

# Bulge

## I

MAC HOERWITZ CAME back to awareness as the screen went blank, and he absently flicked the switch and reset the sheet-scanner. He had not really watched the last act. At least, he didn't think he had. He knew it so perfectly that there was no way to be certain whether Pros-pero's closing words were really still in his ears or that it was simply memory from earlier times.

Two things had been competing with *The Tempest* for his attention. One was the pain where his left index fingernail had formerly been, and the other was a half-serious search through his memory to decide whether Shakespeare had ever used a character quite like Mr. Smith. The two distractions were closely connected, even though Smith had not removed the nail himself. He had merely ordered Jones to do it.

Hoerwitz rather doubted that Shakespeare would have been satisfied with a Smith. The fellow was too simple. He knew what he wanted and went after it without knowing or caring what anyone else in the picture might care. He was an oversized two-year-old. Shakespeare would have made him more complicated and more believable, even back in his *Henry the Sixth* days.

It was a nice idea, with perhaps some scholarly merit. But it didn't really help with the present problem. This was more a piece of post-Edwardian melodrama than a carefully thought out Shakespearean plot. The hero had been trapped by armed villains, in a situation from which there was no obvious escape, and was being forced to help them commit grand larceny.

Of course in a piece of Prohibition-era fiction he would have refused steadfastly to help, but Hoerwitz was no flapper's hero. He was eighty-one years old and had a mass of just one hundred pounds distributed along his seventy inches of height. He could not possibly have lifted that mass against Earth's gravity. He smiled in spite of the pain of his hand when he recalled the facial expressions when Smith and his three followers had first seen him.

They had gone to a great deal of trouble to make their approach unobtrusive. They had arrived near the apogee point of the station's six-day period instead of making the just-after-perigee rendezvous which the freighters found more economical. This had served the double purpose of making fairly sure there would be no other ships present and of being harder to observe from Earth. At one hundred seventy thousand miles or so, a one-mile asteroid is visible to the naked eye and a modest-sized spaceship can be seen in a good telescope, but one has to be looking for them deliberately.

It was a rendezvous, of course, rather than a landing. The latter word means nothing on a celestial body where a spacesuited man weighs about a quarter of an ounce. They had made the rendezvous skillfully enough so that Hoerwitz had not felt the contact—or at least, hadn't noticed it over the sound effects accompanying Hamlet's stepfather's drinking. There had been no trouble about entering, since the airlock leading "under-ground" or "inside," whichever way one preferred to think of it, was plainly visible and easily operated from without. The possibility of anyone's stealing the horse from this particular stable had not occurred seriously to anyone responsible for building the place; or if it had, he had attached more weight to the likelihood of space emergencies which would need fast lock action.

So Mr. Smith and his men had entered and drifted down the tunnel to the asteroid's center not only unopposed but completely unnoticed, and Mac Hoerwitz's first realization that he was in trouble had come after the final peal of ordnance ordered by Fortinbras.

Then he had turned on the lights and found that Hamlet had four more spectators, all carrying weapons. He had been rather startled.

So had the others, very obviously, when they had their first good look at him. Just what they had expected was hard to say, but it must have been something capable of more violence than the station manager. The leader had put away his gun with almost an embarrassed air, and the others had followed his example.

"Sorry to surprise you, Mr. Hoerwitz," the intruder had opened. "That was a very good sheet. I'm

sorry we missed so much of it. Perhaps you'd let me run it again sometime in the next few days."

Mac had been at a loss to reconcile the courtesy with the armament.

"If all you want is to see my library, the weapons are a bit uncalled for," he finally got out. "I don't know what else I can offer you except accommodation and communication facilities. Do you have ship trouble? Did I miss a distress call? Maybe I do pay too much attention to my sheets—"

"Not at all. We'd have been very disappointed if you had spotted our approach, since we made it as unobtrusive as possible. You are also wrong about what you can give us. Not to waste time, we have a four--thousand-ton ship outside which we expect to mass up to ten thousand before we leave, with the aid of your Class IV isotopes."

"Six thousand tons of nuclear fuel? You've been expanding your consciousness. It would take sixty hours or more if I reprogrammed every converter in the place—only one of them is making Class IV now, and the others are all running other orders. There's barely enough conversion mass in the place for what you want, unless you start chipping rock out of the station itself. I'd guess that on normal priority you'd get an order like that in about a year, counting administrative time for the initial request."

"We're not requesting. As you know perfectly well. You will do any programming necessary, without regard to what is running now, and if necessary we will use station rock. I would have said you'd chip it for us, but I admit there's a difference between the merely illegal and the impossible. Why do they keep a wreck like you on duty out here?"

Hoerwitz flushed. He was used to this attitude from the young and healthy, but more accustomed to having it masked by some show of courtesy.

"It's the only place I can live," he said shortly. "My heart, muscles, and bones can't take normal gravity. Most people can't take free-fall—or rather, they don't like the consequences of the medication needed to take it indefinitely. That makes no difference to me. I don't care about muscle, and I had my family half a century ago. This job is good for me, and I'm good for it. For that reason, I don't choose to ruin it. I don't intend to do any reprogramming for you, and I'd be willing to bet you can't do it yourself."

Smith's gun reappeared, and its owner looked at it thoughtfully. The old man nodded toward it and went on, "That's an argument, I admit. I don't want to die, but if you kill me it certainly won't get you further." Mac found that he wasn't as brave as his words sounded; there was an odd and uncomfortable feeling in his stomach as he looked at the weapon. He must have covered it well, however, because after a moment of thought the intruder put the gun away again.

"You're quite right," he said. "I have no intention of killing you, because I do need your help. We'll have to use another method. Mr. Jones, please carry out our first stage of planned persuasion?"

## II

Fifteen minutes later Hoerwitz was reprogramming the converters as well as he could with an unusable left hand.

Smith, who had courteously introduced himself during the procedure, had gone to the trouble of making sure his victim was right-handed before allowing Jones to start work. It would, as he said, be a pity to slow the station manager down too much. The right hand could wait.

"How about my toes?" Hoerwitz had asked sarcastically, not yet fully convinced that the affair was serious.

"It seems to have been proved that feet have fewer nerves and don't feel pain as intensely," replied Smith. "Of course, the toes will still be there if we need them. Mr. Jones, start with the left hand."

Mac had decided almost at once that the visitors were sincere, but Jones had insisted on finishing his job in workmanlike style. Smith had supported him.

"It would be a pity for you to get the idea that we weren't prepared to finish anything we started," he pointed out.

As he floated in front of the monitor panels readjusting potentiometers and flow-control relays, Hoerwitz thought furiously. He wasn't much worried about his guests actually getting away with their stolen fuel; what he was now doing to the controls must be showing on repeaters in Elkhart, Papeete, and

Bombay already. The station was, after all, part of a company supposed to be doing profitable business, and the fact that fusion power plants were still forbidden on Earth didn't mean that the company wasn't keeping close track of its products. There'd be radioed questions in the next few minutes, and when they weren't answered satisfactorily there'd be arrangements to send a ship. Of course, the company would wait two or three days and make a perigee rendezvous, but if the indicators bothered the directors sufficiently they might ask a police launch to investigate sooner. On the whole, it was unlikely that anything would happen until shortly after perigee; but something would happen to prevent the thieves' escape.

The trouble seemed to be that that something wouldn't do Mac himself any good. Up to now, genuine criminals who were willing to use actual violence had been strictly reading material for him; but he had done plenty of reading. He had a vivid mental picture of the situation. The belief that they would kill him before leaving was not so much insight as it was reflex.

They might not even wait until the job was done. The new program was set up for the converters, and he would not be essential unless something went seriously astray. It never did, but he hoped the thieves were the sort of people who worried about things going wrong.

He found his stomach reacting again when Smith approached him after the converters had been restarted. The gun was, not in sight, but Mac knew it was there. For that matter, it wasn't necessary; any of the visitors could break his neck with one hand. However, Smith didn't seem to have violence on his mind at the moment. In fact, his speech was encouraging. He would hardly have bothered to give warnings about Hoerwitz's behavior unless he planned to keep the manager around for a while.

