

One Face



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An alarm rang: a rising, falling crescendo, a mechanical shriek of panic. The baritone voice of the ship's Brain blared, "Strac Astrophysics is not in his cabin! Strac Astrophysics, report to your cabin immediately! The Hogan's Goat will Jump in sixty seconds."

Verd sat bolt upright, then forced himself to lie down again. The Hogan's Goat had not lost a passenger through carelessness in all the nearly two centuries of Verd's captaincy. Passengers were supposed to be careless. If Strac didn't reach his room Verd would have to postpone

Jump to save his life: a serious breach of custom.

Above the green coffin which was his Jump couch the Brain said, "Strac Astrophysics is in his cabin and protected."

Verd relaxed.

"Five," said the Brain. "Four. Three..."

In various parts of the ship, twenty-eight bodies jerked like springs released "Oof," came a complaint from the Jump couch next to Verd's. "That felt strange. Damn strange."

"Um," said Verd.

Lourdi Coursefinder tumbled out of her Jump couch. She was a blend of many subdivisions of man, bearing the delicate, willowy beauty born of low-gravity worlds. She was Verd's wife, and an experienced traveler. Now she looked puzzled and disturbed.

"Jump never felt like that. What do you suppose--"

Verd grunted as he climbed out. He was a few pounds overweight. His face was beefy, smooth and unlined, fashionably hairless. So was his scalp, except for a narrow strip of black brush which ran straight up from between his brow ridges and continued across his scalp and downward until it faded out near the

small of his back. Most of the hair had been surgically implanted. Neither wrinkled skin nor width of hair strip could number a man's years, and superficially Verd might have been anywhere from twenty to four hundred years old. It was in his economy of movement that his age showed. He did things the easy way, the fast way. He never needed more than seconds to find it, and he always took that time. The centuries had taught him well.

"I don't know," he said. "Let's find out what it was. Brain!" he snapped at a wall speaker.

The silence stretched like a nerve.

"Brain?"

One wall arced over to become the ceiling, another jogged inward to leave room for a piece of the total conversion drive, a third was all controls and indicators for the ship's Brain. This was the crew common room. It was big and comfortable, a good place to relax, and no crewman minded its odd shape. Flat ceilings were for passengers.

Verd Spacercaptain, Lourdi
Coursefinder, and Parliss Lifesystems
sat along one wall, watching the fourth
member of the crew.

Chanda Metal minds was a tall, plain woman whose major beauty was her wavy black hair. A strip three inches wide down the center of her scalp had been allowed to grow until it hung to the region of her coccyx. Satin black and satin smooth, it gleamed and rippled as she moved. She stood before the biggest of the Brain screens, which now showed a diagram of the Hogan's Goat, and she used her finger as a pointer.

"The rock hit here." Chanda's finger rested almost halfway back along the spinal maze of lines and little black squares which represented the Jumper section. The Hogan's Goat was a sculptured torpedo, and the Jumper

machinery was its rounded nose and its thick spine and its trailing wasplike sting. You could see it in the diagram. The rest of the Goat had been designed to fit the Jumper. And the Jumper was cut by a slanting line, bright red, next to Chanda's fingertip.

"It was a chunk of dirty ice, a typical piece of comet head," said Chanda. "The meteor gun never had a chance at it. It was too close for that when we came out of overspace. Impact turned the intruder to plasma in the Jumper. The plasma cone knocked some secondary bits of metal loose, and they penetrated here. That rained droplets of high-speed molten metal all through the ship's

Brain."

Parliss whistled. He was tall, ash blond, and very young. "That'll soften her up," he murmured irreverently. He winced under Chanda's glare and added, "Sorry."

Chanda, held the glare a moment before she continued. "There's no chance of repairing the Brain ourselves. There are too many points of injury, and most of them too small to find. Fortunately the Brain can still solve problems and obey orders. Our worst problem seems to be this motor aphasia. The Brain can't speak, not in any language. I've circumvented that by instructing the Brain to use Winsel code. Since I don't

know the extent of the damage precisely, I recommend we land the passengers by tug instead of trying to land the Goat."

Verd cringed at the thought of what the tug captains would say. "Is that necessary?"

"Yes, Verd. I don't even know how long the Brain will answer to Winsel code. It was one of the first things I tried. I didn't really expect it to work, and I doubt it would on a human patient."

"Thanks, Chanda." Verd stood up and the Brain surgeon sat down. "All I have to say, group, is that we're going to take a bad loss this trip. The Brain is sure to need expensive repairs, and the Jumper

will have to be almost completely torn out. It gave one awful discharge when the meteor hit, and a lot of parts are fused. --Lourdi, what's wrong? We can afford it."

Lourdi's face was bloodless. Her delicate surgeon's fingers strangled the arms of her chair.

