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<i>Arkady</i> and <i>Boris Strugatsky,</i> authors of "Destination; Amaltheia", have already several collections of SF stories to their credit. Arkady Strugatsky (b. 1925) is a linguist and translator specialising in Japanese. Boris (b. 1933) is an astronomer and works at the computer laboratory of Pulkovo Observatory. The title story of this volume is their second novelette appearing after "The Country of the Purple Clouds" -about explorations on Venus, First Prize winner in a best SF book competition.

Jupiter, Saturn, Uranus, Neptune. . . . Hydrogen phantoms, the strangest and most enigmatic objects in the solar system. Enormous masses of hydrogen and helium tinged by methane and ammonia. What is their structure? What makes them rotate at such a frantic .speed? What is their source of energy? We observe titanic changes on their surface. We see strips of clouds streak along, broken now and then by giant whirls, streamers of gases erupt into space in flaring bursts. What forces are behind these outer phenomena? Thermonuclear reactions? But these giants have sub-zero surface temperatures: -216°F on Jupiter and even lower on the others. What is then the mechanism of these primaries? Perhaps it is some physical principle we don't know yet and even do not so far dare to guess at....

PROLOGUE

J-STATION, AMALTHEIA

The chief of J-Station enjoys the sight of rising Jupiter while the nutrition engineer bewails the shortage of canned food.

Amaltheia makes one full rotation on its axis in about thirty-five hours. But it takes only twelve hours to complete its orbit round Jupiter. That is why the enormous shapeless hump of Jupiter rears in close view every thirteen and a half hours. And that is a spectacular sight. But to see it at all you have to take a lift to the spectrolite-domed top floor. When your eyes get accustomed to the darkness outside you begin to make out an ice-bound plain receding to the serrated mountain range on the horizon. The sky is black and studded with bright unblinking stars. These shed a faint light on the plain, the mountain range a pitch-black gap in the starry sky. But if you look long enough you will make out the jagged tops. Sometimes Ganymede's mottled crescent or Callisto's silver disc-or more rarely

both-will come out and hang above the range. Then on the plain grey fingers of shade stretch from end to end across the gleaming ice. And when the Sun is a small ball of blinding fire above the horizon the plain turns blue, the shadows black and every crack or hump stands out in stark relief. Coal-black spots on the spacefield look 'like big freshly-frozen puddles and you feel like running over that thin crust of ice to hear it crunch under your magnetic boots and see it fan out in dark wrinkles.

But that is not yet really spectacular. All that can be seen in other places besides Amaltheia. It's when Jupiter rises that the sight becomes really spectacular. And it's really spectacular only when seen from Amaltheia-especially when Jupiter rises in pursuit of the Sun. It all starts with a greenish-brown glow-Jovian exosphere- gaining in intensity behind the rugged peaks. As it grows brighter it extinguishes one by one the stars that the Sun has not been able to obscure and spreads across the black sky, slowly closing in on the Sun itself, which it suddenly engulfs. That is a moment not to miss. That is a moment when, as if at a flourish of a magic wand, the greenish-brown glow turns instantaneously blood red. You tense for it and yet it always catches you unprepared. The Sun turns red and the ice-bound plain turns red and the small dome of the radio-beacon starts sending off blood-red reflections. Even the shadow the mountaintops throw turns pink. By and by the red darkens, turns brownish and then, at last, the enormous brown hump of Jupiter rolls into view over the rugged peaks. The Sun is still visible and red, red-hot as molten metal, like a round disc against a brownish-red backdrop. For some obscure reason this brownish red is classed as an unattractive colour. People who are of this opinion must never have watched Jupiter rise in pursuit of the Sun, never have seen the brownish-red glow across half the sky with the clear-cut red disc superimposed on it. Then the disc disappears. Only Jupiter remains, huge, brown, shaggy. It has taken its time crawling over the horizon as if swelling, and now fills a full quarter of the sky. Black and green belts of ammonia cloud criss-cross the planet. That too is beautiful. Unfortunately you can seldom watch the sight till that stage. There is work to be done. When you are on observation duty you see the sight in toto, of course, but then you don't look for beauty....

The head of J-Station looked at his watch. The Jupiter-rise today promised to be as spectacular as ever but it was time he went below to his office to do some hard thinking. In the shadow of the cliffs the trellis-work skeleton of the Big Antenna stirred and began unfolding. The radio astronomers were about to start observations. The hungry radio astronomers.

The chief threw a final glance at the brownish-red brumous dome of Jupiter swelling over the range and thought he would like some day to catch all the four big satellites above the horizon with Jupiter in the first quarter, half orange, half brownish red. Then it occurred to him he had never seen Jupiter setting. That must be quite a sight too-the exospheric glow dying out and the stars flickering up one after another in the darkening sky like diamond needles against black velvet. But usually Jupiter-set is the peak of the working day.

The chief entered the lift and dropped down to the bottom floor. The station was fairly big and occupied several tiers hacked through the solid ice and encased in plastic metal. Fifty-three people manned it. Fifty-three hungry men and women.

The chief glanced into the recreation rooms as he went along but found them empty save for the spherical swimming pool where someone was splashing about, the room echoing to the sound. The chief went on stepping unhurriedly in his heavy magnetic boots. There was next to no gravity on Amaltheia and that was highly inconvenient. People got accustomed to it, of course, but at first they all felt hydrogen-filled and any moment likely to burst out of their magnetic footgear. Sleeping in particular had cost them all a lot of getting accustomed to.

Two astrophysicists, hair wet after a shower, overtook him, said hullo and passed on to the lifts. Something was wrong with the magnetic soles of one of them, for he was dancing and swaying awkwardly as he tried to keep pace with the other. The chief turned into the canteen, where about fifteen people were still having their breakfast.

Uncle Hoak, the station's nutrition engineer, was himself serving the breakfasts on a trolley. He was gloomy. Not that he was of a sunny disposition ordinarily. But today he was definitely gloomy. As a matter of fact so had he been the day before and the day before that-indeed ever since that unfortunate day when the radio message about the food disaster came from Callisto. J-Station's foodstores on Callisto had been invaded by a fungus. That had happened before, but this time the stores were destroyed completely, to the last biscuit, and so were the chlorella plantations.

Life was hard on Callisto, for no means of keeping the fungus out of the quarters had yet been found. It was a remarkable fungus. It penetrated any wall and demolished any kind of food. It just gobbled up chlorella. Sometimes it attacked men but it was not dangerous. At first people were afraid of it and the bravest flinched discovering on their hands the characteristic grey-coloured slimy film. But there was no pain or after-effects. Some even claimed the fungus was a good tonic.

"Hey, Uncle Hoak," somebody shouted. "Are we going to have biscuits for dinner as well?"

The chief did not notice who it was, for everyone in the canteen immediately turned their faces to Uncle Hoak and stopped eating. Nice young faces, deeply tanned almost all of them. And already drawn a little. Or was he imagining things?

"You will have soup for dinner," said Uncle Hoak.

"Ripping," somebody said, and again the chief didn't notice who.

He sat down at the nearest table. Hoak wheeled up the trolley and deposited a breakfast on the table-two biscuits on a plate, half a bar of chocolate and a squeeze bottle of tea. He did it in his usual smart way but the thick white biscuits jumped up all the same and hung above the table. The bottle stood firm however, held in place by a magnetic rim round the bottom. The chief caught one of the biscuits, took a bite and touched the bottle. The tea was cold.

"Soup," said Hoak. He was speaking in a low voice-just for the chief. "You can imagine what kind of soup. And they think I'm going to serve them chicken broth." He pushed the trolley away and sat down at the table. He watched the trolley run down the aisle slower and slower. "Incidentally they're still enjoying chicken broth on Callisto."

"I don't think so," the chief said absent-mindedly.

"But they are," said Hoak. "I gave them one hundred and seventy cans-more than half of our iron rations."

"And we've finished what was left?" "Yes, of course."

"Well, they must have finished theirs too," the chief said, munching his biscuit. "They've got twice as many people as we have."

I don't believe you. Uncle Hoak, he thought. I know you, nutrition engineer. You surely have another two dozen or so cans tucked away somewhere for the sick and just in case.

Hoak sighed and said, "Your tea's gone cold? Let me refill...."

"No, thank you."

"Chlorella's still not taking on Callisto," Hoak said and again sighed. "They've radioed again, asking for another twenty pounds of culture. Sent a rocket for it, they said."

"Well, we must give it to them."

"That's all right," said Hoak. "But who will give us any? As if I had a hundred tons... it takes time to grow. But I'm spoiling your appetite."

"Never mind," said the chief. He had no appetite anyway.

"Enough of this!" someone said. The chief looked up and saw the embarrassed face of Zoya Ivanova. Next to her sat the nuclear physicist

Kozlov. They always sat together.

"Enough, d'you hear!" Kozlov said hotly.

Zoya flushed and lowered her head. She was visibly disconcerted to find herself the centre of general attention.

"You slipped your biscuit on to my plate yesterday," said Kozlov. "Today you're up to it again."

Zoya was silent and on the verge of tears.

"Don't yell at her, you baboon!" Potapov bawled from the far end of the canteen. "Zoya dear, why d'you have to feed that brute? You'd do much better giving it to me. I'd eat it. And I wouldn't yell at you."

"No, really," Kozlov said in a calmer voice. "She needs more than a healthy fellow like me."

"Stop it, Valya," Zoya said without raising her head.

"Can I have some more tea, Uncle Hoak?" somebody asked.

Hoak got up. Potapov bawled out again:

"Hey, Gregor, care for a game after the knock-off?"

"I don't mind."

"You'll get licked again, Vadim," a voice said.

"The theory of probability's on my side!"

Potapov bawled.

There was general laughter. "The law of high magnitudes is on mine!" A face crumpled with sleep looked in through the door.

"Potapov here? Vadim, there's a storm on Jupe!"

"You don't say so," Potapov said, jumping up.

The face disappeared, then popped into view again:

"Get my biscuits for me, will you."

"Hoak won't give us them," Potapov answered the retreating figure and glanced at Uncle Hoak.

"Why not?" said Hoak. "Konstantin Stetsenko, half a pound of biscuits and two ounces of chocolate. He's entitled to it."

The chief rose, wiping his mouth with a paper serviette. Kozlov said:

"Comrade chief, any news of the <i>Tahmasib</i>?"

All present fell silent and turned their faces to the chief. Deeply-tanned young faces, already drawn a little. The chief replied:

"No news."

He walked slowly down the aisle and to his office. The trouble was that the "fungus invasion" that had struck Callisto was highly inopportune. It wasn't starvation yet. But if Bykov did not arrive with the food.... Bykov was somewhere not far away, in fact he had already been located but had ceased reporting since and had not been heard for sixty hours now. We must cut the rations again, thought the chief. Anything could happen and their base on Mars was a long way off. Anything could happen here. Spaceships from Earth and from Mars had disappeared before. It doesn't happen often, not oftener than the fungus invasions. But it's bad enough that it does happen at all. It's a nuisance.

CHAPTER ONE

THE CARGO PHOTON ROCKET "TAHMASIB"

1. The spaceship approaches Jupiter while her captain has a row with the navigator and takes sporamin.

Alexei Petrovich Bykov, captain of the cargo photon rocket <i>Tahmasib</i> emerged from his cabin and carefully closed the door behind him. His hair was wet and well brushed. The captain had just had his shower. As a matter of fact he'd had two showers—one of water and one of ions—but he still wanted to sleep so badly that his eyes would not stay open. Over the last

three days and nights he had not slept for more than five hours in all. The flight was not proving easy.

The gangway was bare and light. Bykov headed for the control room, making an effort not to shuffle, shaking off the stupor of a short nap he'd just had. His way lay through the mess. Its door stood open and through it Bykov thought he heard quarrelsome voices. They belonged to the planetologists Dauge and Yurkovsky and sounded strained and unusually muffled. Up to something again, those two, thought Bykov. No peace from them. It's not easy for me to give them a ticking off either. After all, they're my friends and jolly glad to be all together on this flight, It's not go often we get the chance.

Bykov stepped into the mess room and stopped dead, his foot on the coaming. The bookcase was open, the books lying in an untidy heap on the floor. The table-cloth was awry. Sticking from under the sofa were Yurkovsky's long legs sheathed in grey drainpipes. The legs were jerking excitedly.

"She's not here, I tell you," said Dauge. He himself was not in sight.

"You go on looking for her," Yurkovsky's muffled voice was heard. "No backing out now."

"What's going on here?" Bykov enquired sternly.

"Ah, here he is," Dauge said, crawling out from under the table. His face was pleasurably animated, his jacket and the collar of his shirt unbuttoned. Yurkovsky backed on all fours from under the sofa.

"What's the matter?" said Bykov.

"Where's my Varya?" Yurkovsky asked, getting up. He was angry.

"The monster!" Dauge exclaimed.

"You loafers," said Bykov.

"It's him," Dauge said in a tragic voice. "Just look at his face, Vladimir! The butcher!"

"I'm quite serious, Alexei," said Yurkovsky. "Where's my Varya?"

"I'll tell you what, planetologists," said Bykov. "Enough of your monkey tricks."

He thrust his jaw at them and strode across to the control room. Dauge said after him:

"He's burnt Varya in the reactor."

Bykov banged the hatch shut behind him.

It was quiet in the control room. In his usual place at the computer sat the navigator, Mikhail Antonovich Krutikov, his double chin propped on his plump fist. The computer was clicking faintly, staring away with its neon pilot lamps. Mikhail Antonovich raised his kind little eyes to the captain and asked:

"Had a good sleep, Alexei old chap?"

"Yes," said Bykov.

"I've received bearing signals from Amaltheia," said Mikhail Antonovich. "They're waiting for us. Oh, how they're waiting for us," and he shook his head. "They're on rations: half a pound of biscuits and two ounces of chocolate. Just imagine. And a plate of chlorella broth. That's another three-quarters of a pound. And such unpalatable stuff...."

You should be there, fatty, thought Bykov. You'd slim down fast. He threw a stern glance at the navigator but couldn't keep it up and grinned. Mikhail Antonovich, his thick lips pouted worriedly, was examining a chart traced on light-blue paper.

"Here, Alexei," he said. "I've compiled the finish-programme. Please check it."

There was no point usually in checking course programmes drawn up by Mikhail Antonovich. He was still the fattest and most experienced navigator in the space fleet.

"I'll check it later," said Bykov. He yawned drowsily, cupping his mouth with a hand. "Feed it into the cyber-navigator, will you."

"I have," Mikhail Antonovich said guiltily.

"Oh," said Bykov. "Good. Where're we now?"

"In an hour's time we begin the finish part of it," said Mikhail Antonovich. "We'll pass over Jupiter's north pole," he pronounced the word "Jupiter" with visible relish, "at a distance of two diameters, about one hundred and eighty thousand miles. Then for the last spiral. We may consider we're already there, old chap."

"You calculated the distance from Jupiter's centre?"

"Yes."

"When we begin the finish, report the distance from the exosphere every quarter of an hour."

"O.K."

Bykov yawned again, rubbed his sore, sleepy eyes vexedly and passed on to the alarm system panel. Everything was in order there. The propulsion plant operated normally, the plasma was injected as required, the tuning of the magnetic traps was kept very tight. The magnetic traps were the responsibility of Engineer Ivan Zhilin. Good for you, Zhilin, thought Bykov. First-class tuning for a raw hand.

Bykov halted and tried, by slightly changing the course, to break the tuning. It held. The white spot behind the translucent plastic would not even waver. Good for you, Zhilin, Bykov thought again. He went round the bulging bulkhead-the photon reactor casing. At the reflector control combine stood Zhilin, his pencil between his teeth. He was leaning over the control panel, his hands on its edge, tap-dancing almost imperceptibly, his powerful shoulder-blades moving on his bent back.

"Hello, Vanya," said Bykov.

