of tenderness as he tried to move. Reaching for his battery pack, he nearly toppled over because his right leg was asleep. Even after he recovered and took a few steps to restore the circulation the knee did not feel right.

"I wonder if I pulled a muscle?" he mused. "Or is it in the suit?"

He looked up at Earth. India was moving into the arc of shadow, but he could see Africa, the Mediterranean, and Europe.

When he realized he must have been out for three or perhaps four hours, he immediately checked his oxygen. It was none too soon. He refilled his suit tank and examined the pressure of the big cylinder. He guessed that he could do the trick once more.

"I wonder how long a man can live in a spacesuit?" he muttered. "Hansen, why aren't you dead?"

Groaning with stiffness, he adjusted his battery pack and tank and slung the cylinder atop the load. Although he seemed as wet as ever, he sucked up a drink of water while he listened to the hiss of his air circulator.

"Wish I wasn't so thirsty," he said. "I'll have to watch it. Beginning to feel lack of food, too."

He started off, moving mincingly to favor his sore muscles, and immediately felt the weakness brought on by hunger. It was hard to believe that a nightmare could last so long, but he remembered that it was almost a full day since he had eaten a sandwich in the tractor.

Gradually, as he moved along, marching away from Kirch into the open wasteland, he began to warm up. The stiffness left his muscles, although the chafing remained annoying. His feet felt sticky in the thick socks, suggesting that he would have trouble. He thought they might be bleeding.

What the hell was the matter with that knee, he wondered.

He thought of stopping to examine it, but the likelihood of his falling over on his face if he bent to feel

the joint deterred him. He kept on. In half an hour, it became clear that a spring had snapped.

Not only was the knee harder to bend than it should have been, but something began to dig through his coveralls behind the knee.

"That's not so good," he told himself, but there was nothing he could think of to do.

He finally mustered the ambition to get up on his toes and bound along at a fairly brisk pace. The miles again floated under his feet, but he found that he could not maintain the trot the way he had earlier. Then, he had congratulated himself on his freshness, but he had come a long way since those few hours of immunity to fatigue.

The end of an hour found him moving at a moderate walk. One more, and he stopped noticing the pace particularly. There were few landmarks about him. He did not even strain ahead to catch a glimpse of the Kirch Mountains.

Finally, the nagging pain behind his knee became bad enough to make him stop.

"This is damn' silly!" he growled. "I can't go along until that point of metal saws through a vein or something! Must be something I can do about it."

He thought it over, but it seemed that there simply was nothing he *could* do. The broken bit of metal was beyond his reach; he could not even feel it through the thickness of the spacesuit and the protective yellow chafing suit. Even if he should remove the latter by some weird contortion, the knee joint, as an obvious trouble spot, was reinforced by a bulge of metal. He would not be able to pinch or prod through that.

"Of course," he muttered, "I might take it off entirely. That would make things easy right away. A lot easier than just sitting down to wait for my air to run out."

He shook that out of mind with a jerk of his head, and struck out across the plain once more.

He had come to a stretch of gently rolling rises, and he tried to get most of his upward push from his left leg. Coming down the slopes, he hopped stiff-legged on his right. It was not too long before this became more tiring than it was worth.

"To hell with it!" he growled, and grimly drove onward with a more normal gait despite the sharp dig . . . dig . . . dig into his flesh at every stride.

Burney and Bucky again sat across the table in the former's room. Instead of the map they had consulted earlier, they gazed down at the new photographs. The room, as before, was crowded with others who had edged in to watch silently. Even "*M. D.*" McLeod, so nicknamed to distinguish him from all the doctors of philosophy and doctors of science among the expedition, lingered with his stethoscope dangling after giving Bucky a routine, post-flight check.

Johnny Pierce stood lankily behind Burney's shoulder, holding a spare magnifying glass and squinting down at the photos. Sherman, Wohl, and Joe stood around the table with the photographers who had developed and enlarged the pictures. Louise watched from behind Bucky resting her hands on his shoulders.

Burney nodded slowly, examining the picture of the interior of Plato through his lens.

"I very much fear," he said, tapping a forefinger on the half-lit heap of material at the foot of the ringwall, "that there is only one conclusion. That is a new slide, is it not?"

"It is," said Dr. Sherman, gesturing slightly with an older photograph of the region.

"And it is quite clear that they reached the crater,"

Burney continued. "These are excellent pictures, and the trail of the tractor treads shows very definitely."

"How about this one, Dr. Burney?" asked Bucky, pushing across another photo.

It showed the region around Mr. Pico, and had been enlarged until tracks of the tractor could be clearly seen. Burney frowned when he looked at it.

"To be perfectly frank," he murmured, "I do not know what to make of it. Those marks accompanying the trail *could* be footprints, I suppose, as has been suggested. But why . . . or how?"

"A man running could make marks that far apart in this gravity," said Bucky. "I know Johnny estimates those little dots are twenty and thirty feet apart, but it's possible."

"It is also possible that they are nothing of the sort. You notice that they leave the trail after a time."

Louise spoke up.

"That at least rules out one interpretation," she said. "They certainly aren't footprints made by someone on the surface on the way *to* Plato. Anybody walking beside the tractor would have left a trail starting and ending at the tread tracks."

There was silence. Some of the men looked at her with pity, other stared very hard at the photographs on the table.

Burney prodded another picture with his finger.

"Bucky took this where the tracks passed Kirch," he reminded them. "There are none of these so-called footprints there. I regret to point out the obvious conclusion—"

"But can't you do something to make sure?" Louise burst out. "You aren't just going to leave them out there! You couldn't!"

"Of course not," said Burney, biting his lip uncomfort-

ably. "As soon as the *Serenitatis* crew get a few hours rest, I shall send them out to recover . . . ah . . . to check. But the time element has already become such that—Well, my dear, there is simply no use in rushing things. Either there is no need, or it is already too late."