"Come on," Verd said gently. What could have driven her into such a panic? "We land on Earth and take a vacation while the orbital repair companies do the worrying. What's wrong with that?"

Lourdi gave her head a spastic shake. "We can't do

that. Oh, Eye of Kdapt, I didn't dare believe it. Verd,

we've got to fix the Jumper out here."

"Not a chance. But--"

"Then we've got trouble," Lourdi had calmed a little, but it was the calm of defeat.

"I couldn't ask the Brain to do it, so I used the telescope myself. That's not Sol."

The others looked at her.

"It's not the Sun. It's a greenish-white dwarf, a dead I

star. I couldn't find the Sun."

Once it had its orders, the Brain was much faster with the telescope than Lourdi. It confirmed her description of the star which was where Sol should have been, and added that it was no star in the Brain's catalogue. Furthermore the Brain could not recognize the volume of space around it. It was still scanning stars, hoping to find its bearings.

"But the rock hit after we came out of overspace. After!" Verd said between his teeth. "How could we have gone anywhere else?" Nobody was listening.

They sat in the crew common room drinking droobleberry juice and vodka.

"We'll have to tell the passengers something," said Chanda. Nobody answered, though she was dead right. Interstellar law gave any citizen free access to a computer. In space the appropriate computer was a ship's Brain. By now the passengers must have discovered that the Brain was incommunicado.

Lourdi stopped using her glass to make rings on the tabletop. "Chanda, will you translate for me?"

Chanda looked up. "Of course."

"Ask the Brain to find the planet in this system which most resembles Saturn."

"Saturn?" Chanda's homely face lost its hopeful expression. Nonetheless she began tapping on the rim of a Brain speaker with the end of a stylus, tapping in the rhythms of Winsel code.

Almost immediately a line of short and long white dashes began moving left to right across the top of the Brain screen. The screen itself went white, cleared, showed what looked like a picture of Saturn. But the ring showed too many gaps, too well defined. Chanda said, "Fifth major planet from primary. Six moons. Period: 29.46 years. Distance from Sun: 9.45 A.U. Diameter: 72,018

miles. Type: gas giant. So?"

Lourdi nodded. Verd and Parliss were watching her intently. "Ask it to show us the second and third planets."

The second planet was in its quarter phase. The Brain screen showed it looking like a large moon, but less badly pocked, and with a major difference: the intensely bright area across the middle. Chanda translated the marching dots: "Distance: 1.18 A.U. Period: 401.4. Diameter: 7918 miles. No moons. No air."

The third planet-- "That's Mars," said Lourdi.

It was.

And the second planet was Earth.

"I believe I know what has happened." Verd was almost shouting. Twenty-seven faces looked back at him across the dining room. He was addressing crew and passengers, and he had to face them in person, for the Brain could no longer repeat his words over the stateroom speakers.

"You know that a Jumper creates an overspace in which the speed of light becomes infinite in the neighborhood of the ship. When--"

"Almost infinite," said a passenger.

"That's a popular misconception," Verd snapped. He found that he did not like public speaking, not under these conditions. With an effort he resumed his speaking voice. "The speed of light goes all the way to infinity. Our speed is kept finite by the braking spine, which projects out of the effective neighborhood. Otherwise we'd go simultaneous: we'd be everywhere at once along a great circle of the universe. The braking spine is that thing like a long stinger that points out behind the ship.

"Well, there was a piece of ice in our way, inside the range of our meteor gun,

when we came out of overspace. It went through the Jumper and into the Brain.

"The damage to the Brain is secondary. Something happened to the Jumper while the meteor was in there. Maybe some metal vaporized and caused a short circuit. Anyway the Goat Jumped back into the counterpart of overspace." Verd stopped. Was he talking over their heads? "You understand that when we say we travel in an overspace of Einsteinian space, we really mean a subspace of that overspace?"

A score of blank faces looked back at him. Doggedly Verd went on. "We went into the counterpart of that subspace. The

speed of light went to zero."

A murmur of whispering rose and fell.
Nobody laughed.

"The braking spine stuck out, or we'd have been in there until the bitter end of time. Well, then. In a region around the ship, the speed of light was zero. Our mass was infinite, our clocks and hearts stopped, the ship became an infinitely thin disk. This state lasted for no time in ship's time, but when it ended several billion years had passed."

A universal gasp, then pandemonium.
Verd had expected it. He waited it out.

"Billion?" "Kdapt stomp it--!" "Oh my

God." "Practical joke, Marna. I must say--" "Shut up and let him finish!"

The shouting died away. A last voice shouted, "But if our mass was infinite--"

"Only in a region around the ship!"