"Hello, Alexei Petrovich," Zhilin said, whirling round. The pencil slipped from his teeth and he caught it smartly in mid air. Zhilin was twenty-three years old, just out of the High School of Cosmogation.

"How's the reflector?" asked Bykov.

"The reflector's in order," said Zhilin, but Bykov leaned over the control panel all the same and pulled at the hard, blue tape of the recorder.

The reflector, or the sail, as it is also called, is the principal and most fragile part of a photon rocket. It is a gigantic parabolic mirror, coated with five layers of superhard mesosubstance. Every second thousands of portions of the deuterium-cum-tritium plasma explode at the focus of the parabola and are transformed into radiation. The pallid lilac flame hits the surface of the reflector and creates thrust. As this goes on the mesosubstance is subjected to tremendous changes in temperature and gradually burns away, layer by layer. Besides, the reflector is eaten away by meteoric corrosion. And if, when the propulsion unit was on, the reflector were to collapse at the base where it is joined by the thick tube of the photon reactor, the ship would go in one silent flash. To avoid this the reflectors of photon ships are replaced after every hundred astronomical units of flight. And this also is why a control system is constantly checking on the working layer all over the reflector's surface.

"Well," Bykov said, examining the tape. "The first layer's burnt away."

Zhilin didn't say anything.

"Mikhail," Bykov called out to the navigator. "Did you know the first layer was burnt out?"

"Yes," the navigator said. "It can't be helped. We're doing on oversun, aren't we."

An "oversun", or a "leap over the Sun", *is* resorted to rarely, in cases

of emergency like this, when the J-Stations were struck by hunger. In an oversun the Sun is between the start-planet and the finish-planet-which is highly unadvantageous from the point of view of "direct cosmogation". In an oversun the photon propulsion unit operates at extreme conditions, the ship's speed is of the order of four thousand miles per second and the instrumentation starts showing the effects of non-classic mechanics, which

we still do not know enough about. The crew has to make do with very little sleep, plasma and reflector consumption is enormous and on top of it all the ship as a rule approaches the finish-planet from one of the poles, which makes landing tricky.

"Yes," said Bykov. "An oversun, that's just it."

He went back to where the navigator sat and looked at the plasma consumption dial.

"Give me a copy of the finish-programme, Misha," he said.

"Just a second," said the navigator.

He was having a busy time of it. Sheets of light-blue paper were scattered on the desk in front of him, a semi-automatic computer attachment was whirring in an undertone. Bykov sank down in a chair and half-shut his eyes. Vaguely he saw Mikhail Antonovich reach a hand out to the panel without taking his eyes off his notes and quickly run his fingers along the keys. His hand looked like a large white spider. The computer gave a louder whirr, then switched off with a flicker of the stop lamp.

"What was it you wanted?" the navigator asked, still deep in his notes.

"The finish-programme," Bykov said, opening his eyes with an effort.

A tabulator tracing snaked out of the output device and Mikhail Antonovich snatched at it with both hands.

"Half a sec," he said hurriedly. Bykov's ears rang and yellow lights danced in front of his eyes. His head sank on to his chest.

"Alexei," said the navigator. He reached across his desk and tapped Bykov on the shoulder. "Here's the programme."

Bykov started, jerked up his head and looked around. Then he took the sheets of figures.

"Hm, hm," he said, the skin moving in waves on his forehead. "Well. A theta-algorithm again..." and he stared sleepily at the notes.

"Why don't you take some sporamin?" said the navigator.

"Wait," said Bykov. "Wait. What's this? Are you crazy, navigator?"

Mikhail Antonovich jumped up, ran round the desk and leaned over Bykov's shoulder.

"Where, where?" he asked.

"Where do you think you're going anyway?" Bykov enquired bitingly. "D'you think you're going to the Seventh Testing Grounds?"

"But what's the matter?" the navigator asked.

"Or do you think they've built a tritium generator for your private use on Amaltheia?"

"If you mean the propellant," said Mikhail Antonovich, "there's enough of it for three such programmes. ..."

Bykov was wide awake now.

"I'm touching down on Amaltheia," he said. "Then I'm making a round trip with the planetologists inside the exosphere. And then I go back to Earth. Which means another oversun!"

"Wait," said Mikhail Antonovich. "Just a moment...."

"And here you're drawing up a crazy programme: for me as though there were stores of propellant waiting for us."

The door was pushed ajar. Bykov turned to look. Dauge's head was squeezed into the crack. The eyes swept round the control room and his voice implored:

"I say, boys, isn't Varya here?"

"Get out!" Bykov snarled.

The head vanished. The door was closed carefully.

"The loafers," said Bykov. "Listen here, navigator. I'll get the propellant for the return oversun by melting down your gammon." ,

"Don't shout," Mikhail Antonovich said indignantly. He thought a moment and added, red-faced, "Damn it."

A silence descended. Mikhail Antonovich returned to his place and they sat glowering at each other across the desk.

"The leap into the exosphere is calculated. The return oversun is

nearly finished," he placed a pudgy hand on the heap of papers on the desk. "But if you've got cold feet we can easily refuel on Antimars...."

That was the cosmogators' name for an artificial planet that moved almost in the Martian orbit on the other side of the Sun. It was just a huge store of propellant, a fully automated refuelling station.

"And I don't see why you should bawl at me," said Mikhail Antonovich. The word "bawl" he said in a whisper. Mikhail Antonovich was cooling down. So was Bykov.

"All right," he said. "Sorry, Misha." Mikhail Antonovich smiled readily. "I shouldn't have gone off the deep end 'like that," said Bykov.

"Oh, it's all right, old fellow," Mikhail Antonovich was saying hurriedly. "Nothing to bother about. ... Just look what a perfect spiral it will make. From the vertical," his hands followed his thoughts, "into the plane of Amaltheia's orbit just above the exosphere and then a free-coasting path to the rendezvous. At the rendezvous the relative velocity will be a mere thirteen feet per second. The maximum G-load will be only twenty-two per cent and weightlessness will only last thirty to forty minutes. And there should only be a slight margin of error."

"It should be slight because it's a theta-algorithm," said Bykov. He wanted to say something pleasant to the navigator: it was Mikhail Antonovich who had first developed and used the theta-algorithm.

Mikhail Antonovich uttered a vague sound. He was pleasantly embarrassed. Bykov finished looking through the programme, nodded several times and, putting the sheets aside, rubbed his eyes with his huge freckled fists.

"Tell you frankly," he said, "I've had a rotten sleep."

"Take some sporamin, Alexei," Mikhail Antonovich said persuasively. "Look at me—I take a tablet every two hours and don't feel like sleep at all. So does Vanya. Why should you torture yourself?"

"Hate the stuff," said Bykov. He grunted, jumped up and paced the room. "Look here, Misha," he said. "What's happening on board my ship anyway?"

"What do you mean?" the navigator asked.

"Those planetologists," Bykov explained.

From behind the casing Zhilin said:

"Varya's disappeared."

"You don't say so," Bykov said. "Good riddance." He paced the room again. "The loafers," he said. "Middle-aged kids."

"Don't be too hard on them, old chap," said the navigator.

"You know," Bykov said as he sank back into his chair, "you know the worst that can happen to you in flight is passengers. And the worst passengers are your old friends. I guess I'll have some of that sporamin after all, Misha."

Hastily, Mikhail Antonovich pulled a small box out of his trouser pocket. Bykov watched him do it with sleepy eyes. .

"Give me two tablets," said he.

2. The planetologists look for Varya while the radio astronomer finds what a hippo is.

"He told me to get out," Dauge said, returning to Yurkovsky's cabin. His host was standing on a chair in the middle of the cabin, feeling with his hands the soft mat ceiling. The remains of a squashed sugar cake were scattered on the floor. "It means he's got her," said Yurkovsky. He jumped off the chair, brushed white crumbs off his knees and called out plaintively:

"Varya, my love, where're you?" "Have you tried sitting on a chair all of a sudden?" asked Dauge. He went up to the sofa and let himself drop on it rod-like, his arms pressed to his sides.

"You'll kill her!" Yurkovsky cried. . "She's not here," Dauge informed him and settled more comfortably,... hoisting his feet on to the back of the sofa. "This is .just what you must do to all the sofas and chairs in the place. Varya likes them soft."

Yurkovsky dragged his chair nearer to the wall.

"No," he said. "When flying she likes to climb on ceilings and walls. I ought to make a round of the ship and try all the ceilings."

"Good Lord," Dauge sighed. "What won't enter a browned-off planetologist's head." He sat up, glanced at Yurkovsky out of the tail of his eye and whispered ominously: "I'm certain it's Alexei. He's always hated her."

Yurkovsky looked at Dauge closely.

"Yes," Dauge went on. "He always has. And you know it. What did she do to him? She was always so nice and quiet...."

"You're a booby, Grigory," said Yurkovsky. "You're being funny, but I'll be really sorry if she's gone."

He sat down and propped his elbows on his knees and his chin on his balled fists. His high balding forehead became furrowed and his black eyebrows tragically arched.

"Come, come," said Dauge. "She can't disappear from aboard a ship, can she? She'll turn up."

"Turn up," said Yurkovsky. "It's time for her to eat. She never asks-she'd sooner starve."

"She won't starve herself to death, don't you fear," said Dauge.

"She's not had a bite for twelve days now-ever since the start. It's bad for her."

"When she wants some grub she'll come," Dauge said with conviction. "That is common to all forms of life."

Yurkovsky shook his head.

"Not she, she won't, Grisha," he said.

He got up and started feeling the ceiling again, inch by inch. There was a knock on the door. Then it slid softly aside and in the doorway stood short ebony-haired Charles Mollard, the radio astronomer.

"Come in?" said Mollard.

"That's right," said Dauge.

Mollard waved his arms.

<i>"Mais - non,"</i> he exclaimed, smiling happily. He was always smiling

happily. <i>"Non</i> come in. I wanted to say: may I come in?"

"Certainly," Yurkovsky said from up his chair. "Certainly you may, Charles. Why not?"

Mollard walked in, slid the door shut and craned his neck with curiosity.

"Voldemar," he said, rolling his r's exquisitely. "You learn to walk on the ceiling?"

<i>"Out, madame,"</i> Dauge said in his execrable accent. "I mean to say

monsieur, of course. Fact is <i>il cherche la</i> Varya."

"No, no," Mollard ejaculated-and waved his arms again. "Not this. Only Russian. I speak only Russian, do I not?"

Yurkovsky got down from his chair.

"Charles, have you seen my Varya?"

Mollard shook a finger at him.

"You joke," he said. "You joke for twelve days." He sat on the sofa next to Dauge. "What is Varya? I heard about Varya many times, you search for her today but I saw her not one time. Eh?" He looked at Dauge. "Is it a bird? Or a cat? Or ... er....."

"Hippo?" said Dauge.

"What is a hippo?" Mollard enquired.

<i>"C'est</i> a kind of <i>I'hirondelle,"</i> said Dauge. "A swallow."

"0, *I'hirondelle!*" exclaimed Mollard. "Hippo?"

"Ja," said Dauge. "Natürlich:"

"Non, non," said Mollard. "Only Russian!" and he turned to Yurkovsky.

"Gregoire says truth?"

"Gregoire says rubbish," Yurkovsky said angrily. "Plain rubbish."

Mollard looked at him attentively.

"You are upset, Voldemar," he said. "Can I help?"

"I don't see how, Charles. One must search-feel everything with the hands as I do...."

"Why feel?" Mollard was surprised. "You tell me how she looks. I search."

"That's just it," said Yurkovsky. "I wish I knew what she looks like."

Mollard leaned back on the sofa and covered his eyes with his hand.

"Je ne comprends pas," he said plaintively. "I do not understand. You don't know what she looks like? Or I don't understand Russian?"

"It's like this, Charles," said Yurkovsky. "She doesn't always look the same. When she's on the ceiling she's like the ceiling, when she's on the sofa she's like the sofa. ..."

"And when she's on Gregoire she's like Gregoire," said Mollard. "You always joke."

"He says the truth," Dauge interfered. "Varya constantly changes colour. Mimicry it's called. She's jolly good at mimicry."

"Mimicry with swallows?" Mollard asked bitterly.

There was a knock at the door again.

"Come in!" Mollard cried happily.

Entered Zhilin, large, ruddy-cheeked and diffident.

"Sorry to barge in like this, Vladimir Sergeyevich," he began, leaning forward somewhat.

"O!" Mollard exclaimed, with a flash of his white teeth. He was very fond of the engineer. *"Le petit ingénieur!"* How's life? Good?"

"Good," said Zhilin.

"How's girls? Good?"

"Good," said Zhilin. It had become routine for him. *"Bon"*

"Excellent pronunciation," Dauge said enviously. "Incidentally, Charles, why do you always ask Vanya about girls?"

"I like girls," Mollard said earnestly. "And I always like to know how they are."

"Bon," said Dauge. *"Je vous comprends."*

"Vladimir Sergeyevich," Zhilin began again. "The captain sent me., In forty minutes we'll be at perijovian, on the edge of the exosphere."

Yurkovsky jumped up.

"Splendid," he said.

"If you're, going to observe I'm at your disposal."

"Thanks, Vanya," said Yurkovsky. Then he turned to Dauge. "Well, Grigory, strike up the march!"

"Watch out, Jupe," said Dauge.

"Les hirondelles, les hirondelles," sang Mollard.

"And I shall go and make dinner. I'm on duty today and I shall make soup. Do you like soup, Vanya?"

Zhilin had no time to answer because at that moment the ship veered sharply and he was thrown through the door, only saved from a fall by catching hold of the jamb at the last second. Yurkovsky stumbled over the stretched-out feet of Mollard lolling on the sofa, and fell on Dauge. Dauge grunted.

"Oh," said Yurkovsky. "That was a meteorite!"

"Get off me," said Dauge.

3. The engineer pays tribute to the heroes while the navigator

discovers Varya.

The small observation bay was crammed chock-full with the planetologists' equipment. Dauge was squatting in front of a big shining apparatus which looked like an ancient television camera. It was called the exospheric spectrograph. The planetologists placed great hopes in it. It was brand-new-straight off assembly line-and worked synchronous with a bomb release, whose mat-black hatch took up half the space in the bay. Next to it the flat cases of bomb-probes lay stacked in light metal racks, gleaming dully. Each case housed twenty bomb-probes and weighed ninety pounds. The original idea was that the cases should be fed in automatically. But the *Tahmasib*, being a cargo rocket, was not fitted out for extensive research,

and no place had been available for an automatic feeder. So the release was serviced by Zhilin.

Yurkovsky ordered:

"Load her!"

Zhilin slid the hatch open, took the nearest case, lilted it with an effort and placed it into the rectangular slit of the loading chamber. The case slid noiselessly into place. Zhilin closed the breech and said:

"Ready."

"So am I-," said Dauge.

"Mikhail," Yurkovsky called into the mike. "How soon?"

"In half an hour," they heard the navigator's husky voice. The ship veered again. The floor seemed to fall from under their feet.

"Another meteorite," said Yurkovsky. "The third."

"Rather thick," said Dauge.

Yurkovsky said into the mike:

"Mikhail, many micrometeorites?"

"Plenty, old chap," said Mikhail Antonovich.

His voice sounded worried. "Thirty per cent above mean density and still thickening...."

"Misha," said Yurkovsky. "Make checkings more often, there's a good chap."

"I'm doing three a minute as it is," replied the navigator. He said something aside. Then they heard Bykov's voice rumble in answer: "All right."

"Vladimir," the navigator called. "I'm switching to ten per minute."

"Thanks, Misha," said Yurkovsky.

The ship veered again.

"I say, Vladimir," Dauge said in an undertone. "This is no longer trivial."

Zhilin, too, was thinking it wasn't trivial. He couldn't remember reading anywhere in textbooks or in space charts anything about high meteoric density in Jupiter's immediate vicinity. But then few people had been in Jupiter's immediate vicinity, and most of those who had, hadn't come back to report. For this meant storming Jupiter, not just skirting it.