There was not much doubt as to which possibility seemed the more likely. The meeting began to break up in unhappy silence.

Hansen trudged along with his chin on the neckpiece of the suit. Every so often, when he lurched in the shifting sand, his forehead bumped against the faceplate of his helmet.

"And that's not so easy to do," he thought foolishly. "Takes a supple neck to accomplish it."

He concentrated for perhaps a hundred paces, and slowly arrived at the corollary.

"Takes a pretty soft and supple head to get out here in the first place. Shoulda stood at home in bed. Should've stayed on Plato and tried to build some kind of a marker. Base'll send out somebody . . . wonder if that was a rocket I saw? Maybe I'd be dead . . . but I'm gonna be dead anyway. Why don't I just sit down and wait? At least, it won't hurt any more. And, I'll be easy."

No arguments to the contrary occurred to him, but some deep impulse refused to let him quit.

He had to pause again; his stops for rest were becoming frequent. He did not sit down.

Never get up again, he realized.

He planted his feet wide apart and stood there, panting and letting his hands hang limply at his sides. His face felt stiff as he bared his teeth against the throb of the cut behind his knee. By now, he was so used to the wetness of the leg that he could not be sure the blood trickled down any faster.

He saw that he was standing on higher ground lighter than usual, and tinted pale yellow. Remembering passing several areas, he slowly realized that they must be rays from Aristillus, traces of vaporized minerals blown out across the surrounding territory when the crater had been formed. It meant, for what it might be worth, that he was getting near Archimedes. Some of the rays of Aristillus reached the larger crater.

He gritted his teeth and took the first step forward. A glance to his right assured him that the jagged peaks of the Kirch Mountains were where they should be. Once, as he walked along half awake, he had discovered himself turning away on a course that would have sent him circling back into the *Mare Imbrium.*

"Sea of Showers," he thought. "I wish there were some. I wish I even had a glass of water to pour over my head. Just a glass of water to rinse out these eyes. I wouldn't even care about a shave."

He began to notice his footsteps, besides the hiss of the air-circulator and the laboring of the suit's motors. Through his boots, they had a distant, swishing sound that insidiously lowered his puffed eyelids little by little. His head bumped against the faceplate again.

Hansen jerked upright with a start. Clumsily, he turned to look back. His tracks were long, dragging gashes in the sandy surface.

"Hell! Going to sleep again," he croaked.

With the effort of speaking aloud—it was getting difficult to think clearly otherwise—the corner of his lower lip cracked. He opened his dry mouth, making a face at the morning-after taste, and gently touched the tip of his tongue to the spot. It stung.

No harm in taking a little water, he decided, though

he knew it would offer only a fleeting relief. But he needed that.

He turned his head to the left and got the thin rubber tube between his teeth. The cracked lip stung as he sucked on the tube.

The water was cool. His tired eyes closed with the sheer pleasure of the sensation.

On the third swallow, it stopped flowing.

"Oh, *no!*" Hansen groaned.

He drew harder on the hose and eked out another mouthful. That was all. The tank was empty. It was supposed to be partly replenished by moisture removed from the air in the suit, but he had apparently reached the limit. The suit was not designed to be worn for twenty hours. It was a wonder that nothing had yet broken down.

He held the last mouthful without swallowing, letting it roll slowly about his mouth.

"Come on!" he thought. "That's all there is. What are you waiting for?"

He knew it was silly to feel angry at this latest pinprick. His growing rage was a sign of exhaustion, and some part of his mind recognized that fact; but he deliberately let his temper go . . . and drew extra strength from it.

The swallow of water gradually slipped down as he surged forward. With the stiff right knee, he staggered once and came so near falling flat that he skidded on all fours under him again.

"Godammit!' he raged. "What are they doing at Base? Waiting for a weather report? Anybody with an ounce of brain would know by now things went sour!"

He lurched down a gentle slope and charged the next rise.

"I'll show the bastards!" he grunted. "I don't need

them, if they're too chicken to come out for me. I'll get there . . . I don't know how I'll get up the goddamned wall . . . but I'll get *to* it! I'll get there!"

Mike sat before his radio and looked at the other three in the room.

Pierce looked thoughtful, Joey was frankly excited, and Louise Hansen paced nervously back and forth.

"The crew from Tractor One say they saw no tracks of any kind," he said, "but that doesn't prove a thing. They came nowheres near the line between Plato and Archimedes."

"Then you think we're justified in not waiting for the same crew?" asked Louise.

"Sure," said Mike. "I don't like to sound like I'm egging you on to something I wouldn't do myself, but—"

"Of course, Mike, of course," interrupted Johnny. "One of you has to stay on the radio, or we couldn't call back. We could get Bucky to take Joey's place, I guess but why wake him up?"

"He did his share," Joey put in quickly.

Mike looked from face to face.

"Well, Joey can say I gave him permission," he said. "I don't know what you will say, but it'd be better if you got going and figured that out on the way back."

The shadowed ringwall loomed up before the yellow speck on the plain. Just enough earthlight reached this face to show where the seven mile wide outer slope was terraced by gentle inclines. Several of these led upward toward the pass used by the scouting expedition. Against the black sky, Hansen could not see the radio tower that had been erected, but he was no longer interested in that. He had jettisoned his radio batteries back on the

plain to be rid of their weight as he tackled the long slope leading to Archimedes.

"There you are . . . there you are!" he mumbled. "Eureka, eureka! Damn' near three hundred miles . . . maybe more the way I came. That's navigating, ain't it?"

The ringwall stood passively before him.

"Well, ain't it?" snarled Hansen thickly. "All right, here we go!"

He lurched forward. Despite having abandoned every bit of excess gear—the empty oxygen cylinder lay back beside the last craterlet he had passed—he could walk no faster than if he had been on Earth. It probably meant that on Earth he would have long since collapsed, but he was beyond thinking that.