"Oh," said a dark stick figure Verd recognized as Strac Astrophysics. Visibly he shrugged off a vision of suns and galaxies snatched brutally down upon his cringing head by the Goat's infinite gravity.

"The zero effect has been used before," Verd continued in the relative quiet. "For suspended animation, for very long-range time capsules, et cetera. To

my knowledge it has never happened to a spacecraft. Our position is very bad. The Sun has become a greenish-white dwarf. The Earth has lost all its air and has become a one-face world; it turns one side forever to the Sun. Mercury isn't there anymore. Neither is the Moon.

"You can forget the idea of going home, and say good-bye to anyone you knew outside this ship. This is the universe, ourselves and nobody else, and our only duty is to survive. We will keep you informed of developments. Anyone who wishes his passage money refunded is welcome to it."

In a crackle of weak graveyard laughter, Verd bobbed his head in dismissal.

The passengers weren't taking the hint. Hearing the captain in person was as unique to them as it was to Verd. They sat looking at each other, and a few got up, changed their minds, and sat down again. One called, "What will you do next?"

"Ask the Brain for suggestions," said Verd. "Out, now!"

"We'd like to stay and listen," said the same man. He was short and broad and big footed, probably from one of the heavier planets, and he had the rough-edged compactness of a land-tank. "We've the legal right to consult the Brain at my time. If it takes a translator

we should have a translator."

Verd nodded. "That's true." Without further comment he turned to Chanda and said, "Ask the Brain what actions will maximize our chance of survival for maximal time."

Chanda tapped her stylus rhythmically against the rim of the Brain speaker.

The dining area was raucous with the sound of breathing and the stealthy shuffling of feet. Everyone seemed to be leaning forward.

The Brain answered in swiftly moving dots of light. Chanda said, "Immediately replace-- Eye of Kdapt!" Chanda looked

very startled, then grinned around at Verd. "Sorry, Captain. 'Immediately replace Verd Spacercaptain with Strac Astrophysics in supreme command over Hogan's Goat.'"

In the confusion that followed, Verd's voice was easily the loudest. "Everybody out! Everybody but Strac Astrophysics."

Miraculously, he was obeyed.

Strac was a long, tall oldster, old in habits and manners and mode of dress. A streak of black-enameled steel wool emphasized his chocolate scalp, and his ears spread like wings. Once Verd had wondered why Strac didn't have them

fixed. Lafer he had stopped wondering. Strac obviously made a fetish of keeping what he was born with. His hairline began not between his eyes, but at the very top of his forehead, and it petered out on his neck. His fingernails grew naturally. They must have needed constant trimming.

He sat facing the members of the crew, waiting without impatience.

"I believe you've traveled on my ship before," said Verd. "Have you ever said or done anything to give the Brain, or any passenger, the idea that you might want to command the Hogan's Goat?"

"Certainly not!" Strac seemed as ruffled

by the suggestion as Verd himself. "The Brain must be insane," he muttered venomously. Then his own words backlashed him, and in fear he asked, "Could the Brain be insane?"

"No," Chanda answered. "Brains of this type can be damaged, they can be destroyed, but if they come up with an answer it's the right one. There's a built-in doubt factor. Any ambiguity gives you an Insufficient Data."

"Then why would it try to take my command?"

"I don't know. Captain, there's something I should tell you."

"What's that?"

"The Brain has stopped answering questions. There seems to be some progressive deterioration going on. It stopped even before the passengers left. If I give it orders in Winsel it obeys, but it won't answer back."

"Oh, Kdapt take the Brain!" Verd rubbed his temples with his fingertips. "Parliss, what did the Brain know about Strac?"

"Same as any other passenger. Name, profession, medical state and history, mass, world of origin. That's all."

"Hmph. Strac, where were you born?"

"The Canyon," said Strac. "Is that germane?"

"I don't know. Canyon is a lonely place to grow up, I imagine."

"It is, in a way. Three hundred thousand is a tiny population for a solar system, but there's no room for more. Above the Canyon rim the air's too thin to breathe. I got out as soon as I could. Haven't been back in nearly a century."

"I see."

"Captain, I doubt that. In the Canyon there's no lack of company. It's the culture that's lonely. Everybody thinks just like everybody else. You'd say

there's no cultural cross-fertilization. The pressure to conform is brutal."

"Interesting," said Verd, but his tone dismissed the subject. "Strac, do you have any bright ideas that the Brain might have latched onto somehow? Or do you perhaps have a reputation so large in scientific circles that the Brain might know of it?"

"I'm sure that's not the case."

"Well, do you have any ideas at all? We need them badly."

"I'm afraid not. Captain, just what is our position? It seems that everyone is dead but us. How do we cope with an

emergency like that?"

"We don't," said Verd. "Not without time travel, and that's impossible. It is, isn't it?"