Zhilin perched on the plate of the hatch and glanced at his watch. Only twenty minutes to the perijovian. In twenty minutes Dauge would fire the first stick. The explosion of a stick of bomb-probes was a marvellous sight, he said. The year before he'd studied the atmosphere of Uranus with just such bomb-probes. Zhilin turned to look at Dauge. He was squatting in front of the spectrograph, his hands on the turn-lever, lean, swarthy, sharp-nosed, with a scar on his left cheek. He would crane his long neck every now and then, looking into the eyepiece of the viewer first with one eye, then with the other, and every time an orange spot of light would flicker across his face. Then Zhilin looked at Yurkovsky. He was standing, his face close to the periscope, shifting impatiently from foot to foot. The many-faceted egg of the mike dangled from his neck on a dark tape. Dauge and Yurkovsky, the well-known planetologists....

Just a month back it was that Chen Run, deputy chief of the High School of Cosmogation, had summoned graduate Ivan Zhilin.

Chen Kun was known as Iron Chen among space flyers. He was past fifty but looked quite young in his navy-blue jacket with turn-down collar. He would have been quite handsome, too, but for the pinkish-grey patches on forehead and chin-reminders of an old ray stroke. He told Zhilin that the Third Department of the State Committee for Space Flights was in urgent need of a good relief engineer and that the School Council had decided to recommend him, graduate Zhilin (at this graduate Zhilin tingled with excitement: all those five years he'd been fearing they would send him on lunar routes on probation). Chen Kun said it was a great honour for a graduate to be given as his first assignment a job on board a ship flying oversun to Jupiter (graduate Zhilin nearly jumped with joy), carrying provisions for a J-Station on Amaltheia, Jupiter's fifth satellite. Amaltheia was facing hunger, said Chen Kun.

"What's more," said Iron Chen, "you will have as your commander the renowned space flyer, Alexei Petrovich Bykov-also a graduate of our School. With him and senior navigator Mikhail Antonovich Krutikov-a man of vast experience, you will go through a first-rate practical school and I must say I am very glad for you."

That Grigory Dauge and Vladimir Yurkovsky were going too Zhilin learnt later, already on the Mirza-Charle spacedrome. What names! Yurkovsky and Dauge, Bykov and Krutikov, Bogdan Spitsin and Anatoly Yermakov. Since his childhood he had known the legend, beautiful yet frightening, that had been woven round the names of that handful of men who had conquered a formidable planet for mankind. He thought of them now, of the men who on an antediluvian *Hius* a photon tub with a single layer of mesosubstance on the

reflector-pierced the Venusian atmosphere and in the primordial black sand-wastes discovered a uranium Golconda- the spot where a mammoth meteorite of anti-substance had hit the planet.

Zhilin knew other remarkable spacemen of course. For instance, the test flyer Vasily Lyakhov who had lectured on the theory of photon propulsion to the third- and fourth-year students. He organised a three-month practical course on Spu-20 for last-year students. Space flyers called Spu-20 the Starlet, and Zhilin found it fascinating. The first ram photon engines were tested there; robot scouts were sent from there into the zone of absolute free fall; the first astroship *Hius-Lightning* was being built there.

One day

Lyakhov took the students into a hangar. In it was a photon robot refueller which had just returned from a six-month wandering in the AFF zone. The robot had travelled away from the Sun to a distance of one light-month. It was a huge ungainly job of a surprising turquoise-green colour. The sheeting fell away in pieces when they touched it. It just crumbled away as dry bread would. But its controls were in working order, or it wouldn't have returned-like three scouts out of the nineteen sent out into the AFF zone. The students wanted to know what had happened to the robot but Lyakhov said he didn't know. "At great distances from the Sun there's something we still don't know anything about," he said. And his thoughts turned to the men who in a few years' time would steer the *Hius-Lightning* to that region where

there was something about which we didn't know anything.

Funny, thought Zhilin, I already have quite a few things to remember myself. Take that time, for instance, on a practice flight in a geodesic rocket when the engine cut dead and I plopped down with my rocket in a state-farm field near Novoyeniseisk. I wandered among the automatic HF ploughs for hours until by the evening I came across a remote control man. That night we lay in his tent watching the lights on the ploughs traverse the dark field, and when a plough chugged by, whiffs of ozone wafted to us. The man plied me with local wine and chafed me and, I still think I left him

unconvinced that space flyers do not drink. In the morning a tractor-haul came for the rocket. Iron Chen gave me a rocket, too, for failing to catapult....

Or my diploma Spu-16 Earth-Giphei Moon flight when a member of the examination panel tried to confuse us by yelling the input data in a panicky voice: "Asteroid, third magnitude, on the starboard! Rate of enclosure twenty-two!" and the like. There were six of us and we were all sick and tired of the chap, though Jan, the monitor, tried to persuade us people should be forgiven their small weaknesses. We agreed in principle but couldn't forgive that particular weakness. We all thought it was a clueless flight and none of us felt any fear when suddenly the ship went into a terrific bank under 4 G's. We scrambled into the control room, where the member of the panel was pretending the overgravity had killed him, and righted her. Then the man opened one eye and said, "Good show, space flyers," and we forgave him all his weaknesses there and then. Before him nobody had called us that in earnest, except our mothers and girl friends, but when saying, "My dear space flyer," they had a look as though they were about to burst into tears.

At that moment the *Tahmasib* was shaken with such a force that Zhilin

fell backwards, knocking his head against the bomb-rack.

"Damn," said Yurkovsky. "It may be untrivial but if the ship's going to yaw like that we won't

get much work done."

"No," said Dauge, his hand pressed to his right eye, "indeed we won't."

Apparently there were more and more large meteorites straight ahead and the cyber-navigator, on orders from the overworked meteorite finders, was jerking the ship crazily out of their paths.

"Surely not a swarm?" Yurkovsky said, clutching at the periscope frame. "Poor Varya, she doesn't like being shaken."

"Why didn't you leave her behind then?" Dauge said viciously. His right eye was swelling visibly; he fingered it, muttering something in Lettish. He was no longer squatting, but half-lying on the floor, his legs spread for better balance.

Zhilin stood upright, gripping with each hand the breech and the bomb-rack for support. Suddenly the floor fell from under his feet, then rushed up, hitting his heels painfully. Dauge groaned. Zhilin's legs buckled. Bykov's hoarse bass roared on the intercom:

"Engineer Zhilin to control room! Passengers take shelter in the acceleration absorbers!"

Zhilin raced, rolling, to the door. Behind his back Dauge said:

"Why in the absorbers?"

"Nothing doing," said Yurkovsky. Something metallic rattled across the floor. Zhilin dashed into the gangway. There was adventure coming.

The ship was being tossed about like flotsam on choppy seas. Zhilin ran along the gangway in a forced zigzag, thinking; That one's past, and that, and that too, they'll all go past.... Then there was a sharp hissing behind him, incredibly loud. He backed against the wall and spun round. In the empty gangway ten paces away there was a dense cloud of white vapour exactly like that which is observed when a bottle of liquid helium bursts open. The hissing soon stopped. The air was icy-cold. "Hit us, the bastard," Zhilin said and tore himself from the wall. The white cloud crept after him, slowly settling.

It was very cold in the control room, and Zhilin saw rainbow-coloured hoarfrost on the walls and the floor. Mikhail Antonovich, his neck purple, sat at the computer, reading a tape. Bykov was not in sight.

"Another hit?" the navigator called in a thin voice.

"Where the dickens is that engineer?" Bykov boomed from behind the casing.

"Here," said Zhilin.

He ran across the control room, which was slippery with hoarfrost. Bykov popped out to meet him, his red hair standing on end.

"To the reflector control," he said.

"Aye, aye," said Zhilin. "Navigator, any gaps?"

"No. Same density all round. Bad luck...." "Cut off the reflector. I'll try to get through on the emergency engines."

Mikhail Antonovich swivelled hurriedly in his chair to the control panel behind him. He put his hand on the keyboard and said:

"Perhaps we could--"

He did not finish. Terror distorted his face. The panel with the keyboard bent, then straightened again and slid noiselessly to the floor. Zhilin heard him scream and ran in confusion from behind the casing. On the wall, clutching at the soft panelling, sat Varya, Yurkovsky's pet, a five-foot-long Martian lizard. The exact replica of the control panel was already fading off her body, but on her horrible triangular muzzle, a red hold lamp was still flickering, on and off. Mikhail Antonovich stared at the patterned monster, sobbing and holding his hand to his heart.

"Shoo!" Zhilin yelled; Varya darted aside and disappeared.

"I'll kill her," Bykov growled. "Zhilin, to your station, damn it."

Just as Zhilin was turning the <i>Tahmasib</i> was hit real hard.

J-STATION, AMALTHEIA

The water-carriers talk about hunger while the nutrition engineer is ashamed of his cuisine.

After supper Uncle Hoak entered the rest-room and said, without looking at anyone:

"I need some water. Any volunteers?"

"Yes," said Kozlov.

Potapov looked up from the chess-board and also said yes.

"Why, yes," said Kostya Stetsenko.

"May I come too?" Zoya Ivanova asked in a thin voice.

"You may," Uncle Hoak said, staring at the ceiling. "So I'll be waiting for you."

"How much water do you need?" asked Kozlov.

"Not much," said Uncle Hoak. "About ten tons."

"Right-o," said Kozlov. "We're going straight away."

Uncle Hoak went out.

"I'll go with you," said Gregor.

"You better stay behind and think over your next move," Potapov advised. "It's your turn. You always take half an hour over every move."

"Never mind," said Gregor. "I'll have time enough to think."

"Galya, will you go with us?" asked Stetsenko.

Galya was reclining in a chair in front of the magnetovideophone. She lazily responded:

"I don't mind."

She stood up and stretched luxuriously. She was twenty-eight years old, tall, dark and handsome. The most beautiful woman of the station. Half of the boys were in love with her. She was in charge of the astrometrical observatory.

"Come on," Kozlov said, buckling on his magnetic boots and making for the door.

They first called at the, stores for fur jackets, electric saws and a self-propelled platform which was to take them to the Ice Grotto. That was the name by which the place where the station got water for all its needs was known. Amaltheia-a somewhat flattened sphere with a diameter of eighty-two miles-is completely composed of ice. It is ordinary water ice, the same as on the Earth, only its surface is sprinkled with meteoric dust and fragments of rock and iron. There was no lack of explanations of this

ice planet's origin. Some people with little knowledge of cosmogony believed that it was the water envelope of some planet which had neared Jupiter closer than was good for it and got it torn off its back; others were inclined to explain the fifth satellite as a result of the condensation of water crystals; still others claimed that Amaltheia did not belong to our galaxy at all, but had wandered out of interstellar space and been captured by Jupiter. But anyway, an unlimited store of water ice, theirs for the hacking, came in very handy to the station's personnel.

The platform ran the length of the bottom tier and stopped in front of the wide gate of the Ice Grotto. Gregor jumped down, went up to the gate and, screwing his eyes short-sightedly, searched for the button lock.

"Lower, lower, you blind owl," said Potapov.

Gregor pressed the button and the gate slid open. The platform ran inside. The place did look like an ice grotto, a tunnel hacked in solid ice. It was lit by three gas-filled tubes, whose light was reflected sparkling from the walls and ceiling, the whole giving the effect of a many-chandeliered ball-room.

There was no magnetic floor, which made walking difficult, and it was intensely cold.

"Ice," said Galya, looking round her. "Just like back on the Earth."

Zoya shivered, pulling her fur jacket tighter round her.

"Looks like Antarctica to me," she muttered.

"I've been to Antarctica," Gregor declared, "Where haven't you been!" said Potapov. "You've been everywhere."

"Come on, boys, let's start," Kozlov ordered. The boys took the saws, went to the far wall and started sawing blocks of ice. The saws went into the ice like hot knives into butter. Ice sawdust sparkled in the air. Zoya and Galya came closer.

"Let me have a go," Zoya asked, looking at Kozlov's bent back.

"No," he said without glancing back. "It'll hurt your eyes."

"Just like snow back on the Earth," Galya said, placing her hand in the stream of ice dust.

"Plenty of that stuff anywhere," said Potapov. "Take Ganymede-any amount of snow there." "I've been to Ganymede," Gregor declared. "You'd drive anyone mad," said Potapov. He switched off his saw and pushed a cube of ice weighing at least a ton away from the wall. "There you are."

"Cut it in pieces," advised Stetsenko. " ' <i>'</i> "No, don't," said Kozlov.

He, too, switched off his saw. "On the contrary," and he gave his huge block of ice a strong push so that it glided slowly towards the exit. "On the contrary--it's easier for Hoak when the blocks are large."

"Ice," said Galya. "Just like on the Earth. I think I'll be coming here often after work now."

"Are you missing the Earth very much?" Zoya asked timidly. She was ten years younger, worked as assistant at the astrometrical observatory and felt shy in front of her chief.

"Yes," said Galya. "Missing the Earth in a general way, Zoya darling, but above all longing to sit on grass, stroll in a park, go to a dance.... Not our airy exercises but an ordinary waltz. And to drink out of ordinary glasses instead of those stupid squeezies. And wear a dress instead of trousers, I'm missing an ordinary skirt terribly."

"So am I," said Potapov.

"Nothing like a bit of skirt," said Kozlov.

"You wits," said Galya.

She picked up a piece of ice and threw it at Potapov. Potapov jumped out of its way, hit the ceiling and bounced back on Stetsenko.

"Easy there," Stetsenko said angrily. "Or you'll get sawn in two."

"Looks like enough," said Kozlov. He had just heaved off a third block. "Load up, boys."

They loaded the ice on to the platform, then Potapov seized Galya with

one arm and Zoya with the other and without warning tossed both on top of the neat pile of ice blocks. Zoya gave a little shriek and clutched at Galya. Galya laughed.

"Come on," Potapov yelled. "There'll be a bonus from Hoak-a plate of chlorella soup each."

"I won't be the one to turn it down," Kozlov muttered.

"You've never turned a plate of soup down yet," said Stetsenko. "Still less now when we're hungry... ." The platform rolled out of the Ice Grotto and Gregor closed the gate.

"Hungry, did you say?" Zoya contributed from high up the ice mound. "Why, I read a book about the war with the fascists the other day- people were really hungry then. In Leningrad when it was besieged."

"I've been to Leningrad," declared Gregor.

"We get chocolate," Zoya went on, "and they were issued five ounces of bread a day. And what bread! Sawdust-half of it."

"Not sawdust, really," said Stetsenko.

"But it was."

"Chocolate or no chocolate," said Kozlov, "we'll be in a tight fix if the <i>Tahmasib</i> doesn't arrive."

He was carrying his electric saw on his shoulder-like a rifle.

"But she will," Galya said with conviction. She jumped down from the platform and Stetsenko hastened to catch her. "Thanks, Kostya. She certainly will, boys."

"Still I think we should suggest to the chief he cut the rations again," said Kozlov. "At least for the men."

"What nonsense," said Zoya. "I've read women endure hunger much better than men."

They walked behind the slowly moving platform.

"Women do," said Potapov. "But not kids."

"Isn't he witty," said Zoya.

"No, really, boys, I mean it," said Kozlov. "If Bykov isn't here tomorrow we ought to drum up everybody and suggest cutting the rations."

"Well," said Stetsenko. "I don't think anyone's going to object."

"I won't," declared Gregor.

"That's good," said Potapov. "I was just thinking what was to be done if you did."

"Greetings to the water-carriers," Astrophysicist Nikolsky said, passing by.

Galya said angrily:

"Shame on you, Kozlov, and on all of you. I don't understand how you can worry about your bellies so blatantly-as if the <i>Tahmasib</i> were a robot with not a man on board."

Even Potapov flushed and was stumped for a reply. The rest of their way to the galley they covered in silence. Uncle Hoak was sitting gloomily at the huge ion exchanger they used to purify the water. The platform stopped at the entrance.

