



# Universe

**Robert A. Heinlein**

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The Proxima Centauri Expedition, sponsored by the Jordan Foundation in 2119, was the first recorded attempt to reach the nearer stars of this galaxy. Whatever its unhappy fate we can only conjecture.

-- Quoted from **The Romance of Modern Astrography**, by Franklin Buck, published by Lux Transcriptions, Ltd., 3.50 cr.

"THERE'S A MUTIE! Look out!"

At the shouted warning, Hugh Hoyland ducked, with nothing to spare. An egg-sized iron missile clanged against the bulkhead just above his scalp with force that promised a fractured skull. The speed with which he crouched had lifted his feet from the floor plates. Before his body could settle slowly to the deck, he planted his feet against the bulkhead behind him and shoved. He went shooting down the passageway in a long, flat dive, his knife drawn and ready.

He twisted in the air, checked himself with his feet against the opposite bulkhead at the turn in the passage from which the mutie had attacked him, and floated lightly to his feet. The other branch of the passage was empty. His two companions joined him, sliding awkwardly across the floor plates.

"Is it gone?" demanded Alan Mahoney.

"Yes," agreed Hoyland. "I caught a glimpse of it as it ducked down that hatch. A female, I think. Looked like it had four legs."

"Two legs or four, we'll never catch it now," commented the third man.

"Who the Huff wants to catch it?" protested Mahoney.

"I don't."

"Well, I do, for one," said Hoyland. "By Jordan, if its aim had been two inches better, I'd be ready for the Converter."

"Can't either one of you two speak three words without swearing?" the third man disapproved. "What if the Captain could hear you?" He touched his forehead reverently as he mentioned the Captain.

"Oh, for Jordan's sake," snapped Hoyland, "don't be so stuffy, Mort Tyler. You're not a scientist yet. I reckon I'm as devout as you are; there's no grave sin in occasionally giving vent to your feelings. Even the scientists do it. I've heard 'em."

Tyler opened his mouth as if to expostulate, then apparently thought better of it. Mahoney touched Hoyland on the arm. "Look, Hugh," he pleaded, "let's get out of here. We've never been this high before. I'm jumpy; I want to get back down to where I can feel some weight on my feet."

Hoyland looked longingly toward the hatch through which his assailant had disappeared while his hand rested on the grip of his knife, then he turned to Mahoney. "OK, kid," he agreed, "It's along trip down anyhow."

He turned and slithered back toward the hatch, whereby they had reached the level where they now were, the other two following him. Disregarding the ladder by which they had mounted, he stepped off into the opening and floated slowly down to the deck fifteen feet below, Tyler and Mahoney close behind him. Another hatch, staggered a few feet from the first, gave access to a still lower deck. Down, down, down, and still farther

down they dropped, tens and dozens of decks, each silent, dimly lighted, mysterious. Each time they fell a little faster, landed a little harder. Mahoney protested at last, "Let's walk the rest of the way, Hugh. That last jump hurt my feet."

"All right. But it will take longer. How far have we got to go? Anybody keep count?"

"We've got about seventy decks to go to reach farm country," answered Tyler.

"How d'you know?" demanded Mahoney suspiciously.

"I counted them, stupid. And as we came down I took one away for each deck."

"You did not. Nobody but a scientist can do numbering like that. Just because you're learning to read and write you think you know everything."

Hoyland cut in before it could develop into a quarrel. "Shut up, Alan. Maybe he can do it. He's clever about such things. Anyhow, it feels like about seventy decks -- I'm heavy enough."

"Maybe he'd like to count the blades on my knife."

"Stow it, I said. Dueling is forbidden outside the village. That is the Rule." They proceeded in silence, running lightly down the stairways until increasing weight on each succeeding level forced them to a more pedestrian pace. Presently they broke through into a level that was quite brilliantly lighted and more than twice as deep between decks as the ones above it. The air was moist and warm; vegetation obscured the view.

"Well, down at last," said Hugh. "I don't recognize this farm; we must have come down by a different line than we went up."

"There's a farmer," said Tyler. He put his little fingers to his lips and whistled, then called, "Hey! Shipmate! Where are we?"

The peasant looked them over slowly, then directed them in reluctant monosyllables to the main passageway which would lead them back to their own village.

A brisk walk of a mile and a half down a wide tunnel moderately crowded with traffic: travelers, porters, an occasional pushcart, a dignified scientist swinging in a litter borne by four husky orderlies and preceded by his master-at-arms to clear the common crew out of the way. A mile and a half of this brought them to the common of their own village, a spacious compartment three decks high and perhaps ten times as wide. They split up and went their own ways, Hugh to his quarters in the barracks of the cadets, young bachelors who do not live with their parents. He washed himself and went thence to the compartments of his uncle, for whom he worked for his meals. His aunt glanced up as he came in, but said nothing, as became a woman.

His uncle said, "Hello, Hugh. Been exploring again?"

"Good eating, Uncle. Yes."

His uncle, a stolid, sensible man, looked tolerantly amused. "Where did you go and

what did you find?"

Hugh's aunt had slipped silently out of the compartment, and now returned with his supper which she placed before him. He fell to; it did not occur to him to thank her. He munched a bite before replying.

"Up. We climbed almost to the level-of-no-weight. A mutie tried to crack my skull."

His uncle chuckled. "You'll find your death In those passageways, lad. Better you should pay more attention to my business against the day when I die and get out of your way."

Hugh looked stubborn. "Don't you have any curiosity, Uncle?"

"Me? Oh, I was prying enough when I was a lad. I followed the main passage all the way around and back to the village. Right through the Dark Sector I went, with muties tagging my heels. See that scar?"

Hugh glanced at it perfunctorily. He had seen it many times before and heard the story repeated to boredom. Once around the Ship, pfft! He wanted to go everywhere, see everything, and find out the why of things. Those upper levels now: if men were not intended to climb that high, why had Jordan created them?

But he kept his own counsel and went on with his meal. His uncle changed the subject. "I've occasion to visit the Witness. John Black claims I owe him three swine. Want to come along?"

"Why, no, I guess not -- Wait! I believe I will."

"Hurry up, then."

They stopped at the cadets' barracks, Hugh claiming an errand. The Witness lived in a small, smelly compartment directly across the Common from the barracks, where he would be readily accessible to any who had need of his talents. They found him leaning in his doorway, picking his teeth with a fingernail. His apprentice, a pimply-faced adolescent with an intent nearsighted expression, squatted behind him.

"Good eating." said Hugh's uncle.

"Good eating to you, Edard Hoyland. D'you come on business, or to keep an old man company?"

"Both," Hugh's uncle returned diplomatically, then explained his errand.

"So," said the Witness. "Well, the contract's clear enough. Black John delivered ten bushels of oats, Expecting his pay in a pair of shoats; Ed brought his sow to breed for pig; John gets his pay when the pigs grow big.

"How big are the pigs now, Edard Hoyland?"

"Big enough," acknowledged Hugh's uncle, "but Black John claims three instead of two."

"Tell him to go soak his head. The Witness has spoken."

He laughed in a thin, high cackle.

The two gossiped for a few minutes, Edard Hoyland digging into his recent experiences to satisfy the old man's insatiable liking for details. Hugh kept decently silent while the older men talked. But when his uncle turned to go he spoke up. "I'll stay awhile, Uncle."

"Eh? Suit yourself. Good eating, Witness."

"Good eating, Edard Hoyland."

"I've brought you a present, Witness," said Hugh, when his uncle had passed out of hearing.

"Let me see it."

Hugh produced a package of tobacco which he had picked up from his locker at the barracks. The Witness accepted it without acknowledgment, then tossed it to his apprentice, who took charge of it.

"Come inside," invited the Witness, then directed his speech to his apprentice. "Here, you, fetch the cadet a chair."

"Now, lad," he added as they sat themselves down, "tell me what you have been doing with yourself."

Hugh told him, and was required to repeat in detail all the incidents of his more recent explorations, the Witness complaining the meanwhile over his inability to remember exactly everything he saw.

"You youngsters have no capacity," he pronounced. "No capacity. Even that lout--" he jerked his head toward the apprentice, "he has none, though he's a dozen times better than you. Would you believe it, he can't soak up a thousand lines a day, yet he expects to sit in my seat when I am gone. Why, when I was apprenticed, I used to sing myself to sleep on a mere thousand lines. Leaky vessels -- that's what you are."

Hugh did not dispute the charge, but waited for the old man to go on, which he did in his own time.

"You had a question to put to me, lad?"

"In a way, Witness."

"Well? Out with it. Don't chew your tongue."

"Did you ever climb all the way up to no-weight?"

"Me? Of course not. I was a Witness, learning my calling. I had the lines of all the Witnesses before me to learn, and no time for boyish amusements."

"I had hoped you could tell me what I would find there."

"Well, now, that's another matter. I've never climbed, but I hold the memories of more

climbers than you will ever see. I'm an old man. I knew your father's father, and his grandsire before that. What is it you want to know?"

"Well..." What was it he wanted to know? How could he ask a question that was no more than a gnawing ache in his breast? Still... "What is it all for, Witness? Why are there all those levels above us?"

"Eh? How's that? Jordan's name, son, I'm a Witness, not a scientist."

"Well ... I thought you must know. I'm sorry."

"But I do know. What you want is the Lines from the Beginning."

"I've heard them."

"Hear them again. All your answers are in there, if you've the wisdom to see them. Attend me. No, this is a chance for my apprentice to show off his learning. Here, you! The Lines from the Beginning -- and mind your rhythm."

The apprentice wet his lips with his tongue and began:

"In the Beginning there was Jordan, thinking His lonely thoughts alone. In the Beginning there was darkness, formless, dead, and Man unknown. Out of the loneliness came a longing, out of the longing came a vision, Out of the dream there came a planning, out of the plan there came decision: Jordan's hand was lifted and the Ship was born.

Mile after mile of snug compartments, tank by tank for the golden corn, Ladder and passage, door and locker, fit for the needs of the yet unborn. He looked on His work and found it pleasing, meet for a race that was yet to be. He thought of Man; Man came into being; checked his thought and searched for the key. Man untamed would shame his Maker, Man unruled would spoil the Plan; So Jordan made the Regulations, orders to each single man, Each to a task and each to a station, serving a purpose beyond their ken, Some to speak and some to listen; order came to the ranks of men. Crew He created to work at their stations, scientists to guide the Plan. Over them all He created the Captain, made him judge of the race of Man. Thus it was in the Golden Age!