"A few points you should understand, Mr. Hoerwitz," the boss-thief explained. "You must be supposing that the change in converter program will attract, or has already attracted, notice at home. You are wrong. A mysterious ailment has affected the monitor computers at the central plant. Signals are coming in quite normally from the space factories, but they are not being analyzed. The engineers are quite frantic about it. They hope to get matters straightened out in a few days, but in the meantime no one is going to worry more about one space factory than another unless some such thing as a distress message is received.

"I know you wouldn't be foolish enough to attempt to send such a message, since you still have nine fingers available for Mr. Jones' attention, but to remove temptation Mr. Robinson has disabled your station's radio transmitters. To make really sure, he is now taking care of those in the spacesuits. We realize that a suit radio could hardly be received, except by the wildest luck, at Earth's present distance; but that distance shrinks to only about a thousand miles at perigee, as I recall.

"If you do wish to go outside, by all means indulge the impulse. I might enjoy a walk with you myself. Our ship is a former police supply boat, heavily armored and solidly locked. One of us has the only key—I wouldn't dream of telling you which one. Even if you forced your way aboard, which seems possible, its transmitter channels are not standard. They would be received by my friends, not yours. You could not take the ship away, supposing you are enough of a pilot to try it, because it is parked beside your waste radiators, and the exhaust would wreck them—"

"You landed beside the radiators?" For the first time, Mac was really alarmed.

"Oh, no. We know better than that. We landed by your airlock and carried the ship around to the radiators. It weighs only about five hundred pounds here. I fear you couldn't carry it away again by yourself, and it's on rough enough ground so I don't think rolling would be practical.

"So, Mr. Hoerwitz, you may as well relax. We'll appreciate your attending to your normal business so that our order is ready as soon as possible, but if you prefer to go out for a walk occasionally we don't really mind. I suppose even you could jump off into space, since I understand that escape velocity here is only about a foot a second, and we'd be sorry to lose you that way; but it's entirely up to you. You are perfectly free in all matters which don't interfere with our order. Personally, if I were you I'd go back to quarters and enjoy that really excellent sheet library."

Hoerwitz had gone, but hadn't really been able to concentrate on *The Tempest*. Some of Caliban's remarks had caught his attention because they expressed his own feelings quite well, and he caught himself once or twice wishing for a handy Ariel. However, he was much too old to spend much mental

effort on wishing, and the only spirits available at the station were material mechanisms of very restricted versatility. Worse, he was probably not completely free to command them, unless Smith and Company were unbelievably incompetent.

Of course, if something appeared to be going wrong, they would have to trust him to fix it; maybe something could be worked up from that side.

But what could be done, anyway? Just what did he have? The plant turned over vast quantities of energy, but it certainly wasn't a magic wand. It had the complex gear of a hydrogen fusion unit, and a modest tonnage of hydrogen-deuterium slush; while it would require deliberate bypassing of a host of safety devices to do it, it would be quite possible to blow the asteroid into a cloud of plasma. This had certain disadvantages besides the likelihood of blinding the unfortunates on Earth who happened to be looking toward the station at the key moment. For one thing, it didn't really deal satisfactorily with Smith and his friend. It merely promised to dispose of them, and the way Mac's finger felt at the moment that wasn't quite bad enough. What else did he have?

There were a score of converters, each designed to take matter and transform it, using the energy of the fuser, into isotopes which could be used on Earth legally and more or less safely as power sources. At the moment, all were working on the Class IV mixtures—the fast-yield substances usable for spacecraft fuel, industrial blasting, and weaponry, which Smith had demanded. Whether he and his friends planned to use the stuff themselves for bank robbery or political subversion, or merely feed the black market, Hoerwitz neither knew or greatly cared. A minute charge of any Class IV product, assuming that he would get hold of it, could certainly get him into the thieves' ship, no matter how well she were armored. Whether the ship would be worth getting into after such treatment was debatable. A production controller is one thing and a nuclear-explosives expert quite another. Hoerwitz happened to be the first. Trying to abstract explosives under the eyes of Smith, Jones and Associates seemed not only dangerous but probably useless.

There were the radiators, the most conspicuous part of the plant from outside. They were four gigantic structures, each some five hundred feet across and nearly as high. The outer walls were cylindrical and contained high-powered refrigeration circuits; their inner surfaces carried free-election fields which rendered them nearly perfect reflectors. Inside the cylinders, out of contact with their walls, were the radiators themselves—huge cores of high-conductivity alloy, running at a temperature which would have evaporated them into space in minutes if they had not been held together by fields similar to those which restrained the fusion units. The whole structure was designed to get rid of waste energy, of course.

Any serious absorption by the planetoid of the flood being radiated from those units would have started a sequence of troubles of which the warming of the fusion-fuel slush would have been a minor preliminary. Secondly, the units were arranged to shine away from Earth; their location on the asteroid and the latter's rotation had been arranged with this in view. It was not a perfect success in one way, since the extremely eccentric orbit in which the asteroid had been placed to facilitate freight-handling work produced a longitude libration of over a hundred degrees each way; but Earth had agreed to put up with this. The periodic flashes of light from the space factories were rather scenic in their way, and most of the astronomers had moved to the Moon or to orbiting observatories anyway.

But those radiators did throw away an awful lot of energy. One should be able to do *something* with it in a situation like this; something really useful. But what?

### III

It was really a pity that the library contained no Fu Manchu or Bulldog Drummond. Hoerwitz needed ideas. Since it looked as though he would have to furnish his own, he selected a sheet for background material, slipped it into the scanner, and drifted toward the cobwebby hammock in the center of the lounge while Flavius berated the holiday-making citizens of Rome on the screen. It was reasonably appropriate, the manager drowsed; there was certainly an Ides of March coming. He wished his finger would stop hurting. The script and background music flowed along a track that his awareness had

followed a hundred times before. . . .

The frantic disclaimers of China the Poet awakened him. He had drifted and been held against the ham-mock by the current from the air circulator. The feeble gravity which gave the visiting ship a weight of five hundred pounds at the surface was of course absent in the living quarters at the center of the asteroid. Almost automatically he pushed himself back to the console and shut off the sheet-scanner at the end of the third act. Obviously this wasn't helping him to think. He'd better check the convertor monitors just to wake himself up and then get some exercise.

Robinson was in the tunnel outside the lounge and without saying a word followed Mac along the passage. The fellow was certainly not very much at home in zero gravity; his coordination as he passed himself from handhold to handhold was worse than sloppy. If this were equally true of the others, it might be a help.

As things turned out, it was.

Smith and Jones were in the control room, drifting idly away from the walls. Another good sign. Either they, too, were unused to free-fall or had completely dismissed Hoerwitz from their minds as a menace. Nei-ther of them could have gotten into action for quite a few seconds, since neither had a pushoff point within reach—not even each other.

They said nothing as the manager and his satellite entered, but watched the former as he aimed and pushed off from a point beside the door and drifted along the indicator panels, taking in their readings as he went. Somewhat to his regret, though not to his surprise since no alarms had sounded, Mac found everything going as programmed. He reached the far end of the room and reversed his drift, aiming for the door. The new course took him within reach of Robinson, and that individual at a nod from Smith seized the old man's arm as he went by.

This was a slight mistake. The result was a two-body system spinning with a period of about five seconds and traveling toward the door at about a quarter of Hoer-witz's former speed. The manager took advantage of the other's confusion to choose the time and style of his breakaway from the system. He came to a halt, spin gone, four or five yards from the meeting point. Robin-son, who had been made a free gift of their joint angu-lar momentum, brought up with his head in painful con-tact with the edge of the doorway. Mac couldn't pretend to be sorry; Jones concealed a grin rather unsuccess-fully, and Smith showed no sign of caring either way. His order to stop Hoerwitz for a conversation had been obeyed; the details didn't bother him.