"Unload it," Uncle Hoak said, looking at the floor. It was unusually quiet, and cool, and odourless in the galley, which was more than Uncle Hoak could bear.

In silence the blocks of ice were unloaded and thrust into the jaws of the water-purifier.

"Thanks," Uncle Hoak said, still not looking up.

"You're welcome, Uncle Hoak," said Kozlov. "Come on, boys."

In silence they headed for the store and in silence they went back to the rest-room. Galya picked up a book and settled down into her chair in front of the magnetovideophone. Stetsenko hovered irresolutely near by, glanced at Kozlov and Zoya who sat at their table again (Zoya was studying by correspondence at a power institute and Kozlov was helping her), then heaved a sigh and shuffled away to his room. Potapov said to Gregor:

"Come on now-it's your move."

CHAPTER TWO

MEN ABOVE THE ABYSS

1. The captain breaks bad news while the engineer is being brave.

Apparently a large meteorite had hit the reflector, at once breaking the symmetry of thrust distribution on the surface of the paraboloid and sending the *Tahmasib* into a frenzied spin. In the control room Captain Bykov

alone did not lose consciousness. To be sure he had knocked his head hard against something, then his side, and been completely winded for a while, but he had managed to retain his hold on the chair against which the first shock had hurled him and he had been clutching, crawling, reaching out until at last he reached the control panel. All was revolving round him at an incredible speed. Zhilin dropped from somewhere up above and flew past him, his arms and legs thrust out, with not a bone whole, it seemed to Bykov. Then he bent his head over the panel and, taking a careful aim, jabbed his finger at the key he wanted.

The cyber-navigator fired the emergency hydrogen engines and Bykov felt another jerk as if he were in a train stopped at full speed-only much more violent. He'd been bracing against the impact for all he was worth and so he was not pitched out of his seat. But for a moment all went dark in front of his eyes, and his mouth was full of chipped-off tooth enamel. The

Tahmasib

righted herself out. Then he steered her straight through the cloud of rock and iron gravel. Blue flashes churned on the screen of the forward scanner. There were many of them, far, far too many, but the ship no longer yawed: the meteorite device was switched off and the cyber held a true course. Above the noise in his ears Bykov heard hissing sounds several times and was enveloped by icy vapours, but he only drew in his head and bent lower over the control panel. Once something burst behind him, scattering fragments. Presently there were fewer flashes on the screen, then none. The meteoric attack was over.

Bykov glanced at the course plotter. The *Tahmasib* was falling. She was

falling through Jupiter's exosphere in a narrowing spiral at a speed which was much slower than the orbital. She'd lost speed during the meteoric attack. A ship always loses her speed in such cases through changing her course. This is what happens during the routine Jupiter-Mars and Jupiter-Earth flights which take ships through the asteroid belt. But there it's not dangerous. Here, over Jupe, loss of speed spells certain destruction. The ship will be burnt up in the denser layers of the monster planet's atmosphere. That's what happened to Paul Danget ten years before. And if she doesn't burn up she will fall into the hydrogen abyss from which there is no return. That's what probably happened to Sergei Petrushevsky early this year.

Only a photon engine could effect a pull-away. Quite mechanically Bykov pressed the ribbed key of the starter. But not a single lamp flashed on the control panel. The reflector was damaged and the auto-emergency device had blocked an unreasonable order. This is the end, thought Bykov. He turned the ship in a tidy manoeuvre and switched the emergency engines to full blast. A load of 5 G's pressed him into the chair. That was the only thing he could do in the circumstances: reduce the speed of fall to a minimum to prevent her from burning up. For thirty seconds he sat immobile, staring at his hands, which appeared increasingly dropsical with overload. Then he cut the fuel and the overload was gone. The emergency engines would go on braking-as long as there was fuel. But there wasn't much. There had never been a case

of emergency engines saving anyone over Jupiter. Over Mars, Mercury or Earth, possibly. But never over that monster.

Bykov heaved himself up and looked beyond the panel. On the floor among plastic fragments lay the navigator, stomach up, looking like a man drowned.

"Misha," Bykov called in a whisper. "You all right, Misha?"

There was a scraping sound and Zhilin crawled on all fours from under the reactor casing. He, too, seemed to be in a bad way. He stared dazedly at the captain, the navigator and the ceiling, then sat up and crossed his legs.

Bykov clambered out of his seat and sank on his haunches beside the navigator, bending his knees with an effort. He touched the man's shoulder and called again:

"You all right, Misha?"

The navigator winced and, without opening his eyes, licked his lips.

"Alexei, old chap," he said in a weak voice.

"Any pain?" Bykov asked and started feeling all over the navigator.

"Ugh!" the navigator said and opened his eyes wide.

"And here?"

"U-ugh!" the navigator said in a painful voice.

"And here?"

"Oh, stop it," the navigator said and sat up, propping himself with his hands. His head lolled to his shoulder. "Where's Ivan?" he asked.

Bykov looked round but couldn't see Zhilin.

"Ivan," Bykov called softly.

"I'm here," Zhilin responded from behind the casing. They heard him drop something and swear under his breath.

"Ivan's all right," Bykov told the navigator.

"That's good," Mikhail Antonovich said and, clutching the captain's shoulder, got up.

"How do you feel, Misha?" asked Bykov. "In condition?"

"In condition," the navigator said uncertainly, Still clutching him. "Looks like I am."

He looked at Bykov with an air of surprise and said:

"What a cat of nine lives man is, eh? Still alive. ..."

"Hm," Bykov said vaguely. "Still alive. Look, Mikhail..." he said and paused. "Things're bad with us. We're falling, old man. If you are in condition, sit down to it and do a little computing- see how things stand. The computer seems intact," he threw a glance at the machine. "But you'd better see for yourself."

Mikhail Antonovich's eyes became round.

"Falling?" he said. "Are we? Falling. On Jupiter?"

Bykov nodded.

"Well, well, well," said Mikhail Antonovich. "Just imagine that! O.K. Just a second. I'll be at it in a second."

He stood for a while, wincing and jerking his head, then let go of the captain and, clutching at the edge of the control panel, hobbled to his place.

"I'll do the computing," he mumbled. "Right away."

Bykov watched him sink into his chair, his hand pressed to his side, then settle more comfortably, grunting and sighing. The chair was bent and sagged to one side. When quite comfortable, Mikhail Antonovich shot his eyes at Bykov and said in alarm:

"But you've braked, old chap, haven't you?"

Bykov nodded and went to Zhilin over the scattered debris crunching underfoot. On the ceiling he noticed a black spot and another one right where a wall joined it. They were meteoric holes filled in with synthetic resin. Large drops of condensed water trembled round the spots.

Zhilin was sitting cross-legged in front of the reflector control combine. Its casing was split in two, its innards looking anything but encouraging.

"How're things?" Bykov asked, though he could see for himself.

Zhilin raised a swollen face.

"Don't know all the details yet," he said. "But it's smashed all right."

Bykov squatted by his side.

"One meteoric hit," said Zhilin. "And twice I barged into this," with his finger he pointed but it was obvious where he meant anyway. "Feet first at the very beginning and head first at the very end."

"I see," said Bykov. "No apparatus could have stood that, of course. Rig up the spare. And another thing-we're falling."

"I heard you first time, Alexei Petrovich," said Zhilin.

"Come to that," Bykov said musingly, "what's the use of a control combine if the reflector's smashed."

"But what if it isn't?" said Zhilin.

Bykov smiled at him wryly.

"That merry-go-round," he said, "can have either of two explanations. Either for some reason the plasma burning point jumped out of focus or a large piece of the reflector broke off. I think it's the reflector because nobody could have shifted the burning point. But you go on all the same- rig up the spare set."

He rose and threw back his head to examine the ceiling.

"Must patch up the holes better," he said. "Pressure's high down there-might force the resin out. Well, I'll see to it."

He turned to go but halted and said:

"Not afraid, are you, youngster?"

"No," said Zhilin.

"Good. Carry on," said Bykov. "I'll make a round of her and then there're passengers to be hauled out of the acceleration absorbers."

Zhilin didn't say anything. He watched the captain's broad stooped back out of sight and then suddenly at arm's length saw Varya. She stood upright, her prominent eyes winking slowly. She was white-specked blue all over and the bosses on her muzzle stuck out in a terrifying manner. That meant she was very much annoyed and feeling unwell. Zhilin had once seen her in that state before. That had been a month ago on the Mirza-Charle spacedrome when Yurkovsky harangued them on the amazing adaptability of Martian lizards and to prove it dipped Varya into a tank of boiling water.

Varya opened her huge grey Jaws in a spasm and then snapped them shut.

"Well, how about you?" Zhilin said softly. A heavy drop tore off the ceiling and smack! hit the burst combine casing. Zhilin looked up. High pressure down there. Yes, he thought, tens and hundreds of thousands of atmospheres. The resin stoppers would certainly get forced out.

Varya stirred and opened her jaws again. Zhilin rummaged in his pocket, found a biscuit and tossed it into the yawning mouth. Varya swallowed slowly and stared away glassily. Zhilin sighed.

"You poor beast," he said softly.

2. The planetologists keep guilty silence while the radio astronomer sings a song about swallows

As soon as the *Tahmasib* stopped somersaulting Dauge disengaged himself

from the breech and pulled the unconscious Yurkovsky from under bits of smashed equipment. He hadn't stopped to see what was smashed and what wasn't, but noticed that plenty was, that the bomb-rack was all bent and the control panel of the radiotelescope buried under bomb-cases. It was hot in the bay and there was a pungent smell of something burnt.

He had got off fairly lightly. The moment the ship was hit he clutched bulldog-like at the breech until blood seeped under his nails and was worse off only by a splitting headache now. Yurkovsky's face was ashen and his lids lilac. Dauge blew into his face, shook him by the shoulders, slapped

his cheeks. Yurkovsky's head was lolling and he showed no signs of coming to. Then Dauge dragged him to the sick bay. In the gangway it was terribly cold, with hoarfrost sparkling on the walls. Dauge put Yurkovsky's head in his lap, scraped a little hoarfrost off a wall and pressed it to his temples. That was where the step-up in acceleration found him. Dauge lay flat, but felt so bad that he turned on his stomach and rubbed his face against the hoarfrosted floor. After the acceleration was off Dauge lay a little longer, then struggled up and, seizing Yurkovsky under the arm-pits, dragged him, backing, farther. But he soon realised he wouldn't make it to the sick bay, so he dragged Yurkovsky into the mess room and on to a sofa, and plopped down at his side, grunting and catching breath. Yurkovsky was wheezing horribly.

Having recovered a little, Dauge got up and went to the sideboard. He took a jug of water and drank from it. Water trickled down his chin and throat and he found it most pleasant. Then he went back to Yurkovsky and sprinkled his face. He put the jug down on the floor and unbuttoned Yurkovsky's jacket. There was a strange pattern of winding lines running across his chest from shoulder to shoulder. The pattern looked like a bunch of seaweeds-purplish against the sun-tanned skin. For some time Dauge stared, understanding nothing, then all of a sudden it struck him that it was the mark of a violent electric shock. Apparently Yurkovsky had fallen on some bare contacts under high voltage. Dauge ran to the sick bay.

He had made four injections altogether before Yurkovsky at last opened his eyes. They were dull and glassy but Dauge was overjoyed.

"You gave me quite a turn, Vladimir," he said with relief. "I thought things were really bad. Well, can you get up now?"

Yurkovsky moved his lips, opened his mouth and wheezed again. His eyes assumed meaning, his brows pressed together.

"There, there, don't move," said Dauge. "You'd better stay on your back for a while."

He turned and saw Charles Mollard in the doorway. He was swaying, steadying himself against the jamb. His face was red and swollen, and he was dripping wet and festooned all over with something white and worm-like. Dauge even fancied that he was steaming. For a few minutes Mollard did not say a word, shifting his sad eyes from Dauge to Yurkovsky and back, while the planetologists stared in confusion at him. Yurkovsky even stopped wheezing. Presently Mollard swayed forward, stepped over the coaming and went straight to the nearest chair. He looked wet and miserable and when he sat down a tasty smell of boiled meat filled the room. Dauge sniffed.

"Soup?" he enquired.

<i>"Oui, monsieur," Mollard confirmed sadly. "Vermicelli soup."

"And how's the soup? Good?" asked Dauge.

"Good," said Mollard and started picking vermicelli off himself.

"I like soup very much," Dauge explained. "And I always ask how it is."

Mollard sighed and smiled.

"No more soup," he said. "It was very hot soup. But the water was no longer boiling."

"Good God," said Dauge, who couldn't help bursting into laughter. Mollard laughed with him.

"Yes," he shouted. "It was very funny but not comfortable and the soup is all gone."

Yurkovsky wheezed. His face contorted and flushed purple. Dauge looked at him with alarm.

"Voldemar knocked badly?" asked Mollard.

Craning his neck he glanced at Yurkovsky with mixed fear and curiosity.

"Voldemar had an electric shock," said Dauge. He was no longer grinning.

"But what happened?" said Mollard. "It was so uncomfortable...."

Yurkovsky stopped wheezing, sat up and, baring his teeth horribly, began searching in his breast pocket.

"What's up, Vladimir?" Dauge asked, at a loss.

"Voldemar can't speak," Mollard said softly.

Yurkovsky nodded rapidly, got his fountain-pen and pad out and began writing, his head jerking.

"Don't upset yourself so, Vladimir," Dauge mumbled. "It'll be all right in no time."

"Yes," Mollard confirmed. "I had the same experience. It was high voltage and I was all right very soon."

Yurkovsky gave the pad to Dauge, lay back and shut his eyes.

"'Can't speak'," Dauge made out with difficulty. "Don't worry, Vladimir, it'll pass." Yurkovsky jerked impatiently. "Well, just a moment. 'What about Alexei and the pilots? And the ship?' "

"I don't know," Dauge said in confusion and glanced towards the control room. "Hell, I forgot everything."

Yurkovsky jerked his head and also looked at the door.

"I'll find out," said Mollard. "I'll find out everything."

He rose from his chair, but at that moment the manhole to the control room was opened and in strode Captain Bykov, huge, dishevelled, with a violently purple nose and a black right eye. He measured them all with his small, irate eyes, went up to the table, put his fists on it and asked:

"Why are the passengers not in their acceleration absorbers?"

It was said very quietly, but in a tone that instantly wiped off Mollard's happy smile. A tense silence descended. Dauge smiled a small awkward smile and looked aside, and Yurkovsky again shut his eyes. Things look bad, thought Yurkovsky. He knew his Bykov.

"When are we going to have discipline on board this ship?" Bykov said.

The passengers were silent.

"You kids," Bykov said in disgust and sat down. "It's a madhouse. What's happened to you, Monsieur Mollard?" he asked in a tired voice.

"It's the soup," Mollard said readily. "I'll go and clean myself at once."

"Wait a minute, Monsieur Mollard," said Bykov.

"Where ... where are we?" Yurkovsky wheezed out.

"We're falling," Bykov said briefly.

Yurkovsky started and sat up.

"Where ... where to?" he asked.

"Into Jupiter," said Bykov. He was not looking at the planetologists. He was looking at Mollard. He felt sorry for him. It was his first real space flight and he was eagerly expected at Amaltheia as a first-class radio astronomer.

"Oh," said Mollard. "Into Jupiter?"

"That's right," Bykov said and paused, feeling the bump on his forehead. "The reflector's smashed. Its control is smashed too. There are eighteen holes in the ship."

"Are we going to burn up?" Dauge asked quickly.

"Don't know-Mikhail's figuring it out. It's possible we aren't."

He fell silent. Mollard said:

"I'll go and clean myself."

"Wait a minute, Charles," said Bykov. "I wonder whether I made myself sufficiently clear, Comrades? We are falling into Jupiter."

"We understand," said Dauge.