Jordan is perfect, all below him lack perfection in their deeds. Envy, Greed, and Pride of Spirit sought for minds to lodge their seeds. One there was who gave them lodging: accursed Huff, the first to sin! His evil counsel stirred rebellion, planted doubt where it had not been; Blood of martyrs stained the floor plates, Jordan's Captain made the Trip. Darkness swallowed up--"

The old man gave the boy the back of his hand, sharp across the mouth. "Try again!"

"From the beginning?"

"No! From where you missed."

The boy hesitated, then caught his stride: "Darkness swallowed ways of virtue, Sin prevailed through out the Ship . . ."

The boy's voice droned on, stanza after stanza, reciting at great length but with little sharpness of detail the dim, old story of sin, rebellion, and the time of darkness. How wisdom prevailed at last and the bodies of the rebel leaders were fed to the Converter. How some of the rebels escaped making the Trip and lived to father the muties. How a new Captain was chosen, after prayer and sacrifice. Hugh stirred uneasily, shuffling his feet. No doubt the answers to his questions were there, since these were the Sacred Lines, but he had not the wit to understand them. Why? What was it all about? Was there really nothing more to life than eating and sleeping and finally the long Trip? Didn't Jordan intend for him to understand? Then why this ache in his breast? This hunger that persisted in spite of good eating?

While he was breaking his fast after sleep an orderly came to the door of his uncle's compartments. "The scientist requires the presence of Hugh Hoyland," he recited glibly.

Hugh knew that the scientist referred to was lieutenant Nelson, in charge of the spiritual and physical welfare of the Ship's sector which included Hugh's flative vilage. He bolted the last of his breakfast and hurried after the messenger.

"Cadet Hoyland!" he was announced. The scientist looked up from his own meal and said:

"Oh, yes. Come in, my boy. Sit down. Have you eaten?"

Hugh acknowledged that he had, but his eyes rested with interest on the fancy fruit In front of his superior. Nelson followed his glance. "Try some of these figs. They're a new mutation; I had them brought all the way from the far side. Go ahead -- a man your age always has somewhere to stow a few more bites."

Hugh accepted with much self-consciousness. Never before had he eaten in the presence of a scientist. The elder leaned back in his chair, wiped his fingers on his shirt, arranged his beard, and started in.

"I haven't seen you lately, son. Tell me what you have been doing with yourself." Before Hugh could reply he went on: "No, don't tell me; I will tell you. For one thing you have been exploring, climbing, without too much respect for the forbidden areas. Is it not so?"

He held the young man's eye. Hugh fumbled for a reply.

But he was let off again. "Never mind. I know, and you know that I know. I am not too displeased. But it has brought it forcibly to my attention that it is time that you decided what you are to do with your life. Have you any plans?"

"Well, no definite ones, sir."

"How about that girl, Edris Baxter? D'you intend to marry her?"

"Why, uh -- I don't know, sir. I guess I want to, and her father is willing, I think. Only..."

"Only what?"

"Well, he wants me to apprentice to his farm. I suppose it's a good idea. His farm together with my uncle's business would make a good property."

"But you're not sure?"

"Well, I don't know."

"Correct. You're not for that. I have other plans. Tell me, have you ever wondered why I taught you to read and write? Of course, you have. But you've kept your own counsel. That is good.

"Now attend me. I've watched you since you were a small child. You have more imagination than the common run, more curiosity, more go. And you are a born leader. You were different even as a baby. Your head was too large, for one thing, and there were some who voted at your birth inspection to put you at once into the Converter. But I held them off. I wanted to see how you would turn out.

"A peasant life is not for the likes of you. You are to be a scientist."

The old man paused and studied his face. Hugh was confused, speechless. Nelson went on, "Oh, yes. Yes, indeed. For a man of your temperament, there are only two things to do with him: Make him one of the custodians, or send him to the Converter."

"Do you mean, sir, that I have nothing to say about it?"

"If you want to put it that bluntly, yes. To leave the bright ones among the ranks of the Crew is to breed heresy. We can't have that. We had it once and it almost destroyed the human race. You have marked yourself out by your exceptional ability; you must now be instructed in right thinking, be initiated into the mysteries, in order that you may be a conserving force rather than a focus of infection and a source of trouble." The orderly reappeared loaded down with bundles which he dumped on the deck. Hugh glanced at them, then burst out, "Why, those are my things!"

"Certainly," acknowledged Nelson. "I sent for them. You're to sleep here henceforth. I'll see you later and start you on your studies, unless you have something more on your mind?"

"Why, no, sir. I guess not. I must admit I am a little confused. I suppose ... I suppose

this means you don't want me to marry?"

"Oh, that," Nelson answered indifferently. "Take her if you like; her father can't protest now. But let me warn you, you'll grow tired of her."

Hugh Hoyland devoured the ancient books that his mentor permitted him to read, and felt no desire for many, many sleeps to go climbing, or even to stir out of Nelson's cabin. More than once he felt that he was on the track of the secret -- a secret as yet undefined, even as a question -- but again he would find himself more confused than ever. It was evidently harder to reach the wisdom of scientishood than he had thought.

Once, while he was worrying away at the curious twisted characters of the ancients and trying to puzzle out their odd rhetoric and unfamiliar terms, Nelson came into the little compartment that had been set aside for him, and, laying a fatherly hand on his shoulder, asked, "How goes it, boy?"

"Why, well enough, sir, I suppose," he answered, laying the book aside. "Some of it is not quite clear to me -- not clear at all, to tell the truth."

"That is to be expected," the old man said equably. "I've let you struggle along by yourself at first in order that you may see the traps that native wit alone will fall into. Many of these things are not to be understood without instruction. What have you there?" He picked up the book and glanced at it. It was inscribed Basic Modern Physics. "So? This is one of the most valuable of the sacred writings, yet the uninitiate could not possibly make good use of it without help. The first thing that you must understand, my boy, is that our forefathers, for all their spiritual perfection, did not look at things in the fashion in which we do.

"They were incurable romantics, rather than rationalists, as we are, and the truths which they handed down to us, though strictly true, were frequently clothed in allegorical language. For example, have you come to the Law of Gravitation?"

"I read about it."

"Did you understand it? No, I can see that you didn't."

"Well," said Hugh defensively, "it didn't seem to mean anything. It just sounded silly, if you will pardon me, sir."

"That illustrates my point. You were thinking of it in literal terms, like the laws governing electrical devices found elsewhere in this same book. 'Two bodies attract each other directly as the product of their masses and inversely as the square of their distance.' It sounds like a rule for simple physical facts, does it not? Yet it is nothing of the sort; it was the poetical way the old ones bad of expressing the rule of propinquity which governs the emotion of love. The bodies referred to are human bodies, mass is

their capacity for love. Young people have a greater capacity for love than the elderly; when they are thrown together, they fall in love, yet when they are separated they soon get over it. 'Out of sight, out of mind.' It's as simple as that. But you were seeking some deep meaning for it."

Hugh grinned. "I never thought of looking at it that way. I can see that I am going to need a lot of help."

"Is there anything else bothering you just now?"

"Well, yes, lots of things, though I probably can't remember them offhand. I mind one thing: Tell me, Father, can muties be considered as being people?"

"I can see you have been listening to idle talk. The answer to that is both yes and no. It is true that the muties originally descended from people but they are no longer part of the Crew; they cannot now be considered as members of the human race, for they have flouted Jordan's Law.

"This is a broad subject," he went on, settling down to it. "There is even some question as to the original meaning of the word 'mutie.' Certainly they number among their ancestors the mutineers who escaped death at the time of the rebellion. But they also have in their blood the blood of many of the mutants who were born during the dark age. You understand, of course, that during that period our present wise rule of inspecting each infant for the mark of sin and returning to the Converter any who are found to be mutations was not in force. There are strange and horrible things crawling through the dark passageways and lurking in the deserted levels."

Hugh thought about it for a while, then asked, "Why is it that mutations still show up among us, the people?"

"That is simple. The seed of sin is still in us. From time to time it still shows up, incarnate. In destroying those monsters we help to cleanse the stock and thereby bring closer the culmination of Jordan's Plan, the end of the Trip at our heavenly home, Far Centaurus."

Hoyland's brow wrinkled again. "That is another thing that I don't understand. Many of these ancient writings speak of the Trip as if it were an actual moving, a going somewhere, as if the Ship itself were no more than a pushcart. How can that be?"

Nelson chuckled. "How can it, indeed? How can that move which is the background against which all else moves? The answer, of course, is plain. You have again mistaken allegorical language for the ordinary usage of everyday speech. Of course, the Ship is solid, immovable, in a physical sense. How can the whole universe move? Yet, it does move, in a spiritual sense. With every righteous act we move closer to the sublime destination of Jordan's Plan."

Hugh nodded. "I think I see."

"Of course, it is conceivable that Jordan could have fashioned the world in some other

shape than the Ship, had it suited His purpose. When man was younger and more poetical, holy men vied with one another in inventing fanciful worlds which Jordan might have created. One school invented an entire mythology of a topsy-turvy world of endless reaches of space, empty save for pinpoints of light and bodiless mythological monsters. They called it the heavenly world, or heaven, as if to contrast it with the solid reality of the Ship. They seemed never to tire of speculating about it, inventing details for it, and of outlining pictures of what they conceived it to be like. I suppose they did it to the greater glory of Jordan, and who is to say that He found their dreams unacceptable? But in this modern age we have more serious work to do."

Hugh was not interested in astronomy. Even his untutored mind had been able to see in its wild extravagance an intention not literal. He turned to problems nearer at hand.

"Since the muties are the seed of sin, why do we make no effort to wipe them out? Would not that be an act that would speed the Plan?"

The old man considered a while before replying. "That is a fair question and deserves a straight answer. Since you are to be a scientist you will need to know the answer. Look at it this way. There is a definite limit to the number of Crew the Ship can support. If our numbers increase without limit, there comes a time when there will not be good eating for all of us. Is it not better that some should die in brushes with the muties than that we should grow in numbers until we killed each other for food?."

"The ways of Jordan are inscrutable. Even the muties have a part in His Plan."

It seemed reasonable, but Hugh was not sure.

But when Hugh was transferred to active work as a junior scientist in the operation of the Ship's functions, he found there were other opinions. As was customary, he put in a period serving the Converter. The work was not onerous; he had principally to check in the waste materials brought in by porters from each of the villages, keep books of their contributions, and make sure that no redeemable metal was introduced into the first-stage hopper. But it brought him into contact with Bill Ertz, the Assistant Chief Engineer, a man not much older than himself.