"How long is our fuel going to take?" he asked.

"Another fifty to fifty-five hours, barring offtrack developments," replied the manager. "I gave you an es-timate at the beginning, and there's no reason to change it so far. I trust these instruments, unless you or one of your friends have been playing with circuits. I know you jimmed the radio, but if your man knew what he was about that shouldn't have bothered this board."

"That's all I wanted to know. Do what you want until it's time to check your instruments again."

"It's night by my clocks. I'm sleeping for a few hours, now that I've had my daily workout. I see you know where my quarters are—what were you searching for, guns or radios? You brought the only weapons this place has ever seen yourselves, and a radio able to reach Earth is a little too large to hide in a photo al-bum."

"Spacesuit radios are pretty small."

"But they're in spacesuits."

"All right. We just like to be sure. Wouldn't you be happier to know that we weren't worrying about you?" Hoerwitz left without trying to answer that. Smith looked after him for a few seconds, and then beckoned to Brown.

"Don't interfere with his routine, but keep an eye on the old fellow. I'm not so sure we really convinced him, after all. I'd much rather keep him around to do the work, but the job is much too important to take chances." Brown nodded, and followed Hoerwitz back to the latter's quarters. Then he took up his station out-side, glanced at his watch, helped himself to a set of the pills needed to keep human metabolism in balance un-der zero-G, and relaxed. The "night" wore on.

Hoerwitz had been perfectly sincere about his inten-tion of sleeping. He had developed the habit of

spending much of his time in that state during his years at the station. His age may have been partly responsible, but the life itself was hardly one to keep a man alert. Few people could be found to accept the lonely and boring jobs in the off-Earth factories—so few that many of them had to be run entirely by computer and remote control. Hoerwitz happened to be one of the sort who could spend all his time quite happily with abstract entertainment—books, plays, music or poetry. He could reread a book, or see the same play over and over again, with full enjoyment, just as many people can get pleasure out of hearing the same music repeatedly. Few jobs on Earth would have permitted him to spend so much time amusing himself; the arrangement was ideal both for him and his employers. Still, he slept a lot.

He therefore woke up refreshed, if not exactly vigorous, some nine hours after Brown had taken up his guard station. He was not only refreshed but enthusiastic. He had a plan. It was not a very complicated one, but it might keep him alive.

It had two parts. One was to convince Smith that the intruders could not load their loot without Mac's help. This should be simple enough, since it was pretty certainly true. Shifting twelve million pounds of mass by muscle power, even in zero-G, is impractical for four men in any reasonable time. The alternative was the station's loading equipment, and it was unlikely that any-one but Hoerwitz would be expert in its use. If the thieves were convinced of that, at least they'd keep him alive until the last minute.

The second part of the plan was to arrange for himself a refuge or hiding place good enough to discourage the four from spending the time necessary to get him. This assumed that they had assigned high priority to getting away as soon as possible after loading the stolen fuel, which seemed reasonable. Details here, however, required more thinking. It might be better to trust to concealment; on the other hand, there was something to be said for a place whose location was known to the enemy but which obviously couldn't be penetrated without a lot of time and effort.

On the whole, the latter choice would make him feel safer, but offhand he couldn't think of a really impregnable spot. There were very few doors of any kind in the station, and even fewer of these could be locked. Air-breaks were solid, but not made to resist intelligent attack. None of the few locks in the place was any better in that respect, if one assumed that the thieves were of professional caliber.

Of course, much of the factory equipment itself, designed to contain nuclear reactions, would have resisted any imaginable tools. None of this could, however, be regarded as practical for hiding purposes; one might as well get inside a blast furnace or sulfuric-acid chamber.

All in all, it looked as though straight concealment were going to be more practical, and this pretty well demanded the outside of the asteroid.

The tunnels of the station were complex enough to make a fairly good labyrinth, but there was a reasonable basic pattern underlying their arrangement. Hoerwitz knew this pattern so well, quite naturally, that it never occurred to him that his unwelcome guests might have trouble finding him in the maze once he got out of sight. He did think of turning out the lights to complicate their job, but they should have little trouble turning them back on again. Robinson, at least, must know something about electricity. Besides, darkness and weightlessness together were a very bad combination even for someone as used to the latter as Hoerwitz. No, outside would be best.

The asteroid was far from spherical, had a reasonable amount of surface area, and its jagged surface promised all sorts of hiding places. This was especially true in the contrasty lighting of airlessness. Mac could think of a dozen possible spots immediately—his years of residence had not been spent entirely inside. During safe periods he had taken several trips outside (safe periods meant, among other things, the presence of company; taking a lone walk in a spacesuit is about as sensible as taking a lone swim in the Indian Ocean).

More familiarity with the surface would have been nice, but what little he had should at least be greater than the others did. If he were to drop casually some remark which would give the impression that he knew the outside like one of his own Shakespeare sheets, they might not even bother to search once he was out of sight—provided he waited until there was very little time left before they were leaving, and provided he was able to disappear at all. Too many ifs? Maybe.

It was also important that Smith not change his mind about letting Hoerwitz take walks outside. It wouldn't require careful guarding to prevent such an excursion; five seconds' work on Mac's spacesuit

would take care of that. It was annoying that so much of the plan depended more on Smith's attitude than on Hoerwitz's action, especially since Smith didn't seem to believe in taking chances. The attitude would be hard to control. The manager would have to seem completely harmless—but he'd better take Hamlet's advice about overacting.

That was a matter of basic behavior. On the question of useful action, there was another factor to consider. At the present setup rate, the isotopes the thieves wanted would be ready ten or a dozen hours before perigee, which Mac was still taking as the latest time they'd want to stay around. Something really ought to be done to delay the conversion and delivery process, to keep at a minimum the supply of spare moments which could be devoted to looking for missing factory managers. Could he slow down the converters without arousing suspicion? He knew much about the machines, and the others presumably knew very little, but trying to fool them with some piece of fiction would be extremely risky. His left hand gave an extra twinge at the thought.

Of course, some genuine trouble could develop. It hadn't in all his years at the station, but it could. There was no point waiting for it, and even if it did they'd probably blame him anyway, but—could he, perhaps, arrange for something to happen which would obviously be Jones' fault? Or Smith's own? The basic idea was attractive, but details failed to crystallize.

It was certainly high time for action, though if he hoped to accomplish anything such as living, the closer to completion the process came, the less good a slow-down would accomplish. In fact, it was time to stop daydreaming and get to work. Hoerwitz nodded slowly to himself as ideas began to shape up.

#### IV

He went to the galley and prepared breakfast, noting without surprise that the others had been using his food. It was too bad that he didn't have anything to dose it with for their benefit. He measured out and consumed his daily supply of null-G medicines, and put the utensils in the washer—one common aspect of his job he had refused to accept. Difficult as such things as ham and eggs are to manage in free-fall, he had insisted on regular food instead of tubes of paste. He worked out techniques of his own for keeping things in the plate. Someday, he had been telling himself for a couple of decades, he would write a book on zero-G cookery.

With the galley chores done, he aimed himself down the corridor toward the control chamber. Brown and Robinson were inside, both looking bored. The latter was drifting within reach of a wall, the manager noticed; perhaps his experience of the day before had taught him something. Hoerwitz hoped not. Brown was near the center of the room and would be useless to his party for quite a few seconds if action were required.

The instruments were disgustingly normal. All twenty converters were simmering along as programmed. Not all were doing just the same things, of course; they had been loaded with different substances originally and had been interrupted in various stages of differing processes when Hoerwitz had been forced to reprogram. One of them had already been processing a Class IV order and was now approaching the climax of its run. It seemed wiser to point this out to the thieves so that they wouldn't think he was up to anything when he shut this one down, as he would have to do in a few hours. He did so.

"At least you people won't have to do everything at once," he remarked.

"What do you mean?" asked Brown.

"When you came, I told you that one of the units was on Four already. You can tell your boss that it should be ready to load in eight hours or so. I'll show you where the loading conveyors are handled from—or do you want to lug it out by hand? You were bragging about carting five hundred pounds of ship around when you came."

