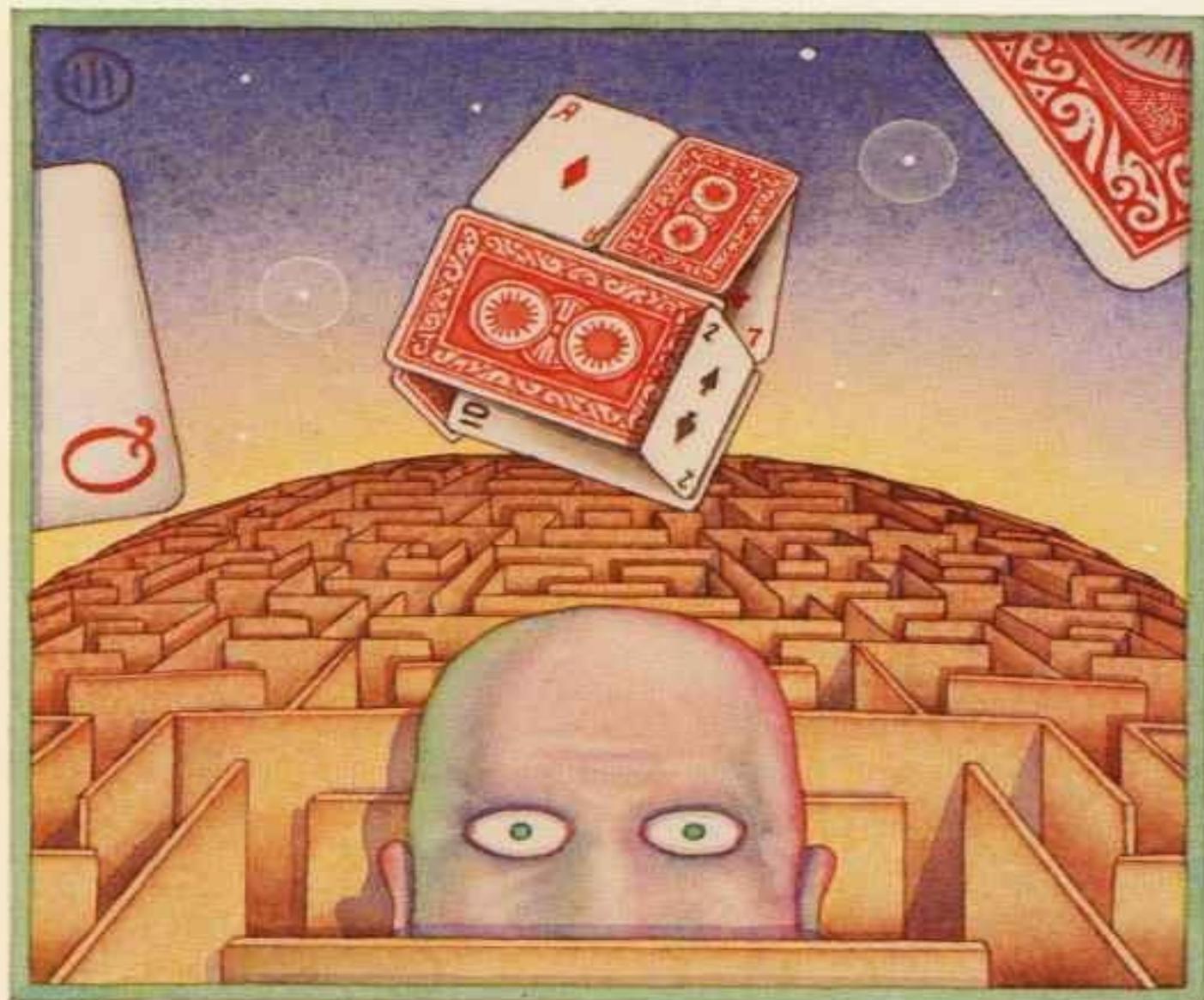


S T A N I S L A W

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"A stunningly inventive fantasy about cosmic travel" —The New York Times



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Contents

- [I - Birnam Wood](#)
- [II - The Council](#)
- [III - The Survivor](#)
- [IV - SETI](#)
- [V - Beta Harpyiae](#)
- [VI - Quinta](#)
- [VII - Hunting](#)
- [VIII - The Moon](#)
- [IX - An Annunciation](#)
- [X - The Attack](#)
- [XI - Show of Strength](#)
- [XII - Paroxysm](#)
- [XIII - A Cosmic Eschatology](#)
- [XIV - Cartoons](#)
- [XV - Sodom and Gomorrah](#)
- [XVI - The Quintans](#)

I - Birnam Wood

"Nice landing."

The man who said this was no longer looking at the pilot in the spacesuit with the helmet under his arm. In the circular control room—horseshoe console in the middle—he went to the wall of glass and looked out at the ship, a large even though distant cylinder, charred around its jets. A blackish fluid still spilled from the jets onto the concrete. The second controller, big in the shoulders, a beret tight on his bald skull, put the tapes on rewind and, like an unblinking bird, regarded the newcomer out of the corner of his eye. He wore headphones, and in front of him was a bank of flickering monitors.

"We managed," said the pilot. Pretending that he needed support to remove his heavy, double-buckled gloves, he leaned slightly against the jutting edge of the console. After that landing he was wobbly in the knees.

"What was it?"

The smaller one, by the glass, in a worn leather jacket, with a mousy, unshaven face, clapped his pockets until he found his cigarettes.

"Deflection in the thrust," murmured the pilot, a little surprised by the coolness of the welcome.

The man by the glass, a cigarette already in his mouth, inhaled and asked through the smoke:

"But why? You don't know?"

"No," the pilot wanted to reply—but he remained silent, because it seemed to him that he ought to have known. The tape ended. It fluttered on the reel. The larger man got up, took off the headphones,

only now nodded to him, and said hoarsely:

"I'm London. And that's Goss. Welcome to Titan. What would you like to drink? We have coffee and whiskey."

The young pilot was flustered. He knew the names of these men but had not met them before. He had assumed, for no reason, that the larger would be the chief, Goss, but it was the other way around. Getting this straight in his head, he chose coffee.

"What's the cargo? Carborundum bits?" asked London when all three of them were seated at the little table that came out of the wall. The steaming coffee was in glasses that resembled laboratory beakers.

Goss took a yellow pill with his coffee, sighed, coughed, and blew his nose until tears came to his eyes.

"And you brought radiators, too, right?" he asked the pilot.

The pilot, again surprised, expecting greater interest in his feat, only nodded. It was not every day that an engine stalled in the middle of a landing. He was full of words not about freight but about how instead of attempting to blow out the jets or increase the main power, he had immediately cut the auto and went down on only the boosters, a trick that he had never tried outside the simulator. And *that* had been ages ago. So he had to collect his thoughts again.

"I brought radiators, too," he said finally, and was even pleased at how it sounded: the laconic type emerging from danger.

"But not to the right place," smiled the smaller man, Goss.

The pilot didn't know whether or not this was a joke.

"What do you mean? You received me—you called me," he corrected himself.

"We had to."

"I don't understand."

"You were supposed to land at Grail."

"Then why did you pull me off course?"

He felt hot. The call had sounded imperative. True, while losing speed he had caught a radio announcement from Grail about some accident, but couldn't make out much through all the static. He had been flying to Titan via Saturn, using the planet's gravity to decelerate and thus save fuel, so his ship had brushed the giant's magnetosphere until there was crackling on all the wavelengths. Immediately afterward he received the call from this spaceport. A navigator had to do what flight control said. And here, before he was out of his suit, they were cross-examining him. Mentally he was still at the helm, with the straps digging into his shoulders and chest as the rocket hit the concrete with its arms spread. The boosters, still firing and rumbling, made the whole hull shudder.

"Where was I supposed to put down?"

"Your cargo belongs to Grail," explained the smaller man, wiping his red nose. He had a cold. "But we intercepted you above orbit and called you here, because we need Killian. Your passenger."

"Killian?" the young pilot said with surprise. "He's not on board. Besides me there's only Sinko, the copilot."

The others were dumbfounded.

"Where is Killian?"

"By now, in Montreal. His wife is having a baby. He left before me, on a shuttle. Before I took off."

"From Mars?"

"Of course, from where else? What's all this about?"

"The mess that obtains in space equals that on Earth," remarked London. He stuffed tobacco in his pipe as if he wanted to break it. He was angry. The pilot, too.

"You should have asked."

"We were positive he was with you. That's what the last radiogram said." Goss blew his nose again and sighed. "You can't take off now in any case," he said finally. "And Marlin couldn't wait to get the radiators. Now he'll put all the blame on me."

"But they're there." The pilot indicated with his head. In the mist stood the dark, slender spindle of his ship. "Six of them, I think. And in gigajoules. They'll disperse any mist or cloud."

"I can't very well put them on my back and carry them to Marlin," returned Goss, in worse and worse humor.

The carelessness, the irresponsibility of the subordinate spaceport, which, as its chief admitted, had intercepted him after three weeks of flight without verifying that he had the passenger they expected, shocked the pilot. He did not say to them that the cargo was their problem now. Until the damage was repaired, he could do nothing, even if he wanted to. He kept silent.

"You'll stay with us, of course." With these words London finished his coffee and rose from the aluminum chair. He was huge, like a heavyweight wrestler. He went over to the glass wall. The Titan landscape, a lifeless fury of mountains of unearthly color in the rusty dimness, with clouds of bronze thick at their peaks, made a perfect background for his figure. The floor of the tower vibrated slightly. An old transformer, thought the pilot. He also got up, to look at his ship. Like an ocean lighthouse it stood vertically out of the low, rushing mist. A gust blew away the wisps, but the marks of overheating on the jets were no longer visible, perhaps because of the distance and the half-light. Or else they had simply cooled.