He discussed with him the things he had learned from Nelson, and was shocked at Ertz's attitude.

"Get this through your head, kid," Ertz told him. "This is a practical job for practical men. Forget all that romantic nonsense. Jordan's Plan! That stuff is all right to keep the peasants quiet and in their place, but don't fall for it yourself. There is no Plan, other than our own plans for looking out for ourselves. The Ship has to have light and heat and power for cooking and irrigation. The Crew can't get along without those things and that makes us boss of the Crew.

"As for this softheaded tolerance toward the muties, you're going to see some changes made! Keep your mouth shut and string along with us."

It impressed on him that he was expected to maintain a primary loyalty to the bloc of younger men among the scientists. They were a well-knit organization within an organization and were made up of practical, hardheaded men who were working toward improvement of conditions throughout the Ship, as they saw them. They were well knit because an apprentice who failed to see things their way did not last long. Either he failed to measure up and soon found himself back in the ranks of the peasants, or, as was more likely, suffered some mishap and wound up in the Converter.

And Hoyland began to see that they were right.

They were realists. The Ship was the Ship. It was a fact, requiring no explanation. As for Jordan, who had ever seen Him, spoken to Him? What was this nebulous Plan of His? The object of life was living. A man was born, lived his life, and then went to the Converter. It was as simple as that, no mystery to it, no sublime Trip and no Centaurus. These romantic stories were simply hangovers from the childhood of the race before men gained the understanding and the courage to look facts in the face.

He ceased bothering his head about astronomy and mystical physics and all the other mass of mythology he had been taught to revere. He was still amused, more or less, by the Lines from the Beginning and by all the old stories about Earth (what the Huff was 'Earth,' anyhow?) but now realized that such things could be taken seriously only by children and dullards.

Besides, there was work to do. The younger men, while still maintaining the nominal authority of their elders, had plans of their own, the first of which was a systematic extermination of the muties. Beyond that, their intentions were still fluid, but they contemplated making full use of the resources of the Ship, including the upper levels. The young men were able to move ahead with their plans without an open breach with their elders because the older scientists simply did not bother to any great extent with the routine of the Ship. The present Captain had grown so fat that he rarely stirred from his cabin; his aide, one of the young men's bloc, attended to affairs for him.

Hoyland never laid eyes on the Chief Engineer save once, when he showed up for the purely religious ceremony of manning landing stations.

The project of cleaning out the muties required reconnaissance of the upper levels to be done systematically. It was in carrying out such scouting that Hugh Hoyland was again ambushed by a mutie.

This mutie was more accurate with his slingshot. Hoyland's companions, forced to retreat by superior numbers, left him for dead.

Joe-Jim Gregory was playing himself a game of checkers. Time was when they had played cards together, but Joe, the head on the right, had suspected Jim, the left-hand

member of the team, of cheating. They had quarreled about it, then given it up, for they both learned early in their joint career that two heads on one pair of shoulders must necessarily find ways of getting along together.

Checkers was better. They could both see the board, and disagreement was impossible.

A loud metallic knocking at the door of the oompartment interrupted the game. Joe-Jim unsheathed his throwing knife and cradled it, ready for quick use. "Come in!" roared Jim.

The door opened, the one who had knocked backed into the room -- the only safe way, as everyone knew, to enter Joe-Jim's presence. The newcomer was squat and rugged and powerful, not over four feet in height. The relaxed body of a man hung across one shoulder and was steadied by a hand.

Joe-Jim returned the knife to its sheath. "Put it down, Bobo," Jim ordered.

"And close the door," added Joe. "Now what have we got here?"

It was a young man, apparently dead, though no wound appeared on him. Bobo patted a thigh. "Eat 'im?" he said hopefully. Saliva spilled out of his still-opened lips.

"Maybe," temporized Jim. "Did you kill him?"

Bobo shook his undersized head.

"Good Bobo," Joe approved. "Where did you hit him?"

"Bobo hit him there." The microcephalic shoved a broad thumb against the supine figure in the area between the umbilicus and the breastbone.

"Good shot," Joe approved. "We couldn't have done better with a knife."

"Bobo good shot," the dwarf agreed blandly. "Want see?" He twitched his slingshot invitingly.

"Shut up," answered Joe, not unkindly. "No, we don't want to see; we want to make him talk."

"Bobo fix," the short one agreed, and started with simple brutality to carry out his purpose.

Joe-Jim slapped him away, and applied other methods, painful but considerably less drastic than those of the dwarf. The younger man jerked and opened his eyes.

"Eat 'im?" repeated Bobo.

"No," said Joe. "When did you eat last?" inquired Jim.

Bobo shook his head and rubbed his stomach, indicating with graphic pantomime that it had been a long time, too long. Joe-Jim went over to a locker, opened it, and withdrew a haunch of meat. He held it up. Jim smelled it and Joe drew his head away in nose-wrinkling disgust. Joe-Jim threw it to Bobo, who snatched it happily out of the air.

"Now, get out," ordered Jim.

Bobo trotted away, closing the door behind him. Joe-Jim turned to the captive and prodded him with his foot. "Speak up," said Jim. "Who the Huff are you?"

The young man shivered, put a hand to his head, then seemed suddenly to bring his surroundings into focus, for he scrambled to his feet, moving awkwardly against the low weight conditions of this level, and reached for his knife.

It was not at his belt.

Joe-Jim had his own out and brandished it. "Be good and you won't get hurt. What do they call you?" The young man wet his lips, and his eyes hurried about the room. "Speak up," said Joe.

"Why bother with him?" inquired Jim. "I'd say he was only good for meat. Better call Bobo back."

"No hurry about that," Joe answered. "I want to talk to him. What's your name?"

The prisoner looked again at the knife and muttered, "Hugh Hoyland."

"That doesn't tell us much," Jim commented. "What d'you do? What village do you come from? And what were you doing in mutie country?" But this time Hoyland was sullen. Even the prick of the knife against his ribs caused him only to bite his lips. "Shucks," said Joe, "he's only a stupid peasant. Let's drop it."

"Shall we finish him off?"

"No. Not now. Shut him up."

Joe-Jim opened the door of a small side compartment, and urged Hugh in with the knife. He then closed and fastened the door and went back to his game. "Your move, Jim."

The compartment in which Hugh was locked was dark. He soon satisfied himself by touch that the smooth steel walls were entirely featureless save for the solid, securely fastened door. Presently he lay down on the deck and gave himself up to fruitless thinking.

He had plenty of time to think, time to fall asleep and awaken more than once. And time to grow very hungry and very, very thirsty.

When Joe-Jim next took sufficient interest in his prisoner to open the door of the cell, Hoyland was not immediately in evidence. He had planned many times what he would do when the door opened and his chance came, but when the event arrived, he was too weak, semi-comatose. Joe-Jim dragged him out. The disturbance roused him to partial comprehension. He sat up and stared around him. "Ready to talk?" asked Jim. Hoyland opened his mouth but no words came out.

"Can't you see he's too dry to talk?" Joe told his twin. Then to Hugh: "Will you talk if

we give you some water?"

Hoyland looked puzzled, then nodded vigorously.

Joe-Jim returned in a moment with a mug of water. Hugh drank greedily, paused, and seemed about to faint.

Joe-Jim took the mug from him. "That's enough for now," said Joe. "Tell us about yourself."

Hugh did so. In detail, being prompted from time to time by questions from one of the twins, or a kick against his shin.

Hugh accepted a de facto condition of slavery with no particular resistance and no great disturbance of soul. The word 'slave' was not in his vocabulary, but the condition was a commonplace in everything he had ever known. There had always been those who gave orders and those who carried them out; he could imagine no other condition, no other type of social organization. It was a fact of life.

Though naturally he thought of escape.

Thinking about it was as far as he got. Joe-Jim guessed his thoughts and brought the matter out into the open. Joe told him, "Don't go getting ideas, youngster. Without a knife you wouldn't get three levels away in this part of the Ship. If you managed to steal a knife from me, you still wouldn't make it down to high-weight. Besides, there's Bobo."

Hugh waited a moment, as was fitting, then said, "Bobo?"

Jim grinned and replied, "We told Bobo that you were his to butcher, if he liked, if you ever stuck your head out of our compartments without us. Now he sleeps outside the door and spends a lot of his time there."

"It was only fair," put in Joe. "He was disappointed when we decided to keep you."

"Say," suggested Jim, turning his head toward his brother's, "how about some fun?" He turned back to Hugh. "Can you throw a knife?"

"Of course," Hugh answered.

"Let's see you. Here." Joe-Jim handed him their own knife. Hugh accepted it, jiggling it in his hand to try its balance. "Try my mark."

Joe-Jim had a plastic target. set up at the far end of the room from his favorite chair, on which he was wont to practice his own skill. Hugh eyed it, and, with an arm motion too fast to follow, let fly. He used the economical underhand stroke, thumb on the blade, fingers together. The blade shivered in the target, well centered in the chewed-up area which marked Joe-Jim's best efforts. "Good boy!" Joe approved. "What do you have in mind, Jim?"

"Let's give him the knife and see how far he gets."

"No," said Joe, "I don't agree."

"Why not?"

"If Bobo wins, we're out one servant. If Hugh wins, we lose both Bobo and him. It's wasteful."

"Oh, well, if you insist."

"I do. Hugh, fetch the knife."

Hugh did so. It had not occurred to him to turn the knife against Joe-Jim. The master was the master. For servant to attack master was not simply repugnant to good morals, it was an idea so wild that it did not occur to him at all.

Hugh had expected that Joe-Jim would be impressed by his learning as a scientist. It did not work out that way. Joe-Jim, especially Jim, loved to argue. They sucked Hugh dry in short order and figuratively cast him aside. Hoyland felt humiliated. After all, was he not a scientist? Could he not read and write?

"Shut up," Jim told Hugh. "Reading is simple. I could do it before your father was born. D'you think you're the first scientist that has served me? Scientists--bah! A pack of ignoramuses!" In an attempt to re-establish his own intellectual conceit, Hugh expounded the theories of the younger scientists, the strictly matter-of-fact, hard-boiled realism which rejected all religious interpretation and took the Ship as it was. He confidently expected Joe-Jim to approve such a point of view; it seemed to fit their temperaments. They laughed in his face.

"Honest," Jim insisted, when he had ceased snorting, "are you young punks so stupid as all that? Why you're worse than your elders."

"But you just got through saying," Hugh protested in hurt tones, "that all our accepted religious notions are so much bunk. That is just what my friends think. They want to junk all that old nonsense."