He found he could not climb the first seven-foot ledge he came to, and had to walk along it to a lower spot.

"No time, no time," he muttered against the delay. "You're on your last tankful now . . . in fact, well into it. You get up there . . . now . . . or not ever."

He found a long lateral slope and followed it up several hundred yards. He was cold and sluggish, and it seemed that his heating batteries were close to exhausted.

The ache across his back seemed normal. Even the dull misery of his legs, chafed, cut, rubbed raw, and the sogginess of his bleeding feet had come to be merely part of his general limpness.

He found himself finishing the last few yards of the slope on hands and knees.

"Funny," he croaked. "Don' remember fallin'."

He reached out for an outcropping of rock to pull himself up. The broken spring twisted in the mangled spot on the back of his thigh as he tried to rise. Getting both hands on the rock, he inched upward little by little.

It took him all of five minutes before he was on his

feet again. At first, he thought he was dreaming again. The rock seemed to move under him.

Then he saw, peering blearily upward, that it was part of an old landslide. One slip on his part now might set it off again, and send him crashing down to the bottom of the ringwall again. Hansen groaned and stepped away as carefully as he could.

He was faced by a forty-five degree slope. If he could negotiate it for about thirty feet, he would reach another ramp. He looked down, and wondered if it would be easier to slide down to a lower terrace which would eventually lead higher than his present position.

"No time," he said dazedly.

He began to scrabble his way up the incline, not one too difficult to climb on Luna. The sun-powered rock flaked off beneath his hands, elbows, knees and feet. He slid back about as fast as he climbed.

With a sob, he lunged for a projection the size of a man's head and got one mitten on it. The rock cracked off and he slid to the foot of the incline.

"Oh, God! It's too much!"

His face twisted up and he expected to feel tears running down his face. Apparently, however, he was too dried out for that.

He sat there dully, staring at the lower ramp and trying to tell himself he could always try that.

He knew better.

"This is the end of the line," he told himself. "Last stop . . . you're done."

Even his conscience did not twitch at his surrender. He only wished he could see Earth and look at North America again where it was centered on the globe once more.

It was too much effort to turn around.

"Wonder if they'll find me," he mumbled. "Dunno if I want to get buried or not . . ."

Something moved to his left. A light.

"I'm seeing things," he muttered. "Not long now."

But the light swung up and down, it lit the slope below him, and it kept moving.

Nothing looked like that but a tractor.

But it would pass a hundred yards below him. The driver would have his eyes glued to the ground ahead, watching for holes or cracks.

Hansen started to laugh and managed to catch himself.

"The chance after the last chance!" he thought he said aloud, although his lips barely moved.

The effort of pulling himself to his knees brought out sweat he did not know he had left.

He waited for the tractor to reach a point below him. Waited . . . lifting the head-sized rock in both hands.

The tiny weight tired him, and he lowered the stone to his knees. The tractor lumbered along, heading down the slope into the plain.

Hansen swayed where he knelt, but concentrated everything upon estimating the distance.

With a grunt, he raised the rock and thrust it away from his chest, outward over the slope on which he sprawled with the motion.

He raised himself on his elbows and looked to see what happened. The tractor had slid to an abrupt halt.

Dimly, he could see the shattered pieces of his missile bouncing in and out of patches of earthlight below the vehicle. The driver could not have missed it crossing his path.

"Gotta get up . . . up!" Hansen thought desperately.

He did not realize that his air was turning foul, but

the simple feat of getting his feet under him left his heart pounding wildly.

He planted his feet somehow until the light swept up the slope as those in the tractor searched for a possible slide.

Brightness filled his helmet. He was dazzled, and felt himself falling.

"Paul, try to help!"

"Paul, can't you get some grip when I shove you in? I can't keep you from sliding out the airlock. Paul!"

The voice was young and desperate.

When the other man backed away, parting the contact of their helmets, Hansen saw the features of Joey, the radio operator, through the other faceplate.

He stirred feebly.

"That's it, Paul," said the faraway voice as Joey bent to lift him again. "Just a little bit of help till I get you inside the airlock."

Something clanged, leaving him in blackness.

The next thing he knew, he was gulping in sobbing breaths of fresh, oxygen-rich air. His head ached, but he felt better.

Someone was mopping his sweaty face with a wet handkerchief. The handkerchief dripped, and the drops were salty.

He could not see Louise, because she held his head cradled against her breast, but Joey was looking at him wide-eyed over the back of another seat.

"How long ago did you start?" asked someone else, and Hansen saw that Johnny Pierce was driving.

"Right after we got to Plato," said Hansen. "Everything but me and a tank of oxygen went down in a slide."

"Musta been nearly twenty-four hours ago!" exclaimed Joey.

"Gol-darn!" said Pierce primly. "Three hundred miles, give or take a few!"

"You ain't human, Paul!" said Joey.

"Do you want your suit off now?" asked Louise. "We could only get your helmet loose in this space."

Without seeing her face, he could tell that she had been crying.

"Just leave it on," said Hansen. "Wait till we're in, and I can go right from the suit to a bath."

"We're coming over the crest," announced Johnny. "Louise, you better hold him in case I hit a few bumps."

Hansen relaxed with a sigh as he felt her hands tighten against him.

"Hold tight, Honey!" he whispered as he closed his eyes against the lights in the tractor. "I . . . I'm a little tired."

KEYHOLE

By Murray Leinster

There's a story about a psychologist who was studying the intelligence of a chimpanzee. He led the chimp into a room full of toys, went out, closed the door and put his eye to the keyhole to see what the chimp was doing. He found himself gazing into a glittering interested brown eye only inches from his own. The chimp was looking through the keyhole to see what the psychologist was doing.