"Of course."

"Chanda, exactly what did you ask the Brain? How did you phrase it?"

"Maximize the probability of our surviving for maximum time. That's what you asked for. Excuse me, Captain, but the Brain almost certainly assumed that 'maximum time' meant forever."

"All right. Parliss, how long will the ship keep us going?"

Parliss was only thirty years old, and burdened with youth's habitual unsureness; but he knew his profession well enough. "A long time, Captain. Decades, maybe centuries. There's some boosterspice seeds in our consignment for the Zoo of Earth; if we could grow boosterspice aboard ship we could keep ourselves young. The air plant will work as long as there's sunlight or starlight. But the food converter-- well, it can't make elements, and eventually they'll get lost somewhere in the circuit, and we'll start getting deficiency diseases, and-- hmmm. I could probably keep us alive for a century and a half, and if we institute cannibalism we could--"

"Never mind. Let's call that our limit if we stay in space. We've got other choices, Strac, none of them pleasant.

"We can get to any planet in the solar system using the matter-conversion drive. We've enough solid chemical fuel in the landing rockets to land us on any world the size of Venus or smaller. With the matter-conversion drive we can take off from anywhere, but the photon beam would leave boiling rock behind us. We can do all that, but there's no point to it, because nothing in the solar system is habitable."

"If I may interrupt," said Strac. "Why do we have a matter-conversion drive?"

"Excuse me?"

"The Hogan's Goat has the Jumper to move between worlds, and the solids to land and take off. Why does such a ship need another reaction drive? Is the Jumper so imprecise?"

"Oh. No, that's not it. You see, the math of Jumper travel postulates a figure for the mass of a very large neighborhood, a neighborhood that takes in most of the local group of galaxies. That figure is almost twice the actual rest mass in the neighborhood. So we have to accelerate until the external universe is heavy enough for us to use the Jumper."

"I see."

"Even with total mass conversion we have to carry a tremendous mass of fuel. We use neutronium; anything less massive would take up too much room. Then, without the artificial gravity to protect us it would take over a year to reach the right velocity. The drive gives us a good one hundred gee in uncluttered space." Verd grinned at Strac's awed expression. "We don't advertise that. Passengers might start wondering what would happen if the artificial gravity went off.

"Where was I? ... Third choice: we can go on to other stars. Each trip would take decades, but by refueling in each system we could reach a few nearby

stars in the hundred and fifty years Parliss gives us. But every world we ever used must be dead by now, and the G-type stars we can reach in the time we've got may have no useful worlds. It would be a gamble."

Strac shifted uneasily. "It certainly would. We don't necessarily need a G-type sun, we can settle under any star that won't roast us with ultraviolet, but habitable planets are rare enough. Can't you order the Brain to search out a habitable planet and go there?"

"No," said Lourdi, from across the room. "The telescope isn't that good, not when it has to peer out of one gravity well into another. The light gets all bent up."

"And finally," said Verd, "if we did land on an Earth-sized planet that looked habitable, and then found out it wasn't, we wouldn't have the fuel to land anywhere else. Well, what do you think?"

Strac appeared to consider. "I think I'll go have a drink. I think I'll have several. I wish you'd kept our little predicament secret a few centuries longer." He rose with dignity and turned to the door, then spoiled the exit by turning back. "By the way, Captain, have you ever been to a one-face world? Or have your travels been confined to the habitable worlds?"

"I've been to the Earth's Moon, but that's

all. Why?"

"I'm not sure," said Strac, and he left looking thoughtful. Verd noticed that he turned right. The bar was aft of the dining room, to the left.

Gloom settled over the dining area. Verd fumbled in his belt pouch, brought forth a white tube not much bigger than a cigarette. Eyes fixed morosely on a wall, he hung the tube between his lips, sucked through it, inhaled at the side of his mouth. He exhaled cool, thick orange smoke.

The muscles around his eyes lost a little of their tension.

Chanda spoke up. "Captain, I've been wondering why the Brain didn't answer me directly, why it didn't just give us a set of detailed instructions."

"Me too. Have you got an answer?"

"It must have computed just how much time it had before its motor aphasia became complete. So instead of trying to give a string of detailed instructions it would never finish, it just named the person most likely to have the right answer. It gave us what it could in the few seconds it had left."

"But why Strac? Why not me, or one of you?"

"I don't know," Chanda said wearily. The damage to the Brain had hit her hard. Not surprising; she had always treated the Brain like a beloved but retarded child. She closed her eyes and began to recite, "Name, profession, mass, world of origin, medical history. Strac, astrophysics, the Canyon..."

In the next few days, each member of the crew was busy at his own specialty.