Joe started to speak; Jim cut in ahead of him. "Why bother with him, Joe? He's hopeless."

"No, he's not. I'm enjoying this. He's the first one I've talked with in I don't know how long who stood any chance at all of seeing the truth. Let us be -- I want to see whether that's a head he has on his shoulders, or just a place to hang his ears."

"O.K.," Jim agreed, "but keep it quiet. I'm going to take a nap." The left-hand head closed its eyes, soon it was snoring. Joe and Hugh continued their discussion in whispers.

"The trouble with you youngsters," Joe said, "is that if you can't understand a thing right off, you think it can't be true. The trouble with your elders is, anything they didn't understand they reinterpreted to mean something else and then thought they understood it. None of you has tried believing clear words the way they were written and then tried to understand them on that basis. Oh, no, you're all too bloody smart for that! If you can't see it right off, it ain't so; it must mean something different."

"What do you mean?" Hugh asked suspiciously.

"Well, take the Trip, for instance. What does it mean to you?"

"Well, to my mind, it doesn't mean anything. It's just a piece of nonsense to impress the peasants."

"And what is the accepted meaning?"

"Well, it's where you go when you die, or rather what you do. You make the Trip to Centaurus."

"And what is Centaurus?"

"It's -- mind you, I'm just telling you the orthodox answers; I don't really believe this stuff -- it's where you arrive when you've made the Trip, a place where everybody's happy and there's always good eating." Joe snorted. Jim broke the rhythm of his snoring, opened one eye, and settled back again with a grunt.

"That's just what I mean," Joe went on in a lower whisper. "You don't use your head. Did it ever occur to you that the Trip was just what the old books said it was: the Ship and all the Crew actually going somewhere, moving?" Hoyland thought about it. "You don't mean for me to take you seriously. Physically, it's an impossibility. The Ship can't go anywhere. It already is everywhere. We can make a trip through it, but the Trip, that has to have a spiritual meaning, if it has any."

Joe called on Jordan to support him. "Now, listen," he said, "get this through that thick head of yours. Imagine a place a lot bigger than the Ship, a lot bigger, with the Ship inside it, moving. D'you get it?"

Hugh tried. He tried very hard. He shook his head. "It doesn't make sense," he said. "There can't be anything bigger than the Ship. There wouldn't be any place for it to be."

"Oh, for Huff's sake! Listen. Outside the Ship, get that? Straight down beyond the level in every direction. Emptiness out there. Understand me?"

"But there isn't anything below the lowest level. That's why it's the lowest level."

"Look. If you took a knife and started digging a hole in the floor of the lowest level, where would it get you?"

"But you can't. It's too hard."

"But suppose you did and it made a hole. Where would that hole go? Imagine it."

Hugh shut his eyes and tried to imagine digging a hole in the lowest level. Digging as if it were soft, soft as cheese. He began to get some glimmering of a possibility, a possibility that was unsettling, soul-shaking. He was falling, falling into a hole that he had dug which had no levels under it. He opened his eyes very quickly. "That's awful!" he ejaculated. "I won't believe it."

Joe-Jim got up. "I'll make you believe it," he said grimly, "if I have to break your neck to do it." He strode over to the outer door and opened it. "Bobo!" he shouted.

"Bobo!"

Jim's head snapped erect. "Wassa matter? Wha's going on?"

"We're going to take Hugh to no-weight."

"What for?"

"To pound some sense into his silly head."

"Some other time."

"No, I want to do it now."

"All right, all right. No need to shake. I'm awake now anyhow."

Joe-Jim Gregory was almost as nearly unique in his -- or their -- mental ability as he was in his bodily construction. Under any circumstances he would have been a dominant personality; among the muties it was inevitable that he should bully them, order them about, and live on their services. Had he had the will-to-power, it is conceivable that he could have organized the muties to fight and overcome the Crew proper.

But he lacked that drive. He was by native temperament an intellectual, a bystander, an observer. He was interested in the 'how' and the 'why,' but his will to action was satisfied with comfort and convenience alone.

Had he been born two normal twins and among the Crew, it is likely that he would have drifted into scientishood as the easiest and most satisfactory answer to the problem of living and as such would have entertained himself mildly with conversation and administration. As it was, he lacked mental companionship and had whiled away three generations reading and rereading books stolen for him by his stooges.

The two halves of his dual person had argued and discussed what they had read, and had almost inevitably arrived at a reasonably coherent theory of history and the physical world, except in one respect. The concept of fiction was entirely foreign to them; they treated the novels that had been provided for the Jordan expedition in exactly the same fashion that they did text and reference books.

This led to their one major difference of opinion. Jim regarded Allan Quartermain as the

greatest man who had ever lived; Joe held out for John Henry.

They were both inordinately fond of poetry; they could recite page after page of Kipling, and were nearly as fond of Rhysling, the blind singer of the spaceways. Bobo backed in. Joe-Jim hooked a thumb toward Hugh. "Look," said Joe, "he's going out."

"Now?" said Bobo happily, and grinned, slavering.

"You and your stomach!" Joe answered, rapping Bobo's pate with his knuckles. "No, you don't eat him. You and him, blood brothers. Get it?"

"Not eat 'im?"

"No. Fight for him. He fights for you."

"O.K." The pinhead shrugged his shoulders at the inevitable. "Blood brothers. Bobo know."

"All right. Now we go up to the place-where-everybody-flies. You go ahead and make lookout."

They climbed in single file, the dwarf running ahead to spot the lie of the land, Hoyland behind him, Joe-Jim bringing up the rear, Joe with eyes to the front, Jim watching their rear, head turned over his shoulder.

Higher and higher they went, weight slipping imperceptibly from them with each successive deck. They emerged finally into a level beyond which there was no further progress, no opening above them. The deck curved gently, suggesting that the true shape of the space was a giant cylinder, but overhead a metallic expanse which exhibited a similar curvature obstructed the view and prevented one from seeing whether or not the deck in truth curved back on itself.

There were no proper bulkheads; great stanchions, so huge and squat as to give an impression of excessive, unnecessary strength, grew thickly about them, spacing deck and overhead evenly apart.

Weight was imperceptible. If one remained quietly in one place, the undetectable residuum of weight would bring the body in a gentle drift down to the 'floor,' but 'up' and 'down' were terms largely lacking in meaning. Hugh did not like it; it made him gulp, but Bobo seemed delighted by it and not unused to it. He moved through the air like an uncouth fish, banking off stanchion, floor plate, and overhead as suited his convenience.

Joe-Jim set a course parallel to the common axis of the inner and outer cylinders, following a passageway formed by the orderly spacing of the stanchions. There were handrails set along the passage, one of which he followed like a spider on its thread. He made remarkable speed, which Hugh floundered to maintain. In time, he caught the trick of the easy, effortless, overhand pull, the long coast against nothing but air resistance, and the occasional flick of the toes or the hand against the floor. But he was much too busy to tell how far they went before they stopped. Miles, he guessed it to be, but he did

not know.

When they did stop, it was because the passage, had terminated. A solid bulkhead, stretching away to right and left, barred their way. Joe-Jim moved along it to the right, searching.

He found what he sought, a man-sized door, closed, its presence distinguishable only by a faint crack which marked its outline and a cursive geometrical design on its surface. Joe-Jim studied this and scratched his right-hand head. The two heads whispered to each other. Joe-Jim raised his hand in an awkward gesture.

"No, no!" said Jim. Joe-Jim checked himself. "How's that?" Joe answered. They whispered together again, Joe nodded, and Joe-Jim again raised his hand.

He traced the design on the door without touching it, moving his forefinger through the air perhaps four inches from the surface of the door. The order of succession in which his finger moved over the lines of the design appeared simple but certainly not obvious.

Finished, he shoved a palm against the adjacent bulkhead, drifted back from the door, and waited.

A moment later there was a soft, almost inaudible insufflation; the door stirred and moved outward perhaps six inches, then stopped. Joe-Jim appeared puzzled. He ran his hands cautiously into the open crack and pulled. Nothing happened. He called to Bobo, "Open it."

Bobo looked the situation over, with a scowl on his forehead which wrinkled almost to his crown. He then placed his feet against the bulkhead, steadying himself by grasping the door with one hand. He took hold of the edge of the door with both hands, settled his feet firmly, bowed his body, and strained.

He held his breath, chest rigid, back bent, sweat breaking out from the effort. The great cords in his neck stood out, making of his head a misshapen pyramid. Hugh could hear the dwarf's joints crack. It was easy to believe that he would kill himself with the attempt, too stupid to give up.

But the door gave suddenly, with a plaint of binding metal. As the door, in swinging out, slipped from Bobo's fingers, the unexpectedly released tension in his legs shoved him heavily away from the bulkhead; he plunged down the passageway, floundering for a handhold. But he was back in a moment, drifting awkwardly through the air as he massaged a cramped calf.

Joe-Jim led the way inside, Hugh close behind him. "What is this place?" demanded Hugh, his curiosity overcoming his servant manners.

"The Main Control Room," said Joe.

Main Control Room! The most sacred and taboo place in the Ship, its very location a forgotten mystery. In the credo of the young men it was nonexistent. The older scientists

varied in their attitude between fundamentalist acceptance and mystical belief. As enlightened as Hugh believed himself to be, the very words frightened him. The Control Room! Why, the very spirit of Jordan was said to reside there. He stopped.

Joe-Jim stopped and Joe looked around. "Come on," he said. "What's the matter?"

"Why, uh ... uh ..."

"Speak up."

"But ... but this place is haunted ... this is Jordan's..."

"Oh, for Jordan's sake!" protested Joe, with slow exasperation. "I thought you told me you young punks didn't take any stock in Jordan."

"Yes, but ... but this is..."

"Stow it. Come along, or I'll have Bobo drag you." He turned away. Hugh followed, reluctantly, as a man climbs a scaffold. They threaded through a passageway just wide enough for two to use the handrails abreast. The passage curved in a wide sweeping arc of full ninety degrees, then opened into the control room proper. Hugh peered past Joe-Jim's broad shoulders, fearful but curious.

He stared into a well-lighted room, huge, quite two hundred feet across. It was spherical, the interior of a great globe. The surface of the globe was featureless, frosted silver. In the geometrical center of the sphere, Hugh saw a group of apparatus about fifteen feet across. To his inexperienced eye, it was completely unintelligible; he could not have described it, but he saw that it floated steadily, with no apparent support.