When they brought Butch into the station in Tycho crater he seemed to shrivel as the gravity-coils in the airlock went on. He was impossible to begin with. He was all big eyes and skinny arms and legs and he was very young and he didn't need air to breathe. Worden saw him as a limp bundle of bristly fur and terrified eyes as his captors handed him over.

"Are you crazy?" demanded Worden angrily. "Bringing him in like this? Would you take a human baby into eight gravities? Get out of the way!"

He rushed for the nursery that had been made ready for somebody like Butch. There was a rebuilt dwelling-cave on one side. The other side was a human school-room. And under the nursery the gravity-coils had been turned off so that in that room things had only the weight that was proper to them on the Moon.

The rest of the station had coils to bring everything up to normal weight for earth. Otherwise the staff of the station would be seasick most of the time. Butch was in

the earth-gravity part of the station when he was delivered and he couldn't lift a furry spindly paw.

In the nursery though it was different. Worden put him on the floor. Worden was the uncomfortable one there—his weight only twenty pounds instead of a normal hundred and sixty. He swayed and reeled as a man does on the moon without gravity-coils to steady him.

But that was the normal thing to Butch. He uncurled himself and suddenly flashed across the nursery to the reconstructed dwelling-cave. It was a pretty good job, that cave. There were the five-foot chipped rocks shaped like dunce-caps, found in all residences of Butch's race. There was the rockingstone on its base of other flattened rocks. But the spear-stones were fastened down with wire in case Butch got ideas.

Butch streaked it to these familiar objects. He swarmed up one of the dunce-cap stones and locked his arms and legs about its top, clinging close. Then he was still. Worden regarded him. Butch was motionless for minutes, seeming to take in as much as possible of his surroundings without moving even his eyes.

Suddenly his head moved. He took in more of his environment. Then he stirred a third time and seemed to look at Worden with an extraordinary intensity—whether of fear or pleading Worden could not tell.

"Hmm," said Worden, "so that's what those stones are for! Perches or beds or roosts, eh? I'm your nurse, fella. We're playing a dirty trick on you but we can't help it."

He knew Butch couldn't understand, but he talked to him as a man does talk to a dog or a baby. It isn't sensible, but it's necessary.

"We're going to raise you up to be a traitor to your kinfolk," he said with some grimness. "I don't like it but it has to be done. So I'm going to be very kind to you

as part of the conspiracy. Real kindness would suggest that I kill you instead—but I can't do that."

Butch stared at him, unblinking and motionless. He looked something like an Earth monkey but not too much so. He was completely impossible but he looked pathetic.

Worden said bitterly, "You're in your nursery, Butch. Make yourself at home!"

He went out and closed the door behind him. Outside he glanced at the video screens that showed the interior of the nursery from four different angles. Butch remained still for a long time. Then he slipped down to the floor. This time he ignored the dwelling-cave of the nursery.

He went interestedly to the human-culture part. He examined everything there with his oversized soft eyes. He touched everything with his incredibly handlike tiny paws. But his touches were tentative. Nothing was actually disturbed when he finished his examination.

He went swiftly back to the dunce-cap rock, swarmed up it, locked his arms and legs about it again, blinked rapidly and seemed to go to sleep. He remained motionless with closed eyes until Worden grew tired of watching him and moved away.

The whole affair was preposterous and infuriating. The first men to land on the Moon knew that it was a dead world. The astronomers had been saying so for a hundred years and the first and second expeditions to reach Luna from Earth found nothing to contradict the theory.

But a man from the third expedition saw something moving among the upflung rocks of the Moon's landscape and he shot it and the existence of Butch's kind was discovered. It was inconceivable of course that there should be living creatures where there was neither air

nor water. But Butch's folk did live under exactly those conditions.

The dead body of the first living creature killed on the Moon was carried back to Earth and biologists grew indignant. Even with a specimen to dissect and study they were inclined to insist that there simply wasn't any such creature. So the fourth and fifth and sixth Lunar Expeditions hunted Butch's relatives very earnestly for further specimens for the advancement of science.

The sixth expedition lost two men whose space-suits were punctured by what seemed to be weapons while they were hunting. The seventh expedition was wiped out to the last man. Butch's relatives evidently didn't like being shot as biological specimens.

It wasn't until the tenth expedition of four ships established a base in Tycho crater that men had any assurance of being able to land on the Moon and get away again. Even then the staff of the station felt as if it were under permanent siege.

Worden made his report to Earth. A baby Lunar creature had been captured by a tractor-party and brought into Tycho station. A nursery was ready and the infant was there now, alive. He seemed to be uninjured. He seemed not to mind an environment of breathable air for which he had no use. He was active and apparently curious and his intelligence was marked.

There was so far no clue to what he ate—if he ate at all—though he had a mouth like the other collected specimens and the toothlike concretions which might serve as teeth. Worden would of course continue to report in detail. At the moment he was allowing Butch to accustom himself to his new surroundings.

He settled down in the recreation-room to scowl at his companion scientists and try to think, despite the program beamed on radar-frequency from Earth. He defi-

nitely didn't like his job, but he knew that it had to be done. Butch had to be domesticated. He had to be persuaded that he was a human being, so human beings could find out how to exterminate his kind.

It had been observed before, on Earth, that a kitten raised with a litter of puppies came to consider itself a dog and that even pet ducks came to prefer human society to that of their own species. Some talking birds of high intelligence appeared to be convinced that they were people and acted that way. If Butch reacted similarly he would become a traitor to his kind for the benefit of man. And it was necessary!

Men had to have the Moon and that was all there was to it. Gravity on the Moon was one-eighth of gravity on Earth. A rocket-ship could make the Moon-voyage and carry a cargo but no ship yet built could carry fuel for a trip to Mars or Venus if it started out from Earth.