Lourdi Coursefinder spent most of her time at the telescope. It was a powerful instrument, and she had the Brain's limited help. But the worlds of even the nearest stars were only circular dots.

The sky was thick with black suns, visible only in the infrared. She did manage to find Earth's Moon-- more battered than ever, in a Trojan orbit, trailing sixty degrees behind the parent planet in her path around the Sun.

Parliss Lifesystems spent his waking hours in the ship's library, looking up tomes on the medical aspects of privation. Gradually he was putting together a detailed program that would keep the passengers healthy for a good long time, and alive for a long time after that, with safety factors allowing for breakdown of the more delicate components of the life-support system. Later he planned to prepare a similar

program using cannibalism to its best medical advantage. That part would be tricky, involving subtle psychological effects from moral shock.

Slowly and painfully, with miniature extensible waldos, Chanda searched out the tiny burns in the Brain's cortex and scraped away the charred semiconducting ash. "Probably won't help much," she admitted grimly, "but the ash may be causing short circuits. It can't hurt to get it out. I wish I had some fine wire."

Once he was convinced that the Jumper was stonecold dead, Verd left it alone. That gave him little to do but worry. He worried about the damage to the Brain,

and wondered if Chanda was being overoptimistic. Like a surgeon forced to operate on a sick friend, she refused even to consider that the Brain might get worse instead of better. Verd worried, and he checked the wiring in the manual override systems for the various drives, moving along outside the hull in a vac suit.

He was startled by the sight of the braking spine. Its ultrahard metal was as shiny as ever, but it was two-thirds gone. Sublimation, over several billion years.

He worried about the passengers too. Without the constant entertainment

provided by the Brain, they would be facing the shock of their disaster virtually unaided. The log had a list of passengers, and Chanda got the Brain to put it on the screen, but Verd could find few useful professions among them.

Strac Astrophysics

Jimm Farmer

Avran Zooman

The other professions were all useless here. Taxer, Carmaker, Adman-- he was lucky to find anything at all. "All the same," he told Lourdi one night, "I'd give anything to find a Jak FTLsystems aboard."

"How 'bout a Harlan Alltrades?"

"On this tub? Specializing nonspecialists ride the luxury liners." He twisted restlessly in the air between the sleeping plates. "Wanta buy an aircar? It was owned by a sniveling coward--"

Jimm Farmer was the heavy-planet man, with long, smooth muscles and big broad feet. His Anxian accent implied that he could probably kick holes in hullmetal. "I've never worked without machinery," he said. "Farming takes an awful lot of machinery. Diggers, plowers, seeders, transplinters, aerators, you name it. Even if you gave me seeds and a world to grow them on, I couldn't do anything by myself." He scratched his bushy

eyebrows. For some reason he'd let them grow outward from the end of his hairline, like the crossbar on an upside-down T. "But if all the passengers and crew pitched in and followed directions, and if they didn't mind working like robots, I think we could raise something, if we had a planet with good dirt and some seeds."

"At least we've got the seeds," said Verd. "Thanx, Mr. Farmer."

Verd had first seen Avran Zooman walking through the hall at the beginning of the trip. Zooman was a shocking sight. Hithin strip of hair was bleached-bone white and started halfway back on his

scalp. His skin had faint lines in it, like the preliminary grooves in tooled leather. Verd had avoided him until now. Obviously the man belonged to one of those strange, nearly extinct religious orders which prohibit the taking of boosterspice.

But he didn't behave like a religious nut. Verd found him friendly, alert, helpful, and likable. His thick We Made It accent was heavy with stressed esses.

"In this one respect we are lucky," Avran was saying. "Or you are lucky. I should have been lucky enough to miss my ship. I came to protect your cargo, which is a selection of fertile plant seeds and frozen animal eggs for the Zoo

of Earth Authority."

"Exactly what's in the consignment?"

"Nearly everything you could think of, Captain. The Central Government wished to establish a zoo to show all the life that Earth has lost as a result of her intense population compression. I suspect they wished to encourage emigration. This is the first consignment, and it contains samples of every variety of nondomestic life on We Made It. There were to be other shipments from other worlds, including some expensive mutations from Wunderland designed to imitate the long extinct 'big cats.' We do not have those, nor the useless

decorative plants such as orchids and cactus, but we do have everything we need for farming."

"Have you got an incubator for the animals?"

"Unfortunately not. Perhaps I could show you how to make one out of other machinery." Avran smiled humorously. "But there is a problem. I am fatally allergic to boosterspice extract. Thus I will be dead in less than a century, which unfortunately limits the length of any journey that I cail make."

Verd felt his face go numb. He was no more afraid of death than the next man, but-- frantically he tried to sort his

climbing emotions before they strangled him. Admiration, wonder, shame, horror, fear. How could Avran live so casually with death? How could he have reached such a state of emotional maturity in what could be no more than fifty years? Shame won out, shame at his own reaction, and Verd felt himself flushing.