Running from the end of the passage to the mass at the center of the globe was a tube of metal latticework, wide as the passage itself. It offered the only exit from the passage. Joe-Jim turned to Bobo, and ordered him to remain in the passageway, then entered the tube.

He pulled himself along it, hand over hand, the bars of the latticework making a ladder. Hugh followed him; they emerged into the mass of apparatus occupying the center of the sphere. Seen close up, the gear of the control station resolved itself into its individual details, but it still made no sense to him. He glanced away from it to the inner surface of the globe which surrounded them.

That was a mistake. The surface of the globe, being featureless silvery white, had nothing to lend it perspective. It might have been a hundred feet away, or a thousand, or many miles. He had never experienced an unbroken height greater than that between two decks, nor an open space larger than the village common. He was panic-stricken, scared out of his wits, the more so in that he did not know what it was he feared. But the ghost of long-forgotten jungle ancestors possessed him and chilled his stomach with the basic primitive fear of falling.

He clutched at the control gear, clutched at Joe-Jim.

Joe-Jim let him have one, hard across the mouth with the flat of his hand. "What's the matter with you?" growled Jim.

"I don't know," Hugh presently managed to get out. "I don't know, but I don't like this place. Let's get out of here!"

Jim lifted his eyebrows to Joe, looked disgusted, and said, "We might as well. That weak-bellied baby will never understand anything you tell him."

"Oh, he'll be all right," Joe replied, dismissing the matter. "Hugh, climb into one of the chairs; there, that one."

In the meantime, Hugh's eyes had fallen on the tube whereby they had reached the control center and had followed it back by eye to the passage door. The sphere suddenly shrank to its proper focus and the worst of his panic was over. He complied with the order, still trembling, but able to obey. The control center consisted of a rigid framework, made up of chairs, or frames, to receive the bodies of the operators, and consolidated instrument and report panels, mounted in such a fashion as to be almost in the laps of the operators, where they were readily visible but did not obstruct the view. The chairs had high supporting sides, or arms, and mounted in these aims were the controls appropriate to each officer on watch, but Hugh was not yet aware of that. He slid under the instrument panel into his seat and settled back, glad of its enfolding stability. It fitted him in a semi-reclining position, footrest to head support.

But something was happening on the panel in front of Joe-Jim; he caught it out of the corner of his eye and turned to look. Bright red letters glowed near the top of the board: 2ND ASTROGATOR POSTED. What was a second astrogator? He didn't know; then he noticed that the extreme top of his own board was labeled 2ND ASTROGATOR and concluded it must be himself, or rather, the man who should be sitting there. He felt momentarily uncomfortable that the proper second astrogator might come in and find him usurping his post, but he put it out of his mind; it seemed unlikely.

But what was a second astrogator, anyhow?

The letters faded from Joe-Jim's board, a red dot appeared on the left-hand edge and remained. Joe-Jim did something with his right hand; his board reported: ACCELERATION: ZERO, then MAIN DRIVE. The last two words blinked several times, then were replaced with NO REPORT. These words faded out, and a bright green dot appeared near the right-hand edge.

"Get ready," said Joe, looking toward Hugh; "the light is going out."

"You're not going to turn out the light?" protested Hugh.

"No, you are. Take a look by your left hand. See those little white lights?"

Hugh did so, and found, shining up through the surface the chair arm, little beads of light arrayed to form two squares, one above the other. "Each one controls the light of one quadrant," explained Joe. "Cover them with your hand to turn Out the light. Go

ahead, do it."

Reluctantly, but fascinated, Hugh did as he was directed. He placed a palm over the tiny lights, and waited. The silvery sphere turned to dull lead, faded still more, leaving them in darkness complete save for the silent glow from the instrument panels. Hugh felt nervous but exhilarated. He withdrew his palm; the sphere remained dark, the eight little lights had turned blue.

"Now," said Joe, "I'm going to show you the Stars!"

In the darkness, Joe-Jim's right hand slid over another pattern of eight lights.

Creation.

Faithfully reproduced, shining as steady and serene from the walls of the stellarium as did their originals from the black deeps of space, the mirrored stars looked down on him. Light after jeweled light, scattered in careless bountiful splendor across the simulacrum sky, the countless suns lay before him; before him, over him, under him, behind him, in every direction from him. He hung alone in the center of the stellar universe.

"Ooooooh!" It was an involuntary sound, caused by his indrawn breath. He clutched the chair arms hard enough to break fingernails, but he was not aware of it. Nor was he afraid at the moment; there was room in his being for but one emotion. Life within the Ship, alternately harsh and workaday, had placed no strain on his innate capacity to experience beauty; for the first time in his life he knew the intolerable ecstasy of beauty unalloyed. It shook him and hurt him, like the first trembling intensity of sex.

It was some time before Hugh sufficiently recovered from the shock and the ensuing intense preoccupation to be able to notice Jim's sardonic laugh, Joe's dry chuckle. "Had enough?" inquired Joe. Without waiting for a reply, Joe-Jim turned the lights back on, using the duplicate controls mounted in the left arm of his chair.

Hugh sighed. His chest ached and his heart pounded. He realized suddenly that he had been holding his breath the entire time that the lights had been turned out. "Well, smart boy," asked Jim, "are you convinced?"

Hugh sighed again, not knowing why. With the lights back on, he felt safe and snug again, but was possessed of a deep sense of personal loss. He knew, subconsciously, that, having seen the stars, he would never be happy again. The dull ache in his breast, the vague inchoate yearning for his lost heritage of open sky and stars, was never to be silenced, even though he was yet too ignorant to be aware of it at the top of his mind. "What was it?" he asked in a hushed voice.

"That's," answered Joe. "That's the world. That's the universe. That's what we've been trying to tell you about."

Hugh tried furiously to force his inexperienced mind to comprehend. "That's what you mean by Outside?" he asked. "All those beautiful little lights?"

"Sure," said Joe, "only they aren't little. They're a long way off, you see; maybe thousands of miles."

"What?"

"Sure, sure," Joe persisted. "There's lots of room out there. Space. It's big. Why, some of those stars may be as big as the Ship, maybe bigger."

Hugh's face was a pitiful study in overstrained imagination. "Bigger than the Ship?" he repeated. "But ... but ..."

Jim tossed his head impatiently and said to Joe, "Wha'd' I tell you? You're wasting our time on this lunk. He hasn't got the capacity."

"Easy, Jim," Joe answered mildly; "don't expect him to run before he can crawl. It took us a long time. I seem to remember that you were a little slow to believe your own eyes." "That's a lie," said Jim nastily. "You were the one that had to be convinced."

"O.K., O.K.," Joe conceded, "let it ride. But it was a long time before we both had it all straight."

Hoyland paid little attention to the exchange between the two brothers. It was a usual thing; his attention was centered on matters decidedly not usual. "Joe," he asked, "what became of the Ship while we were looking at the Stars? Did we stare right through it?"

"Not exactly," Joe told him. "You weren't looking directly at the stars at all, but at a kind of picture of them. It's like... Well, they do it with mirrors, sort of. I've got a book that tells about it."

"But you can see 'em directly," volunteered Jim, his momentary pique forgotten. "There's a compartment forward of here..."

"Oh, yes," put in Joe, "it slipped my mind. The Captain's veranda. He's got one all of glass; you can look right out."

"The Captain's veranda? But--"

"Not this Captain. He's never been near the place. That's the name over the door of the compartment."

"What's a 'veranda'?"

"Blessed if I know. It's just the name of the place."

"Will you take me up there?"

Joe appeared to be about to agree, but Jim cut in. "Some other time. I want to get back; I'm hungry."

They passed back through the tube, woke up Bobo, and made the long trip back down.

It was long before Hugh could persuade Joe-Jim to take him exploring again, but the time intervening was well spent. Joe-Jim turned him loose on the largest collection of books that Hugh had ever seen. Some of them were copies of books Hugh had seen before, but even these he read with new meanings. He read incessantly, his mind soaking up new ideas, stumbling over them, struggling, striving to grasp them. He begrudged sleep, he forgot to eat until his breath grew sour and compelling pain in his midriff forced him to pay attention to his body. Hunger satisfied, he would be back at it until his head ached and his eyes refused to focus.

Joe-Jim's demands for service were few. Although Hugh was never off duty, Joe-Jim did not mind his reading as long as he was within earshot and ready to jump when called. Playing checkers with one of the pair when the other did not care to play was the service which used up the most time, and even this was not a total loss, for, if the player were Joe, he could almost always be diverted into a discussion of the Ship, its history, its machinery as equipment, the sort of people who had built it and then manned it and their history, back on Earth, Earth the incredible, that strange place where people had lived on the outside instead of the inside.

Hugh wondered why they did not fall off.

He took the matter up with Joe and at last gained some notion of gravitation. He never really understood it emotionally; it was too wildly improbable; but as an intellectual concept he was able to accept it and use it, much later, in his first vague glimmerings of the science of ballistics: and the art of astrogation and ship maneuvering. And it led in time to his wondering about weight in the Ship, a matter that had never bothered him before. The lower the level the greater the weight had been to his mind simply the order of nature, and nothing to wonder at. He was familiar with centrifugal force as it applied to slingshots. To apply it also to the whole Ship, to think of the Ship as spinning like a slingshot and thereby causing weight, was too much of a hurdle; he never really believed it.

Joe-Jim took him back once more to the Control Room and showed him what little Joe-Jim knew about the manipulation of the controls and the reading of the astrogation instruments.

The long-forgotten engineer-designers employed by the Jordan Foundation had been instructed to design a ship that would not -- could not -- wear out, even though the Trip were protracted beyond the expected sixty years. They builded better than they knew. In planning the main drive engines and the auxiliary machinery, largely automatic, which would make the Ship habitable, and in designing the controls necessary to handle all machinery not entirely automatic, the very idea of moving parts had been rejected. The engines and auxiliary equipment worked on a level below mechanical motion, on a level

of pure force, as electrical transformers do. Instead of push buttons, levers, cams, and shafts, the controls and the machinery they served were planned in terms of balance between static fields, bias of electronic flow, circuits broken or closed by a hand placed over a light.

On this level of action, friction lost its meaning, wear and erosion took no toll. Had all hands been killed in the mutiny, the Ship would still have plunged on through space, still lighted, its air still fresh and moist, its engines ready and waiting. As it was, though elevators and conveyor belts fell into disrepair, disuse, and finally into the oblivion of forgotten function, the essential machinery of the Ship continued its automatic service to its ignorant human freight, or waited, quiet and ready, for someone bright enough to puzzle out its key.