With a fueling-stop on the Moon though the matter was simple. Eight drums of rocket-fuel on the Moon weighed no more than one on Earth. A ship itself weighed only one-eighth as much on Luna. So a rocket that took off from Earth with ten drums of fuel could stop at a fuel-base on the Moon and soar away again with two hundred, and sometimes more.

With the Moon as a fueling-base men could conquer the Solar System. Without the Moon Mankind was Earthbound. Men had to have the Moon!

But Butch's relatives prevented it. By normal experience there could not be life on an airless desert with such monstrous extremes of heat and cold as the Moon's surface experienced. But there was life there. Butch's kinfolk did not breathe oxygen. Apparently they ate it in some mineral combination and it interacted with other minerals in their bodies to yield heat and energy.

Men thought squids peculiar because their blood

stream used copper in the place of iron but Butch and his kindred seemed to have complex carbon compounds in place of both. They were intelligent in some fashion, it was clear. They used tools, they chipped stone and they had long, needlelike stone crystals which they threw as weapons.

No metals, of course, for lack of fire to smelt them. There couldn't be fire without air. But Worden reflected that in ancient days some experimenters had melted metals and set wood ablaze with mirrors concentrating the heat of the sun. With the naked sunlight of the Moon's surface, not tempered by air and clouds, Butch's folk could have metals if they only contrived mirrors and curved them properly like the mirrors of telescopes on Earth.

Worden had an odd sensation just then. He looked around sharply as if somebody had made a sudden movement. But the video screen merely displayed a comedian back on Earth, wearing a funny hat. Everybody watched the screen.

As Worden glanced the comedian was smothered in a mass of soapsuds and the studio audience two hundred thirty thousand miles away squealed and applauded the exquisite humor of the scene. In the Moon-station in Tycho crater somehow it was less than comical.

Worden got up and shook himself. He went to look again at the screen that showed the interior of the nursery. Butch was motionless on the absurd cone-shaped stone. His eyes were closed. He was simply a furry pathetic little bundle, stolen from the airless wastes outside to be bred into a traitor to his race.

Worden went to his cabin and turned in. Before he slept though he reflected that there was still some hope for Butch. Nobody understood his metabolism. Nobody

could guess at what he ate. Butch might starve to death. If he did he would be lucky. But it was Worden's job to prevent it.

Butch's relatives were at war with men. The tractors that crawled away from the station—they went amazingly fast on the Moon—were watched by big-eyed furry creatures from rock-crevices and from behind the boulders that dotted the Lunar landscape.

Needle-sharp throwing-stones flicked through emptiness. They splintered on the tractor-bodies and on the tractor-ports but sometimes they jammed or broke a tread and then the tractor had to stop. Somebody had to go out and clear things or make repairs. And then a storm of throwing-stones poured upon him.

A needle-pointed stone, traveling a hundred feet a second, hit just as hard on Luna as it did on Earth—and it traveled farther. Space-suits were punctured. Men died. Now tractor-treads were being armored and special repair-suits were under construction, made of hardened steel plates.

Men who reached the Moon in rocket-ships were having to wear armor like medieval knights and men-at-arms! There was a war on. A traitor was needed. And Butch was elected to be that traitor.

When Worden went into the nursery again—the days and nights on the Moon are two weeks long apiece, so men ignored such matters inside the station—Butch leaped for the dunce-cap stone and clung to its top. He had been fumbling around the rocking-stone. It still swayed back and forth on its plate. Now he seemed to try to squeeze himself to unity with the stone spire, his eyes staring enigmatically at Worden.

"I don't know whether we'll get anywhere or not," said Worden conversationally. "Maybe you'll put up a fight if I touch you. But we'll see."

He reached out his hand. The small furry body—neither hot nor cold but the temperature of the air in the station—resisted desperately. But Butch was very young. Worden peeled him loose and carried him across the room to the human schoolroom equipment. Butch curled up, staring fearfully.

"I'm playing dirty," said Worden, "by being nice to you, Butch. Here's a toy."

Butch stirred in his grasp. His eyes blinked rapidly. Worden put him down and wound up a tiny mechanical top. It moved. Butch watched intently. When it stopped he looked back at Worden. Worden wound it up again. Again Butch watched. When it ran down a second time the tiny handlike paw reached out.

With an odd tentativeness, Butch tried to turn the winding-key. He was not strong enough. After an instant he went loping across to the dwelling-cave. The winding-key was a metal ring. Butch fitted that over a throw-stone point, and twisted the toy about. He wound it up. He put the toy on the floor and watched it work. Worden's jaw dropped.

"Brains!" he said wryly. "Too bad, Butch! You know the principle of the lever. At a guess you've an eight-year-old human brain! I'm sorry for you, fella!"

At the regular communication-hour he made his report to Earth. Butch was teachable. He only had to see a thing done once—or at most twice—to be able to repeat the motions involved.

"And," said Worden, carefuly detached, "he isn't afraid of me now. He understands that I intend to be friendly. While I was carrying him I talked to him. He felt the vibration of my chest from my voice.

"Just before I left him I picked him up and talked to him again. He looked at my mouth as it moved and put his paw on my chest to feel the vibrations. I put his paw

at my throat. The vibrations are clearer there. He seemed fascinated. I don't know how you'd rate his intelligence but it's above that of a human baby."

Then he said with even greater detachment, "I am disturbed. If you must know I don't like the idea of exterminating his kind. They have tools—they have intelligence. I think we should try to communicate with them in some way—try to make friends—stop killing them for dissection."

The communicator was silent as his voice traveled a second and a half to Earth and for the answer to come a second and a half back. Then the recording clerk's voice said briskly, "Very good, Mr. Worden! Your voice was very clear!"

Worden shrugged his shoulders. The Luna Station in Tycho was a highly official enterprise. The staff on the Moon had to be competent—and besides political appointees did not want to risk their precious lives—but the Earth end of the business of the Space-Exploration Bureau was run by the sort of people who do get on official payrolls. Worden felt sorry for Butch—and for Butch's relatives.