"We'll be falling into Jupiter all our lives," said Mollard. Bykov glanced at him sharply sideways.

"Well said," said Yurkovsky.

"C'est un mot," said Mollard. He was smiling happily. "May I ... may I

go and clean myself nevertheless?"

"Yes, go," Bykov said slowly.

Mollard went out. They all watched him go. Then they heard him start up a song in the gangway, in a weak but pleasant voice.

"What is he singing?" asked Bykov. Mollard had never sung before.

Dauge listened and then translated:

" 'Two swallows kiss each other outside the window of my spaceship. In the void. How did they get there? They love each other dearly and they ripped it there to admire the stars. Tra-la-la. But what do you care?' Or something like that."

"Tra-la-la," Bykov said musingly. "Damn good!"

"You tr-tr-translate m-m-masterfully," said Yurkovsky. "Ripped it there. P-p-piece of art."

Bykov threw an astonished glance at him.

"What's that, Vladimir?" he asked. "What's happened to you?"

"St-st-stutterer for the r-r-rest of my life," Yurkovsky replied with a crooked smile.

"He's had an electric shock," Dauge said quietly.

Bykov pursed his lips.

"Well, cheer up," he said. "We've been through worse scrapes."

But he knew they'd never had it so bad before -neither he nor the planetologists. Through the half-open manhole came Mikhail Antonovich's voice:

"I'm ready, Alexei."

"Come in here," said Bykov.

Mikhail Antonovich, fat and scratched, rolled into the mess room. The upper portion of his body was stripped bare and glistening with sweat.

"Br, isn't it cold?" he said, clasping his fat chest with his pudgy hands. "But it's terribly hot in there."

"Fire away, Mikhail," Bykov said impatiently.

"But what's happened to Vladimir?" the navigator asked in a frightened voice.

"Come on," said Bykov. "He's had an electric shock."

"And where's Charles," the navigator asked, sitting down.

"Charles is alive and kicking," Bykov said, hardly able to control himself. "So's everybody. Come on, out with it."

"Thank God," said the navigator. "Well, boys. I've done a little computing and here's what it adds up to. The <i>Tahmasib</i> is falling and we

haven't enough fuel to pull her out."

"Clear as noonday," Yurkovsky said almost without stuttering.

"Not enough fuel. The photon reactor could do that but it seems the reflector is smashed. But we have enough fuel for braking. So I've drawn up a programme. We're not going to burn up provided the generally-recognised theory of Jupiter's structure is correct."

Dauge wanted to say there was no generally-recognised theory of Jupiter's structure and never had been, but desisted.

"We're already braking quite well," went on Mikhail Antonovich. "So I believe we'll have a safe fall. Beyond that nothing can be done, boys." Mikhail Antonovich smiled guiltily. "Unless, of course, we repair the reflector."

"There are no repair stations on Jupiter," Bykov said in a croaking voice. "Any theory on Jupiter will tell you that." He wanted them to understand. To understand right and thoroughly. It still seemed to him they didn't.

"Which theory do you take as generally recognised?" asked Dauge.

Mikhail Antonovich shrugged a plump shoulder.

"Kangren's theory," he said.

Bykov looked at the planetologists in expectation.

"Well," said Dauge. "Might as well take Kangren's."

Yurkovsky was staring at the ceiling.

"Look here, planetologists," Bykov tackled them. "What's waiting for us down there? Can you tell us that, experts?"

"Why, of course," said Dauge. "We'll tell you that pretty soon."

"When?" Bykov said, brightening.

"When we are down there," Dauge said and grinned.

"Planetologists!" said Bykov. "Some experts!"

"It could be calculated," Yurkovsky said, still staring at the ceiling. He spoke slowly, almost without a stutter. "Let Mikhail calculate at what depth the ship will stop falling and hang in balance."

"That's interesting," said Mikhail Antonovich.

"According to Kangren, pressure inside Jupiter is increasing fast. What you should calculate, Mikhail, is the eventual depth of immersion, pressure, pull of gravity."

"Yes," said Dauge. "What will the pressure be? Perhaps we'll just be flattened."

"Hardly," Bykov growled. "We can bear two hundred thousand atmospheres. And the photon reactor and the hydrogen engines even more."

Yurkovsky sat up, crossing his legs.

"Kangren's theory is as good as any," he said. "It will give you the order of magnitude." He looked at the navigator. "We could do it ourselves but you've got the computer."

"Of course," said Mikhail Antonovich. "What's there to discuss? Of course I'll do it, boys."

Bykov said:

"Mikhail, get the programme for me, will you, and then feed it into the cyber."

"I've fed it in, Alexei old chap," the navigator said guiltily.

"Aha," said Bykov. "Well, all right." He rose. "There you are. It's all clear now. We won't be crushed, of course, but neither will we ever come back. Let's face it. Well, we're not the first. An honest end to an honest life. Zhilin and I are going to tinker a little with the reflector, but it's so-" he made a wry face and twitched his swollen nose. "What will you be doing?"

"Observing," Yurkovsky said harshly. Dauge nodded.

"Very good." Bykov threw a searching glance at them. "I want to ask you something. Look after Mollard."

"Yes, of course," said Mikhail Antonovich. "He's new to it and ... well, all sorts of things happen ... you know."

"All right, Alexei," Dauge said, smiling cheerfully. "Don't worry. We'll look after him."

"So that's that," said Bykov. "You, Misha, go to the control room and do all the calculations that are needed, while I hop over to the sick bay for a massage. I've had my side knocked about rather badly." Leaving, he heard Dauge say to Yurkovsky:

"In a certain sense we've been lucky, Vladimir, we'll see something nobody's seen before. Let's go and do the repairs."

"Y-yes, c-come on," said Yurkovsky. Well, you won't fool me, thought Bykov. You still don't understand. You still have hope. You think Alexei will pull you out of this hydrogen tomb just as he pulled you out of Golconda's black sands and rotten swamps. That's what Dauge thinks anyhow. But Alexei won't. Or will he?

In the sick bay, breathing through nostrils extended with pain, Mollard was smearing himself with thick tannic ointment. His face and arms were lobster-red and shiny. Catching sight of Bykov he smiled amiably and struck up his song about the swallows. He was almost calm now. Had he not started his song Bykov would have been sure he was really calm. But Mollard was singing in a voice that was over-loud and deliberate, hissing with pain every now and then.

3. The engineer reminisces while the navigator advises shutting off memory.

Zhilin was repairing the reflector control combine. It was hot and stuffy and he thought the ship's air conditioners must have broken down but he had no time or wish to see to them. At first he threw off his jacket, then his overalls, and remained in shorts and shirt. Varya settled promptly on the discarded overalls and soon was invisible, save for her shadow and her prominent eyes, which flashed into presence sometimes.

Zhilin was getting out of the torn casing plastic-metal printed circuits, sounding the good ones, putting aside those that were cracked and replacing them by spares. He worked steadily and unhurriedly as during a repairs test, because he had all the time he needed and because anyway it would probably be to no purpose. He tried not to think of anything and was happy he remembered the general scheme quite well, enough to avoid consulting the servicing volume more than a couple of times, and that he'd been knocked about not so badly after all and there were only scratches on his head. Behind the photon reactor casing the computer buzzed, Mikhail Antonovich rustled paper and hummed to himself something unmelodious. He always hummed something to himself when working.

I wonder what's he doing now, thought Zhilin. Or perhaps he's just trying to keep his mind busy. It's great to be able to pick up work at a time like this. The planetologists are also working now most likely, dropping bomb-probes. So I haven't seen a stick of probes go off after all. Or a lot of other things either, for that matter. They say, for instance, Jupe's a smashing sight from Amaltheia. And I always wanted to go on an astral trip or a pathfinder expedition to another planet to search for signs of beings from outer worlds. And then they said there were some nice girls on the J-stations and I wanted to meet them to have something to brag about to Perez Junto-he's been assigned to lunar routes and is happy about it too, rum sort as he is. Funny the way Mikhail Antonovich is singing out of tune-as if on purpose. He's married and has two children, no, three, and the eldest, a girl, is sixteen; he's been promising to introduce me and winking raffishly every time, but that is not to happen. Nor a lot of other things.

Father will be terribly upset-that's bad. Just my rotten luck that it should have happened on my first independent trip. It's a good thing she and I have drifted apart, it suddenly occurred to him. Altogether easier. It's much harder, say, for Mikhail Antonovich. Or for the captain. The captain's wife's beautiful and clever, likes a laugh, too. When she was seeing him off she didn't seem worried at all, or perhaps she was, but didn't show it, though I rather thought she wasn't, being used to it. You get used to anything. I for one got used to acceleration, though at first felt suicidal and even expected they'd transfer me to the Ground Control Department. It was called "joining the girls", the Department being mostly female, and considered a disgrace. Nobody was quite sure why though, for the girls were good company and later worked at the various Spu's and stations and bases on other planets, giving a very good account of themselves. Better than boys sometimes. Anyway, thought Zhilin, it's a good thing we've drifted apart. Just imagine what she'd be thinking now. And he stared meaninglessly at the cracked circuit he was holding in his hand.

We kissed in the Bolshoi Park and then on the embankment under some white statues, and then I saw her home and we kissed more in the entrance hall of her block of flats and people kept going up and down all the time despite the late hour. She was afraid her mother might appear any moment and ask her what she thought she was doing there and who that young man was. That was in summer, during the white nights. Then I came for my winter vacation and we met again, and it was like that first time, only there was snow in the park and bare branches stirred in the grey low sky. Her lips were soft and warm and I remember I told her I found kissing more of a winter occupation. Gusts of wind showered snow on us until we felt quite frozen and ran for warmth and shelter to a cafe in the Street of Spacemen. I remember how happy we were to find it empty. We settled at a window and watched the cars sweep by outside. I betted her I knew all the car makes and

lost: a flash low-seated job pulled up at the kerb which I couldn't name. I went outside to enquire and was told it was a Golden Dragon, the new Chinese atom-powered car. The stake was three wishes for the winner. It seemed then that it would be like this always, in winter and in summer, on the embankment under the white statues and in the Bolshoi Park, and in the theatre where she looked breathtakingly beautiful in her black dress with a white collar and was nudging me all the time so I wouldn't laugh so loud. But one day she didn't turn up and I made another date by videophone. And she didn't come again, and she didn't answer my letters when I went back to the School. I still wouldn't take it. I kept sending her long and foolish letters, though I didn't know at the time they were foolish. A year later I saw her in our club. She was with another girl and didn't recognise me. I felt then life was over for me, but it wore off by the end of my fifth year and I can't even understand why I should be remembering all this now. Probably because it doesn't matter any longer. Yes, I think I wouldn't want to be reminiscing otherwise. ...

The hatch clanged. Bykov's voice said:

"How're things, Mikhail?"

"Finishing the first spiral, Alexei. Dropped three hundred miles."

"Well..." Zhilin heard somebody kick plastic fragments along the floor.

"And of course no communication with Amaltheia?"

"The receiver's dead," said Mikhail Antonovich and sighed. "The transmitter's working but there are such radio storms here...."

"What about your calculations?"

"Almost finished. We'll drop something in the order of four thousand miles and then hang, it appears. Floating, as Vladimir says. The pressure'll be terrific but not big enough to crush us-that's clear. It will be big enough, however, to make it hard for us, with a load of anything up to 2.5 G's."

"Hm," said Bykov. For a while he was silent, then said, "Have you got any idea?"

"Pardon?"

"I say, have you got any idea-how to get out of it?"

"Why, no, old chap," the navigator said gently, almost ingratiatingly.

"How could I. It's Jupiter. Why, I have never even heard about anybody ever ... getting out of here."

A long silence descended. Zhilin began working again, quickly and noiselessly. Then Mikhail Antonovich said in a rush:

"You stop thinking about her, old chap. Much better not to, or you start feeling so rotten, really...."

"But I'm not," Bykov said in a grating voice. "And you'd be well advised not to. Ivan!" he yelled.

"Here," Zhilin called back and started working urgently. "Still at it?" "Finishing soon," he said.

He heard the captain coming across to him, kicking plastic fragments out of his path.

"Litter everywhere," Bykov was muttering. "A real pigsty." -He emerged from behind the casing and squatted beside Zhilin.

"I'm finishing," Zhilin repeated. "Taking your time about it, aren't you," Bykov growled.

He grunted and started emptying the spare blocks out of the kit on to the floor. Zhilin shifted a little to make more room for him. They were both big and broad, and there was really not quite enough elbow-room for both of them in the space in front of the combine. They worked silently and rapidly, and soon heard Mikhail Antonovich start his computer again and then begin humming to himself.

When they were through Bykov called out:

"Mikhail, come here, will you."

"He straightened up and wiped sweat off his forehead. Then he kicked aside the heap of Cracked circuits and switched on the general control. The

3D reflector scheme appeared on the screen. It was revolving slowly. "Well, well, well," said Mikhail Antonovich.

A blue graph started tick-tick-tick, unreeling slowly.

"Not too many microholes," Zhilin said quietly. "Microholes be hanged," Bykov said, made an ugly face and bent close to the screen. "Look at this bastard."

The reflector scheme was tinted blue. Now this blue was showing ragged patches of white. Those were the spots where either the mesosubstance layers were pierced or control cells smashed. There were plenty of white spots, and to one side of the reflector they ran into a big blotch of white taking up at least one-eighth of the paraboloid's surface.

"Just look at this bastard," Bykov repeated and thrust his thumb between his teeth. He was thinking.

Mikhail Antonovich shook his head and went back to his computer.

"The thing's only good for fireworks now," Zhilin muttered. He reached for his overalls, shook Varya out and pulled them on: it had got cold again. Bykov was still standing looking at the screen and biting at a nail. Presently he picked up the blue graph and ran a cursory eye over it.

"Zhilin," he suddenly said in a tense voice. "Get a couple of sigma-testers, check them and go to the air-lock. I'll be waiting for you there."

Mikhail, drop everything and start reinforcing the holes. I said drop everything." "Where're you going, old chap?" Mikhail

Antonovich asked in surprise.

"Outside," Bykov said and went out. "But what for?" Mikhail Antonovich asked, turning to Zhilin.

Zhilin shrugged. He didn't know what for. Repairing a mirror in space and in flight, without mesochemists, without huge crystallisers, without reactor furnaces, was absolutely impossible. As absolutely impossible as, say, pulling the Moon to the Earth with your bare hands. And as it was, with a corner smashed, the reflector could only impart a spinning movement to the ship. Just what it did when the thing had happened.

"Makes no sense," Zhilin said uncertainly.

He looked at Mikhail Antonovich and Mikhail Antonovich looked at him. They never said a word but all of a sudden were both in a terrible hurry. Fussily Mikhail Antonovich gathered up his sheets, saying urgently:

"You go, Vanya. You go quickly."

In the air-lock Bykov and Zhilin got into space suits and then squeezed themselves into the lift. The cab raced along the gigantic tube of the photon reactor which stringed all the ship's compartments-from the living quarters down to the parabolic reflector.

"Good," said Bykov.

"What's good?" asked Zhilin.

The lift stopped.

"It's good the lift's in order," said Bykov.

"Ah." Zhilin was disappointed.

"It might have been out of order," Bykov said sternly. "You'd have to crawl all of seven hundred feet there and then back."

They stepped out on to the upper platform of the paraboloid. The black ribbed dome of the reflector sloped in a curve from under their feet. It was enormous: 700 yards in length and 500 yards in diameter. From where they stood they could not see its edges. Poised over their heads was the huge silver disc of the cargo bay. On its sides, slung far out on brackets the hydrogen engines shot out silent furious blue flames. An awesome world gleamed eerily round them.

A bank of carroty fog stretched on their left. Far down, incredibly deep underfoot, the fog lay in fat layers of cloud with darker gaps in between. Still farther and deeper, the clouds ran together into a dense brown expanse. On their right all was enveloped in an even pink haze in which Zhilin saw suddenly the Sun-a small bright pink disc.