Genius had gone into the building of the Ship. Far too huge to be assembled on Earth, it had been put together piece by piece in its own orbit out beyond the Moon. There it had swung for fifteen silent years while the problems presented by the decision to make its machinery foolproof and enduring had been formulated and solved. A whole new field of submolar action had been conceived in the process, struggled with, and conquered.

So, when Hugh placed an untutored, questing hand over the first of a row of lights marked ACCELERATION, POSITIVE, he got an immediate response, though not in terms of acceleration. A red light at the top of the chief pilot's board blinked rapidly and the annunciator panel glowed with a message: MAIN ENGINES: NOT MANNED.

"What does that mean?" he asked Joe-Jim.

"There's no telling," said Jim. "We've done the same thing in the main engine room," added Joe. "There, when you try it, it says 'Control Room Not Manned.'"

Hugh thought a moment. "What would happen," he persisted, "if all the control stations had somebody at 'em at once, and then I did that?"

"Can't say," said Joe. "Never been able to try it."

Hugh said nothing. A resolve which had been growing, formless, in his mind was now crystalizing into decision. He was busy with it for some time, weighing it, refining it, and looking for the right moment to bring it into the open.

He waited until he found Joe-Jim in a mellow mood, both of him, before broaching his idea. They were in the Captain's veranda at the time Hugh decided the moment was due. Joe-Jim rested gently in the Captain's easy chair, his belly full of food, and gazed out through the heavy glass of the view port at the serene stars. Hugh floated beside him. The spinning of the Ship caused the stars to cross the circle of the port in barely perceptible arcs.

Presently he said, "Joe-Jim ..."

"Eh? What's that, youngster?" It was Joe who had replied.

"It's pretty swell, isn't it?"

"What is?"

"All that. The stars." Hugh indicated the view through the port with a sweep of his arm, then caught at the chair to stop his own backspin.

"Yeah, it sure is. Makes you feel good." Surprisingly, it was Jim who offered this.

Hugh knew the time was right. He waited a moment, then said, "Why don't we finish the job?"

Two heads turned simultaneously, Joe leaning out a little to see past Jim. "What job?"

"The Trip. Why don't we start up the main drive and go on with it? Somewhere out there," he said hurriedly to finish before he was interrupted, "there are planets like Earth, or so the First Crew thought. Let's go find them."

Jim looked at him, then laughed. Joe shook his head.

"Kid," he said, "you don't know what you are talking about. You're as balmy as Bobo.

"No," he went on, "that's all over and done with. Forget it."

"Why is it over and done with, Joe?"

"Well, because. It's too big a job. It takes a crew that understands what it's all about, trained to operate the Ship."

"Does it take so many? You have shown me only about a dozen places, all told, for men actually to be at the controls. Couldn't a dozen men run the Ship ... if they knew what you know," he added slyly.

Jim chuckled. "He's got you, Joe. He's right"

Joe brushed it aside. "You overrate our knowledge. Maybe we could operate the Ship, but we wouldn't get anywhere. We don't know where we are. The Ship has been drifting for I don't know how many generations. We don't know where we're headed, or how fast we're going."

"But look," Hugh pleaded, "there are instruments. You showed them to me. Couldn't we learn how to use them? Couldn't you figure them out, Joe, if you really wanted to?"

"Oh, I suppose so," Jim agreed.

"Don't boast, Jim," said Joe.

"I'm not boasting," snapped Jim. "If a thing'll work, I can figure it out."

"Humph!" said Joe. The matter rested in delicate balance. Hugh had got them disagreeing among themselves -- which was what he wanted -- with the less tractable of

the pair on his side. Now, to consolidate his gain, "I had an idea," he said quickly, "to get you men to work with, Jim, if you were able to train them."

"What's your idea?" demanded Jim suspiciously. "Well, you remember what I told you about a bunch of the younger scientists?"

"Those fools!"

"Yes, yes, sure; but they didn't know what you know. In their way they were trying to be reasonable. Now, if I could go back down and tell them what you've taught me, I could get you enough men to work with."

Joe cut in. "Take a good look at us, Hugh. What do you see?"

"Why ... why, I see you. Joe-Jim."

"You see a mutie," corrected Joe, his voice edged with sarcasm. "We're a mutie. Get that? Your scientists won't work with us."

"No, no," protested Hugh, "that's not true. I'm not talking about peasants. Peasants wouldn't understand, but these are scientists, and the smartest of the lot. They'll understand. All you need to do is to arrange safe conduct for them through mutie country. You can do that, can't you?" he added, instinctively shifting the point of the argument to firmer ground.

"Why, sure," said Jim.

"Forget it," said Joe.

"Well, O.K.," Hugh agreed, sensing that Joe really was annoyed at his persistence, "but it would be fun." He withdrew some distance from the brothers.

He could hear Joe-Jim continuing the discussion with himself in low tones. He pretended to ignore it. Joe-Jim had this essential defect in his joint nature: being a committee, rather than a single individual, he was hardly fitted to be a man of action, since all decisions were necessarily the result of discussion and compromise. Several moments later Hugh heard Joe's voice raised. "All right, all right, have it your own way!" He then called out, "Hugh! Come here!" Hugh kicked himself away from an adjacent bulkhead and shot over to the immediate vicinity of Joe-Jim, arresting his flight with both hands against the framework of the Captain's chair.

"We've decided," said Joe without preliminaries, "to let you go back down to the high-weight and try to peddle your goods. But you're a fool," he added sourly.

Bobo escorted Hugh down through the dangers of the levels frequented by muties and left him in the uninhabited zone above high-weight "Thanks, Bobo," Hugh said in parting. "Good eating." The dwarf grinned, ducked his head, and sped away, swarming

up the ladder they had just descended. Hugh turned and started down, touching his knife as he did so. It was good to feel it against him again.

Not that it was his original knife. That had been Bobo's prize when he was captured, and Bobo had been unable to return it, having inadvertently left it sticking in a big one that got away. But the replacement Joe-Jim had given him was well balanced and quite satisfactory.

Bobo had conducted him, at Hugh's request and by Joe-Jim's order, down to the area directly over the auxiliary Converter used by the scientists. He wanted to find Bill Ertz, Assistant Chief Engineer and leader of the bloc of younger scientists, and he did not want to have to answer too many questions before he found him. Hugh dropped quickly down the remaining levels and found himself in a main passageway which he recognized. Good! A turn to the left, a couple of hundred yards walk and he found himself at the door of the compartment which housed the Converter. A guard lounged in front of it. Hugh started to push on past, was stopped. "Where do you think you're going?"

"I want to find Bill Ertz."

"You mean the Chief Engineer? Well, he's not here."

"Chief? What's happened to the old one?" Hoyland regretted the remark at once, but it was already out.

"Huh? The old Chief? Why, he's made the Trip long since." The guard looked at him suspiciously. "What's wrong with you?"

"Nothing," denied Hugh. "Just a slip."

"Funny sort of a slip. Well, you'll find Chief Ertz around his office probably."

"Thanks. Good eating."

"Good eating."

Hugh was admitted to see Ertz after a short wait Ertz looked up from his desk as Hugh came in. "Well," he said, "so you're back, and not dead after all. This is a surprise. We had written you off, you know, as making the Trip."

"Yes, I suppose so."

"Well, sit down and tell me about it; I've a little time to spare at the moment. Do you know, though, I wouldn't have recognized you. You've changed a lot, all that gray hair. I imagine you had some pretty tough times."

Gray hair? Was his hair gray? And Ertz had changed a lot, too, Hugh now noticed. He was paunchy and the lines in his face had set. Good Jordan! How long had he been gone? Ertz drummed on his desk top, and pursed his lips. "It makes a problem, your coming back like this. I'm afraid I can't just assign you to your old job; Mort Tyler has

that. But we'll find a place for you, suitable to your rank."

Hugh recalled Mort Tyler and not too favorably. A precious sort of a chap, always concerned with what was proper and according to regulations. So Tyler had actually made scientisthood, and was on Hugh's old job at the Converter. Well, it didn't matter. "That's all right, he began. "I wanted to talk to you about--"

"Of course, there's the matter of seniority," Ertz went on, "Perhaps the Council had better consider the matter. I don't know of a precedent. We've lost a number of scientists to the muties in the past, but you are the first to escape with his life in my memory."

"That doesn't matter," Hugh broke in. "I've something much more pressing to talk about. While I was away I found out some amazing things, Bill, things that it is of paramount importance for you to know about. That's why I came straight to you. Listen. I--"

Ertz was suddenly alert. "Of course you have! I must be slowing down. You must have had a marvelous opportunity to study the muties and scout out their territory. Come on, man, spill it! Give me your report."

Hugh wet his lips. "It's not what you think," he said. "It's much more important than just a report on the muties, though it concerns them, too. In fact, we may have to change our whole policy with respect to the mu--"

"Well, go ahead, go ahead! I'm listening."

"All right." Hugh told him of his tremendous discovery as to the actual nature of the Ship, choosing his words carefully and trying very hard to be convincing. He dwelt lightly on the difficulties presented by an attempt to reorganize the Ship in accordance with the new concept and bore down heavily on the prestige and honor that would accrue to the man who led the effort.

He watched Ertz's face as he talked. After the first start of complete surprise when Hugh launched his key idea, the fact that the Ship was actually a moving body in a great outside space, his face became impassive and Hugh could read nothing in it, except that he seemed to detect a keener interest when Hugh spoke of how Ertz was just the man for the job because of his leadership of the younger, more progressive scientists.

When Hugh concluded, he waited for Ertz's response. Ertz said nothing at first, simply continued with his annoying habit of drumming on the top of his desk. Finally he said, "These are important matters, Hoyland, much too important to be dealt with casually. I must have time to chew it over."

"Yes, certainly," Hugh agreed. "I wanted to add that I've made arrangements for safe passage up to no-weight. I can take you up and let you see for yourself."

"No doubt that is best," Ertz replied. "Well, are you hungry?"

"No."

"Then we'll both sleep on it. You can use the compartment at the back of my office. I don't want you discussing this with anyone else until I've had time to think about it; it might cause unrest if it got out without proper preparation."

"Yes, you're right"

"Very well, then." Ertz ushered him into a compartment behind his office which he very evidently used for a lounge. "Have a good rest," he said, "and we'll talk later."

"Thanks," Hugh acknowledged. "Good eating."

"Good eating."

Once he was alone, Hugh's excitement gradually dropped away from him, and he realized that he was fagged out and very sleepy. He stretched out on a built-in couch and fell asleep.