In a later lesson-session Worden took an empty coffee-tin into the nursery. He showed Butch that its bottom vibrated when he spoke into it, just as his throat did. Butch experimented busily. He discovered for himself that it had to be pointed at Worden to catch the vibrations.

Worden was unhappy. He would have preferred Butch to be a little less rational. But for the next lesson he presented Butch with a really thin metal diaphragm stretched across a hoop. Butch caught the idea at once.

When Worden made his next report to Earth he felt angry.

"Butch has no experience of sounds as we have of course," he said curtly. "There's no air on the Moon. But sound travels through rocks. He's sensitive to vibrations in solid objects just as a deaf person can feel the vibration of a dance-floor if the music is loud enough.

"Maybe Butch's kind has a language or a code of sounds sent through the rock underfoot. They do communicate somehow! And if they've brains and a means of communication they aren't animals and shouldn't be exterminated for our convenience!"

He stopped. The Chief Biologist of the Space-Exploration Bureau was at the other end of the communication-beam then. After the necessary pause for distance his voice came blandly.

"Splendid, Worden! Splendid reasoning! But we have to take the longer view. Exploration of Mars and Venus is a very popular idea with the public. If we are to have funds—and the appropriations come up for a vote shortly—we have to make progress toward the nearer planets. The public demands it. Unless we can begin work on a refueling-base on the Moon public interest will cease!"

Worden said urgently, "Suppose I send some pictures of Butch? He's very human, sir! He's extraordinarily appealing! He has personality! A reel or two of Butch at his lessons ought to be popular!"

Again that irritating wait while his voice traveled a quarter-million miles at the speed of light and the wait for the reply.

"The—ah—Lunar creatures, Worden," said the Chief Biologist regretfully, "have killed a number of men who have been publicized as martyrs to science. We cannot give favorable publicity to creatures that have killed men!" Then he added blandly, "But you are progressing splendidly, Worden—*Splendidly!* Carry on!"

His image faded from the video-screen. Worden said naughty words as he turned away. He'd come to like Butch. Butch trusted him. Butch now slid down from that crazy perch of his and came rushing to his arms every time he entered the nursery.

Butch was ridiculously small—no more than eighteen inches high. He was preposterously light and fragile in his nursery, where only Moon-gravity obtained. And Butch was such an earnest little creature, so soberly absorbed in everything that Worden showed him!

He was still fascinated by the phenomena of sound. Humming or singing—even Worden's humming and singing—entranced him. When Worden's lips moved now Butch struck an attitude and held up the hoop-diaphragm with a tiny finger pressed to it to catch the vibrations Worden's voice made.

Now too when he grasped an idea Worden tried to convey he tended to swagger. He became more human in his actions with every session of human contact. Once indeed Worden looked at the video-screens which spied on Butch and saw him—all alone—solemnly going through every gesture and every movement Worden had made. He was pretending to give a lesson to an imaginary still-tinier companion. He was pretending to be Worden, apparently for his own satisfaction!

Worden felt a lump in his throat. He was enormously fond of the little mite. It was painful that he had just left Butch to help in the construction of a vibrator-microphone device which would transfer his voice to rock-vibrations and simultaneously pick up any other vibrations that might be made in return.

If the members of Butch's race did communicate by tapping on rocks or the like men could eavesdrop on them—could locate them, could detect ambushes in prep-

aration and apply mankind's deadly military countermeasures.

Worden hoped the gadget wouldn't work. But it did. When he put it on the floor of the nursery and spoke into the microphone, Butch did feel the vibrations underfoot. He recognized their identity with the vibrations he'd learned to detect in air.

He made a skipping exultant hop and jump. It was plainly the uttermost expression of satisfaction. And then his tiny foot pattered and scratched furiously on the floor. It made a peculiar scratchy tapping noise which the microphone picked up. Butch watched Worden's face, making the sounds which were like highly elaborated footfalls.

"No dice, Butch," said Worden unhappily. "I can't understand it. But it looks as if you've started your treason already. This'll help wipe out some of your folks."

He reported it reluctantly to the Head of the station. Microphones were immediately set into the rocky crater-floor outside the station and others were made ready for exploring parties to use for the detection of Moon-creatures near them. Oddly enough the microphones by the station yielded results right away.

It was near sunset. Butch had been captured near the middle of the three-hundred-and-thirty-four hour Lunar day. In all the hours between—a week by Earth-time—he had had no nourishment of any sort. Worden had conscientiously offered him every edible and inedible substance in the station. Then at least one sample of every mineral in the station collection.

Butch regarded them all with interest but without appetite. Worden—liking Butch—expected him to die of starvation and thought it a good idea. Better than encompassing the death of all his race anyhow. And it did

seem to him that Butch was beginning to show a certain sluggishness, a certain lack of bounce and energy. He thought it was weakness from hunger.

Sunset progressed. Yard by yard, fathom by fathom, half-mile by half-mile, the shadows of the miles-high western walls of Tycho crept across the crater floor. There came a time when only the central hump had sunlight. Then the shadow began to creep up the eastern walls. Presently the last thin jagged line of light would vanish and the colossal cup of the crater would be filled to overflowing with the night.

Worden watched the incandescent sunlight growing even narrower on the cliffs. He would see no other sunlight for two weeks Earth-time. Then abruptly an alarm-bell rang. It clanged stridently, furiously. Doors hissed shut, dividing the Station into airtight sections.

Loudspeakers snapped, *"Noises in the rock outside! Sounds like moon-creatures talking nearby! They may plan an attack! Everybody into space-suits and get guns ready!"*

At just that instant the last thin sliver of sunshine disappeared. Worden thought instantly of Butch. There was no space-suit to fit him. Then he grimaced a little. Butch didn't need a space-suit.