"Take this," said Bykov. He thrust a coil of thin cable into Zhilin's hands. "Make it fast in the lift shaft, will you," he said.

He made a noose with the other end of the cable and fastened it round his waist. Then he slung both testers round his neck and swung his legs over the railing.

"You pay it out," he said. "Here goes."

Zhilin stood against the railing, gripping the cable with both hands and watching the thick awkward figure in a bright space suit slowly disappear beyond the curvature of the dome. The suit gleamed pinkish and the ribbed dome sent off pinkish reflections too.

"Pay it out livelier," Bykov's angry voice boomed inside Zhilin's helmet.

The space-suited figure crawled out of sight and there was only the bright taut line of the cable on the ribbed surface now. Zhilin glanced at the Sun. It was veiled by haze now, sharply outlined and almost red. Zhilin looked down at his feet and saw his own blurred pinkish shadow.

"Look, Ivan," Bykov's voice said. "Look down!"

Zhilin looked. Deep down, bulging out of the brown expanse, was a colossal whitish mass looking like a monstrous toadstool. It was swelling out slowly and a pattern like a bunch of writhing snakes could be seen quivering on its surface.

"An exospheric protuberance," said Bykov. "A rare thing-as far as I know. A pity the boys aren't here to see it."

He meant the planetologists. The mass was suddenly lighted from within with trembling lilac luminescence.

"Whew, what a sight," Zhilin said involuntarily.

"Pay it out," said Bykov.

Zhilin payed out more cable without taking his eyes off the protuberance. At first it seemed to him as though the ship was going to pass through it, then he realised it would be far on the starboard. The protuberance tore off the brown mass and sailed towards the pink haze, trailing behind it a tail of yellow transparent filaments. Again a lilac glow flickered on in them and died out. Presently the protuberance was lost in the pink haze.

Bykov worked for a long time. He would return to the platform for a short rest and then crawl in a new direction. When he climbed back for the third time he had only one tester. "Dropped it," he said laconically. Zhilin payed out the cable patiently, bracing his foot against the railing. He felt quite secure in this position and could watch for sights. But nothing happened. Only when the captain climbed up for the sixth time and muttered, "That'll do," did he realise that the carroty wall on the left-Jupiter's cloudy surface -was visibly nearer.

It was clean and tidy in the control room. Mikhail Antonovich had swept it out and was sitting in his usual place, huddled in a fur jacket over his overalls. It was so cold in the room that one could see his breath. Bykov sat down in his chair, 'leaned forward, propping himself against his knees, and looked closely first at the navigator, then at the engineer.

"Have you plugged the holes tighter?" he asked the navigator.

Mikhail Antonovich nodded several times. "We've got a chance," said Bykov. Mikhail Antonovich sat up and took in a noisy breath. Zhilin swallowed. "We've got a chance," Bykov repeated. "A tiny chance. A fantastic chance." "Go on, Alexei," the navigator begged. "It's like this," Bykov said and cleared his throat. "Sixteen per cent of the reflector surface is gone. The question is: can we make the other eighty-four per cent work? Less than that in fact, because another ten percent or so is-uncontrollable, the control cells being smashed."

The navigator and engineer listened intently, craning their necks.

"The answer is we can," said Bykov. "We can try anyway. We must shift the plasma burning point so as to compensate asymmetry in the damaged reflector."

"I see," Zhilin said in a trembling voice.

Bykov threw him a glance.

"That is our only chance. Ivan and I are going to reorientate the magnetic traps. I've seen Ivan in action. You, Misha, will calculate a new position for the burning point in accordance with the pattern of the damage. You'll have that pattern straight away. It's a hell of a lot of work, but it's the only chance we've got."

His eyes were full on the navigator. Mikhail Antonovich looked up and their glances met. They understood each other immediately and completely. They understood it might be too late. That down there, where pressure was terrific, corrosion would eat into the ship's hull so that she might dissolve like a lump of sugar in boiling water before they finished. That they couldn't even hope to achieve complete compensation. That nobody had ever attempted before to steer ships with such a compensation, the engines at least one-third below rated power....

"It's the only chance we've got," Bykov said loudly.

"I'll do it, old chap," said Mikhail Antonovich. "It's not difficult to calculate a new point. I'll do it."

"I'll give you the pattern of the dead areas straight away," Bykov repeated. "And we must hurry all we can. Overgravity'll soon be on us and make all work a hundredfold harder. And if we fell too deep the reactor'd be too risky to switch-might start off a chain reaction in the compressed hydrogen..." he paused and said, "make gas out of us."

"I see," said Zhilin. He felt a terrible urge to start that very minute, at once. He liked very much that tiny fantastic chance.

Mikhail Antonovich stretched out a stumpy hand and said in a thin voice:

"The pattern, give me the pattern, Alexei."

On the emergency panel three red lights flashed on.

"There you are," said Mikhail Antonovich. "'Fuel's running out in the emergency engines."

"Never mind," Bykov said and rose.

CHAPTER THREE

MEN IN THE ABYSS

1. The planetologists play while the navigator is caught smuggling.

"Load her," said Yurkovsky.

He was hanging at the periscope, his face thrust into the suede frame cover. He was hanging horizontally, stomach down, legs and elbows spread wide, with the thick log-book and fountain-pen floating within easy reach. Mollard slid the breech open smartly, pulled a case of bomb-probes out of the rack and, pushing it this way and that, forced it into the rectangular slit of the loading chamber. The case slid slowly and noiselessly into place. Mollard closed the breech, locked it and said:

"Ready, Voldemar."

Mollard was bearing weightlessness very well. Sometimes he made rash movements and hung at the ceiling so that he had to be pulled back, and sometimes he felt like being sick, but for a man experiencing weightlessness for the first time in his life his performance was very creditable.

"Ready," Dauge said at the exospheric spectre-graph.

"Fire," ordered Yurkovsky.

Dauge pressed the trigger. They heard the deep doo-doo-doo of the breech, immediately followed by the tick-tick-tick of the spectrograph. In the periscope Yurkovsky saw white balls of fire flare up one after another and race upwards in the orange fog through which the *Tahmasib* was now

falling. Twenty balls of fire for twenty bomb-probes, each carrying a meson emitter.

"Lovely," Yurkovsky said quietly. Pressure was increasing outside. The bomb-probes were exploding closer and closer because of the greater drag.

Dauge was speaking into the dictaphone, glancing at the reference device of the spectroanalyser.

"Molecular hydrogen-eighty-one point three five, helium-seven point one one, methane-four point one six, ammonia-one point zero one.... The unidentified line is increasing.... I told them we should have an automatic reader-it's so inconvenient...."

"We're falling," said Yurkovsky. "Just look how we're falling. Methane's down to four already...."

Dauge, turning adroitly, was keeping up with the readings on the other equipment.

"So far Kangren's right," he said. "There. The bathometer's dead-at three hundred atmospheres. No more pressure readings."

"Never mind," said Yurkovsky. "Load her."

"Is it worth it?" said Dauge. "Without the bathometer synchronisation will be faulty."

"Let's try," said Yurkovsky. "Load her."

He looked back at Mollard. He was swaying against the ceiling, smiling ruefully.

"Pull him down, Grigory," said Yurkovsky.

Dauge straightened up, caught Mollard by his foot and pulled him down. "Charles," he said patiently. "Try and avoid rash movements. Thrust your toes in here and hold fast."

Mollard heaved a sigh and slid the hatch open. The spent case floated out of the chamber, hit him in the chest and rebounded towards Yurkovsky, who dodged it.

"Oh, again," Mollard said guiltily. "I am terribly sorry, Voldemar. Oh, this weightlessness."

"Go on, load her," said Yurkovsky.

"The Sun," Dauge said suddenly.

Yurkovsky plunged his face in the periscope frame. For a fleeting moment he saw a reddish disc vague against the orange fog.

"It's the last we'll see of it," Dauge said and coughed.

"You have said that three times," Mollard said, closing the breech and bending down to make quite sure he'd done a good job of it. <i>"Adieu, le soldat,"</i> as Captain Nemo used to say. But it turns out it was not the last time. I am ready, Voldemar."

"So am I," said Dauge. "But shouldn't we really call it a day?"

At that moment Bykov strode in to a loud clang of his magnetic boots.

"Knock off," he said morosely.

"But why?" Yurkovsky enquired, turning to him. .

"Big pressure outside. Another half-hour and your bombs'll be exploding in this bay."

"Fire," Yurkovsky said hastily. Dauge hesitated, then pulled the trigger. Bykov listened to the doo-doo-doo in the breech and said:

"Enough's enough. Batten all the instrument portholes. And spike this thing," he pointed at the bomb-release. "Spike it good and proper."

"Are periscopic observations still allowed?" asked Yurkovsky.

"Yes," said Bykov. "You may play a little more."

He turned and strode out.

"Just as I told you-not a damned thing," said Dauge. "Not with synchronisation gone."

He switched off his equipment and recovered the reel out of the dictaphone.

"Grigory," said Yurkovsky. "I have a shrewd suspicion Alexei's "up to

something. What do you think?"

"I don't know," Dauge said and glanced at him. "What makes you think so?"

"Just something in his ugly mug," said Yurkovsky. "I know my man."

For a while everybody was silent, only Mollard, overcome by a feeling of nausea, heaved occasional sighs. Presently Dauge said:

"I'm famished. Where's our soup, Charles? You spilt our soup and we're hungry. Who's on duty today, Charles?"

"I am," said Charles. At the mention of food the nausea came over him again. But he said: "I shall go and make some more soup."

"The Sun," said Yurkovsky.

Dauge pressed his black eye to the viewer.

"You see," said Mollard. "The Sun again."

"But that isn't the Sun," said Dauge.

"No," said Yurkovsky. "It doesn't look like the Sun."

The distant luminescent mass in the light-brown haze paled, swelling and drifting apart in greying patches, and then disappeared. Yurkovsky watched, his teeth clamped together so hard that his temples ached. Farewell, Sun, he thought. Farewell, Sun.

"I'm hungry," Dauge said testily. "Let's go to the galley, Charles."

He pushed off the wall deftly, sailed towards the door and opened it. Mollard too pushed off and hit his head against the wall above the door. Dauge caught him by his spread-fingered hand and pulled him out into the gangway. Yurkovsky heard Grigory ask, "How's life-good?" and Mollard answer, "Good, but very inconvenient." "Never mind," Dauge said cheerily. "You'll get used to it soon."

Never mind, Yurkovsky thought, it'll be all over soon. He glanced into the periscope. He saw the brownish fog grow still denser overhead, while deep below in the incredible depths of the hydrogen abyss into which the ship was falling an eerie pinkish light beckoned to him. He shut his eyes. To live, he thought. To live long. To live eternally. He clutched at his hair. To live even if he were deaf, blind, paralysed. Just to feel the sun and the wind on his skin and a friend by his side. And pain, impotence and pity. Just as now. He tore at his hair. Let it be just as now, but for ever. Suddenly he became aware he was breathing laboriously and came to himself. The feeling of unbearable, unreasoning terror was gone. This had happened to him before: on Mars twelve years before, in Golconda ten years before and again on Mars the year before last. A spasm of crazy desire just to live, a desire as obscure and primordial as protoplasm itself. It swooped on him like a black-out. But it always passed. It had to be endured like sharp pain. And he must start doing something. Alexei had ordered the instrument portholes to be battened. He took his hands from his face, opened his eyes and saw he was sitting on the floor. The ship's fall was being braked and things were acquiring weight.

Yurkovsky reached for a small panel and shut the instrument portholes, the orifices in the ship's hull through which the receptors of the instrumentation are thrust out. Then he carefully spiked the breech of the bomb-release, collected the scattered bomb-cases and stacked them neatly on the rack. Then he glanced through the periscope and it seemed to him that the darkness overhead had become denser and the glow underneath stronger. He thought that no one before had penetrated Jupiter to such a depth except Sergei Petrushevsky, may he rest in peace, and even he had probably been blown up earlier. His reflector was smashed too.

He went out into the gangway and headed for the mess room, glancing into all the cabins on his way. The *Tahmasib* was still falling, though more

slowly every minute, and Yurkovsky walked on tiptoe as though under water, balancing with outspread arms and making involuntary little skips every now and then. In the quiet gangway Mollard's muffled call came to him like a war-cry: "How's life, Gregoire, good?" Apparently Dauge had managed 'to

restore the Frenchman's high spirits. He could not catch Dauge's response. "Good," he muttered and even did not notice he was no longer stammering. Good-in spite of everything.

He glanced into Mikhail Antonovich's cabin. It was dark and there was an odd spicy smell. He went in and switched on the light. In the middle of the cabin lay a ripped suit case. Never before had he seen a suit case in such a state. It looked as though a bomb-probe had gone off inside it. The mat-finished ceiling and the walls were spattered with brown, slippery-looking blotches. These gave off a spicy aroma. Spiced mussels, he defined promptly. He was very fond of spiced mussels but they were unfortunately never part of space flyers' rations. He looked around and spotted a bright black patch-a meteoric hole '-just above the door. All sections of the living quarters were air-tight. When the hull was pierced by a meteorite, the air supply was automatically cut until the synthetic resin layer between the ship's sheetings had had time to seal the hole. It took a second, at the most two seconds, but pressure might drop quite substantially in that time. It was not dangerous for man but it would be fatal for contraband tinned food. Tins would just explode. Particularly when spiced. A plain case of smuggling, he thought. The old glutton. Well, you'll get it hot from the captain. Bykov's never stood for smuggling.

Yurkovsky gave the cabin a last glance and noticed that the black patch shone silver. Aha, he thought. Somebody must have been metallising the holes. Quite right too, for such a pressure would have just forced the resin stoppers out. He switched off the light and stepped back into the gangway. He felt dead tired and lead-heavy in his whole body. Oh, damn, I'm cracking up, he thought, and suddenly he realised that the tape on which his mike hung was cutting into his neck. Then he understood. The *Tahmasib* was

arriving. Their flight was coming to an end. In a few minutes gravity would be doubled, overhead there would be six thousand miles of compressed hydrogen and under their feet forty thousand miles of supercompressed, liquid and solid hydrogen.

Every pound of their weight would increase to two or more. Poor Charles, he thought. Poor Misha.

"Voldemar," Mollard called from behind him. "Voldemar, help us carry the soup. It's a very heavy soup."

He looked back. Dauge and Mollard, both flushed and sweating, were pushing through the door of the galley a heavily-swaying trolley with three steaming pots on it. Yurkovsky made to meet them and only then fully realised how heavy he had become. Mollard uttered a vague sound and sank to the floor. The *Tahmasib* stopped. The ship, her crew, passengers and cargo had arrived at their last port of call.

2. The planetologists interrogate the navigator while the radio astronomer interrogates the planetologists.

"Who cooked this meal?" asked Bykov. He ran his eye round them and stared at the pots again. Mikhail Antonovich was breathing in gasps, leaning heavily against the table top. His face was purplish and bloated. "I did," Mollard said timidly. "But what's wrong with it?" asked Dauge. They all spoke in hoarse voices, only able to wheeze out a few words at a time. Mollard smiled crookedly and lay back on the sofa. He felt quite bad. The *Tahmasib* had stopped and their weight was becoming unbearable. Bykov looked at Mollard.

"That meal will kill you," he said. "You'll eat and never get up again. It'll crush you, you understand?"

"Christ," Dauge said, annoyed. "I forgot all about gravity."

Mollard lay still, eyes closed, breathing heavily. His jaw was hanging

open.

"We'll have the soup," said Bykov. "And nothing more. Not a bite." He glanced at Mikhail Antonovich and grinned mirthlessly. "Not a bite," he repeated.

Yurkovsky took the ladle and served the soup.

"A heavy meal," he said.

"Smells tasty," said Mikhail Antonovich. "Won't you give me a little more, Vladimir old man?"