Awan looked concerned. "Perhaps I should come back later," he suggested.

"No! I'm all right." Verd had found his tabac stick without thinking. He pulled in a deep, cooling draft of orange smoke, and held it in his lungs for a long moment.

"A few more questions," he said briskly.

"Does the Zoo consignment have grass seed? Are there any bacteria or algae?"

"Grass, yes. Forty-three varieties. No bacteria, I'm afraid."

"That's not good. It takes bacteria to turn rock dust into fertile soil."

"Yes." Avran considered. "We could start the process with sewage from the ship mixed with intestinal flora. Then add the rock dust. We have earthworms. It might work."

"Good."

"Now I have a question, Captain. What is that?"

Verd followed his pointing finger.
"Never seen a tabac stick?"

Avran shook his head.

"There's a funny tranquilizer in tobacco that helps you concentrate, lets you block out distractions. People used to have to inhale tobacco smoke to get it. That caused lung cancer. Now we do it better. Are there tobacco plants in the consignment?"

"I'm afraid not. Can you give up the habit?"

"If I have to. But I'll hate it."

Verd sat for a moment after Avran had

left, then got up and hunted down Parliss. "Avran claims to be allergic to boosterspice. I want to know if it's true. Can you find out?"

"Sure, Captain. It'll be in the medical record."

"Good.

"Why would he lie, Captain?"

"He may have a religious ban on boosterspice. If so, he might think I'd shoot him full of it just because I need him. And he'd be right."

There was no point in interviewing Strac Astrophysics again. Parliss told him that

Strac spent most of his time in his room, and that he had found a pocket computer somewhere.

"He must have something in mind," said Parliss.

The next day Parliss came to the cabin. "I've gone through the medical histories," he said. "We're all in good shape, except Avran Zooman and Laspia Waitress. Avran told the truth. He's allergic to boosterspice. Laspia has a pair of cultured arms, no telling how she lost the old ones, and both ulnas have machinery in them. One's a dooper, one's a multirange sonic. I wonder what that sweet girl is doing armed to the teeth like that."

"So do I. Can you sabotage her?"

"I put an extension-recharger in her room. If she tries to shoot anyone she'll find her batteries are drained."

The sixth day was the day of mutiny.

Veid and Parliss were in the crew common room, going over Parliss' hundred-and-fifty-year schedule for shipboard living, when the door opened to admit Chanda. The first hint came from Chanda's taut, determined expression. Then Verd saw that someone had followed her in. He stood up to

protest, then stood speechless as a line of passengers trooped into the crew common room, filling it nearly to bursting.

"I'm sorry, Captain," said Chanda. "We've come to demand your resignation."

Verd, still standing, let his eyes run over them. The pretty auburn-haired woman in front, the one who held her arms in an inconspicuously strained attitude-she must be Laspia Waitress. Jimm Farmer was also in the front rank. And Strac Astrophysics, looking acutely embarrassed. Many looked embarrassed, and many looked angry; Verd wasn't sure what they were angry at, or who. He

gave himself a few seconds to think. Let 'em wait it out...

"On what grounds?" he asked mildly.

"On the ground that it's the best chance we have to stay alive," said Chanda.

"That's not sufficient grounds. You know that. You need a criminal charge to bring against me: dereliction of duty, sloppiness with the drive beam, murder, violation of religious tenets, drug addiction. Do you wish to make such a charge?"

"Captain, you're talking about impeachment-- legal grounds for mutiny. We don't have such grounds. We don't

want to impeach you, regardless."

"Well, just what did you think this was, Chanda? An election?"

"We're inviting you to resign."

"Thanx, but I think not."

"We could impeach you, you know." Jimm Farmer was neither angry nor embarrassed; merely interested. "We could charge you with addiction to tabac sticks, try you, and convict you."

"Tabac sticks?"

"Sure, everybody knows they're not addictive. The point is that you can't find

a higher court to reverse our decision."

"I guess that's true. Very well, go ahead."

Parliss broke in, in a harsh whisper. "Chanda, what are you doing?" His face, scalp, and ears burned sunset red.

The tall woman said, "Quiet, Parl. We're only doing what needs to be done."

"You're crazy with grief over that damn mechanical moron."

Chanda flashed him a smoking glare. Parliss returned it. She turned away, aloofly ignoring him.

Strac spoke for the first time. "Don't make us use force, Captain."