"You have gamma defect scopes here?"

The ship mattered more to him than their trouble. They had brought the trouble on themselves.

"We do, but I won't permit anyone to approach the rocket in an ordinary suit," replied Goss.

"You think it's the pile?" the pilot blurted.

"You don't?"

The small chief got up and walked over. From the floor registers along the convex glass came a pleasant warmth.

"The temperature did jump above normal during the descent, but the Geigers were quiet. It was probably only a jet. A ceramic might have been flushed from the combustion chamber. I had the feeling that I was losing something."

"A ceramic, fine, but there was a leak," Goss said firmly. "Ceramics don't melt."

"That puddle?" The pilot was surprised. They stood at the double glass. Indeed, beneath the bottom fins lay a black puddle. Mist, wind-driven, intermittently swept the hull of the ship.

"What do you have in the pile? Heavy water or sodium?" asked London. He was a head taller than the pilot.

Squeaking sounds came from the radio. Goss hurried over, put on a headset, and spoke quietly with someone.

"It can't be from the pile..." the pilot said, at a loss. "I have heavy water. The solution is pure. Crystal-clear. But that is black as tar."

"Well, then, the refrigerant in the jets bled out," agreed London. "Which cracked the ceramic."

It was as if he were talking about fuses. He was not in the least bothered by the accident that had stuck the pilot and his ship in this hole.

"Yes," said the young man. "The greatest pressure is in the funnels when braking. If the ceramic cracks in one place, the main thrust will clean out the rest. Everything was flushed from the starboard jet."

London said nothing.

The pilot added hesitantly: "I might have landed a little too close..."

"Nonsense. It was good that you even landed straight."

The pilot waited for more words bordering on praise, but London turned to him and looked him over: from the tousled fair hair to the white boots of the suit.

"Tomorrow I'll send a technician with a defect scope... Did you put the pile in neutral?" he added suddenly.

"No, I shut the whole thing off. As if docking."

"Good."

The pilot saw by now that no one was interested in the details of his struggle with the rocket right above the port. Coffee was fine—but shouldn't his hosts, who had imposed so much on him, provide room and a bath? He longed for a hot shower. Goss kept whispering into the microphone. London stood leaning over him. The situation was unclear but full of tension. The pilot was beginning to feel that these two had something on their minds more important than his adventure, something that involved the signals from Grail. In flight, he had caught fragments—about machines that hadn't made it, about the search for them.

Goss turned with his chair, so that the taut line to his headset pulled the phones off his ears onto his neck.

"Where is this Sinko of yours?"

"On board. I told him to check the reactor."

London looked questioningly at the chief. The latter shook his head slightly and muttered, "Nothing."

"And their copters?"

"They returned. Visibility zero."

"You asked about the maximum load?"

"There's nothing they can do. What does a gigajoule radiator weigh?" he turned to the pilot, who was listening.

"I don't know exactly. Under a hundred tons."

"What are they doing?" insisted London. "What are they waiting for?"

"For Killian—" replied Goss and cursed.

From a compartment in the wall London took out a bottle of White Horse, shook it as if debating whether it would be suitable for the situation, and placed it back on the shelf. The pilot stood, waiting. He no longer felt the heaviness of his suit.

"We lost two men," said Goss. "They didn't reach Grail."

"Three, not two," London corrected him gloomily.

"A month ago," Goss went on, "we received a shipment of new Diglas. Six, for Grail. Grail couldn't accommodate the carrier; the spaceport was still being reconcreted, and when the first freighter set down there—the *Achilles*, ninety-nine thousand tons—the whole reinforced slab, guaranteed by the government, cracked. We were lucky the ship didn't fall over. It was pulled out of its hole and kept in dock for two days. They did some quick first aid on the concrete, put down a fireproof cover, and opened the port again. But the Diglas stayed with us. The experts decided that hauling them by rocket wouldn't pay. Besides, the captain of the *Achilles* was Ter Leoni. He wasn't about to take a ninety-nine-thousand-ton craft a measly hundred and eighty miles, from Grail to here, for such peanuts. Marlin sent two of his best operators. Last week they took two machines to Grail. The machines are working there now. The day before yesterday the same two men returned by copter, to take two more. They set out at dawn and by noon had passed the Promontory. When they began to descend, we lost contact with them. A lot of time was lost because beyond the Promontory Grail itself does the guiding. We thought they weren't answering because they were in our radio shadow."

Goss spoke in a calm monotone. London stood at the glass, his back to them. The pilot listened.

"In the same copter, with the operators, came Pirx. He had landed his *Cuivier* at Grail and wanted to

see me. We've known each other for years. The copter was supposed to take him back in the evening. It didn't arrive, because Marlin had sent out everything available in the search. Pirx didn't want to wait. Or he couldn't. He was supposed to take off the next day and wanted to be on hand for the clearance of the ship. Well, he pressed me to let him return to Grail using one of the Diglas. I made him give me his word that he would take the southern trail, which was longer but avoided the Depression. He gave me his word—and broke it. I saw him, on the patsat, descending into the Depression."

"The patsat?" asked the pilot. He was pale. Sweat beaded on his brow, but he waited for the explanation.

"Our patrol satellite. It passes overhead every eight hours. It gave me a clear picture. Pirx went down and disappeared."

"Commander Pirx?" asked the pilot, his face changing.

"Yes. You know him?"

"Know him!" cried the pilot. "I served under him as an intern. He signed my diploma... Pirx? For so many years he managed to extricate himself from the worst—"

He stopped. There was a pounding in his ears. He lifted the helmet with both hands, as if to hurl it at Goss.

"So you let him go alone in the Digla? How could you? The man's a commander of a fleet, not a truck driver."

"He knew these machines when you were still in diapers," replied Goss. It was obvious that he was trying to defend himself. London, stony-faced, went to the monitors, where Goss sat with the earphones around his neck. In front of Goss's nose, he knocked the ashes from his pipe into an empty aluminum drum. London examined the pipe, as if not knowing what it was, then took it in both hands. The pipe snapped. He threw away the pieces, returned to the window, and stood motionless, clenched fists held together behind his back.

"I couldn't refuse him."

Goss turned to London, who, as if not listening, looked through the glass at the shifting skeins of red mist. Now only the prow of the rocket occasionally emerged from them.

"Goss," said the pilot suddenly, "give me a machine."

"No."

"I have a license to operate thousand-ton striders."

There was a brief glitter in Goss's eyes, but he repeated:

"No. You never operated one on Titan."

Saying nothing, the pilot began to take off his suit. He unscrewed the wide metal collar, unfastened the shoulder clasps, the zipper underneath, then reached deep inside and brought out a folder bent from being carried so long under the heavy padding of the suit. Its flaps opened as if ripped. He went to Goss and placed papers before him, one by one. "That's from Mercury. I had a Bigant there. A Japanese model. Eighteen hundred tons. And here's my license. I drilled a glacier in Antarctica, with Swedish ice-strider, a cryopter. Here's a photocopy of my second-place in the Greenland competition and this is from Venus."

He slapped down the photographs as if playing trumps.

"I was there with Holley's expedition. That's my thermoped, and that's my colleague's. He was my alternate. Both models were prototypes, not bad. Except that the air conditioning leaked."

Goss looked up at him.

"But aren't you a pilot?"

"I transferred, got my qualification, with Commander Pirx. I served on his *Cuivier*. My first command was a tug..."

"How old are you?"

"Twenty-nine."

"You were able to switch like that?"

"If you want to, it's possible. Besides, an operator of planetary machines can master any new type in an hour. It's like going from a moped to a motorcycle."

He broke off. He had another packet of pictures, but didn't produce them. He gathered the ones tossed on the console, put them in the worn leather folder, and returned them to his inside pocket. In the opened suit, a little red in the face, he stood near Goss. Across the monitors ran the same streaks of light, indicating nothing. London, sitting on the handrail by the glass, watched this scene in silence.

"Suppose I were to give you a Digla. Let us suppose. What would you do?"

The pilot smiled. Drops of sweat glistened on his forehead. The fair hair bore the mark of the helmet's pads on top.

"I would take a radiator with me. A gigajoule, from the ship's bay. The helicopters at Grail could never lift that, but for the Digla even a hundred tons is nothing. I would go and have a look around... Marlin's wasting his time searching from the air. I know there's a lot of hematite there. And mist. From the copters you can't see a thing."

"And you'll take the machine straight to the bottom."

The pilot's smile widened, showing his white teeth. Goss noticed that this kid—because it was practically a kid, only the size of the suit had added a few years—had the same eyes as Pirx. A little lighter perhaps, but with the exact same wrinkles at the corners of the eyes. When he squinted, he had the look of a large cat in the sun—both innocent and crafty.

"He wants to enter the Depression and 'have a look around,' " Goss said to London, half as a question, half ridiculing the audacity of the volunteer. London didn't blink. Goss stood, removed the earphones, went to the cartograph, and pulled down, like a blind, a large map of the northern hemisphere of Titan.

He pointed to two thick lines that curved on a yellow-purple field cut with contour lines.

"We are here. As the crow flies, it's 110 miles to Grail. By this route, the black, it's 146. We lost four people on it when the concrete was being poured for Grail and ours was the only landing field. At that time, pedipulators on diesels were used, powered by hypergols. For local conditions, the weather was perfect. Two teams of machines reached Grail without a hitch. And then, in a single day, four striders disappeared. In the Depression. In this circle. Without a trace."

"I know," said the pilot. "I learned that in school. I know the names of those people."

Goss put a finger on the place where, along the black trail north, a red circle had been drawn.