"No more," Bykov said harshly. He was sipping his soup slowly, holding his spoon in a childish way in his fist, which was smeared with graphite lubricant.

They began eating in silence. Mollard made an attempt to get up and sank back again. "I can't," he said. "Excuse me, but I can't."

Bykov put down his spoon and rose.

"I recommend all passengers to get into their acceleration absorbers," he said. Dauge shook his head. "As you like," said Bykov. "But make sure Mollard gets into his."

"Right," said Yurkovsky.

Dauge took up Mollard's plate, sat down beside him and began spoon-feeding him expertly. His eyes closed, he was swallowing noisily.

"And where's Ivan?" asked Yurkovsky.

"On watch," said Bykov. He took the pot with the remaining soup and strode heavily towards the hatchway. With pursed lips Yurkovsky watched the stooped figure go.

"My mind's made up, boys," Mikhail Antonovich said in a pitiful voice. "I'm going to start slimming. This won't do. I'm over four hundred and fifty pounds now-the mere thought of it makes me shudder. And that's not the limit. We're still falling a little."

He leaned against the back of his chair, crossing his bloated hands on his stomach. Then he wriggled a little, transferred his hands on to the armrests and almost immediately was asleep.

"Fatty's asleep," Dauge said, turning to look at him. "The ship's aground and the navigator's asleep. One more spoonful, Charles," he said. "For Daddy. That's good. Now for Mummy."

"Excuse me, I can't," Mollard murmured. "I can't. I'll 'lie down." He lay back and started mumbling incoherently in French.

Dauge put the plate on the table.

"Mikhail," he called softly. "Misha."

Mikhail Antonovich snored away.

"Watch me wake him up," said Yurkovsky. "Mikhail," he said softly. "Mussels. Spiced mussels."

Mikhail Antonovich started and woke up. "What?" he mumbled. "What?" "Troubled conscience," said Yurkovsky. Dauge fixed the navigator with his eye. "What are you up to, you in the control room?" he said.

Mikhail Antonovich's red lids blinked, then he shifted in his chair, mumbled faintly: "Oh, I quite forgot..." and tried to get up.

"Stay put," said Dauge.

"What're you up to there?" asked Yurkovsky.

"And what's the ruddy use anyway?"

"Nothing special," Mikhail Antonovich said and looked back at the hatchway. "Nothing, boys, honest. We're just...."

"Misha," said Yurkovsky. "We can see he's up to something."

"Spill the beans, fatty," Dauge said fiercely.

Again the navigator tried to get up.

"Stay put," Yurkovsky said implacably. "Mussels. Spiced mussels. Speak up."

Mikhail Antonovich flushed poppy-red.

"We're not children," said Dauge. "We've faced death before. What the hell are you plotting there?"

"There is a chance," the navigator mumbled faintly.

"There's always a chance," said Dauge. "Be specific."

"A tiny chance," said Mikhail Antonovich. "Really, boys, I must be off."

"What are they doing?" asked Dauge. "What're they so wrapped up in-Alexei and Ivan?"

Mikhail Antonovich looked longingly at the hatchway.

"He doesn't want to tell you," he whispered. "Doesn't want to raise a false hope in you. But he hopes to get us out of this. They're rearranging the magnetic trap system.... And please stop pestering me!" he shouted in a thin voice, struggled up and hobbled to the control room.

"Mon dieu," Mollard said softly and lay back again.

"Oh, nonsense, straw-clutching," said Dauge; "It's just that Bykov can't sit still with the Old Floorer about to get us. Come on. Come on, Charles, we'll put you in the acceleration absorber. Captain's orders."

Between them they got Mollard on his feet and walked him along the gangway. His head was lolling.

"Mon dieu," he mumbled. "Excuse me. I am a bad space flyer. I am only a radio astronomer."

It was no easy job to drag Mollard along when they had difficulty in walking themselves, but still they got him to his cabin and then into the acceleration absorber. He lay in the oversize box, small, miserable, blue-faced, fighting for breath.

"You'll feel better in a moment, Charles," said Dauge. Yurkovsky nodded and winced with the pain in his back. "Have a rest," he said.

"Good," said Mollard. "Thank you, *camarades*."

Dauge slid the top in place and tapped on it. Mollard tapped back.

"Well, that's that," said Dauge. "I wish we could get a pair of antigrav suits."

Yurkovsky went to the door without saying anything. There were only three such suits on board their ship *for* her crew. The passengers were expected to take to their acceleration absorbers whenever the G-load was increased.

They made a round of the cabins and collected all the blankets and cushions they could lay their hands on. Back in the observation bay they made themselves as comfortable as they could at the two periscopes, then lay back and were silent for a while, resting. Breathing was difficult. They felt as though heavy weights had been laid on their chests.

"Reminds me of the time I had acceleration training," said Yurkovsky. "Had to slim a lot."

"So had I," said Dauge. "But I don't remember much. What's that spiced mussel nonsense?"

"Quite a delicacy, isn't it?" said Yurkovsky. "Our navigator had a few tins stowed away and they went bang in his suit case."

"No," said Dauge. "Not again? What a glutton. What a smuggler. He's 'lucky Bykov's busy."

"Bykov probably doesn't know yet," said Yurkovsky.

And never will, he thought. They fell silent, then Dauge took the observation logs and began leafing through them. They made a few calculations, then had an argument about the meteoric attack. Dauge said it was a stray swarm. Yurkovsky claimed it was a ring. "A ring round

Jupiter?" Dauge said contemptuously. "That's right," said Yurkovsky. "I've suspected one for a long time. Now it's been proved." "No," said Dauge. "Anyway it's not a ring. It's a half-ring." "Perhaps it is," Yurkovsky agreed. "Kangren's a wizard," said Dauge. "His calculations are amazingly exact." "Not quite," Yurkovsky demurred.

"Why not?" asked Dauge.

"Because temperature increases have been markedly slower," Yurkovsky explained.

"That's inner luminescence of a non-classical type," Dauge retorted.
"That's just it- non-classical," said Yurkovsky.

"Kangren couldn't have possibly taken account of it," said Dauge.

"But he should," said Yurkovsky. "There have been arguments about it for the last hundred years and he should have taken it into account."

"You're ashamed, that's all," said Dauge. "You had such a row with Kangren that time in Dublin and now you're ashamed."

"You're a fool," said Yurkovsky.

"Of course you're ashamed," said Dauge.

"I was right," said Yurkovsky. "I took the non-classical effects into account."

"I know," said Dauge. "But if you do," said Yurkovsky, "why don't you stop your nonsense?"

"Don't shout at me," said Dauge. "This is no nonsense. You took the non-classical effects into account all right, but look at the price we're paying for it."

"It's the price you're paying," Yurkovsky said, getting angry. "I see you haven't read my latest paper."

"Well," said Dauge, "don't get shirty. My back's got numb."

"So's mine," said Yurkovsky.

He turned over and got on all fours. It wasn't easy. He reached up to the periscope and glanced into it.

"Have a look," he said.

They looked into the periscopes. The *Tahmasib* was floating in a void

filled with a pinkish light. There was absolutely nothing to rest their eyes on. Just an even pinkish light everywhere. It seemed they were looking at a phosphorescent screen. After a long silence Yurkovsky said:

"Rather dull, isn't it?"

He straightened the cushions and lay down again.

"No one has seen this before," said Dauge. "It's metallic hydrogen radiation."

"A fat lot of good such observations will do us," said Yurkovsky. "Suppose we pair a periscope with the spectrograph?"

"Rubbish," Dauge said, hardly able to move his lips. He slid on to the cushions and also lay on his back. "A pity," he said. "To think that no one has ever seen this before."

"I feel just rotten doing nothing," said Yurkovsky. Dauge rose on an elbow suddenly and craned his neck, listening. "What's happened?" Yurkovsky asked.

"Quiet," said Dauge. "Listen."

Yurkovsky listened. A faint low rumbling came from somewhere, changing in volume like a giant bumble-bee buzzing. The rumbling rose in pitch, then died down.

"What's that?" said Dauge.

"I dunno," Yurkovsky said in an undertone. He sat up. "Surely not the engine?"

"No, it's from that side." Dauge waved a hand at the periscopes. "Well now..." They listened and again heard a rumbling sound swelling into a high-pitched buzz, then dying down.

"Must have a look," said Dauge. The giant bumble-bee was silent for a second, then buzzed again. Dauge rose to his knees and buried his face in the periscope frame. "Look!" he shouted.

Yurkovsky crawled to his periscope.

"Just look at that!" Dauge shouted again.

A multitude of huge iridescent spheres were sailing upwards out of the yellowish-pink abyss like so many soap-bubbles. It was a sight of rare beauty. The spheres, all of different sizes, were rising with a low rumbling sound that swelled as they shot past the ship and out of sight. Dauge clutched at the drum of the range-finder. One of the spheres, looking

especially huge and pulsating, was passing quite close to them, and, for a moment, the bay reverberated to an unbearably low, sort of nagging rumble and rocked a little.

"Hey, you in the observatory," Bykov was heard on the intercom. "What's that outside?"

"Phenomena," Yurkovsky said, bending his head to the mike.

"What phenomena?" asked Bykov.

"Bubbles of some kind," Yurkovsky explained.

"That much I understand myself," Bykov muttered and cut off.

"This is no longer metallic hydrogen," Yurkovsky said when the last bubbles were gone.

"There," said Dauge. "Diameters of six hundred, ten hundred and three thousand five hundred yards-provided of course there's been no distortion of perspective. That's all I've been able to manage. What could it be?"

Two more bubbles shot past them in the pinkish void outside. A bass rumble swelled and died away.

"That's the planet's mechanism in action," said Yurkovsky. "But we'll never learn its workings...."

"Bubbles in gas," said Dauge. "Not gas really- 'it's as dense as petrol."

He turned and saw Mollard sitting in the doorway, his head pressed against the jamb. All the skin on his face seemed to have sagged to his chin under the pull of gravity. His forehead was white and his neck ripe-cherry.

"It's me," he said. Then he turned on his stomach and crawled to his place at the breech. The planetologists looked at him in silence, then Dauge got up, took two cushions-one of his and one of Yurkovsky's-and made Mollard more comfortable. Nobody said a word.

"Very dull," Mollard said finally. "I can't be alone. I want to talk."

"Delighted to see you, Charles," Dauge said sincerely. "We too find it dull and are talking all the time."

Mollard wanted to sit up but thought better of it and remained lying, breathing heavily, his eye fixed on the ceiling.

"How's life, Charles?" Yurkovsky asked with interest.

"Life's good," Charles said and smiled wanly. "Only short."

Dauge lay down and also stared at the ceiling. Life's short, he thought. Much too short. He swore in Lettish softly. "'Pardon?" asked Mollard.

"He's swearing," explained Yurkovsky.

Suddenly Mollard said, "My friends!" in a high-pitched voice and the planetologists turned to him.

"My friends!" Mollard repeated. "What shall I do? You're experienced space flyers. You are great men and heroes. Yes, heroes. *Mon dieu!* You faced

death more often than I looked into a girl's eyes." He shook his head ruefully on the cushion. "But I am not experienced. I am afraid and I want to talk much, but the end is near and I don't know how."

He was looking at them with bright eyes. Dauge muttered, "Damn," awkwardly and glanced at Yurkovsky. He was lying back, his head cradled in his arms, looking at Mollard out of the corner of his eye.

"I can tell you a story of how I nearly got a leg sawn off," Yurkovsky suggested.

"Excellent," Dauge said happily. "And then you tell us something funny, Charles."

"You are always joking," said Mollard.

"Or we can sing," said Dauge. "It's been done-I read about it somewhere. Can you sing us something, Charles?"

"Sorry," said Mollard. "I've gone to pieces."

"Not in the least," said Dauge. "You're doing fine, Charles. That's the main thing. Isn't Charles doing fine, Vladimir?"

"Of course he is," said Yurkovsky. "Just fine."

"Our captain's not napping," Dauge continued in a cheery voice. "Have you noticed, Charles? He's thought something up, our captain has."

"Yes," said Mollard. "Oh, yes. Our captain is our big hope."

"I should think so," said Dauge. "You just can't imagine how big a hope he is."

"Six-foot-six," said Yurkovsky.

Mollard laughed.

"You are always joking," he said.

"And in the meantime we shall talk and observe," said Dauge. "Want to have a peep in the periscope, Charles? It's beautiful. It's something nobody has ever seen before." He rose and looked into the periscope. Yurkovsky noticed his back arch suddenly. Dauge seized the periscope frame with his both hands. "Good God," he breathed out. "A spaceship!"

A spaceship hung motionless outside. They saw her clearly in all details and she seemed to be at a distance of a mile or so from the <i>Tahmasib</i>. She was a first-class photon cargo ship, with parabolic reflector

which looked like a hooped skirt, globular living quarters, a flat cargo bay, and three cigarshaped emergency rockets flung far out on brackets. She hung vertically and was completely motionless. And she was grey like a black-and-white film still.

"Who's that?" Dauge mumbled. "Surely not Petrushevsky?"

"Look at her reflector," said Yurkovsky. The reflector of the grey ship was chipped. "They've had bad luck too," said Dauge. "Oh," said Mollard. "There's another one." The second spaceship-an exact replica of the first-hung farther and lower.

"She's got a chipped reflector too," said Dauge. "I've got it," Yurkovsky said suddenly. "It's our

<i>Tahmasib</i>. A mirage."

It was a double mirage. A string of iridescent bubbles raced upwards and the ghost <i>Tahmasib</i> rippled and vanished. But three more appeared- to the right and higher.

"What beautiful bubbles," said Mollard. "And they sing."

He lay on his back again. His nose had started bleeding and he was blowing it, wincing and glancing at the planetologists to make sure they were not looking. Of course they weren't.

"There," said Dauge. "And you say it's dull."

"I don't," said Yurkovsky.

"Yes, you do," said Dauge. "You keep whining that it's dull."

They both avoided looking at Mollard. The bleeding couldn't be stopped. The blood would congeal of itself. They really ought to get him into his acceleration absorber, but. ... Never mind, it would congeal. Mollard was blowing his nose softly.

"There's another mirage," said Dauge, "but it's not a ship."

Yurkovsky looked in the periscope. No, he thought. It just doesn't make sense. Not here in Jupiter. Slowly gliding below and past the <i>Tahmasib</i> was

the peak of an enormous grey cliff. Its base was lost in the pinkish haze. Another cliff rose near by, bare, vertical, deep-creviced. A little further there was a whole range of similar sharp sheer peaks. The silence in the observation bay was now filled with creaking, rustling and faint rumbling like echoes of far-off mountain-slides.

"This is no mirage," said Yurkovsky. "This looks like a core."

"Rubbish," said Dauge.

"Perhaps Jupiter has a core after all."

"Stuff and nonsense," Dauge said impatiently.

The mountain range under the <i>Tahmasib</i> now stretched as far as they could see.

"Look over there," said Dauge.

Above the jagged peaks a dark silhouette loomed, grew, assumed the shape of a huge fragment of black rock, then disappeared. Immediately another appeared, then a third, while in the distance some roundish grey mass shimmered palely, only just visible. The mountain range, which had been sinking slowly, slipped out of view. Yurkovsky, without taking his eyes off the sight, picked up his mike. In the silence his joints cracked.

"Bykov," he called. "Alexei."

"Alexei's not here, Vladimir," they heard the navigator's voice. The voice was hoarse and faltering. "He's in the engine."

"Mikhail, we're passing over some cliffs," said Yurkovsky.

"What cliffs?" Mikhail Antonovich asked in a frightened voice.

In the distance a huge plain fringed by low hills slid into view and then vanished in the pinkish haze.

"We don't understand it yet," said Yurkovsky.

"I'll have a look right away," said Mikhail Antonovich.