"Don't be funny, old fellow," cut in Robinson. "You might as well have that loading machinery ready. You might even be ready to show a couple of us how to use it. If Smith should decide he doesn't like your attitude, we might be the only ones able to."

"All right with me," replied the manager. He felt reasonably safe as long as Smith himself was not

present. It had seemed likely that none of the others would dare do anything drastic to him without direct orders, and Robinson's remark had strengthened the belief. "The controls are in a dome at the surface. They're simple enough, like a chess game."

"What does that crack mean?"

"Just what it sounded like. Any six-year-old can learn the rules of chess in an hour, but that doesn't make him a good player. I'm sure Mr. Smith won't need you to remind him of that when you suggest that you ought to do the loading." The two men glanced at each other, and Robinson shrugged.

"Better show me where the controls are, anyway," he said. "You better stay here," he added to Brown. "I'll be with Hoerwitz, but Smith said this panel was never to be left unwatched. We might not have time to explain if he found us both gone." The other man nodded. Hoerwitz, keeping his face as expressionless as he could, led the way to the station he had mentioned.

This was about as far from the control chamber as anything could be, since it was at the surface. It lay near the main entrance, a quarter of the way around the asteroid's equator from the radiators. The converters themselves were scattered at fairly regular intervals just under the surface. The general idea was that if one of them did misbehave it would meet only token resistance outward, and the rest of the plant might have a chance. Access and loading tunnels connecting the converters with the cargo locks and the living quarters were deliberately crooked. All these tricks would of course be futile in a major blowup, but it is possible to have minor accidents even in nuclear engineering.

The dome containing the loading control panels was one of the few places offering a direct view to the outside of the asteroid. It had served as a conning site while the body was being driven in from beyond Mars; it still was sometimes used that way. The thrust pits were still in service, as the present long, narrow orbit was heavily perturbed by the Moon and required occasional correction near apogee. This was not done by Hoerwitz, who could no more have corrected an orbit than he could have built a spaceship. The thrust controls were disconnected except when a ballistics engineer was on hand.

The dome was small, little more than a dozen feet across, and its entire circle was rimmed with conveyor control panels. Hoerwitz, quite unintentionally, had exaggerated their simplicity. This might have gotten him into trouble with anyone but Robinson. Without worrying about this situation, since he failed to recognize it, the manager promptly began explaining.

"First, you want to be careful about these guarded switches on each panel," he pointed out. "They're designed to bypass the safeties which normally keep you from putting too hot a load on the conveyors, so that you can dump a converter in an emergency. At the moment, since all the units are hot, you couldn't operate any part of the conveyor system except by those switches.

"Basically, the whole thing is simple enough. One panel is concerned with each of the twenty separate conveyor systems, and all panels are alike, so—"

"Why didn't they make just one panel, then, and have a selector to set it on any one of the reactors?" asked Robinson. Hoerwitz sadly revised upward his estimate of the fellow's brain power, as he answered.

"Often several ships are loading, or several reactors unloading, at one time. It turned out to be simpler and safer to have independent control systems. Also, the system works both ways—customers get credit for mass brought to the station for conversion. We have to take material to the converters as well as away from them, and it's more efficient to be able to carry on several operations at once. The original idea, as you probably know, was to use the mass of the asteroid itself for conversion; but with laws about controlling rotation so that the radiators would point away from Earth most of the time, and the expense of the original installation, and the changes in orbit and angular momentum and so on, they finally decided it was better to try to keep the mass of the place fairly constant. They did use quite a bit of material from it at first. There are a lot of useless tunnels inside, and quite a few pits outside, left over from lose days."

Hoerwitz was watching his listener covertly as he spoke, trying to judge how much of this information was being absorbed, but the other's face was unreadable. He gave up and went on with the lesson.

They were joined after about a quarter of an hour by Smith, but the head thief said little, merely ordering the instruction to continue. The factory manager decided to take no more chances testing his



listeners with double-talk; Smith had impressed him as being a different proposition from his followers. The decision to play safe in his presence proved a wise one.

It took another ten minutes for Mac to wind up the lesson.

"You'll need some practice," he concluded, "and there's no way to get it just yet. I was never a school-teacher, but I understand that your best way of making sure how well you know something is to try to teach it to someone else. I trust Mr. Smith approves of that thought."

"I do." Smith's face didn't show approval or anything else, but the words were encouraging.

"Give me a lesson right now, Rob. I'd particularly like to know just what this switch does—or did Mr. Hoerwitz forget to mention it?" He indicated the emergency-dump override.

"Oh, no, he showed me that first. We'd better keep clear of it, because it empties that particular converter onto its conveyor and dumps it into space, even though it's still hot."

For a moment there might have been a flicker of sur-prise on Smith's face.

"And he told you about it? I rather thought he might skip items like that in the hope that one of us might make a mistake he could not be blamed for." Hoerwitz decided that it would be less suspicious to answer that remark than to let it pass.

"Is there anything that could possibly go wrong that you would not blame me for?" he asked.

"Probably not, at that. I'm glad you realize it, Mr. Hoerwitz. Perhaps I'll be spared the nuisance of having to leave a man on guard here as well as at the main controls." He glanced through the dome's double wall at Earth's fat crescent, which dominated the sky on one side of the meridian as the Moon did on the other. "Is there any way of shutting off access to this place until we're ready to use it? Think how much more at ease we'd both feel if there were."

Hoerwitz shrugged. "No regular door. There are a couple of safety air-breaks in the corridor below; you could get one of them closed easily enough, since there are manual switches for them as well as the pressure and temperature differential sensors, but it would be a lot harder to open. If one of those things does shut, it's normally because air is being lost or dangerous reac-tions going on on one side or the other. A good deal of red tape is necessary to convince the machinery that all is well after all."

"Hmph." Smith looked thoughtful. "All right, we'll consider it. Rob, you stay here until I decide. You come with me, old fellow." Hoerwitz obeyed with mixed feel-ings.

It was lucky he hadn't tried to dump the reactors and shut himself off in the dome section, in view of Smith's perspicacity, but he couldn't thank his own intelligence or foresight for saving him. The sad fact was that he'd never thought of the trick until he was explaining matters to Robinson. Now it was certainly too late. Of course, it probably wouldn't have worked anyway, since someone like Robinson could presumably get air doors open again in short order; and there was an even bright-er side, now that he thought of it. The last few minutes might well have gone far in convincing Smith that the manager was really reconciled to the situation. One could not be sure of that, naturally, with a person like Smith, but one could hope. Time would no doubt tell—and quite possibly in bad language.

As they floated back down toward the living section—Hoerwitz noted with some regret that Smith was getting better at handling himself in free-fall—the head thief spoke briefly.

"Maybe you've learned your lesson. From what's just happened, I guess we can both hope so. Just the same, I don't want to see you anywhere near that place where we just left Robinson, except when I tell you myself to go there for my own reasons. Is that clear?"

"It is."

"Good. I don't really enjoy persuading people the hard way, but you may have noticed that Mr. Jones does. If you've really accepted the fact that I have the bulge on you, though, we won't have to amuse him."

"You've made everything very clear. Do you want the reactor which was working on Class IV when you came, and which will be ready pretty soon, to be un-loaded as soon as it's done?"

"Hmph. I don't know. Does your loading machine deliver to any spot on the surface, or just by that dome?"

"Just at the dome, I'm afraid. It wouldn't have been practical to run conveyors all over the place, and it's even less so to drive trucks around on the surface."

"All right. If it would mean moving our ship an extra time we'll wait until everything is ready. It would be a nuisance to have to guard it, too."

"Then you're not really convinced I've learned my lesson, after all?"

"Don't ask too many questions, Mr. Hoerwitz. Why not just assume that I don't like to take chances?"

The manager was not inclined to act on impulse, but he sometimes talked on that basis. This was one of the times.

"I don't want to assume that."

"Why not?"