When he awoke he discovered that the only door to the compartment was barred from the other side. Worse than that, his knife was gone.

He had waited an indefinitely long time when he heard activity at the door. It opened; two husky, unsmiling men entered. "Come along," said one of them. He sized them up, noting that neither of them carried a knife. No chance to snatch one from their belts, then. On the other hand he might be able to break away from them.

But beyond them, a wary distance away in the outer room, were two other equally formidable men, each armed with a knife. One balanced his for throwing; the other held his by the grip, ready to stab at close quarters. He was boxed in and he knew it. They had anticipated his possible moves.

He had long since learned to relax before the inevitable. He composed his face and marched quietly out. Once through the door he saw Ertz, waiting and quite evidently in charge of the party of men. He spoke to him, being careful to keep his voice calm. "Hello, Bill. Pretty extensive preparations you've made. Some trouble, maybe?"

Ertz seemed momentarily uncertain of his answer, then said, "You're going before the Captain."

"Good!" Hugh answered. "Thanks, Bill. But do you think it's wise to try to sell the idea to him without laying a little preliminary foundation with the others?"

Ertz was annoyed at his apparent thickheadedness and showed it. "You don't get the idea," he growled. "You're going before the Captain to stand trial for heresy!"

Hugh considered this as if the idea had not before occurred to him. He answered mildly, "You're off down the wrong passage, Bill. Perhaps a charge and trial is the best way to get at the matter, but I'm not a peasant, simply to be hustled before the Captain. I must be tried by the Council. I am a scientist."

"Are you now?" Ertz said softly. "I've had advice about that. You were written off the

lists. Just what you are is a matter for the Captain to determine."

Hugh held his peace. It was against him, he could see, and there was no point in antagonizing Ertz. Ertz made a signal; the two unarmed men each grasped one of Hugh's arms. He went with them quietly.

Hugh looked at the Captain with new interest. The old man had not changed much, a little fatter, perhaps. The Captain settled himself slowly down in his chair, and picked up the memorandum before him. "What's this all about?" he began irritably. "I don't understand it."

Mort Tyler was there to present the case against Hugh, a circumstance which Hugh had had no way of anticipating and which added to his misgivings. He searched his boyhood recollections for some handle by which to reach the man's sympathy, found none. Tyler cleared his throat and commenced: "This is the case of one Hugh Hoyland, Captain, formerly one of your junior scientists--"

"Scientist, eh? Why doesn't the Council deal with him?"

"Because he is no longer a scientist, Captain. He went over to the muties. He now returns among us, preaching heresy and seeking to undermine your authority."

The Captain looked at Hugh with the ready belligerency of a man jealous of his prerogatives. "Is that so?" he bellowed. "What have you to say for yourself?"

"It is not true, Captain," Hugh answered. "All that I have said to anyone has been an affirmation of the absolute truth of our ancient knowledge. I have not disputed the truths under which we live; I have simply affirmed them more forcibly than is the ordinary custom. I--"

"I still don't understand this," the Captain interrupted, shaking his head. "You're charged with heresy, yet you say you believe the Teachings. If you aren't guilty, why are you here?"

"Perhaps I can clear the matter up," put in Ertz. "Hoyland--"

"Well, I hope you can," the Captain went on. "Come, let's hear it."

Ertz proceeded to give a reasonably correct, but slanted, version of Hoyland's return and his strange story. The Captain listened, with an expression that varied between puzzlement and annoyance. When Ertz had concluded, the Captain turned to Hugh. "Humph!" he said.

Hugh spoke immediately. "The gist of my contention, Captain, is that there is a place up at no-weight where you can actually see the truth of our faith that the Ship is moving, where you can actually see Jordan's Plan in operation. That is not a denial of faith; that

affirms it. There is no need to take my word for it. Jordan Himself will prove it."

Seeing that the Captain appeared to be in a state of indecision, Tyler broke in: "Captain, there is a possible explanation of this incredible situation which I feel duty bound that you should hear. Offhand, there are two obvious interpretations of Hoyland's ridiculous story. He may simply be guilty of extreme heresy, or he may be a mutie at heart and engaged in a scheme to lure you into their hands. But there is a third, more charitable explanation and one which I feel within me is probably the true one.

"There is record that Hoyland was seriously considered for the Converter at his birth inspection, but that his deviation from normal was slight, being simply an overlarge head, and he was passed. It seems to me that the terrible experiences he has undergone at the hands of the muties have finally unhinged an unstable mind. The poor chap is simply not responsible for his own actions."

Hugh looked at Tyler with new respect. To absolve him of guilt and at the same time to make absolutely certain that Hugh would wind up making the Trip: how neat!

The Captain shook a palm at them. "This has gone on long enough." Then, turning to Ertz, "Is there recommendation?"

"Yes, Captain. The Converter."

"Very well, then. I really don't see, Ertz," he continued testily, "why I should be bothered with these details. It seems to me that you should be able to handle discipline in your department without my help."

"Yes, Captain."

The Captain shoved back from his desk, started to get up. "Recommendation confirmed. Dismissed."

Anger flooded through Hugh at the unreasonable injustice of it. They had not even considered looking at the only real evidence he had in his defense. He heard a shout: "Wait!" -- then discovered it was his own voice. The Captain paused, looking at him.

"Wait a moment," Hugh went on, his words spilling out of their own accord. "This won't make any difference, for you're all so damn sure you know all the answers that you won't consider a fair offer to come see with your own eyes. Nevertheless ... Nevertheless, it still moves!"

Hugh had plenty of time to think, lying in the compartment where they confined him to await the power needs of the Converter, time to think, and to second-guess his mistakes. Telling his tale to Ertz immediately, that had been mistake number one. He should have waited, become reacquainted with the man and felt him out, instead of depending on a friendship which had never been very close.

Second mistake, Mort Tyler. When he heard his name he should have investigated and found out just how much influence the man had with Ertz. He had known him of old, he should have known better.

Well, here he was, condemned as a mutant, or maybe as a heretic. It came to the same thing. He considered whether or not he should have tried to explain why mutants happened. He had learned about it himself in some of the old records in Joe-Jim's possession. No, it wouldn't wash. How could you explain about radiations from the Outside causing the birth of mutants when the listeners did not believe there was such a place as Outside? No, he had messed it up before he was ever taken before the Captain.

His self-recriminations were disturbed at last by the sound of his door being unfastened. It was too soon for another of the infrequent meals; he thought that they had come at last to take him away, and renewed his resolve to take someone with him.

But he was mistaken. He heard a voice of gentle dignity: "Son, son, how does this happen?" It was Lieutenant Nelson, his first teacher, looking older than ever and frail.

The interview was distressing for both of them. The old man, childless himself, had cherished great hopes for his protégé, even the ambition that he might eventually aspire to the captaincy, though he had kept his vicarious ambition to himself, believing it not good for the young to praise them too highly. It had hurt his heart when the youth was lost.

Now he had returned, a man, but under disgraceful conditions and under sentence of death. The meeting was no less unhappy for Hugh. He had loved the old man, in his way, wanted to please him and needed his approval. But he could see, as he told his story, that Nelson was not capable of treating the the story as anything but an aberration of Hugh's mind, and he suspected that Nelson would rather see him meet a quick death in the Converter, his atoms smashed to hydrogen and giving up clean useful power, than have him live to make a mock of the ancient teachings.

In that he did the old man an injustice; he underrated Nelson's mercy, but not his devotion to 'science.' But let it be said for Hugh that, had there been no more at issue than his own personal welfare, he might have preferred death to breaking the heart of his benefactor, being a romantic and more than a bit foolish. Presently the old man got up to leave, the visit having grown unendurable to each of them. "Is there anything I can do for you, son? Do they feed you well enough?"

"Quite well, thanks," Hugh lied.

"Is there anything else?"

"No ... yes, you might send me some tobacco. I haven't had a chew in a long time."

"I'll take care of it. Is there anyone you would like to see?"

"Why, I was under the impression that I was not permitted visitors ... ordinary visitors."

"You are right, but I think perhaps I may be able to get the rule relaxed. But you will have to give me your promise not to speak of your heresy," he added anxiously. Hugh thought quickly. This was a new aspect, a new possibility. His uncle? No, while they had always got along well, their minds did not meet; they would greet each other as strangers. He had never made friends easily; Ertz had been his obvious next friend and now look at the damned thing! Then he recalled his village chum, Alan Mahoney, with whom he had played as a boy. True, he had seen practically nothing of him since the time he was apprenticed to Nelson. Still... "Does Alan Mahoney still live in our village?"

"Why, yes."

"I'd like to see him, if he'll come."

Alan arrived, nervous, ill at ease, but plainly glad to see Hugh and very much upset to find him under sentence to make the Trip. Hugh pounded him on the back. "Good boy," he said. "I knew you would come."

"Of course, I would," protested Alan, "once I knew. But nobody in the village knew it. I don't think even the Witnesses knew it."

"Well, you're here, that's what matters. Tell me about yourself. Have you married?"

"Huh, uh, no. Let's not waste time talking about me. Nothing ever happens to me anyhow. How in Jordan's name did you get in this jam, Hugh?"

"I can't talk about that, Alan. I promised Lieutenant Nelson that I wouldn't."

"Well, what's a promise, that kind of a promise? You're in a jam, fellow."

"Don't I know it!"

"Somebody have it in for you?"

"Well, our old pal Mort Tyler didn't help any; I think I can say that much."

Alan whistled and nodded his head slowly. "That explains a lot."

"How come? You know something?"

"Maybe, -- maybe not. After you went away he married Edris Baxter."

"So? Hmm-m-m ... yes, that clears up a lot." He remained silent for a time.

Presently Alan spoke up: "Look, Hugh. You're not going to sit here and take it, are you? Particularly with Tyler mixed in it. We gotta get you outa here."

"How?"

"I don't know. Pull a raid, maybe. I guess I could get a few knives to rally round and help us; all good boys, spoiling for a fight."

"Then, when it's over, we'd all be for the Converter. You, me, and your pals. No, it won't wash."

"But we've got to do something. We can't just sit here and wait for them to burn you."

"I know that." Hugh studied Alan's face. Was it a fair thing to ask? He went on, reassured by what he had seen. "Listen. You would do anything you could to get me out of this, wouldn't you?"

"You know that." Alan's tone showed hurt.

"Very well, then. There is a dwarf named Bobo. I'll tell you how to find him..."