"The road was lengthened, but no one knew how far the treacherous terrain extended. Geologists were called in. It would have made just as much sense to call in dentists—they're experts on holes, too. No planet has traveling geysers—but we have them here. The blue in the north is the Mare Hynicum. We and Grail are deep inland. Except that this is not land—it's a sponge. The Mare Hynicum does not flood the depression between us and Grail, because the entire coastline is plateau. The geologists said that this so-called continent resembled the Baltic plate of Finno-Scandinavia."

"They were wrong," the pilot put in. This was beginning to sound like a lecture. He set his helmet down in a corner, sat back in the chair, and folded his hands like an attentive student. He did not know whether Goss intended to acquaint him with the route or scare him away from it, but the whole situation was to his liking.

"Of course. Beneath the rocks lies a slush of frozen hydrocarbons. An abomination discovered by the drills. A permanent ice, treacherous, made of polymers. The stuff doesn't melt even at zero Celsius, and the temperature here never gets higher than ninety below. Inside the Depression, there are hundreds of old calderas and extinct geysers. The experts said that these were the remnants of volcanoes."

activity. When the geysers came back to life, we received visitors with higher degrees. Seismo-acoustics discovered, far beneath the rocks, a network of caves that branched to an extent never before seen. There was speleological research—people perished, and the insurance companies paid. Finally the Consortium, too, opened its pocket book. Then the astronomers said: When Saturn's other moons are between Titan and the Sun, and the gravitational pull reaches its maximum, the continental plate crumples and the fire beneath the mantle expels magma. Titan still has a hot core. The magma cools before it rises from the depths in vents, but, cooling, it heats all of Orlandia. The Mare Hynicum is like water, and the bedrock of Orlandia is like a sponge. The plugged subterranean channels soften and open. Hence the geysers. The pressure reaches a thousand atmospheres. One never knows where the damned thing will erupt next. But you have your heart set on going there?"

"I do," replied the pilot in a studied manner. He would have liked to cross his legs, but could not in the suit. He remembered how a colleague of his once tried that and fell over, taking the stool with him. "You mean Birnam Wood?" he added. "Am I supposed to flee now, or can we talk seriously?"

Goss, ignoring this, continued:

"The new trail cost a fortune. One had to nibble away, with successive charges, at that ridge of lava—the main flow from the Gorgon. Even the Mons Olympus of Mars can't compare with the Gorgon. Dynamite proved too weak. There was a guy with us, Hornstein—you may have heard of him—who proposed that instead of breaking through the ridge they should cut steps in it, make stairs. Because that would be cheaper. In the U.N. Convention there ought to be a rule barring idiots from going into astronautics. The Typhon Ridge, anyway, they breached with special thermonuclear bombs, after digging a tunnel. Gorgon, Typhon—we're lucky the Greeks have so many monsters in their mythology for us to borrow. The new trail was opened a year ago. It intersects only the southernmost extension of the Depression. The experts pronounced it safe.

"Meanwhile, the migration of underground caverns is everywhere—beneath all of Orlandia. Three quarters of Africa! When Titan cooled, its orbit was highly elliptical. It approached the Roche Zone, into which a multitude of smaller moons had fallen. Saturn ground them up to make its rings. So Titan cooled while boiling; great bubbles were created in the perisaturnium of the orbit, and they froze in the aposaturnium; then came sedimentation, glaciations, and this bubble-ridden, sponge-like, amorphous rock was covered and pushed underneath. It's not true that the Mare Hynicum flows in only during the ascension of all the moons of Saturn. The invasions and eruptions of geysers cannot be predicted. Everyone who works here knows this, and the carriers, too, including pilots like yourself. The trail cost billions, but it ought to be closed to heavy machines. All of us keep to the sky. We're in heaven here. Look at the name of the mine: Grail. Except that heaven has turned out to be damned expensive. The whole thing could have been set up better. The bookkeeping is a nightmare. Payments for those who die are hefty, but less money than it would take to reduce the danger. That's about all I have to say.

"It's possible for the men to crawl out, even if they're submerged. The tide is receding, and the armor on a Digla can take a hundred atmospheres per square inch. They have oxygen for three hundred hours. Marlin sent out robot hovercraft and is having two superheavies repaired. No matter what you can accomplish, it's not worth it. It's not worth risking your neck. The Digla is one of the heaviest—"

"You said you were finished," interrupted the pilot. "I have only one question, all right? What about Killian?"

Goss opened his mouth, coughed, and sat down.

"It was for this, wasn't it, that I was supposed to bring him?" added the pilot.

Goss tugged on the bottom edge of the map, which made it roll up with a flutter, then took a cigarette and said over the flame of his lighter:

"That's his specialty. He knew the terrain. Also, he had a contract. I can't forbid operators to do

business with Grail. I can hand in my resignation, and I will. Meanwhile, I can send any hero packing."

"You'll give me the machine," the pilot said quietly. "I can talk with Grail right now. Marlin will jump at the offer, give me the job, and that'll be that. You'll get an official pat on the back. Marlin doesn't care whether it's Killian or me. And the instructions I've memorized. We're wasting time, Mr Goss. Give me something to eat, please. I'll wash up, and then we can go over the details."

Goss looked to London for support, but found none in that quarter.

"He'll go," said the assistant. "I heard about him from that speleologist who was at Grail last summer. This one's cut from the same cloth as your Pirx. Still waters. Go and wash, hero. The showers are below. And come right back up, or the soup will get cold."

The pilot left, giving London a grin of gratitude. On his way out, he lifted his white helmet with such energy that the tubes slapped the sides of his suit.

As soon as the door was closed, London began clattering pots and pans by the hot plate.

"What good will this do?" Goss threw the question angrily at his back. "You're a big help!"

"And you're spineless. Why did you give Pirx the machine?"

"I had to. I gave my word."

London turned to him, a pot in his hand.

"Your word! You're the kind of friend that if you give your word that you'll jump in after me, you keep it. And if you swear that you'll stand there and watch me drown, you jump in anyway. Am I right?"

"Who knows what's right?" Goss said, defending himself halfheartedly. "How will *he* be able to help them?"

"Maybe he'll find tracks. He'll be taking a radiator—"

"Stop! Let me listen to Grail. There might be some news."

Dusk was still far off, although the clouds settling around the illuminated mushroom tower made everything dark. London set the table while Goss, smoking cigarette after cigarette, his earphones on, picked up the small talk between the base at Grail and the tractors that had been sent out after the copters returned. At the same time, he thought about the pilot. Hadn't the pilot changed course too readily, without questions, to land here? A twenty-nine-year-old captain of a ship, licensed to operate long-range spacecraft, had to be tough, hot-blooded. Otherwise he would not have risen so quickly. Danger was a lure to plucky youth. If he, Goss, was to blame, it was for an oversight. Had he asked about Killian, he would have sent the ship on to Grail. Chief Goss, after twenty hours without sleep, was unaware that in his thoughts he had already laid the newcomer to rest. And what was the kid's name? He'd forgotten it, and took this as a sign of advancing age.

He touched the left monitor. In green rows the letters went:

SHIP: HELIOS GENERAL CARGO II CLASS

HOME PORT: SYRTIS

MAJOR PILOT: ANGUS PARVIS

COPILOT: ROMAN SINKO

FREIGHT: ITEM LIST

He turned off the screen. They came in wearing sweatsuits. Sinko—thin, curly-haired—greeted them with embarrassment, because the pile turned out to have a leak after all. They sat down to cannor soup. The thought occurred to Goss that this daredevil who would be taking the machine out had a jumbled name. He should have been not Parvis but parsifal, which went with Grail. Not in the mood for jokes, however, Goss kept the anagram to himself.

After a short discussion on the subject of whether they were eating lunch or supper—unresolvable

because of the difference in times: the ship's time, Earth time, Titan time—Sinko went down to talk with the technician about the defect scope, which was being set up for the end of the week, when the pile would be cool and the cracks in the housing could be temporarily sealed. The pilot, London, and Goss meanwhile viewed a diorama of Titan in an empty part of the hall. The image—created by holographic projectors, three-dimensional, in color, with the routes drawn in—went from the northern pole to the tropic parallel of latitude. It could be reduced or enlarged. Parvis studied the region that separated them from Grail.

The room that he was given was small but cozy, with a bunk bed, a little desk that slanted, an armchair, a cabinet, and a shower so narrow that when he soaped himself he kept banging his elbows into the walls. He stretched out on the blanket and opened the thick handbook of Titanography he had borrowed from London. First he looked in the index for BIRNAM WOOD, then WOOD, BIRNAM. It was not there; science had not taken cognizance of the name. He leafed through until he came to the geysers. The author's account of them was not exactly what Goss had said. Titan, solidifying more rapidly than Earth and the other inner planets, locked in its depths enormous masses of compressed gases. These gases, at the folds in Titan's crust, pressed against the bases of old volcanoes and against the subterranean veins of magma that formed a network of roots for hundreds of kilometers; at certain configurations of synclines or anticlines they could break into the atmosphere in fountains of high-pressure, volatile compounds. The mixture, chemically complex, contained carbon dioxide, which froze immediately into snow. Carried by strong winds, the snow covered the plains and mountain slopes with a thick layer. Parvis grew annoyed with the dry tone of the text. He turned out the light, got into bed, was surprised that both the blanket and the pillow stayed in place—accustomed as he was, after nearly a month, to weightlessness—and fell asleep in an instant.