Another mountain range was gliding past them. Its base was far above them and its tops were thrust downwards. It was an eerie, fantastic sight and Yurkovsky took it for a mirage at first, but it wasn't. Then he understood and said, "It's no core, this, Grigory. It's a graveyard." Dauge did not understand. "It's a graveyard of worlds," said Yurkovsky. "Jupe's gobbled them up."

Dauge didn't say anything for a while, then he muttered:

"What discoveries.... Ring, pinkish radiation, graveyard of worlds.... A pity."

He turned and called Mollard. "There was no answer. He was lying on his face."

They dragged Mollard all the way to his cabin, brought him round there and he instantly fell asleep in the acceleration absorber as though he had fainted. Then they returned to their periscopes. Under the ship, next to her and over her fragments of unborn worlds-mountains, cliffs, huge fissured rocks, grey transparent clouds of dust-swam slowly past in the streams of compressed hydrogen. Then the *Tahmasib* drifted off and the periscopes again showed nothing but a pinkish void all round them.

"I'm fagged out," said Dauge. He turned to lie on his side and his bones cracked. "Hear that?" "Yes," said Yurkovsky. "Let's go on observing." "Yes," said Dauge. "I thought it was a core," said Yurkovsky. "It couldn't be," said Dauge. Yurkovsky rubbed his face with his hands. "That's what you say," he said. "Let's go on."

They were to see and hear much more, or it seemed to them they did, for they were both utterly exhausted and often on the verge of a blackout. Then they were unaware of their surroundings except for the even pinkish light. They saw broad stark zigzags of lightning propped between the darkness overhead and the pinkish haze beneath, and heard the iron clang of the lilac discharges that pulsated in them. They saw quivering films of substance rush hard by with a thin whistle. They watched weird shadows which stirred and moved about, and Dauge argued they were three-dimensional, while Yurkovsky insisted he was just delirious. And they heard howling, and squeaking, and rattling, and strange noises like voices. Dauge suggested they record them, but noticed Yurkovsky was fast asleep, lying on his stomach. He turned Yurkovsky over and was back in his place when through the open door crawled Varya, white-specked blue and dragging her belly, sidled to Yurkovsky and clambered on to his knees. Dauge wanted to shoo her away but found he had no strength left for the effort. He could not even raise his head. Varya's sides heaved heavily and she was blinking. The bosses on her muzzle stood out and her two-foot tail jerked spasmodically in time to her breathing.

3. Time to take leave but the radio astronomer doesn't know how to.

It was hard, unbelievably hard to work under those conditions. Zhilin had had several blackouts. His heart would just stop beating and he would be plunged into a bloody mist. And all the time there was a taste of blood in his mouth. And each time Zhilin was acutely mortified because Bykov worked on untiringly, with the steady rhythm and precision of a machine. He was drenched in sweat, probably found the work just as hard, but apparently was able to retain consciousness by force of will. After two hours Zhilin had lost all understanding of their purpose, all hope and even desire to survive, but after each black-out he picked up where he had left because Bykov was at his side. Once he had come to and there was no Bykov. He wept. But Bykov soon returned, placed a mess-tin of soup at his side and said, "Eat." He ate and pitched into his work. Bykov's face was white and his neck purple and hanging in folds. He was breathing heavily and hurriedly, his huge mouth wide open. And he never said a word. Zhilin was thinking: if we do break out of this I won't go on any interstellar flights or expeditions to Pluto or anywhere before I am like Bykov. As ordinary and even dull in times of routine. As morose and even slightly ridiculous. So much so that it was hard to believe in all those stories about the Golconda and Callisto and other places. Zhilin remembered that behind Bykov's back young space flyers would poke fun at the Red-Haired Hermit-incidentally, how did he come by that odd nickname?-but he had never heard a pilot or scientist of Bykov's generation speak slightingly about him. If I come out I must become like Bykov. If I don't I must die like Bykov. When Zhilin blacked out, Bykov stepped over him silently and finished his work. When Zhilin came to, Bykov went silently to his place.

Then Bykov said, "Come on," and they filed out of the magnetic-system chamber. Everything was swimming in front of Zhilin's eyes, he wanted to lie down and bury his nose in something soft and wait until he was picked up. He got stuck in the hatchway following Bykov and lay down after all, his nose pressed against the cold floor, but came to rapidly and saw Bykov's boot close to his face. The boot was tapping impatiently. Must be quite an effort-tapping one's boot with a G-load like this, he thought. Must try it. He made a supreme effort and forced himself through the hatchway. Then he squatted to batten the hatch more securely. The lock wouldn't obey and he clawed at it with his scratched fingers. Bykov towered near by like a radio mast, looking at him steadily from above.

"Just a moment," Zhilin said hurriedly. "Just a moment." Finally the hatch was locked.

"Ready," Zhilin said and got up. His knees were shaking.

"Come on," said Bykov.

They went back to the control room. Mikhail Antonovich was asleep in his chair at the computer. His lips hung loose and he was snoring. The computer was on. Bykov leaned over the navigator, picked up the mike of the intercom and said:

"All passengers are summoned to the mess-room."

"What?" Mikhail Antonovich asked, startled out of his sleep. "What-already?"

"Yes," said Bykov. "Let's go to the mess room." He didn't go immediately, but stood and absently watched Mikhail Antonovich get out of his chair, grunting and wincing. Then he came to and said, "Come on."

They went to the mess room. Mikhail Antonovich made straight for the sofa, plopped down and folded his arms on his stomach. Zhilin too sat down-to stop his knees shaking-and stared at the table-top. Dirty plates still stood in a pile on it. Presently the door opened and in stumbled the passengers. The planetologists had Mollard between them. He hung limply, dragging his feet and clutching at their shoulders. In his hand he had a balled handkerchief covered with dark spots.

In silence Dauge and Yurkovsky seated Mollard on to the sofa and sat down on either side of him. Zhilin ran his eye over them all. What horrible mugs, he thought. Surely I can't look like them? He touched his face

stealthily. His cheeks felt very thin, while his chin seemed as thick as Mikhail Antonovich's. He felt pins and needles in his face. As if I've been sitting on it, he thought.

"Well," said Bykov. He got up from a chair in a corner, went to the table and leaned on it heavily. Mollard gave Zhilin a sudden wink and covered his face with the spotted handkerchief. Bykov glanced at him coldly. Then he rested his glance on the opposite wall.

"Well," he repeated. "We have finished refitting the <i>Tahmasib.</i> We can

now use the photon propulsion unit and that is precisely what I have decided to do. However -I should like first to let you into all possible consequences. I warn you the decision's final and I'm not proposing to consult you and ask for your opinions."

"Please make it shorter, Alexei," said Dauge.

"The decision is final," said Bykov. "But I consider you're entitled to know how it might end. First, the reactor's activation might touch off an explosion in the compressed hydrogen round us. And that would mean the <i>Tahmasib's</i> total destruction. Second, the plasma's first flash might destroy

the reflector-the outer surface of the mirror's probably whittled away by corrosion by now. Then we'd stay here and.... It's clear what that would mean. Third, the <i>Tahmasib</i> might fight her way out of Jupiter and-"

"That's clear," said Dauge.

"And the food would be delivered to Amaltheia," said Bykov.

"For which the food would be eternally grateful to Bykov," said Yurkovsky. Mikhail Antonovich smiled wanly. He didn't find it funny.

Bykov was looking at the wall.

"I'm giving the start right away," he said. "The passengers are requested to take their places in the acceleration absorbers. All of you. And without any of your tricks," he glanced at the planetologists. "It's going to be eight G's. If not more. Carry out orders. Engineer Zhilin, check on compliance and report to me."

He ran his eye over them, then turned and strode into the control room.

<i>"Mon dieu;"</i> said Mollard. "What a life."

His nose was bleeding again. Dauge jerked his head and said:

"We need someone who's lucky. Any lucky dog among you? We absolutely need someone who's lucky."

Zhilin got up.

"It's time. Comrades," he said. He wished everything would soon be over. He desperately wished everything was over and done with. They had all remained seated. "It's time, Comrades," he repeated in confusion.

"There's about ten per cent of probability of a favourable result," Yurkovsky said musingly and started rubbing his cheeks. Mikhail Antonovich grunted and struggled up out of the sofa.

"Boys," he said. "Looks we ought to bid farewell to one another. Just in case, you know. Anything might happen." He smiled piteously.

"We might as well," said Dauge. "Yes."

"And I again don't know how," said Mollard.

Yurkovsky rose.

"I'll tell you what," he said. "Let's go and get into the acceleration absorbers. Bykov might come any moment and then-I'd prefer to be burned up. He's a heavy hand-I remember to this day, though it was ten years ago...."

"Quite," Mikhail Antonovich said and fussed. "Come on, boys, come on.... But let me kiss you first."

He kissed Dauge, then Yurkovsky, then turned to Mollard and kissed him on the forehead.

"Where will you be, Misha?" asked Dauge.

Mikhail Antonovich kissed Zhilin, gave a little sob and said:

"In the acceleration absorber-same as everyone."

"And you, Vanya?"

"Me too," said Zhilin. He was holding Mollard by his shoulders.

"And the captain?"

They were in the gangway now and everyone stopped. There were a few more steps before separation.

"Alexei Petrovich says he doesn't trust automation inside Jupe," said Zhilin. "He'll steer her himself."

"Just like Bykov," Yurkovsky said with a wry smile. "A knight in shining armour."

Mikhail Antonovich gave a little whimper and headed for his cabin.

"Let me help you. Monsieur Mollard," said Zhilin.

"Please," Mollard said and Obediently clutched at Zhilin's shoulder.

"Good luck and quiet plasma," said Yurkovsky. Dauge nodded and they parted. Zhilin led Mollard to his cabin and helped him into the absorber.

"How's life, Vanya?" Mollard asked sadly. "Good?"

"Good, Monsieur Mollard," said Zhilin.

"And how are the girls?"

"Very good," said Zhilin. "There're nice girls on Amaltheia."

He smiled politely, slid the top in place and switched off the smile. I wish it was all over, he thought. He walked the length of the gangway and it looked very bare to him. He tapped on each shock-absorber, got the replies and went back to the control room.

Bykov sat in the senior pilot's place. He was in an antigrav suit. It looked like a silk worm's cocoon, from one end of which a mop of red hair was sticking out. The face was as ordinary as always, only sterner and very tired. \ "All set, Alexei Petrovich," said Zhilin.

"Good," said Bykov. He glanced at Zhilin sideways. "Not afraid, youngster?"

"No," said Zhilin. He wasn't afraid. He only wished it would all be over soon. And then he suddenly wished to see Father as he used to emerge out of his spaceship after a long trip, stout, moustachioed, helmet in hand. And to introduce Father to Bykov.

"Go, Ivan," said Bykov. "I give you ten minutes."

"Quiet plasma to you, Alexei Petrovich," said Zhilin.

"Thanks," said Bykov. "Go."

I must bear it out, Zhilin thought. Surely I will bear it out. He was at the door of his cabin when he spotted Varya. Varya was crawling laboriously, hugging the wall, dragging her wedge-shaped tail. Catching sight of Zhilin she raised her triangular muzzle and winked slowly.

"You poor beast," said Zhilin. He seized her by the loose skin on her neck, dragged her inside, slid open the top of his acceleration absorber and looked at his watch. Then he threw Varya into the box-she felt very heavy as she quivered in his hands-and got in himself. He lay back in complete darkness and listened to the gurgling of the absorber mixture while his body was becoming lighter and lighter. It was very pleasant, only Varya kept jerking at his side, her bosses prickling his hand. I must bear it out, he thought. Like he does.

In the control room Bykov jabbed at the ribbed key of the starter with his thumb.

EPILOGUE

J-STATION, AMALTHEIA

The chief of the Station has no eye for the setting Jupiter and Varya gets her tail pulled.

'The setting of Jupiter is also a spectacular sight. The yellowish-green exospheric glow dies out and stars flicker up one after another in the darkening sky like diamond needles against black velvet.

But the chief of the J-Station saw neither the stars nor the yellowish-green glow above the cliffs. His eyes were on the icy field of the spacedrome. Just where the colossal tower of the <i>Tahmasib</i> was falling

slowly, in a barely perceptible movement. The first-class cargo photon ship was indeed colossal. It was so huge it even dwarfed the bluish-green plain pitted with black round spots it was falling on. From the spectrolite dome it seemed the ship was free-coasting. But in real fact it was being towed into place. Hidden in the shadows of the cliffs on the sides of the field there were powerful winches, and bright filaments of hawser would sometimes sparkle into view in the sun's rays. The sun shone full on the ship and she was all in sight, from the huge bowl of the reflector to the globe of the living quarters.

Never before had so badly damaged a ship come to Amaltheia. The reflector was cracked on the edge so that there was a dense distorted shadow in the huge bowl. The six-hundred-foot tube of the photon reactor looked mottled as though eaten away by scab. The emergency rockets protruded at awkward angles on the twisted brackets, the cargo bay was lop-sided and looked like a round tin that had been trodden on by a magnetic boot. Part of the food has perished, thought the chief. What nonsense I'm thinking. As though that mattered. But one thing's certain: the <i>Tahmasib</i> is going to stay here for a while.

"Quite a price to pay for chicken broth," said Uncle Hoak.

"Yes," the chief muttered. "Chicken broth. Stop it, Hoak. You don't really mean it."

"Why not?" said Hoak. "The boys could do with some chicken broth."

The spaceship settled on the plain and was lost in the shade. Only the ship's titanium sides glowed a faint green, then there were pin-points of light and the fuss of tiny black figures. Jupiter's shaggy hump dipped behind the cliffs and they darkened and became taller, and a gorge was lit bright for an instant, revealing the trellis-work of the antennae.

The radiophone in the chief's pocket sang mosquito-like. He got the smooth case out and pressed reception.

"Listening," he said.

The switchboardman's tenor-gay, with no diffidence-came to him in a rattle:

"Comrade chief, Captain Bykov's arrived with crew and passengers and is waiting for you in your office."

"Coming," said the chief.

Together with Uncle Hoak he took the lift down and went to his office. The door was wide open. The room was full of people who all 'spoke and laughed loudly. Still in the gangway the chief heard a gay yell:

"How's life-good? How're the boys- good?"

The chief lingered in the doorway, his eyes searching for the newcomers. Hoak was breathing noisily just behind him and the chief knew he was grinning from ear to ear. It would be interesting to look at a grinning Hoak, but the chief didn't turn. He saw Mollard, his hair wet after a bath. The Frenchman was gesticulating wildly and laughing his head off. There were girls round him, Zoya, Galya, Nadya, Jane, Yuriko-in fact, all the Station's girls-who were laughing heartily too. Mollard had a way of gathering all the girls round him. Then the chief spotted Yurkovsky, or rather the back of his head, and a nightmarish monster on his shoulder. The monster was jerking its head here and there and yawning horribly, while a few daredevils kept pulling at its tail. Dauge was not in sight but could be heard as easily as Mollard. He was yelling: "Hands off! Let me go! Ah-ah!" A huge young fellow he did not know was standing to the side, very handsome and very pale compared with the group of local space flyers with whom he was engaged in a lively conversation. Mikhail Antonovich Krutikov was sitting in a chair beside the chief's desk. He was talking away, waving his short pudgy hands

and sometimes pressing a balled lace-trimmed handkerchief to his eyes.

Only then did the chief recognise Bykov. He was pale to the point of blueness and there were bluish bags under his bloodshot eyes that spoke of prolonged exposure to high acceleration. Round him stood department chiefs and the chief of the spacedrome. He was speaking to them, but in so low a voice that the chief could not understand a word and only saw his lips move slowly in the effort of speech. This was the quietest group in the room. Presently Bykov looked up and saw the chief. He got up, a whisper ran around and there was a general hush.

They both moved at the same time, their magnetic soles clanging against the metal floor, and met in the middle of the room. They shook hands and stood for a while silently and motionlessly. Then Bykov disengaged his hand and said:

"Comrade Kangren, I report the spaceship *Tahmasib* with its cargo."