Worden got into the clumsy outfit. The lights dimmed. The harsh airless space outside the station was suddenly bathed in light. The multimillion-lumen beam, made to guide rocketships to a landing even at night, was turned on to expose any creatures with designs on its owners. It was startling to see how little space was really lighted by the beam and how much of stark blackness spread on beyond.

The loudspeaker snapped again. *Two moon-creatures! Running away! They're zigzagging! Anybody who wants to take a shot—"* The voice paused. It didn't matter.

Nobody is a crack shot in a space-suit. *"They left something behind!"* said the voice in the loudspeaker. It was sharp and uneasy.

"I'll take a look at that," said Worden. His own voice startled him but he was depressed. "I've got a hunch what it is."

Minutes later he went out through the airlock. He moved lightly despite the cumbrous suit he wore. There were two other staff-members with him. All three were armed and the searchlight beam stabbed here and there erratically to expose any relative of Butch who might try to approach them in the darkness.

With the light at his back Worden could see that trillions of stars looked down upon Luna. The zenith was filled with infinitesimal specks of light of every conceivable color. The familiar constellations burned ten times as brightly as on Earth. And the Earth itself hung nearly overhead. It was three-quarters full—a monstrous bluish giant in the sky, four times the Moon's diameter, its ice-caps and continents mistily to be seen.

Worden went forebodingly to the object left behind by Butch's kin. He wasn't much surprised when he saw what it was. It was a rocking-stone on its plate with a fine impalpable dust on the plate as if something had been crushed under the egg-shaped upper stone acting as a mill.

Worden said sourly into his helmet microphone, "It's a present for Butch. His kinfolks know he was captured alive. They suspect he's hungry. They've left some grub for him of the kind he wants or needs most."

That was plainly what it was. It did not make Worden feel proud. A baby—Butch—had been kidnapped by the enemies of its race. That baby was a prisoner and its captors would have nothing with which to feed it. So someone, greatly daring—Worden wondered somberly if

it was Butch's father and mother—had risked their lives to leave food for him with a rocking-stone to tag it for recognition as food.

"It's a dirty shame," said Worden bitterly. "All right! Let's carry it back. Careful not to spill the powdered stuff!"

His lack of pride was emphasized when Butch fell to upon the unidentified powder with marked enthusiasm. Tiny pinch by tiny pinch Butch consumed it with an air of vast satisfaction. Worden felt ashamed.

"You're getting treated pretty rough, Butch," said Worden. "What I've already learned from you will cost a good many hundred of your folks' lives. And they're taking chances to feed you! I'm making you a traitor and myself a scoundrel."

Butch thoughtfully held up the hoop-diaphragm to catch the voice vibrations in the air. He was small and furry and absorbed. He decided that he could pick up sounds better from the rock underfoot. He pressed the communicator-microphone on Worden. He waited.

"*No!*" said Worden roughly. "Your people are too human. Don't let me find out any more, Butch. Be smart and play dumb!"

But Butch didn't. It wasn't very long before Worden was teaching him to read. Oddly, though, the rock microphones that had given the alarm at the station didn't help the tractor-parties at all. Butch's kinfolk seemed to vanish from the neighborhood of the station altogether. Of course if that kept up the construction of a fuel-base could be begun and the actual extermination of the species carried out later. But the reports on Butch were suggesting other possibilities.

"If your folks stay vanished," Worden told Butch, "it'll be all right for awhile—and only for awhile. I'm being

urged to try to get you used to Earth-gravity. If I succeed they'll want you on Earth in a zoo. And if that works—why—they'll be sending other expeditions to get more of your kinfolks to put in other zoos."

Butch watched Worden, motionless.

"And also"—Worden's tone was very grim—"there's some miniature mining-machinery coming up by the next rocket. I'm supposed to see if you can learn to run it."

Butch made scratching sounds on the floor. It was unintelligible of course but it was an expression of interest at least. Butch seemed to enjoy the vibrations of Worden's voice, just as a dog likes to have his master talk to him. Worden grunted.

"We humans class you as an animal, Butch. We tell ourselves that all the animal world should be subject to us. Animals should work for us. If you act too smart we'll hunt down all your relatives and set them to work digging minerals for us. You'll be with them. But I don't want you to work your heart out in a mine, Butch! It's wrong!"

Butch remained quite still. Worden thought sickishly of small furry creatures like Butch driven to labor in airless mines in the Moon's frigid depths. With guards in space-suits watching lest any try to escape to the freedom they'd known before the coming of men. With guns mounted against revolt. With punishments for rebellion or weariness.

It wouldn't be unprecedented. The Indians in Cuba when the Spanish came—Negro slavery in both Americas—concentration-camps . . .

Butch moved. He put a small furry paw on Worden's knee. Worden scowled at him.

"Bad business," he said harshly. "I'd rather not get fond of you. You're a likeable little cuss but your race is doomed. The trouble is that you didn't bother to develop

a civilization. And if you had, I suspect we'd have smashed it. We humans aren't what you'd call admirable."

Butch went over to the blackboard. He took a piece of pastel-chalk—ordinary chalk was too hard for his Moon-gravity muscles to use—and soberly began to make marks on the slate. The marks formed letters. The letters made words. The words made sense.

YOU, wrote Butch quite incredibly in neat pica lettering, GOOD FRIEND.

He turned his head to stare at Worden. Worden went white. "I haven't taught you those words, Butch!" he said very quietly. "What's up?"

He'd forgotten that his words, to Butch, were merely vibrations in the air or in the floor. He'd forgotten they had no meaning. But Butch seemed to have forgotten it too. He marked soberly:

MY FRIEND GET SPACE SUIT. He looked at Worden and marked once more. TAKE ME OUT. I COME BACK WITH YOU.