Some internal impulse brought him out of unconsciousness so suddenly that he was sitting when he opened his eyes, ready to jump out of bed. Blankly he looked around, rubbing his jaw. The jaw reminded him of his dream. Boxing. He had been in the ring against a professional, knew the blow was coming, and fell like a ton of bricks, kayoed. When he opened his eyes wide, the whole room reeled like a cockpit in a sharp turn. He woke completely. In a flash everything returned to him—yesterday's landing, the malfunction, the argument with Goss, and the council of war around the diorama. The room was as cramped as a cabin in a freighter, which brought to mind Goss's parting words: that in his youth he had served on board a whaler. Shaving, Parvis reviewed his decision. If it hadn't been for the name Pirx, he would have thought twice before insisting on this excursion. Under the rush of hot, then ice-cold water, he tried singing, but it lacked conviction. He was not himself. He felt that the thing he had asked for was not merely risky but bordered on stupidity. With the stream in his raised face, blinded, he considered for a moment the idea of backing out. But he knew that that was out of the question. Only a kid would do such a thing. He towed himself vigorously, made the bed, dressed, and went to look for Goss. Now he was beginning to hurry. He still had to acquaint himself with an unknown model, practice a little, recall the right movements.

Goss was nowhere. At the base of the control tower there were two buildings, one in either direction, connected to the tower by tunnels. The location of the spaceport was the result of an oversight or an outright mistake. According to unmanned soundings, mineral deposits were supposed to lie beneath this once-volcanic valley, while actually it was an old crater whose basin had been pushed up by the seismic contractions of Titan. So straightaway machines and people were thrown in and they began to assemble the barrel-like conduit of living quarters for the mining crews—when the news came that a few hundred miles farther on was an incredibly rich and easily accessible lode of uranium.

The project administration, at that point, underwent a split. One group wanted to abandon this

spaceport and start all over again to the northeast; the other group insisted on remaining, arguing that yes, beyond the Depression there were surface deposits, but they were shallow and therefore would yield little. Those in favor of dismantling the first bridgehead were called, by someone, Seekers of the Holy Grail, and the name of Grail stuck to that area of opencast mining. The first spaceport was not abandoned, but neither was it expanded. A weak compromise was struck, necessitated by the lack of capital. Thus, although the economists calculated x times that in the long run it would pay to close the landing field in the old crater and concentrate all the activity in a single place—Grail—the ad hoc logic of meeting the demands of the moment prevailed. Grail was unable to receive the larger ships for a long time; but, then, the Roembden Crater (named after the geologist who discovered it) did not have its own repair docks, loading derricks, up-to-date equipment. And there was the constant debate over who served whom and who got what out of the arrangement. Some of the top brass still seemed to believe that there was uranium under the crater. Some drilling was done. But the drilling went slowly because as soon as a few people and a little power were allocated here, Grail immediately expropriated them, intervening at headquarters, and once again construction halted and the machines stood idle by the darkening walls of the Roembden.

Parvis, like the other transporters, did not participate in these frictions and conflicts, though he had to have a passing knowledge of them; that was required by the delicate position of everyone in transport. Grail still wanted—by dint of the de facto situation—to dismantle the spaceport, particularly after the expansion of its own landing field, but Roembden thwarted Grail. Or, whether it thwarted Grail or not, it demonstrated its usefulness when the excellent concrete at Grail began to sink. Personally, Parvis was of the opinion that at the root of this chronic schism lay psychology and not money: that two local and therefore mutually antagonistic patriotisms—of the Roembden Crater and of Grail—had arisen, and everything else was a rationalization favoring one side or the other. But this was best left unsaid to anyone working on Titan.

The passageways beneath the control tower brought to mind an abandoned subterranean city, and it was painful to see how many supplies were piled up, untouched. He had landed at Roembden once before, as assistant navigator, but they were in such a hurry at the time that he did not even leave the ship during the unloading, to supervise it. Now he looked upon the unpacked—still sealed, even—containers with disgust, especially since he recognized among them the ones that he had brought there. Annoyed by the silence, he began yelling as in a forest, but only an echo boomed dully down the corridors of this storage section.

He took an elevator up. He found London in the flight-control room, but London had no idea where Goss was, either. No new communiqués had come in from Grail. The monitors flickered. The smell of bacon filled the air; London was making scrambled eggs in bacon fat. The shells he threw in the sink.

"You have *eggs* here?" The pilot was amazed.

"Oh, plenty."

London now spoke to him as one of the crew.

"There was an electronics guy, with ulcers. He brought a whole chicken coop with him—watching his diet. Well, there were protests at first: people complained that he was stinking up the place, and what would he feed the chickens with, etc. But he left a couple of hens and a rooster, and now we love them. Fresh eggs are a delicacy in these parts. Have a seat. Goss will turn up."

Parvis felt hungry. Stuffing his mouth with unaesthetically large pieces of scrambled egg, he justified this to himself: in the face of what awaited him, he ought to stock up on calories. The telephone buzzed; Goss wanted to talk to him. Parvis thanked London for the feast, bolted the rest of his coffee, and took the elevator down a floor.

The chief was in the corridor, already in coveralls. The hour had struck. Parvis ran to the supply room for his spacesuit. He got into it efficiently, connected the oxygen tank to the hose, but did not

open the valve or put on the helmet, not sure that they would be leaving immediately. They took a different elevator—for freight—to the basement. There was storage there, too, piles of containers resembling artillery caissons, with oxygen cylinders jutting from them, five apiece, like heavy-caliber shells. The storeroom was large but packed; one walked between walls of boxes pasted with labels in different languages. Here was cargo from manufacturers on every continent on Earth. The pilot waited quite a while for Goss, who went to put on his suit, and then did not recognize him at first: the suit was the heavy kind that a mechanic wore, smeared with grease and having a night visor drawn over the glass of the helmet.

They went outside through a pressure chamber. The underside of the building hung above them, the whole resembling a giant mushroom with a glass cap. At the top, London was already busy at his station, his silhouette against the green glow of the monitors. They went around the base of the tower—circular, windowless, like a lighthouse raised against the sea—and Goss opened wide the gate of a garage made of corrugated metal. Fluorescent lights fluttered. The garage was empty except for a lift truck by the back wall and a jeep similar to the old lunar vehicles of the Americans. An open chassis, seats with footrests, nothing but a frame, tires, a steering wheel, and a storage battery in the rear. Goss drove it out onto the uneven rubble that covered the ground near the tower and stopped so that the pilot could get on. They moved through red-brown mist toward an indistinct, low structure, blocklike with a flat roof. In the distance, behind a mountain ridge, were dull columns of illumination, like anti-aircraft searchlights. They had nothing in common, however, with such antiquated nonsense.

Titan's sun, on cloudy days, provided little light; therefore, giant mirrors were put into stationary orbit over Grail during the working of the uranium ore. Called "selectors," they concentrated the Sun's rays on the mining area. Their usefulness proved problematic. Saturn and its moons constituted a region of the interaction of many masses, setting up perturbations impossible to calculate. Thus, despite the efforts of the astrophysicists, the columns of light underwent deviations, often wandering as far afield as the Roembden Crater. The solitary souls of Roembden took pleasure—a pleasure not merely sardonic—in these solar visitations, since, especially at night, the whole basin of the crater emerged suddenly from darkness and showed its grim, fascinating beauty.

Goss, taking the jeep around obstacles—cylindrical blocks that resembled misshapen vats, plugs from small volcanic fumaroles—also noticed the brightness cold as northern lights, and muttered, half to himself:

"Heading our way. Good. In a minute or two we'll be able to see everything like on a stage."

And he added, with obvious malice:

"Nice of Marlin to share with us."

Parvis understood the joke, because the illumination of Roembden meant that it would be pitch-black at Grail, and therefore Marlin and his dispatcher were now getting the selector maintenance crew out of bed, to man the engines that would put the space mirrors back where they belonged. But the two columns of light came closer, and under one of them flashed an ice-covered peak on the eastern ridge. An additional benefit for the Roembdenites was the remarkable clarity of the atmosphere (considering Titan) in their crater. It allowed them for weeks at a time to admire, against the starry firmament, the yellow, flat-ringed disk of Saturn. Though it was at a distance five times greater than the Moon was from the Earth, the ascending planet's size always shocked novices. With the naked eye one could see the many-colored stripes on the surface as well as the black dots that were shadows cast by Saturn's nearer moons. Such views were made possible by the northern wind that drove through the gorges and chasms with such force that it produced a foehn effect. Nowhere else on Titan was it as warm as at Roembden.

Whether the maintenance crew had not yet managed to regain control of their selectors, or whether because of the emergency there was no one around to do this, the beam of sunlight was already

moving across the bottom of the basin. The basin became as bright as day. The jeep didn't even need its headlights. The pilot saw the stained gray concrete around his *Helios*. And beyond that, in the place where they were heading, there stood, like petrified stumps of unbelievable trees, volcanic plugs that had been ejected from seismic blowholes millions of years ago and congealed. In foreshortened perspective, these looked like the colonnade of a ruined temple; their moving shadows were pointers on a row of sundials that indicated an alien, galloping time. The jeep passed this irregular palisade. It rolled, lurching; its electric motor whined. The flat building still lay in darkness, but they could now see two black silhouettes looming behind it—like Gothic cathedrals.

The pilot appreciated their true size when he and Goss got off and approached them on foot.

Such giants he had never seen before. (And had never operated a Digla, either, which he hadn't admitted.) Put one of these machines in a fur suit and you had King Kong. The proportions were more anthropoid than human. The legs, made of bridge trusswork, descended vertically to feet as mighty as tanks, embedded in the rubble and motionless. The towerlike thighs rose to a pelvic girdle, in which, like a flat-bottomed boat, rested the iron trunk. The hands of the upper limbs could be seen only by throwing one's head back. They hung alongside the torso like useless, lowered derrick cranes with fins of steel. Both colossi were headless. What at a distance he had taken for turrets turned out to be, against the sky, antennas atop the shoulders of each.