"Why not? Do you idiots realize what you're asking?" Verd's control was going. He'd been a young man when the Hogan's Goat was built. In nearly two centuries he'd flown her further than the total distance to Andromeda; nursed her and worried about her and lived his life in her lighted, rushing womb. What he felt must have showed in his face, for the girl with the auburn hair raised her left arm and held it innocently bent, pointed right at him. Probably it was the sonic; no doubt he would have been swathed in calming vibrations if her batteries had worked. But all he felt was nausea and a

growing rage.

"I do," Strac said quietly. "We're asking you to make it possible for us to give you back your ship after this is over."

Verd jumped at him. A cold corner of his mind wag amazed at himself, but most of him only wanted to get his hands around Strac's bony, fragile throat. He glimpsed Laspia Waitress staring in panic at her forearms, and then a steel band closed around his ankle, and jerked. Verd stopped in midair.

It was Jimm Farmer. He had jumped across the room like a kangaroo. Verd looked back over his shoulder and carefully kicked him under the jaw.

Jimm looked surprised and hurt. He squeezed!

"All right!" Verd yelped. More softly, "All right. I'll resign."

The autdoc mended two cracked ankle bones, injected mysterious substances into the badly bruised lower terminal of his Achilles tendon, and ordered a week of bed rest.

Strac's plans were compatible. He had ordered the ship to Earth. Since the Goat was still moving at nearly lightspeed, and had gone well past the solar system, the trip would take about two weeks.

Verd began to enjoy himself. For the

first time since the last disastrous Jump, he was able to stop worrying for more than minutes at a time. The pressure was off. The responsibility was no longer his. He even persuaded Lourdi to cooperate with Strac. At first she would have nothing to do with the mutineers, but Verd convinced her that the passengers depended on her. Professional pride was a powerful argument.

After a week on his back Verd started moving around the ship, trying to get an idea of the state of the ship's morale. He did little else. He was perversely determined not to interfere with the new captain.

Once Laspia Waitress stopped him in the hall. "Captain, I've decided to take you into my confidence. I am an ARM, a member of the Central Government Police of Earth. There's a badly wanted man aboard this ship." And before Verd could try to humor her out of it she had produced authentic-looking credentials.

"He's involved in the Free Wunderland conspiracy," she went on. "Yes, it still exists. We had reason to believe he was aboard the Hogan's Goat, but I wasn't sure of it until he found some way to disarm me. I still haven't identified him yet. He could be anyone, even--"

"Easy, easy," Verd soothed her. "I did that. I didn't want anyone wandering

around my ship with concealed weapons."

Her voice cracked. "You fool! How am I going to arrest him?"

"Why should you? Who would you turn him over to if you did? What harm can he do now?"

"What harm? He's a revolutionary, a-- a seditionist!"

"Sure. He's fanatically determined to free Wunderland from the tyranny of the Central Government of Earth. But Wunderland and the Central Government have been dead for ages, and we haven't a single Earthman on board. Unless

you're one."

He left her sputtering helplessly.

When he thought about it later it didn't seem so funny. Many of the passengers must be clinging to such an outmoded cause, unwilling to face the present reality. When that defense gave out, he could expect cases of insanity.

Surprisingly, Strac had talked to nobody, except to ask questions of the crew members. If he had plans, they were all his own. Perhaps he wanted one last look at Earth, ancient grandmother Earth, dead now of old age. Many passengers felt the same.

Verd did not. He and Lourdi had last seen Earth twelve years ago-- subjective time-- when the Goat was getting her life-support systems rejuvenated. They had spent a wonderful two months in Rio de Janeiro, a hive of multicolored human beings moving among buildings that reached like frustrated spacecraft toward the sky. Once they had even seen two firemanes, natives of l'Elephant, shouldering their way unconcerned among the bigger humans, but shying like fawns at the sight of a swooping car. Perhaps firemanes still lived somewhere in the smoky arms of this galaxy or another. Perhaps even humans lived, though they must be changed beyond recognition. But Verd did not want to

look on the corpse face of Earth. He preferred to keep his memories unspoiled.

He was not asked.

On the tenth day the Goat made turnover. Verd thought of the drive beam sweeping its arc across deserted asteroidal cities. Neutronium converted to a destroying blast of pure light. In civilized space a simple turnover required seconds of calculation on the part of the Brain, just to keep the drive beam pointed safely. Anything that light touched would vanish. But now there was nothing to protect.

On the fifteenth ship's-day morning the

Earth was a wide, brilliant crescent, blinding bright where the seas had dried across her sunward face. The Sun shone with eerie greenish-white radiance beyond the polarized windows. Verd and Lourdi were finishing breakfast when Strac appeared outside the one-way transparent door. Lourdi let him in.

"I thought I'd better come personally," said Strac. "I've called for a meeting in the crew common room in an hour. I'd appreciate it if you'd be there, Verd."

"I'd just as soon not," said Verd. "Thanx anyway. Have a roast dove?"