"Because one of your most obvious ways of not taking chances would be to leave no witnesses. If I believed you were that thorough, I might as well stop everything now and let you shoot me—not that I really enjoy the prospect, but I could at least die with the satisfaction that I hadn't helped you."

"That's logical," Smith answered thoughtfully. "I have only two answers to it. One you already know—we wouldn't just shoot you. The other, which I hope will make you feel better, is that we aren't worried about witnesses. You've been reading too much. We'll have lived in this place for several days before we're done, but you must have noticed that we aren't wearing gloves to keep from leaving fingerprints, or spacesuits to foil the scent analyzers, or anything else of that sort. I'm sure the law will know who was here after we've gone, but that doesn't worry us. They already want us for so many different things that our main care is to avoid getting caught up with, not identified."

"Then why those names? Do you expect me to believe they're real?"

For almost the first time, Smith showed emotion. He grinned. "Go back to your drama sheets, Mr. Hoerwitz, but stick to Shakespeare. Lord Peter Wimsey is leading you astray. Just remember what I said about the convey-or controls; keep away from them."

## V

If his finger hadn't been so painful, Hoerwitz would have been quite happy as he made his way back to the lounge and let the air currents settle him into the ham-mock. He shunted *Julius Caesar* into the "hold" stack without zeroing its tracker, started *The Pajama Game*, and remained awake through the whole show. It was quite an occasion.

For the next couple of days everyone was on almost friendly terms, though Hoerwitz's finger kept him from forgetting entirely the basic facts of the situation or warming up very much to Jones. Some of the men watched shows with him, and there was even casual conversation entirely unconnected with reactors and fuel processing. Smith's psychology was working fairly well.

It did not backfire on him until about twenty hours before perigee.

At that time Mac had been making one of his periodic control checks, and had reported that the runs would be finishing off during the next ten or twelve hours. He would have to stay at the board, since they would not all end at the same time, and it was safer to oversee the supposedly automatic cooling of each converter as its job ended.

"What's all that for?" asked Smith. "I thought it didn't matter much what was in the converters at the start. Why will it hurt if a little of this is still inside when you begin your next job? Won't it just be converted along with everything else?"

"It's not quite that simple," replied the manager. "Basically you are right; we don't deal in pure products, and what we deliver is processed chemically by our customers. Still, it's best to start clean. If too much really hot stuff were allowed to accumulate in the converters between runs, it could be bad. If Class I or II fuel intended to power a chemical industry, for example, were contaminated with Class IV there could be trouble on Earth—especially if the plant in question were doing a chemical separation of nuclear fuels."

"But it's *all* Class IV this time," pointed out Smith, "unless you've been running a major bluff on us, and I'm sure you wouldn't do that." His face hardened, and once more Hoerwitz mentally kicked himself. He hadn't even thought of such a trick, and he could probably have gotten away with it. There was no

easy way to identify directly the isotopes being put out by the converters; it took specialized apparatus and specialized knowledge. It was pretty certain that Smith had neither. Well, too late now.

"It's all one class, as you said," the manager admitted with what he hoped was negligible delay, "but that's just it. With Class IV in every converter and on every conveyor it's even more important than usual to watch the cooling. I live here, you know. I'm not an engineer and don't know what would happen if any of that stuff found its way into the hydrogen reactors, but I'd rather not find out."

"But you must be enough of an engineer to handle the fusion units."

"That doesn't demand an engineer. I'm a button pusher. I can operate them very sensibly, but they don't waste a trained engineer out, here with the price of skilled labor what it is. The trouble frequency of these plants is far too low to keep one twiddling his thumbs on standby the whole time."

"But how about safety? If this place blows apart, it would take quite a few centuries of engineers' pay to replace it, I'd think."

"No doubt. I suspect that's the point they're trying to make, in order to modify or get rid of that law about hydrogen reactors on Earth. The idea is that if the company trusts them enough to risk all this capital without a resident engineer, what's everyone worried about?"

"But the place could really let go if the right—or I should say the wrong—things happened."

"I suppose so, but I don't know what they'd be, short of deliberate mishandling. In the forty years I've been here nothing out of line had ever happened. I've never had to use that emergency dump I've showed you, or even the straight shutoff on the main board. Engineers come twice a year to check everything over, and I just move switches—like this." He began manipulating controls. "Number thirteen has flashed over. I'm shutting down, and in about an hour it can be transferred from field-bottle to physical containers."

"Why not now? What's this field-bottle?"

Hoerwitz was genuinely surprised, and once again annoyed. He had supposed everyone knew about that; if he had realized that Smith didn't . . . Well, another chance gone.

"At conversion energies no material will hold the charge in. Three hundred tons of anything at all, at star-core temperature, would feel cramped in a hundred cubic miles of space, to say nothing of a hundred cubic yards. It's held in by fields, since nothing else will do it, and surrounded by a free-electron layer that reflects just about all the radiation back into the plasma. The little bit that isn't reflected is carried, also by free-electron field, to the radiators."

"I think you're trying something," Smith said sternly, and the manager felt his stomach misbehave again. "You said that those loads could be dumped in an emergency by the conveyors. And you described the conveyors as simply mechanical belt-and-bucket systems, a couple of days ago. Stuff that you just described would blow them into gas. Which was the lie?"

"Neither!" Hoerwitz gasped desperately. "I didn't say that the emergency dumping was instantaneous—it isn't. The process involves fast chilling, using the same conductor fields; and even with them, we'd expect the conveyors to need replacing if we ever used the system!"

"If that's so," Smith asked, "what do you mean by saying a while ago that you didn't know what could happen to blow this place up? If one of those fields let go—"

"Oh, but it couldn't. There are all sorts of automatic safety systems. I don't have to worry about that sort of thing. If a field starts to weaken, the energy loss automatically drains into conductor fields, and they carry plasma energy that much faster to the radiators, so the plasma cools and the pressure drops—I can't give you all the details because I don't understand them myself, but it's a real fail-safe."

Smith still looked suspicious, though he was as accustomed as any civilized person to trusting machinery. It wasn't the machinery that bothered him just now.

"You keep switching," he snapped, "and I don't like it. One minute you say nothing can happen, and the next you talk about all these emergency features in case it does. Either the people who built this place didn't know what they were doing, or you're not leveling."

Hoerwitz's stomach felt even worse, but he kept up the battle.

"That's not what I said! I told you things couldn't happen because of the safety stuff! They knew what they were doing when they built this place—of course, half the major governments on Earth were passing

laws about the way it should be done—"

"Passing laws? For something off Earth?"

"Sure. Ninety-five percent of the company's potential customers were nationals of those countries, and there's nothing like economic pressure. Now, will you stop this nonsense and let me work, or decide you don't trust me and do it all yourself? There are more reactors almost ready to flash over."

It was the wrong line for the old man to take, but Smith also made a mistake in resenting it. It was here that his psychology really went wrong.

"I don't trust you'," he said. "Not one particle. You've evaded every detailed question I asked. I don't even know for certain that that's Class IV stuff you've been cooking for me."

"That's right. You don't." Hoerwitz, too, was losing his tact and foresight. "I've been expecting you to make some sort of test ever since I set up the program. Or did you take for granted that whoever you found here would be scared into doing just what you wanted? Surely it isn't possible that you and the friends you said were somewhere else just don't have anyone able to make such a test! Any properly planned operation would have made getting such a person its first step, I should think—or have I been reading too much again?"

The expression which had started to develop on Smith's face disappeared, and he looked steadily at the old man for perhaps half a minute. Then he spoke.

"Mr. Jones. I think we will have to start Phase Two of the persuasion plan. Will you please prepare for it? We planned this operation, as you call it, Mr. Hoerwitz, quite carefully, in view of certain limitations which faced us. Exactly what those limitations were is none of your business, but remember that we so arranged matters that no one on Earth has been seriously worried by your failure to communicate—nor will they for some time yet. We know that no scheduled freighters are due here for two more revolutions, though we recognize the chance of a tramp tug dropping in with mass to deposit for credit—that is why we plan to have the job done before the next perigee. Our plans also included details for insuring the cooperation of the person we found on duty. The fact that he turned out to be about three times as old as we expected doesn't affect those plans at all. You have experienced the first part of them. I was rather hoping that no more would be necessary, but you seem to have forgotten that we have the bulge on you. Therefore, you will experience the second part, unless you can think of a way to prove to me that you have been telling the truth—and prove it in a very short time.