Alan climbed, up and up, higher than he had ever been since Hugh had led him, as a boy, into foolhardy peril. He was older now, more conservative; he had no stomach for it. To the very real danger of leaving the well-traveled lower levels was added his superstitious ignorance. But still he climbed.

This should be about the place, unless he had lost count. But he saw nothing of the dwarf Bobo saw him first. A slingshot load caught Alan in the pit of the stomach, even as he was shouting, "Bobo!"

Bobo backed into Joe-Jim's compartment and dumped his load at the feet of the twins. "Fresh meat," he said proudly.

"So it is," agreed Jim indifferently. "Well, it's yours; take it away."

The dwarf dug a thumb into a twisted ear, "Funny," he said, "he knows Bobo's name."

Joe looked up from the book he was reading: *\_Browning's Collected Poems\_*, L-Press, New York, London, Luna City, cr. 35. "That's interesting. Hold on a moment."

Hugh had prepared Alan for the shock of Joe-Jim's appearance. In reasonably short order he collected his wits sufficiently to be able to tell his tale. Joe-Jim listened to it without much comment, Bobo with interest but little comprehension.

When Alan concluded, Jim remarked, "Well, you win, Joe. He didn't make it." Then, turning to Alan, he added, "You can take Hoyland's place. Can you play checkers?"

Alan looked from one head to the other. "But you don't understand," he said. "Aren't you going to do anything about it?"

Joe looked puzzled. "Us? Why should we?"

"But you've got to. Don't you see? He's depending on you. There's nobody else he can look to. That's why I came. Don't you see?"

"Wait a moment," drawled Jim, "wait a moment. Keep your belt on. Supposing we did want to help him, which we don't, how in Jordan's Ship could we? Answer me that."

"Why, why," Alan stumbled in the face of such stupidity. "Why, get up a rescue party, of course, and go down and get him out!"

"Why should we get ourselves killed in a fight to rescue your friend?" Bobo pricked his ears. "Fight?" he inquired eagerly. "No, Bobo," Joe denied. "No fight. Just talk." "Oh," said Bobo and returned to passivity.

Alan looked at the dwarf. "If you'd even let Bobo and me--"

"No," Joe said shortly. "It's out of the question. Shut up about it."

Alan sat in a corner, hugging his knees in despair. If only he could get out of there. He could still try to stir up some help down below. The dwarf seemed to be asleep, though it was difficult to be sure with him. If only Joe-Jim would sleep, too.

Joe-Jim showed no indication of sleepiness. Joe tried to continue reading, but Jim interrupted him from time to time. Alan could not hear what they were saying.

Presently Joe raised his voice. "Is that your idea of fun?" he demanded.

"Well," said Jim, "it beats checkers."

"It does, does it? Suppose you get a knife in your eye; where would I be then?"

"You're getting old, Joe. No juice in you any more."

"You're as old as I am."

"Yeah, but I got young ideas."

"Oh, you make me sick. Have it your own way, but don't blame me. Bobo!"

The dwarf sprang up at once, alert. "Yeah, Boss."

"Go out and dig up Squatty and Long Arm and Pig."

Joe-Jim-got up, went to a locker, and started pulling knives out of their racks.

Hugh heard the commotion in the passageway outside his prison. It could be the guards coming to take him to the Converter, though they probably wouldn't be so noisy. Or it could be just some excitement unrelated to him. On the other hand it might be ...

It was. The door burst open, and Alan was inside, shouting at him and thrusting a brace of knives into his hands. He was hurried out of the door, while stuffing the knives in his belt and accepting two more.

Outside he saw Joe-Jim, who did not see him at once, as he was methodically letting fly, as calmly as if he had been engaging in target practice in his own study. And Bobo, who ducked his head and grinned with a mouth widened by a bleeding cut, but continued the easy flow of the motion whereby he loaded and let fly. There were three others, two of whom Hugh recognized as belonging to Joe-Jim's privately owned gang of bullies, muties by definition and birthplace; they were not deformed.

The count does not include still forms on the floor plates.

"Come on!" yelled Alan. "There'll be more in no time." He hurried down the passage to the right

Joe-Jim desisted and followed him. Hugh let one blade go for luck at a figure running away to the left. The target was poor, and he had no time to see if he had thrown 01000. They scrambled along the passage, Bobo bringing up the rear, as if reluctant to leave the fun, and came to a point where a side passage crossed the main one.

Alan led them to the right again. "Stairs ahead," he shouted.

They did not reach them. An airtight door, rarely used, clanged in their faces ten yards short of the stairs. Joe-Jim's bravoes checked their flight and they looked doubtfully at their master. Bobo broke his thickened nails trying to get a purchase on the door.

The sounds of pursuit were clear behind them.

"Boxed in," said Joe softly. "I hope you like it, Jim."

Hugh saw a head appear around the corner of the passage they had quitted. He threw overhand but the distance was too great; the knife clanged harmlessly against steel. The head disappeared. Long Arm kept his eye on the spot, his sling loaded and ready.

Hugh grabbed Bobo's shoulder. "Listen! Do you see that light?"

The dwarf blinked stupidly. Hugh pointed to the intersection of the glowtubes where they crossed in the overhead directly above the junction of the passages. "That light. Can you hit them where they cross?"

Bobo measured the distance with his eye. It would be a hard shot under any conditions at that range. Here, constricted as he was by the low passageway, it called for a fast, flat trajectory, and allowance for higher weight than he was used to.

He did not answer. Hugh felt the wind of his swing but did not see the shot. There was a tinkling crash; the passage became dark.

"Now!" yelled Hugh, and led them away at a run. As they neared the intersection he shouted, "Hold your breaths! Mind the gas!" The radioactive vapor poured lazily out from the broken tube above and filled the crossing with a greenish mist.

Hugh ran to the right, thankful for his knowledge as an engineer of the lighting circuits. He had picked the right direction; the passage ahead was black, being serviced from beyond the break. He could hear footsteps around him; whether they were friend or enemy he did not know.

They burst into light. No one was in sight but a scared and harmless peasant who scurried away at an unlikely pace. They took a quick muster. All were present, but Bobo was making heavy going of it.

Joe looked at him. "He sniffed the gas, I think. Pound his back."

Pig did so with a will. Bobo belched deeply, was suddenly sick, then grinned.

"He'll do," decided Joe.

The slight delay had enabled one at least to catch up with them. He came plunging out of the dark, unaware of, or careless of, the strength against him. Alan knocked Pig's arm down, as he raised it to throw. "Let me at him!" he demanded. "He's mine!" It was Tyler.

"Man-fight?" Alan challenged, thumb on his blade.

Tyler's eyes darted from adversary to adversary and accepted the invitation to individual duel by lunging at Alan. The quarters were too cramped for throwing; they closed, each achieving his grab in parry, fist to wrist.

Alan was stockier, probably stronger; Tyler was slippery. He attempted to give Alan a knee to the crotch. Alan evaded it, stamped on Tyler's planted foot. They went clown. There was a crunching crack.

A moment later, Alan was wiping his knife against his thigh. "Let's get goin'," he complained. "I'm scared."

They reached a stairway, and raced up it, Long Arm and Pig ahead to fan out on each level and cover their flanks, and the third of the three choppers (Hugh heard him called Squatty) covering the rear. The others bunched in between.

Hugh thought they had won free, when he heard shouts and the clatter of a thrown knife just above him.

He reached the level above in time to be cut not deeply but jaggedly by a ricocheted blade.

Three men were down. Long Arm had a blade sticking in the fleshy part of his upper arm, but it did not seem to bother him. His slingshot was still spinning. Pig was scrambling after a thrown knife, his own armament exhausted. But there were signs of his work; one man was down on one knee some twenty feet away. He was bleeding from a knife wound in the thigh.

As the figure steadied himself with one hand against the bulkhead and reached towards an empty belt with the other, Hugh recognized him.

Bill Ertz.

He had led a party up another way, and flanked them, to his own ruin. Bobo crowded behind Hugh and got his mighty arm free for the cast. Hugh caught at it. "Easy, Bobo," he directed. "In the stomach, and easy."

The dwarf looked puzzled, but did as he was told.

Ertz folded over at the middle and slid to the deck. "Well placed," said Jim. "Bring him along, Bobo," directed Hugh, "and stay in the middle." He ran his eye over their party, now huddled at the top of that flight of stairs. "All right, gang; up we go again! Watch

it."

Long Arm and Pig swarmed up the next flight, the others disposing themselves as usual. Joe looked annoyed. In some fashion, a fashion by no means clear at the moment, he had been eased out as leader of this gang, his gang, and Hugh was giving orders. He reflected as there was no time now to make a fuss. It might get them all killed.

Jim did not appear to mind. In fact, he seemed to be enjoying himself.

They put ten more levels behind them with no organized opposition. Hugh directed them not to kill peasants unnecessarily. The three braves obeyed; Bobo was too loaded down with Ertz to constitute a problem in discipline. Hugh saw to it that they put thirty-odd more decks below them and were well into no man's land before he let vigilance relax at all. Then he called a halt and they examined wounds.

The only deep ones were to Long Arm's arm and Bobo's face. Joe-Jim examined them and applied presses with which he had outfitted himself before starting. Hugh refused treatment for his flesh wound. "It's stopped bleeding," he insisted, "and I've got a lot to do."

"You've got nothing to do but to get up home," said Joe, "and that will be an end to this foolishness." "Not quite," denied Hugh. "You may be going home, but Alan and I and Bobo are going up to no-weight; to the Captain's veranda."

"Nonsense," said Joe. "What for?"

"Come along if you like, and see. All right, gang. Let's go."

Joe started to speak, stopped when Jim kept still. Joe-Jim followed along. They floated gently through the door of the veranda, Hugh, Alan, Bobo with his still-passive burden, and Joe-Jim. "That's it," said Hugh to Alan, waving his hand at the splendid stars, "that's what I've been telling you about."

Alan looked and clutched at Hugh's arm. "Jordan!" he moaned. "We'll fall out!" He closed his eyes tightly.

Hugh shook him. "It's all right," he said. "It's grand. Open your eyes."

Joe-Jim touched Hugh's arm. "What's it all about?" he demanded. "Why did you bring him up here?" He pointed to Ertz.

"Oh, him. Well, when he wakes up I'm going to show him the stars, prove to him that the Ship moves."

"Well? What for?"

"Then I'll send him back down to convince some others."

"Hm-m-m, suppose he doesn't have any better luck than you had?"

"Why, then," Hugh shrugged his shoulders "why, then we shall just have to do it all over, I suppose, till we do convince them.

"We've got to do it, you know."