Behind the first Digla, practically touching its armor plate with an arm bent at the elbow joint—as if, intending to poke the thing in the side, it had frozen in place—stood a second, identical. Because it was a little farther off, one could see in its chest the gleam of a glass window: the driver's cabin.

"This is Castor, and this is Pollux," Goss made the introduction. He played a hand-held floodlight on the giants. The beam brought out, from the semidarkness, the plate metal of the shin guards, the shields protecting the knees, and the trunk that was as smooth and black as the carcass of a whale.

"Hartz, that blockhead, couldn't even put them in the hangar," said Goss. He groped on his chest for a knob: his breath was fogging the glass of the helmet. "He barely braked in time, before that slope..."

The pilot understood why Hartz had packed both colossi into this gap in the rock and why he had chosen to leave them there. It was the inertia. Just like a seagoing vessel, a walking machine responded more sluggishly to the helmsman the greater its mass. He was about to ask how much a Digla weighed, but, not wanting to show his ignorance, instead took the light from Goss and proceeded along the foot of the giant. Running the light over the steel, he found, as he expected, a name plate riveted at eye level. Maximum operating power 14,000 kw; overload limit 19,000 kw; rest mass 1680 tons; reactor multishielded Tokamak with Foucault converter; hydraulic drive, main transmission, and gears by Rolls-Royce; chassis made in Sweden.

He directed the cone of light upward, along the beams and girders of the leg, but couldn't take in the entire frame at once. The light barely showed the contours of the black, headless shoulders. When he returned, Goss was gone—probably to switch on the heating system of the landing field. Indeed, the pipes that ran along the ground were beginning to dispel the thin, low-flowing mist. The wandering column of sunlight moved across the basin like a slow drunkard, tearing the darkness from the blocks that were storehouses, or from the mushroom of the control tower with the green band of its own light, or it made flashes that faded instantly, touching the ice patches on more distant cliffs, as if trying to waken the dead landscape by giving it motion. Suddenly the column swerved, rushed across the wide concrete, jumped the mushroom tower, the palisade of magma stumps, the hangar, and hit the pilot, who raised a protecting glove and quickly craned his neck as much as possible in his helmet, taking this opportunity to see the whole Digla at once.

Coated with a black anticorrosive enamel, it gleamed above him like a two-legged battleship rearing. Holding a pose for a flash camera. The tempered breastplates, the circular undercarriage of the hips, the beams and drive shafts of the thighs, the shielding on the knee joints, the ribwork of the

shins—everything shone, spotless, indicating that the giant had as yet done no work. Parvis experienced both joy and butterflies in the stomach. He swallowed with difficulty. As the light moved off, he walked around behind the Digla. Its foot, as he approached it, bore less and less of a resemblance to a human foot of steel; it became a caricature, and then, near the sole sunken in the dust, bore no resemblance at all. Parvis stood as if at the base of a dock derrick that nothing could budge. The armored heel could have served as the support of a hydraulic press. The ankle had cotter pins like screw propellers, and the knee, bulging halfway up the leg, at a height of at least two stories was like the drum of a steam roller. The hands of the giant, larger than power-shovel dippers, hung motionless, frozen at attention.

Though Goss had gone off somewhere, the pilot did not intend to wait. He saw the steps that jutted from the back edge of the heel, and the grip bars, so he began to ascend. The ankle was encircled by a small platform from which rose, now inside the trusswork of the calf, a vertical ladder. It was not difficult so much as strange to climb its rungs. The ladder led him to a hatch that was situated not too conveniently above the right thigh—for the reason that the original, most logical place (for the builders) had become the butt of endless jokes. The designers of the first striders ignored this low humor, of course, but later they had to take it into account. It came to light that operators were reluctant to sign up for these Atlases, teased by their colleagues about *how* one got inside them.

Unbolting the hatch activated a garland of tiny lights. He took a spiral staircase to the cabin. The cabin was like a great glass barrel or section of pipe transfixing the chest of the Digla—not in the center but on the left, as if the engineers had wanted to put a man in the place the heart would be if the giant were living.

He cast his eyes around the interior, now also lit, and with considerable relief saw that the control systems were familiar. He felt at home. Quickly removing his helmet and getting out of his suit, he turned up the heat: all he was wearing was a jersey and tights, and to move the giant he would need to strip completely. Warm air filled the cabin. At the convex front pane, he gazed into the distance. It was daybreak, and gloomy as usual; on Titan a storm always seemed to be brewing. In the dim light he observed the scattered rocks of a region far beyond the landing field. He was eight stories up, and it was like looking from the window of an office building. He could even look down on the mushroom of the control tower. Except for the mountain peaks at the horizon, only the prow of the *Helios* stood above him. Through the side walls of glass, also curved, he could see into the dark shafts, poorly illuminated, full of machinery that slowly, steadily sighed, as if awakened from a trance or sleep. The cabin contained no control consoles, no steering wheels, no viewscreens; there was nothing but a piece of clothing, crumpled on the floor like an empty, metallicly glittering skin, and two mosaics of black cubes fastened to the front glass. The cubes were like blocks in a child's playpen, because their surfaces held silhouettes of tiny arms and legs—the right on the right mosaic, the left on the left. When the colossus walked and everything in it functioned smoothly, each little picture glowed a peaceful willow-green. In the event of a disturbance, the color changed to brown if the problem was minor, and purple for emergencies.

This was a segmented image of the entire machine projected onto the black mosaic. The young man in a current of heated air, removed the rest of his clothes; he tossed the jersey in a corner and began pulling on the operator's suit. The elastic material, yielding, clung to his bare feet, his thighs, belly, shoulders. Aglitter to his neck in the electronic snakeskin, he eased his hands carefully, finger by finger, inside the gloves. Then, when he pulled the zipper up past his chest in a single movement, the black mosaic burst into colored lights. A glance verified that this system was the same as in the ordinary ice striders that he had handled in Antarctica, though those didn't compare with the Digla in mass. He reached to the ceiling for a strap, a kind of harness, and put it around him, buckled it tight across his chest. When the buckle clicked shut, the harness lifted him gently, resiliency, so that,

supported from under the arms, as in a well-padded corset, he was suspended and could move either leg freely. Checking that the arms were just as free, he felt for the main switch at the neck, found the lever, and threw it all the way. The lights on the cubes doubled in intensity, and at the same time he heard, deep beneath him, the engines of all the limbs. They idled in neutral, making soft sucking noises because there was excess grease on the connecting rods, from the rotary bearings, which had been packed at the Earth shipyard to protect against corrosion.

Looking down with care, so as not to hit the side of the storage building, he made his first, tentative small step. In the lining of his suit were thousands of electrodes, sewn in supple spirals. Pressed against the naked body, they gathered the impulses from the nerves and muscles and transmitted them to the Goliath. Just as to each of the skeletal joints of the man there corresponded, in the machine, a magnified, hermetically sealed joint of metal, so for each group of muscles that flexed or straightened a limb there were cannonlike cylinders in which pistons moved, pushed by pumped oil. But the operator did not need to think or even know about all this. He merely moved as if walking, as if treading the ground with his feet, or as if bending his torso to pick up, with outstretched hand, a desired object. There were only two significant differences. First, that of size, since a single human footfall equaled a twelve-meter step by the machine. It was the same with every movement. Thanks to the extraordinary precision of the relays, the machine was able, if the operator wished to demonstrate his skill, to lift a full liqueur glass from a table and raise it to a height of twelve stories without spilling a drop or crushing the crystal stem in the great tongs of its grip. But the colossus was made to lift not little glasses or pebbles but multiton pipes, beams, and boulders. With the appropriate tools put in its hands, it became a drilling rig, a bulldozer, a crane—but always a mighty union of virtually inexhaustible force with human dexterity.

The giant striders were an extension of the concept of the exoskeleton, which, as an external amplifier of the human body, had been applied in many twentieth-century prototypes. The invention languished, because on Earth no immediate practical use was found for it. What revived the idea was the exploitation of the solar system. Planetary machines arose, adapted to the globes on which they were to work, to the local tasks and conditions. In weight the machines varied, but in inertial mass they were the same everywhere, and therein lay the second important difference between them and people.

Both strength of construction material and engine power had their limits. The limits were imposed even at a distance from all gravitational bodies, by the machine's inertial mass. One could not make sudden movements in a strider, just as one could not stop an ocean liner on a dime or spin the arm of a crane like a propeller. Trying that in a Digla would break its girdered limbs. To protect against any such self-destructive maneuver, therefore, the engineers had installed safety cutoffs in each of the branching drive units. The operator, however, could override any or all of these neutralizers if he found himself in dire straits. He might be able, at the cost of ruining the machine, to save his own neck—to emerge from a cave-in, for example. And if that did not save him, he had one last resort, an ultimate refuge: the vitrifax.

The man was protected by the outer armor of the strider and by the inner shields of its cabin—but inside, above the operator, in the shape of a bell, was the open mouth of the vitrifax. The device could freeze a man in the blink of an eye. Granted, medicine still lacked the means to restore the frozen one to life. Victims of catastrophes, preserved in cylinders of liquid nitrogen, lay waiting, unchanged, for the advent of a resurrection technology in the next century.

This medical passing of the buck to an indefinite future seemed, to many people, a gruesome desertion of duty, a promise of rescue with no guarantee of its fulfillment. There was, however, more than one precedent in medicine of such extreme, terminal measures. The first transplants of ape hearts in dying patients evoked similar reactions of indignation and horror. Still, polling the operators

themselves revealed how little hope they placed in the vitrifax apparatus. Their profession may have been brand-new, but the death that lurked in it was as old as any human enterprise. Therefore Angus Parvis, treading the ground of Titan with heavy steps, gave no thought to the black shaft above his head, or to the pushbutton glowing like a ruby within its transparent little bubble-case.