I won't tell you what the time limit is, but I have already decided on it. Start thinking, Mr. Hoerwitz. I believe Mr. Jones is ready."

Hoerwitz couldn't think. He probably couldn't have thought if the same situation had faced him forty or fifty years earlier; he had never claimed to be a hero. He spoke, but—as Smith had intended—it was without any sort of consideration.

"The Class IV stuff that was going when you arrived—it's cool—you could get a sample of it and test it in your ship's power plant!"

"Not good enough. I never doubted that you were telling the truth about that load. It will have to be something else. The material that's finishing now, or your claim that could really go wrong enough to blow this place into vapor if your fail-safe rigs weren't there—"

"But how could I possibly prove that, except by doing it?" gasped the old man.

"Your problem. Think fast. Mr. Jones will be with you in a moment. In fact, I think he's on the way now—not hurrying, you understand, because he isn't really proficient at moving around in this no-weight nuisance—but I think if I looked around I'd see that he had pushed off and was drifting your way. It would be unfair of me to spoil his fun if he gets to you before you've thought of something, wouldn't it?"

Smith of course meant to reduce the manager to a state of complete panic in which he would be unable to lie, or at least to lie convincingly; but just as he had planned badly in not getting hold of a nuclear engineer of his own, he had planned badly in failing to consider all the possible results of panic. He may, of course, have realized that Hoerwitz might try to do something desperate, but failed to foresee how hard such an action would be to stop in the unfamiliar environment of weightlessness. It was easy to take for granted that a person with such a frail physique could be controlled physically by anyone with no trouble. This was perfectly correct—for anyone within reach of the old man.

No one was. Worse, from Smith's point of view, no one but Robinson was in a position to get there. As a result, Mac was able to do something which he would never have seriously considered if he had been given time to think. He was, of course, within reach of a push-off point as a matter of habit. He used every bit of muscle his frail old body could muster in a dive toward the center of the board—and made it.

Only Robinson had learned his lesson about drifting, and he misjudged his own pushoff and failed to intercept the manager. Hoerwitz reached and opened a plainly labeled switch, and with the action his panic left him as suddenly as it had come, though fear still churned at his stomach.

"At least, you believed me enough not to risk bullets in the controls," he almost sneered. "There's your proof, Mr. Smith. I've just shut down all the converters. They're bleeding energy out of the main radiators and will be cool enough to handle in an hour. If you replace that switch, you'll know I was telling the truth about safeties. Go ahead. Close it. It's safe. All you'll get is a bunch of red lights all over the boards, telling you that safety circuits are blocking you. You'll have to start those processes from the beginning. I can set that up for you, of course. I will if you give the order; but anything else at all, except dumping the loads, of course, will block you with safeties."

"Why?" Smith was still in control of himself, though it was a visible strain.

"What do you think I am, an astrophysicist? I don't know why, if you want one of those detailed answers you were complaining about not getting. They come in high-class equations. In words, which is all I understand about it, most of the processing time in these converters is for setup. The actual conversion is the sort of thing that goes on in the last moments of a supernova's fling, as I thought everyone knew. The converter has to set up millions of parameters in terms of temperature, density gradients, potential of all sorts—even the changing distance from Earth in this orbit has to be allowed for, I understand—and I don't know what else before the final step is triggered, if a decent percentage of the desired isotope class is to be produced. I've just cleared the setup in eighteen of those converters. If you were actually to build them up to the temperature they had before I hit that switch, you probably would blow the place up. Hence, my friend, the safeties. Working out a reaction that not only produces useful isotopes but also balances endothermic and exothermic processes closely to hold the whole works under control is a perfectly good subject for a doctorate thesis. Do you think we could confine a supernova—or even a few tons of one? Now, do you want me to start these stoves all over, or will you take two loads of Class IV instead of twenty, pull out all my fingernails and fly off in a rage gnashing your teeth?"

During this diatribe Smith had actually calmed down, which was hardly what Hoerwitz had expected. The thief nodded slowly at its end.

"I wouldn't have said there was anything which could happen here which I wouldn't blame on you," he said, "but I have to admit this one is on me. By all means, start the cooking over. I have learned most of what I need to know. I think I can now manage well enough even if visitors show up during this overtime period you have pushed us into.

"You just restart the runs you interrupted, and when that's done come with me up to the dome. I want you to get the load that was just finished out onto the conveyors. Then you may resume your life of leisure and entertainment. Hop to it, Mr. Hoerwitz."

The manager hopped. He was too surprised at Smith's reaction to do anything else. He would have to recheck his Shakespeare memory; maybe there was someone like this after all. He worked the controls rapidly.

Jones looked disappointed except for a moment when Robinson suddenly said, "That's not the way he had them set before!"

Smith started to raise his eyebrows in surprise, but the manager, who had had no thought of deception at the moment, said, "We're not starting with the same stuff as before, remember. Many things happen long before the main conversion."

Smith stopped, thought for a moment, looked carefully at the old man, and nodded. Jones shrugged and relaxed once more.

By this time, certain facts were beginning to fit together in the manager's mind.

By the time the trip to the dome had been made and the finished load of isotopes transferred to its conveyor, Hoerwitz's brief sense of elation had evaporated, and he had written himself off as a walking corpse. He realized just what details he had overlooked, and just where the omissions left him. He floated slowly to his quarters, his morale completely flattened and hope for the first time gone.

Robinson's acute detail memory must have been a major factor in the planning Smith had mentioned. If Hoerwitz himself could run the plant effectively without a real basic understanding of what went on, so could Robinson. By arranging what had amounted to another lesson in the operation of the controls, the manager had made himself superfluous from the thieves' viewpoint.

Also, and much worse, he had completely missed the hole in the logic Smith had used when the fellow had tried to prove that he really wasn't worried about leaving witnesses. It was quite true that the thieves were taking no care about leaving fingerprints. Why should they bother about such details? No one can analyze individual personality traces from a million-degree cloud of ionized gas, and they certainly knew enough now to leave only that behind them.

Even if wiring around the safety circuits was too much for Robinson, which seemed unlikely in Hoerwitz's present mood, they could always sacrifice a ton or so of their loot. The Class IV fuels might not be up to hydrogen fusion standards, but they would be quite adequate for the purpose intended. Hiding, inside the asteroid or out, would be meaningless.

The only remaining shred of his original plan which retained any relevance was the desirability of fooling the others about his own attitude. As long as they believed that he expected to come out of the affair with his life, they would not expect him to do anything desperate, and they might let him live until the last moment to save themselves work. If they even suspected that he had convinced himself that they were going to dispose of him, Smith's dislike of taking chances would probably become the deciding factor.

This might involve a difficult bit of acting. Behaving as though he had forgotten what had happened would certainly be unconvincing. Trying to act as though he had even forgiven it would be little better. On the other hand, any trace of an uncooperative attitude would also be dangerous. Maybe he should go back to Hamlet and rerun the prince's instructions to the players. No, not worth it. He knew them word for word anyway, and the more he thought of the problem as one of acting the less likely he was to get away with it.

Maybe he should just try, unobtrusively, to keep in Jones' company as much as possible. His natural feelings toward that member of the group were unlikely to make the others suspicious.

In any case, he wouldn't have to act for a while. The last couple of hours had been exhausting enough so that not even Smith was surprised when Mac sought his own quarters. One of the men followed and took up watch outside, of course, but that was routine.

The manager was in no mood for music. He brought the Julius Caesar sheet out of standby and let the scanner start at the point where he had left it a couple of days before.

As a result, it was only a few minutes before Brutus solved his problem for him.