He looked at Worden with large incongruously soft and appealing eyes. And Worden's brain seemed to spin inside his skull. After a long time Butch printed again—YES.

Then Worden sat very still indeed. There was only Moon-gravity in the nursery and he weighed only one-eighth as much as on Earth. But he felt very weak. Then he felt grim.

"Not much else to do, I suppose," he said slowly. "But I'll have to carry you through Earth-gravity to the airlock."

He got to his feet. Butch made a little leap up into his arms. He curled up there, staring at Worden's face. Just before Worden stepped through the door Butch reached

up a skinny paw and caressed Worden's cheek tentatively.

"Here we go!" said Worden. "The idea was for you to be a traitor. I wonder—"

But with Butch a furry ball, suffering in the multiplied weight Earth-gravity imposed upon him, Worden made his way to the airlock. He donned a space-suit. He went out.

It was near sunrise then. A long time had passed and Earth was now in its last quarter and the very highest peak of all that made up the crater-wall glowed incandescent in the sunshine. But the stars were still quite visible and very bright. Worden walked away from the station, guided by the Earth-shine on the ground underfoot.

Three hours later he came back. Butch skipped and hopped beside his space-suited figure. Behind them came two other figures. They were smaller than Worden but much larger than Butch. They were skinny and furry and they carried a burden. A mile from the station he switched on his suit-radio. He called. A startled voice answered in his earphones.

"It's Worden," he said drily. "I've been out for a walk with Butch. We visited his family and I've a couple of his cousins with me. They want to pay a visit and present some gifts. Will you let us in without shooting?"

There were exclamations. There was confusion. But Worden went on steadily toward the station while another high peak glowed in sunrise light and a third seemed to burst into incandescence and dawn was definitely on the way.

The airlock door opened. The party from the airless Moon went in. When the airlock filled, though, and the gravity-coils went on, Butch and his relatives became

helpless. They had to be carried to the nursery. There they uncurled themselves and blinked enigmatically at the men who crowded into the room where gravity was normal for the Moon and at the other men who stared in the door.

"I've got a sort of message," said Worden. "Butch and his relatives want to make a deal with us. You'll notice that they've put themselves at our mercy. We can kill all three of them. But they want to make a deal."

The Head of the station said uncomfortably, "You've managed two-way communication, Worden?"

"*I* haven't," Worden told him. "*They* have. They've proved to me that they've brains equal to ours. They've been treated as animals and shot as specimens. They've fought back—naturally! But they want to make friends. They say that we can never use the Moon except in space-suits and in stations like this and they could never take Earth's gravity. So there's no need for us to be enemies. We can help each other."

The Head of the station said drily, "Plausible enough but we have to act under orders. Worden. Did you explain that?"

"They know," said Worden. "So they've got set to defend themselves if necessary. They've set up smelters to handle metals. They get the heat by sun-mirrors, concentrating sunlight. They've even begun to work with gases held in containers. They're not far along with electronics yet but they've got the theoretic knowledge and they don't need vacuum tubes. They live in a vacuum. They can defend themselves from now on."

The Head said mildly, "I've watched Butch, you know, Worden. And you don't look crazy. But if this sort of thing is sprung on the armed forces on Earth there'll be trouble. They've been arguing for armed rocket-ships.

If your friends start a real war for defense—if they can—maybe rocket warships will be the answer."

Worden nodded.

"Right. But our rockets aren't so good that they can fight this far from a fuel-store and there couldn't be one on the Moon with all of Butch's kinfolk civilized—as they nearly are now—and as they certainly will be within the next few weeks. Smart people, these cousins and such of Butch!"

"I'm afraid they'll have to prove it," said the Head. "Where'd they get this sudden surge in culture?"

"From us," said Worden. "Smelting from me, I think. Metallurgy and mechanical engineering from the tractor-mechanics. Geology—call it Lunology here—mostly from you."

"How's that?" demanded the Head.

"Think of something you'd like Butch to do," said Worden grimly, "and then watch him."

The Head stared and then looked at Butch. Butch—small and furry and swaggering—stood up and bowed profoundly from the waist. One paw was placed where his heart could be. The other made a grandiose sweeping gesture. He straightened up and strutted, then climbed swiftly into Worden's lap and put a skinny furry arm about his neck.

"That bow," said the Head, very pale, "is what I had in mind. You mean—"

"Just so," said Worden. "Butch's ancestors had no air to make noises in for speech. So they developed telepathy. In time, be sure, they worked out something like music—sounds carried through rock. But like our music it doesn't carry meaning. They communicate directly from mind to mind. Only we can't pick up communications from them and they can from us."

"They read our minds!" said the Head. He licked his

lips. "And when we first shot them for specimens they were trying to communicate. Now they fight."

"Naturally," said Worden. "Wouldn't we? They've been picking our brains. They can put up a terrific battle now. They could wipe out this station without trouble. They let us stay so they could learn from us. Now they want to trade."

"We have to report to Earth," said the Head slowly, "but—"

"They brought along some samples," said Worden. "They'll swap diamonds, weight for weight, for records. They like our music. They'll trade emeralds for textbooks —they can read, now! And they'll set up an atomic pile and swap plutonium for other things they'll think of later. Trading on that basis should be cheaper than a war!"

"Yes," said the Head. "It should. That's the sort of argument men will listen to. But how—"

"Butch," said Worden ironically. "Just Butch! We didn't capture him—they planted him on us! He stayed in the station and picked our brains and relayed the stuff to his relatives. We wanted to learn about them, remember? It's like the story of the psychologist . . ."

There's a story about a psychologist who was studying the intelligence of a chimpanzee. He led the chimp into a room full of toys, went out, closed the door and put his eye to the keyhole to see what the chimp was doing. He found himself gazing into a glittering interested brown eye only inches from his own. The chimp was looking through the keyhole to see what the psychologist was doing.