With exaggerated caution he moved out onto the concrete slab of the spaceport, to test-walk the Digla. Instantly the old feeling came back to him, that he was both incredibly light and incredibly heavy, free and constrained, swift and slow. The closest analogy might have been the sensation of a diver, whose weight was lessened by the buoyancy of the water, but who found greater resistance in the medium the faster he tried to go. The first prototypes of the planetary machines, after a few hours of operation, ended up on the scrap heap, lacking motion neutralizers. The novice who took a few steps in an early strider got the impression that there was nothing to it, and thus, when he went to execute a simple task—say, setting a row of crossbeams on the walls of a house under construction—he would demolish the wall and bend the pipes before he knew what was happening. But a machine with neutralizers could also be treacherous for an unskilled operator. Reading numbers of maximum loads was as easy as reading a book on skiing, but no one ever mastered the slalom from a book. Parvis, well acquainted with thousand-ton craft, judged, from the small acceleration of the steps at first, that the giant under his control had almost double that mass. Suspended in his glass cabin like a spider in a strange net, he immediately moderated the movements of his legs, and even stopped, in order to begin—very slowly—exercises in place. He shifted from foot to foot, bending the trunk to either side, and only then walked several times around his ship.

His heart was beating more heavily than usual, but everything went without a hitch. He saw the barren basin, dark gray in the low mist, the distant rows of lights that marked the borders of the landing field, and, at the base of the control tower, the tiny form of Goss, a veritable ant. Parvis was surrounded by a pleasant, not insistent sound; his ears, able more and more to distinguish the different noises, recognized the background bass of the main engines, which sometimes built up to a muffled singing and sometimes grumbled a mild reproach when the hundred-ton legs, thrusting forward, were halted too abruptly. He was now able to pick out the choral call of the hydraulics, whose oil coursed through thousands of ducts and cylinders, setting up a steady beat of pistons that bent and extended each limb as the tank-clad feet walked the concrete. He could even hear the delicate whine of the gyroscopes that autonomously assisted him in maintaining balance. When he tried a sharper turn, the massive structure that he occupied proved to be not so maneuverable, and although the engines obediently roared full-force, the giant began to sway—but did not go out of control, because Parvis instantly eased up, increasing the radius of the curve.

Then he began to play with lifting the multiton boulders that lay beyond the edge of the concrete field. Sparks flew and there was a shrill grating sound when the pincers grasped and bit into the stone. Before an hour went by, he felt sure of his Digla. He had achieved, again, the familiar state that veterans called "fusion of man and strider." The boundary between himself and the machine had disappeared; its movements were now his movements. To complete his preparation, he climbed quite high up a debris-covered slope, and had become so proficient that he could tell, from the rumble of the rocks as they began to slip from under his crushing feet, exactly how much he could demand of his colossus. Already he was fond of it.

It was only when he went back down to the hazily lit lines of the landing field that his satisfaction with himself got punctured by the needle-reminder of the excursion before him—and the knowledge that Pirx and two other people, encased in the very same giants, had become trapped in the Depression of Titan. Whether it was for additional practice or to say good-bye, he could not say, but he circled the ship in which he had landed, then held a brief conversation with Goss. The chief was now standing beside London, behind the glass of the tower. Parvis saw them, heard from them that there was still n

news about the missing men. Leaving, he lifted high an iron hand. Someone might have thought the gesture melodramatic or even clownish, but he preferred it to any words. He did a steady about-face, put a holographic of the terrain to be crossed on the single, ceiling-high monitor, switched on the azimuth finder and the projection of the path to Grail, and set out, a twelve-meter step at a time.

There were two kinds of landscape characteristic of the inner planets of the Sun: the purposeful and the desolate. Purpose informed every scene on Earth, the planet that produced life, because every detail there had its "benefit," its teleology. True, it did not always—but billions of years of organic labor had accomplished much: thus flowers possessed color for the purpose of attracting insects, and clouds existed for the purpose of dropping rain on pastures and forests. Every form and thing was explained by some benefit, whereas what was clearly devoid of any benefit, like the icebergs of Antarctica or the mountain chains, constituted an enclave of desolation, an exception to the rule, a wild though possibly attractive waste. But even this was not certain, because man—undertaking the deflection of the course of rivers to irrigate areas of drought, or warming the polar regions—paid for the improvement of some territories with the abandonment of others, thereby upsetting the climatic equilibrium of the biosphere, which had been adjusted so painstakingly (though with seeming indifference) by the efforts of natural evolution. It was not that the ocean depths served the creatures there with darkness, to protect them from attack—a darkness they could light, as they needed, with luminescence—but vice versa: the darkness gave rise precisely to those that were pressure-resistant and could illuminate themselves.

On planets overgrown with life it was only in the depths, in caves and grottoes, that the creative power of nature could timidly express itself, a power that, not harnessed to any adaptational requirement, or hemmed in, in the struggle for survival, by the competition of its own results, could create—over billions of years, with infinite patience, in droplets of hardening salt solutions—phantasmagoric forests of stalactites and stalagmites. But on such globes this was a deviation from the planetary labors, a deviation locked away in vaults of rock and therefore unable to reveal its vigor. Hence the impression that such places were not usual in nature but, rather, spawning grounds for monstrosities only on the fringe of things. Infrequent exceptions to the statistical rule of chaos.

In turn, on globes parched like Mars or, like Mercury, immersed in a violent solar wind, the surfaces, due to that rarefied but incessant exhalation from the mother star, were lifeless wastes, since all raised forms were eroded by the fiery heat and reduced to dust that filled the crater basins. It was only in places where eternal, still death reigned, where neither the sieves nor the mills of natural selection were at work, shaping every creature to fit the rigors of survival, that an amazing realm opened up—of compositions of matter that did not imitate anything, that were not controlled by anything, and that went beyond the framework of the human imagination.

For this reason, the fantastic landscapes of Titan were a shock to the first explorers. People equated order with life, and chaos with a dreary inanimateness. One had to stand on the outer planets—on Titan, the greatest of their moons—to appreciate the full error of this dichotomy-dogma. The strange formations of Titan, whether relatively safe or treacherous, were ordinary rubble heaps of chaos when viewed from a distance and a height. But they did not appear so when one set foot on the soil of this moon. The intense cold of this whole sector of space, in which the Sun shone but gave no heat, proved to be not a throttle but a spur to the creativity of matter. The cold, indeed, slowed the creativity, but in that very slowing gave it an opportunity to display its talent, providing a dimension that was indispensable to a nature untouched by life and unwarmed by sun: time—time on a scale where one million centuries, or two million, was of no significance.

The raw materials here were the same chemical elements as on Earth. But on Earth they had entered the servitude, so to speak, of biological evolution and only in *that* context amazed man with subtlety—the subtlety of the complex bondings that combined to form organisms and the interdependent

hierarchies of species. It was therefore thought that high complexity was a property not of all matter but only of living matter, and that chaos in the inorganic state produced nothing more than haphazard volcanic spasms, lava flows, rains of sulfurous ash.

The Roembden Crater had cracked, once, at the northeast on its large circle. Then a glacier of frozen gas crept through the gap. In the following millennia, the glacier retreated, leaving on that furrowed terrain mineral deposits—the delight and vexation of the crystallographers and other, no less dumbfounded scientists. It was indeed a sight to see. The pilot (now operator of a strider) faced a sloping plain ringed by distant mountains and strewn with... with what, exactly? It was as if the gates of unearthly museums had been flung open and the remains of decrepit monsters had been dumped in a cascade of bones. Or were these the aborted, insane blueprints for monsters, each one more fantastical than the last? The shattered fragments of creatures that only some accident had kept from participating in the cycles of life? He saw enormous ribs, or they could have been the skeletons of spiders whose tibiae eagerly gripped blood-speckled, bulbous eggs; mandibles that clung to each other with crystal fangs; the platelike vertebrae of spinal columns, as if spilled out in coin rolls from the bodies of prehistoric reptiles after their decay.

This eerie scene was best viewed, in all its wealth, from the height of the Digla. The area near Roembden was called, by the people there, the Cemetery—and in fact the landscape seemed a battlefield of ancient struggles, a burial ground that was an exuberant tangle of rotting skeletons. Parvis saw the smooth surfaces of joints that could have emerged from the carcass of some mountainous monstrosity. One could even make out on them the reddish, bloodclotted places where the tendons had been attached. Nearby were draped skin coverings, with bits of hair that the wind gently combed and lay in changing waves. Through the mist loomed more many-storied arthropods, gnawing through one another even in death. From faceted, mirrorlike blocks thrust antlers, also gleaming, among a spill of femurs and skulls of a dirty-white color. He saw this, realizing that the images that arose in his brain, the macabre associations, were only an illusion, a trick of the eyes shocked by the strangeness. If he dug methodically in his memory, he would probably remember which compounds yielded—in a billion-year chemistry—precisely these forms that, stained with hematites, impersonated bloody bones, or that went beyond the modest accomplishments of terrestrial asbestos to create an iridescent fluff as of the most delicate fleece. But such sober analysis would have no effect on what the eyes saw.