It was beautiful. There was no slow groping, no rejection of one detail and substitution of another. It was just there, all at once. It would have Wertheimer, Kohler, and the rest of the Gestalt school dance with glee. The only extraneous thought to enter Hoerwitz's mind as the idea developed was a touch of amazement that Shakespeare could have written anything so relevant more than four decades before the birth of Isaac Newton. He didn't wait for the end of the play. There was quite a while remaining before the plan could be put into action, so he went to sleep. After all, a man needs his ten or twelve hours when careful, exhausting, and detailed work is in the offing.

A good meal helps, too, and Hoerwitz prepared himself one when he woke up—one of his fancier break-fasts. With that disposed of, there were seven hours to go before perigee.

He went to check the controls, pointedly ignoring the thief on duty outside his quarters and the second one in the control room. Everything about the converters was going well, as usual, but this time the fact didn't annoy him. For all he cared, all those loads of explosives could cook themselves to

completion.

They hadn't been ordered properly, but there would be no trouble finding customers for them later on.

He checked in time his impulse to go to the dome for a look outside. Smith's order had been very clear, so it would be necessary to trust the clocks without the help of a look at Earth. No matter. He trusted them.

Six hours to perigee. Four and a half to action time. He hated leaving things so late, since there was doubt about Smith's reaction to the key question and time might be needed to influence the fellow. Still, starting too soon would be even more dangerous.

A show killed three of the hours, but he never re-membered afterward which show he had picked.

Another meal helped. After all, it might be quite a long time before he would eat anything but tube-mush, if things went right. If they went wrong, he had the right to make his last meal a good one. It brought him almost up to the deadline. He thought briefly of not bothering to clean the dishes, but decided that this was no time to change his habits. Smith was suspicious enough by nature without giving him handles for it.

Now a final check of the controls, which mustn't look as though it were final. Normal, as usual. Robinson and Brown were in the control room—the latter had accompanied the manager from his quarters—and when the check was finished the old man turned to them.

"Where is your boss?"

Robinson shrugged. "Asleep, I suppose. Why?"

"When you first came, he said it would be all right for me to walk outside, once you'd jimmed the trans-mitter in my suit. I like to watch Earth as we go by perigee, but I suppose I'd better make sure he still doesn't object."

"Why can't you watch from the dome?"

"Partly because he told me to keep away from there, and partly because in the hour and a half around perigee Earth shifts from one side of this place to the other. You can see only the first part from the dome. I like to go to the North Pole and watch it swing around the horizon—you get a real sense of motion. Whoever Smith sends with me, if he lets me go at all, will enjoy it. Maybe he'd like to go himself."

Robinson was doubtful. "I suppose he won't shoot anyone for asking. I take it this happens pretty soon." Hoerwitz was glad of the chance to look at a clock without arousing suspicion.

"Very soon. There won't be much more than enough time to check our suits. Remember, there's no such thing as fast walking, outside."

"Don't I know it. All right, I'll ask him. You stay here with Mr. Brown."

"You're sure you didn't damage anything in my suit except the radio?"

"Positive. Make a regular checkout; I stand by the result."

"As long as I don't fall by it." Robinson shrugged and left. "Mr. Brown, in view of what your friend just said, how about coming with me up to the lock so I can start that suit check early?"

Brown shook his head negatively, and nodded toward the controls.

"Smith said to keep it guarded." Hoerwitz decided that debate was useless, and waited for the leader. It was not really as long a wait as it seemed.

Smith was accompanied by Robinson, as the manager had expected, and also by Jones, who, Hoerwitz had assumed, must be on guard at the dome. He hadn't stopped to figure out the arithmetic of three men on watch at once out of a total strength of four.

Smith wasted no time.

"All right, Mr. Hoerwitz, let's take this walk. Have you checked your suit?"

"I've had no chance."

"All right, let's get to it. Tell me what you expect to see as we go up. With your suit radio out you won't be able to give a proper guide's talk outside."

The manager obeyed, repeating what he had told Robinson and Brown a few minutes before. The recital lasted to the equipment chamber inside the airlock, where the old man fell silent as he started to make the meticulous checkout which was routine for people who have survived much experience in

spacesuits. He was especially careful of the nuclear-powered air-recycling equipment and the reserve tanks which made up for its unavoidable slight inefficiency. He was hoping to de-pend on them for quite a while.

Satisfied, he looked up and spoke once more.

"I mentioned only the North Pole walk," he said, "because I assume you'd disapprove of something else I often do. At the place where Earth is overhead at peri-gee, right opposite the radiators, I have a six-foot optical flat with a central hole. You probably know the old distress-mirror trick. I have friends at several places on Earth, and sometimes at perigee I stand there and flash sunlight at them. The beam from the mirror is only about twelve or fifteen miles wide at a thousand miles, and if I aim it right it looks brighter than Venus from the other end—they can spot in full daylight without much trouble. Naturally the mirror has to be in sunlight itself, and as I remember it won't be this time, but I thought I'd better mention it in case you came across the mirror as we wandered around and got the idea that I was up to something."

"That was very wise of you, Mr. Hoerwitz. Actually, I doubt that there will be any random wandering. Mr. Jones will remain very close to you at all times, and unless you yourself approach the mirror he is unlikely to. I trust you will have a pleasant walk and am sure that there is no point in reminding you of the impossibility of finding a man drifting in space."

"One chance in ten thousand isn't exactly impossible, but I'd rather not depend on it," admitted the manager. "But aren't you coming?"

"No. Possibly some other time. Enjoy yourself."

Mac wondered briefly whether he had made some mistake. He had told only two lies since bringing up the subject of the walk and felt pretty sure that if Smith had detected either of them the fact would now be obvious.

But he had expected to get out only by interesting Smith himself in the trip. If Smith didn't want to go, why was he permitting it at all? Out of kindheartedness?

No. Obviously not.

For a moment Hoerwitz wished he hadn't eaten that last meal. It threatened to come back on him as he saw what must be Smith's reason. Then he decided he might as well enjoy the memory of it while he could. After that, almost in a spirit of bravado, he made a final re-mark.

"Jones, I don't pretend to care what happens to you outside, but you might remember one thing."

"What?" The fellow paused with his helmet almost in place.

"If I do anything that you think calls for shooting me, be sure you are holding on to something tightly or that your line of fire is upward."

"Why?"

"Well, as Mr. Smith pointed out some time ago, the escape velocity of this asteroid is about one foot a sec-ond. I don't know too much about guns, but I seem to recall that an ordinary pistol shot will provide a space-suited man with a recoil velocity of around a third of that. You wouldn't be kicked entirely into space, but you'd be some time coming down; and just think of the embarrassment if your first shot had missed me. Don't say I didn't warn you."

He clamped down his own helmet without waiting for an answer from either man. Then he wished he'd men-tioned something about the danger to a spacesuit from ricochet, but decided that it would be an anticlimax.

He would have liked to hear the remarks passed be-tween them, but he had already discovered that Robin-son hadn't wasted time cutting out his transmitter but avoiding the receiver. He had simply depowered the whole unit, and Mac could neither transmit nor receive.

He stepped—using the word loosely—in the inner lock door, hit the switch that opened it and stepped through. Turning to see whether Jones was with him, he was surprised to discover that the latter still had not donned his helmet and was engaged in an animated dis-cussion with Smith.

Hoerwitz sometimes spoke on impulse, but it had been well over fifty years since he had performed an important action on that basis; the mental machinery concerned was rather corroded. It might be



possible to get the inner lock door closed and the air pumps started before either of the two men could reach the inner switch; if he could do that, it would give him nearly two minutes' start—quite long enough to disappear on the irregular, harshly lit surface of the asteroid. On the other hand, if they stopped the cycle before the inner door was closed and the inside switch out of circuit, they would presumably shoot him on the spot.

His spacesuit had the usual provisions for sealing small leaks, but it was by no means bulletproof. He wished he had taken the time to make that remark about ricochet; it would apply well to the metal-walled chambers they were all standing in. Unfortunately the thieves might not think of that in time.