For the very reason that here nothing served a purpose—not ever, not to anyone—and that here no guillotine of evolution was in play, amputating from every genotype whatever did not contribute to survival, nature, constrained neither by the life she bore nor by the death she inflicted, could achieve liberation, displaying a prodigality characteristic of herself, a limitless wastefulness, a brute magnificence that was useless, an eternal power of creation without a goal, without a need, without a meaning. This truth, gradually penetrating the observer, was more unsettling than the impression that he was witness to a cosmic mimicry of death, or that these were in fact the mortal remains of unknown beings that lay beneath the stormy horizon. So one had to turn upside down one's natural way of thinking, which was capable of going only in one direction: these shapes were similar to bones, ribs, skulls, and fangs not because they had once served life—they never had—but only because the skeletons of terrestrial vertebrates, and their fur, and the chitinous armor of the insects, and the shells of the mollusks all possessed the same architectonics, the same symmetry and grace, since Nature could produce this just as well where neither life nor life's purposefulness had ever existed, or ever would.

Fallen into such philosophical reverie, the young pilot gave a start, remembering how he had come here, and his vehicle, and his mission. Obediently, the iron strider magnified that waver and jerk a thousandfold, bringing him back to reality with the howl of its drive transmission and the trembling of

its entire mass. The pilot blushed. Collecting himself, he moved on. At first he was reluctant to set his feet, which landed like steam hammers, on the pseudo-skeletons, but sidestepping them proved as futile as it was troublesome. Therefore he hesitated only on occasion, when his way was blocked by a particularly remarkable structure, and even then he walked around it only if plowing through the high heap and crushing it presented any difficulty to his servant-giant. Also, from up close the impression that he was tramping through endless bones—smashing craniums, branched phalanges of wings, zygomatic arches that had separated from the frontals, plus various horns—dwindled to nothing. Sometimes it was as if he were walking on the remains of organic machines—hybrid beings, half-animal, arisen from the union of the living and the nonliving, of reason and unreason—and sometimes it was as if he were bringing his iridium boots down on weirdly spreading gems, precious and impure, partially clouded due to interpenetrations and metamorphoses. Because from his height he had to watch constantly where and at what angle he was placing the towerlike legs, and because this march of the first stage was taking more than an hour—it was necessary to go slow—he laughed at the mighty efforts made by the artists of Earth to reach beyond the boundary of human imagination (which must visualize everything); at how the poor devils beat against the walls in their minds; and at how little, really, they departed from platitude, though straining to the utmost to depart—while here, in a single acre, there was more proud originality than in a hundred of their anxious, anguished art shows.

There being no stimulus to which a man did not soon become accustomed, before long he was marching through the cemeteries of chalcocites, spinels, amethysts, plagioclases—or, rather, their distant, nonterrestrial relatives—as if this were ordinary rock debris underfoot. In an instant he shattered a branch that had taken millions of years to crystallize into unique, unrepeatable forkings, not wanting to but forced to reduce it to powdered glass. Although from time to time he regretted the loss of the more splendid of these works of eons, they crowded each other so much, eclipsed each other in such extreme profusion, that finally only one thing impressed him.

Namely, the extent to which this region seemed to him—and not to him alone!—a dream, a kingdom of phantoms, and of a beauty afflicted by madness. This was a realm—he said to himself, almost aloud—where nature slept, incarnating her magnificent grimness, her unfettered nightmares, directly somehow, without the mediation of any Psyche, into the solid hardness of material forms. Just as in a dream, whatever he saw was both totally alien and extremely familiar, reminding him continually of something that in the next minute would always elude him, and he would remain with a senselessness that concealed some subtle deceit—because here things seemed definite-defined only in their ancient origins; they could never complete themselves, never achieve full realization, never decide on a conclusion, on a destiny.

Thus he mused, dazed by both the surroundings and his own reflections, since he was not in the habit of philosophizing. He had the risen sun behind him now, so his shadow preceded him, and it was strange to see, in the movements of that long, sharp-cornered, forward-rushing silhouette, its machine nature and his own, human, nature combined. The shape was that of a headless robot swaying, as it went, like a boat, but it had at the same time movements peculiar only to him, displaying them as if with a perverse ostentation since they were magnified, exaggerated. True, he had noticed this before, but the nearly two-hour march in this enchanted place somehow charged or sharpened the imagination. And it did not bother him when, turning more to the west from Roembden, he lost radio contact with the Roembdenites. He would be emerging from the radio shadow at mile thirty—not that far ahead—but for now he wanted to be by himself, free of the stock questions and the reports in reply.

On the horizon there were dark shapes, he could not tell whether of clouds or mountains. Angus Parvis, on his way to Grail, not once in the whole rambling sequence of his ruminations connected his name with Parsifal. It was always difficult for a man to step out of his mental identity—it was like jumping out of one's skin—let alone into mythology. His attention wandered from the immediate

surroundings of his route, particularly as the scenery of counterfeit death, the anatomical theater of planetary minerals, was thinning out. He passed places that gleamed with such deception, as if—arranged mysteriously for his eyes alone—he passed them now with true indifference. (From the moment he made his decision, he refused to think about what had prompted that decision. This was not a problem for him. As an astronaut, alone for long periods, he had learned how not to argue with himself.) He marched on in the swaying Digla: the colossus had to tilt from side to side, but he was well acquainted with that. The tachometer indicated about thirty miles an hour.

The grisly reptilian-amphibian dances of death gave way to gentle folds of rock covered with a volcanic tuff finer and lighter than sand. Though he could accelerate, he knew that the sensations experienced at full speed were hard to take for long, and he had a march of several hours ahead of him in much more difficult terrain, before he reached the Depression. The flat, toothed contours on the horizon no longer looked like clouds. As he walked toward them, his shadow swept before him, misshapen. Because of the strider's great mass, the legs were only a third the length of the trunk. Pressed to increase its speed, it had to lengthen its steps, throwing each limb forward in turn with the hip. The hip could move because the circular mounting of the legs (more precisely, their undercarriage) was an enormous bearing plate into which the trunk fitted. The problem was that to the lateral tilting was then added the up-and-down motion of the giant, making the landscape reel before the operator like a drunkard. Such heavy machines were not built for running. Even a jump from a height of two meters was unwise on Titan. On lesser spheres, and on the Earth's Moon, there was more freedom of movement. But the constructors had not concerned themselves about the speed of these machines, whose walking was not to serve as a means of transportation but, rather, to perform heavy tasks. The ability to cover a distance was a plus, making the industrious colossi more self-sufficient.

For an hour or more, it seemed to Parvis alternately that 1) any second he would become stuck in a chaos of rock, and that 2) the azimuth line had been drawn by a genius, because each time Parvis approached a pile of rubble—slabs of stone balanced so precariously that it looked as if the least breeze would start a thundering avalanche—at the last moment there would always be a convenient way through, so he never needed to circle around or backtrack out of cul-de-sacs. Before long, he concluded that on Titan the best operator would be cross-eyed, since one had to watch the terrain in front of the machine, from a height, and at the same time the glowing directional indicator, which quivered like the needle of an ordinary compass on a semi-transparent map. Somehow he managed, doing not badly at all, relying on his eyes and on the needle. Cut off from the world by the roar of the power units and the overall rumble of resonance in the frame, he still could see Titan through the nonreflecting glass of his compartment. No matter where he turned his head—and he did so whenever more level terrain permitted—he saw, above a sea of mist, mountain ridges split by volcanoes that had been dead for centuries. Proceeding along the ragged ice, he noticed, sunken deep within it, the shadows of volcanic bombs and darker, unidentifiable shapes—as of starfish or octopuses set like insects in amber.

Then the land changed. It was still forbidding, but in a different way. The planet had gone through a period of bombardments and eruptions, sending blind bursts of lava and basalt skyward, to freeze in wild, alien immobility. He entered these volcanic defiles. The overhangs farther on were unbelievably tall. The nonliving dynamism of these seismic congealings—inexpressible in the language of beings raised on a tamer planet—was accentuated by a gravitation no greater than that of Mars. To a man lost in the labyrinth, his striding vehicle ceased to seem a giant. It dwindled, insignificant among the crags of lava, which once, in kilometer-long cascades of fire, had been transfixed by the cosmic cold. The cold cut short their flow, and before they froze, falling in the precipices, it drew them out into gigantic, vertical icicles—monstrous colonnades—a sight that was one of a kind. It made of the Digla a microscopic bug that inched past towering pillars—pillars of a building abandoned, after construction

as careless as it was mighty, by the true giants of the planet. Or: a thick syrup flowing from the lip of some vessel and hardening into stalactites—as witnessed by an ant from its crack in the floor. The scale, however, was more awesome than that. It was in this wilderness, in this order-disorder so foreign to the human eye, bearing no similarity to any mountains on Earth, that the cruel beauty of the place showed itself, of a waste vomited from the planet's depths and turned, beneath a remote sun, from fire to stone. Remote—because the sun here was no flaming disk as on the Moon or Earth; it was a coldly glowing nail hammered into a dun sky, giving little light and even less heat. Outside, it was 90 below, the temperature of an exceptionally mild summer for this year. At the mouth of the gorge Parvis observed a glow in the sky. The glow rose higher and higher until it took up a quarter of the firmament. He did not realize at first that this was neither dawn nor the illumination of a selector, but the mother and ruler of Titan, great-ringed, yellow as honey: Saturn.

A sharp lurch, the reeling of the cabin, the sudden bellow of the engines—countered more swiftly by the reflex of the gyroscopes than by his maneuver—reminded him that now was not the time for astronomical or philosophical contemplation. Humbly he returned his eyes to the ground. Curiously, it was only then that he became aware of the ludicrousness of his movements. Hanging in the harness, he trod the air like a child playing on a swing, yet felt each thunderous step. The gorge grew steep. Although he shortened his stride, the engine room filled with the howl of the turbines. He found himself in deep shadow before he had time to switch on the headlights, and in the next second was walking into a bulge of rock larger than the Digla. The tendency of his pendular, driven mass—obeying Newton's first law—to continue its straight trajectory, when he forced it to turn, threw the engines into overload. All the dials, until now a peaceful green, flared purple. The turbines bellowed with despair, giving everything they had. The rpm indicator for the main gyroscope began to flash, which meant that the fuse was overheating. The cabin dipped, as if the Digla would fall any moment. Parvis broke into a cold sweat. To destroy, in such an insanely stupid way, the machine entrusted to him! But only the left elbow scraped the rock, with a grating sound as of a ship pushed up onto a reef. Smoke, dust, a shaft of sparks sprayed from under the steel, and the giant, shaking, regained its balance.

The pilot pulled himself together. He was glad that in the gorge he had lost radio contact with Gos. If the automatic transmitter would have put this little incident on the monitor. Emerging from the shadow, he doubled his vigilance. He still felt shame, because it was an elementary thing, as old as the world. Any engineer knew from long experience, without thinking, that to start a locomotive by itself and to start it when it pulled a string of cars were two entirely different matters. So he advanced as if on inspection, and the colossus was again wonderfully obedient. Through the glass he saw how a small motion of his hand instantly became the sweep of a mighty tongs-shaped paw, and when he extended his leg, a tower moved forward, its knee shield gleaming.

He was now fifty-eight miles from the spaceport. Going by the map, by the satellite photographs that he had studied the previous evening, and by the diorama, which had a scale of 1:800, he knew that the way to Grail basically was divided into three parts. The first comprised the so-called Cemetery and the volcanic gorge he had just left. The second he could now see: a gap in the massif of frozen lava made with a series of detonated thermonuclear charges. This massif, the greatest of the flows from the Orlandian volcano, could not have been dealt with in any other way, on account of the bulwark steepness of its slopes. The nuclear blasts had chewed through the formation that blocked passage, had cut it in two, as a heated knife bisects a lump of butter. The pass, on the cabin's diagram of Titan, was circled with exclamation points, a reminder that here under no circumstance should one leave one's vehicle.

The residual radiation from the thermonuclears was still unsafe for a man outside the armor of his strider. Between the exit and entrance to the defile lay a mile-long plain, black, as if blanketed with

soot. On it, he could hear Goss again. Parvis said nothing about his collision with the rock. Goss told him that after the defile, at the Promontory, the halfway point, Grail would take over on the radio to guide him. There, also, would begin the third, final stretch of the trail, through the Depression.

The black powder filling the plain between the two bulges of the formation covered the legs of the Digla above its knees. Parvis walked through the low puffs quickly and easily, toward the nearly perpendicular walls of the corridor. He reached a wall, stepping on rubble that was vitreous: smooth surfaces fractured by the solar heat of the explosions. These pieces, hard as diamonds, made sounds like gunfire when ground beneath the iridium heels of the Digla. But the bottom of the defile was as flat as a table. He walked between the blackened walls, in the rumbling echo of steps, steps that were his own: he had joined with the machine, it was his magnified body. Then he found himself in darkness so sudden, so thick, that he had to turn on the headlights. Their mercury glare contended, in the swirl of shadows between the pillar-jaws of rock, with the cold, reddish, unfriendly light of the sky framed by the far gate of the defile, which became larger the closer he drew to it. Toward the end the defile narrowed, as if it would not let his giant pass, as if he would be wedging the square shoulders in a chimneylike cleft. But this was an illusion—on either side there was clearance of several meters. Nevertheless, he slowed, because Pollux swayed more from side to side the faster it went. There was no help for this. The duck waddle when hurrying arose from the laws of dynamics, from angular momentum, and the engineers were unable to overcome it completely. For the last three hundred meters he again ascended, more and more steeply, planting the feet with care, leaning forward a little from his high, suspended place to see what he was stepping on. This close examination took so much of his attention that it was only when the light surrounding him on all sides filled the cabin that he lifted his head and saw the next—altogether different—unearthly landscape.

The Promontory stood above a white and ruddy ocean of fleecy clouds; solitary, black, slender, it was the only thing in the sky from horizon to horizon. Parvis understood why some called it God's Finger. Slowly he came to a halt and, with the magnificent scene spread out before him, tried—over the soft singing of the turbines—to catch the voice of Grail. But he heard nothing. He tried to raise Goss, but Goss did not respond, either. Parvis was still in radio shadow. Then a curious thing happened. Before, radio contact with the spaceport was somehow irritating to him, unpleasant, perhaps because he felt, not in Goss's words so much as in the man's voice, a concealed anxiety, a disbelief almost, that Parvis would make it, and in that anxiety there was an element of pity, which Parvis couldn't stand. But now that he was truly alone, with neither a human voice nor the automatic pulse of the radio beacon from Grail to guide him in this endless white waste, he felt not relief at being free but the uneasiness of a man who, in a palace full of marvels, though he has not the least desire to leave, sees the main door—before, open and inviting—now close behind him. He scolded himself for this unproductive frame of mind, akin to fear, and began to walk down to the surface of the sea of cloud, along a gradual incline—icy in places—directly toward the Promontory. Black, reaching the sky, it was bent, like a finger beckoning.

Once, twice, the sole-plate of the strider slipped with a dull grinding sound, sending great numbers of stones rolling down, knocked from their ice settings, but these slips did not threaten a fall. Parvis merely changed his gait so as to fix each step into the frozen snow crust, using the spikes of his heels which made him proceed more slowly than before. He descended a bulging slope between two gullies stamping with stubborn exaggeration, until arcing sprays of ice rattled on his shin guards and knee shields. He strained his eyes to see into the valley, whose bottom now appeared through gaps in the mist, and the lower he went, the more the black finger of the Promontory towered over him, rising above the distant, milky clouds. In this way he reached the level of the fluffy fog that floated evenly and slowly as over unseen water; it flowed around his thighs, his hips; one puff of cloud enwrapped him and the cabin, but vanished as if blown away. For a few moments yet the Black Finger loomed

above the feathery whiteness—like a club of rock jutting out of an arctic sea, unmoved amid the foam and floes. But then it disappeared, as from the view of a diver submerging.

He stopped, listened; he thought that he could hear an intermittent thin, high tone. Turning the Digla now to the left, now to the right, he waited for the plaintive note, quite clear, to sound in both ears equally. This was not Grail itself but the directional radio beacon of the Promontory. He was supposed to head straight for it, and if he deviated from that path, the intermittent signal would split in two, depending on the deviation: going too far to the right, in the perilous direction of the Depression, he would hear in his right ear a warning squeal; and if he strayed the opposite way, toward the impassable, sheer walls, the signal would sound in a less urgent but nevertheless error-indicating bass in the left ear. The odometer read a hundred miles. The greater, mechanically more difficult part of the trail was behind him. The more treacherous part lay before him, wrapped in depths of mist. Massive clouds now darkened overhead; the visibility was to several hundred meters; the aneroid barometer verified that the syncline trough of the Depression began here—or, more precisely, its mercifully solid rim. He walked, using his eyes as well as his ears, since the region was brightened by snow—frozen carbon dioxide, of course, and the anhydrides of other solidified gases.

Sometimes an erratic boulder protruded from their whiteness, the mark of a glacier that had once come from the north, packed itself into the rift of this volcanic massif, deepened it southward with its creeping body, like a plow, and put into the ground ice great hunks of rock. Later, retreating, or melting from the magma heat that came from deep within Titan, the glacier spat out and left behind a moraine, scattered in a disorderly retreat. The landscape reversed itself: as if laying out a wintry day at the bottom and then covering it with a night of impenetrable clouds. Parvis did not even have his own shadow now for a companion. He stepped steadily, sinking into the snow his steel boots, covered with the dust of tiny crystals, and in his wide-angle rearview mirrors he could see his own tracks, tracks worthy of a tyrannosaur, that greatest of the biped predators of the Mesozoic. Glancing back, he checked that his trail was staying straight. For an indeterminate time, however, he had an odd feeling—an impression that grew in strength but which he dismissed as impossible: that he was not alone in the cabin, that behind his back there was another man. The presence of the man was given away by his breathing. Finally, the illusion made him so nervous (he did not doubt that it was an illusion, caused, perhaps, by the fatigue of listening to the same, monotonous radio signal) that he held his breath. The other gave a long, unmistakable sigh. This could not be an illusion. In his astonishment, Parvis tripped, making the colossus stagger. He righted it in a blaze of indicators and a howl of turbines and brought it gradually to a halt.

The other stopped breathing. Was it, then, after all, an echo from the machine wells of the Digla? Standing still, he cast his eye around and noticed, on the endless beds of snow, a black mark, an exclamation point drawn in India ink on the white horizon, though the illumination did not show whether the horizon was a bank of windblown drifts or a bank of clouds. Even though he had never seen a strider from a mile away in such a winter setting, the conviction seized him that this was Pirx. He headed for him, not caring about the increasing division of the signal in his earphones. He hurried. The black mark, moving along the same wall of white, was a figure now, and it, too, swayed in walking quickly. After about fifteen minutes its true proportions became evident. A half a mile separated them, perhaps a little more. Why didn't Parvis speak, call him on the transmitter? He didn't know why, but somehow didn't dare. Looking hard, he observed in the small glass window—the hearth of the colossus—an extremely tiny man who, suspended, moved like a puppet on strings. Parvis kept after him, and both left long plumes of powder behind them, like ships in a channel pulling foaming furrows after themselves. Parvis rushed to overtake him, at the same time noting what was happening ahead of them—and something was indeed happening, because in the distance a thick white blizzard fluttered and rippled. Its curving arcs shone brighter than the snow. This was the region of the cold

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