Hoerwitz might, if given another minute or two to mull it over, have taken the chance on that much data; but before he made up his mind the conversation ended. Jones donned his helmet, safetied its clamps and looked toward the airlock. At that same moment all three men suddenly realized that Smith and Jones were both out of touch with pushoff points. They were "standing" on the floor, of course, since they had been in the room for some time and weighed several grams each, but that weight would not supply anything like the traction needed to get them to the switch quickly. An experienced spaceman would have jumped hard, in any direction, and trusted to the next wall collision to provide steerage; but it had become perfectly evident in the last couple of days that these men were not experienced spacemen. Hoerwitz's impulses broke free with an almost audible screech of metal on rust, and he slapped the cycling control.

## VII

Jones had drawn his gun. He might have fired, but the action of drawing had spoiled his stance. Hoerwitz thought he had fired, but that the sound failed to get through his suit; the bullet, if any, must have gone bouncing around the equipment room. The inner door was shut, and the red light indicated pump cycling before any really interesting details could be observed.

The pumps took fifty seconds to get the pressure down, and the motors ten more to get the outer door open. Hoerwitz would have been outside almost on the instant, but his low-gravity reflexes took over.

One simply does not move rapidly in a place where the effort which would lift a man half a millimeter on Earth will give him escape velocity. This is true even when someone can be counted on to be shooting at you in the next minute or so; a person drifting helplessly out of touch with pushoff mass is a remarkably easy target. The idea was to get out of sight, rather than far away.

The asteroid was not exactly porous—no one has found a porous body made of lava yet—but it was highly irregular from a few hundred million years of random collisions out beyond Mars. There were explosion pits and crevices from this source, and quite a few holes made by men in the days when the material of the body itself had been used for conversion mass.

There were plenty of nice, dark cracks and holes to hide in. Hoerwitz maneuvered himself into one of the former five yards from the airlock and vanished:

He didn't bother to look behind him. He neither knew nor cared whether they would follow. All things considered, they might not even try. However, they would very probably send out at least two men, one to hunt for the fictitious mirror and the other to guard the spaceship—not that they could guess, the old man hoped, what he intended to do about the latter.

Both places—sub-Earth and its antipodes—were just where Hoerwitz wanted them to be; they were the spots where an unwarned space-walker would be in the greatest danger.

However, the ship would be a refuge, if it were still there, and Hoerwitz wanted to get there before any possible guard. He therefore set out at the highest speed he could manage, climbing across the asteroid.

It was like chimney work in Earthly rock-climbing, simpler in one way because there was no significant weight. The manager was not really good at it, but presumably he was better than the others.

Earth was overhead and slightly to the west—about as far as it ever got that way, seen from near the air-lock. That meant that time was growing short. When the planet started eastward again the asteroid

was within a hundred degrees or so of perigee—an arc which it would cover in little over three-quarters of an hour, at this end of its grossly eccentric orbit.

Travel grew more complicated, and rather more dangerous, as the planet sank behind him. Roche's limit for a body of this density was at around twelve thousand miles from Earth's center, and the tidal bulge—invisible, imponderable, a mere mathematical quirk of earth's potential field—was not only swinging around but growing stronger. With Earth, now spanning more than thirty degrees of sky, on the horizon behind him he was safe, but as it sank he knew he was traveling to meet the bulge, and it was coming to meet him. He had to get to the ship before the field had been working on that area too long.

The last thousand feet should have been the hardest, with his weight turning definitely negative; physically, it turned out to be the easiest, though the reason shocked him. He discovered, by the simple expedient of running into it, that the thieves had strung a cable between their ship and the airlock.

With its aid, they would travel much faster than he could. There might be a guard there already. Mac, terrified almost out of his senses, pulled himself along the cable with reckless haste until he reached a point where he could see the base of the ship a few hundred feet away.

No spacesuits were in sight, but the bottom of the globe was in black shadow. There was no way to be sure—except by waiting. That would eventually make one thing certain. The old man almost hurled himself along the cable toward the ship, expecting every second to be his last, but trying to convince himself that no one was there.

He was lucky. No one was.

The ship was already off the "ground" by a foot or so; the tide was rising at this part of the asteroid and weight had turned negative. Hoerwitz crammed himself into the space between the spherical hull and the ground and heaved upward for all he was worth.

At a guess, his thrust amounted to some fifty pounds. This gave him something over a minute before the vessel was too high for further pushing. In this time it had acquired a speed of perhaps two inches a second relative to the asteroid; but this was still increasing, very slowly, under tidal thrust.

The hull was of course covered with handholds. Hoerwitz seized two of these and rode upward with the vessel. It was quite true that a man drifting in space was an almost hopeless proposition as far as search-and-rescue was concerned; but a ship was a very different matter. If he and it got far enough away before any of the others arrived, he was safe.

Altitude increased with agonizing slowness. Earth's bulk gradually came into view all around the planetoid's jagged outline. At first, the small body showed almost against the center of the greater one; then, as the ship in its larger, slower orbit began to fall behind, the asteroid appeared to drift toward one side of the blue-and-white-streaked disk. Hoerwitz watched with interest and appreciation—it was a beautiful sight—but didn't neglect the point where the cable came around the rocks.

He was perhaps five hundred feet up when a space-suited figure appeared, pulling itself along with little appearance of haste. It was not yet close enough for the ship's former site to be above the "horizon." Mac waited with interest to see what the reaction to the discovery would be.

It was impressive, even under circumstances which prevented good observation. The thief was surprised enough to lose grip on the cable.

He was probably traveling above escape velocity, or what would have been escape velocity, even if the tide had been out. As it was, any speed would have been too great. For a moment, Hoerwitz thought the fellow was doomed.

Maybe it was Robinson, though; at least, he reacted promptly and sensibly. He drew a gun and began firing away from the asteroid. Each shot produced only a tiny velocity change in his drifting body, but those few inches a second were enough. He collided with one of the structures at the base of a radiator, kicked himself off and downward as he hit it, touched the surface, and clutched frantically at some handhold Hoerwitz couldn't see. Then he began looking around and promptly discovered the ship.

The manager was quite sure the fellow wouldn't try a jump. He wished, once again, that his radio receiver was working—the man might be saying something interesting, though he must be out of radio reach of the others. It would be nice to know whether the thief could see Hoerwitz's clinging figure on the ship's hull. It was possible, since the lower side of the sphere was illuminated by Earthlight, but far from

certain, since the man's line of sight extended quite close to the sun. He wasn't shooting. But it was more than likely that his gun was empty anyway.

It was disappointing in a way, but Hoerwitz was able to make up for himself a story of what the fellow was thinking, and this was probably more fun than the real facts. Eventually the figure worked its way back to the cable and started along it toward the airlock. The old man watched it out of sight. Then feeling almost secure, he resumed his favorite state of relaxation after fasten-ing himself to a couple of holds with the snap-rings on his suit, and relaxed.

There was nothing more to do. The drifting vessel would be spotted in the next hour or so, if it hadn't been already, and someone would be along. In a way, it was a disappointing ending.

He spent some of the time wondering what Shake-speare would have done to avoid the anticlimax. He might have learned, if he had stayed awake, but he slept through the interesting part.

Smith, upon hearing that the ship was drifting away, had made the best possible time to the radiator site. Knowing that there was no other hope, he jumped; and not being a lightning calculator able to make all the necessary allowances for the local quirks in the poten-tial field, he naturally went slightly off course.

He used all but one of his bullets in attempted cor-rections and wound up drifting at a velocity very well matched with that of the ship, but about fifty yards away from it. He could see Hoerwitz plainly.

Up to that time he had had no intention either of harming the old man fatally or blowing up the station; but the realization that the manager had had a part in the loss of his ship changed his attitude drastically. When the police ship arrived, he was still trying to de-cide whether to fire his last bullet at Hoerwitz, or in the opposite direction. Hoerwitz himself, of course, was asleep.