Strac politely declined, and left. He had not repeated his invitation.

"He wasn't just being polite," Lourdi told him. "He needs you."

"Let 'im suffer."

Lourdi took him gently by the ears and turned him to face her-- a trick she had developed to get his undivided attention. "Friend, this is the wrong time to play prima donna. You talked me into serving the usurper on grounds that the passengers needed my skills. I'm telling you they need yours."

"Dammit, Lourdi, if they needed me I'd still be captain!"

"They need you as a crewman!"

Verd set his jaw and looked stubborn. Lourdi let go, patted his ears gently, and stepped back. "That's my say. Think it through, Lord and Master."

Six people circled the table. Verd was there, and Lourdi and Parliss and Chanda. Strac occupied the captain's chair, beneath the Brain screen. The sixth man was Jimm Farmer.

"I know what we have to do now," said Strac. His natural dignity had deepened lately, though his shoulders sagged as if ship's gravity were too much for him, and his thin, dark face had lost the ability to smile. "But I want to consider alternatives first. To that end I want you all to hear the answers to questions I've

been asking you individually. Lourdi, will you tell us about the Sun?"

Lourdi stood up. She seemed to know exactly what was wanted.

"It's very old," she said. "Terribly old and almost dead. After our Jumper went funny the Sun seems to have followed the main sequence all the way. For awhile it got hotter and brighter and bigger, until it blew up into a red giant. That's probably when Mercury disappeared. Absorbed.

"Sol could have left the main sequence then, by going nova for example, but if it had there wouldn't be any inner planets. So it stayed a red giant until there wasn't

enough fuel to bum to maintain the pressure, and then the structure collapsed.

"The Sun contracted to a white dwarf. What with unradiated heat working its way out, and heat of contraction, and fusion reactions still going on inside, it continued to give off light, and still does, even though for all practical purposes there's no fuel left. You can't burn iron. So now the Sun's a greenish dwarf, and in a few million years it'll be a black one."

"Only millions?"

"Yes, Strac. Only millions."

"How much radiation is being put out now?"

Lourdi considered. "About the same as in our time, but it's bluer light. The Sun is much hotter than we knew it, but all its light has to radiate through a smaller surface area. Do you want figures?"

"No thanx, Lourdi. Jimm. Farmer, could you grow foodstuffs under such a star?"

Peculiar question, thought Verd. He sat up straighter, fighting a horrible suspicion.

Jimm looked puzzled, but answered readily. "If the air was right and I had enough water, sure I could. Plants like

ultraviolet. The animals might need protection from sunburn."

Strac nodded. "Lourdi, what's the state of the galaxy?"

"Lousy," she said promptly. "Too many dead stars, and most of what's left are blue-white and white giants. Too hot. I'll bet that any planet in this neighborhood that has the right temperature for life will be a gas giant. The young stars are all in the tips of the galactic arms, and they've been scattered by the spin of the galaxy. We can find some young stars in the globular clusters. Do you want to hear about them?"

"We'd never reach them," said Verd. His

suspicion was a certainty. He blew orange smoke and waited, silently daring Strac to put his intention into words.

"Right," said Strac. "Chanda, how is the Brain?"

"Very, very sick. It might stop working before the decade's end. It'll never lost out the century, crippled as it is." Chanda wasn't looking so good herself. Her eyes were red, underlined with blue shadows. Verd thought she had lost mass. Her hair hadn't had its usual care. She continued, as if to herself, "Twice I've given it ordinary commands and gotten the Insufficient Data sign. That's very bad. It means the Brain is starting to distrust the data in its own memory

banks."

"Just how bad is that?"

"It's a one-way street, with a wiped mind at the end. There's no way to stop it."

"Thanx, Chanda." Strac was carrying it off, but beneath his battered dignity he looked determined and frightened. Verd thought he had reason. "Now you know everything," he told them. "Any comments?"

Parliss said, "If we're going star hunting we should stop on Pluto and shovel up an air reserve. It'd give us a few decades leeway."

"Uh huh. Anything else?"

Nobody answered.

"Well, that's that." Strac drew a deep breath, let it out slowly. "There's too much risk in searching the nearby stars. We'll have to make do with what we've got. Chanda, please order the Brain to set us down on the highest flat point in Earth's noon-equator region."

Chanda didn't move. Nobody moved.

"I knew it," Verd said, very quietly. His voice echoed in the greater quiet. The crew common room was like a museum exhibit. Everyone seemed afraid to move. Everyone but Jimm Farmer, who

in careful silence was getting to his feet.

"Didn't you understand, Strac?" Verd paused and tried to make his voice persuasive. "The Brain put you in charge because you had more useful knowledge than the rest of us. You were supposed to find a new home for the human race."

They were all staring at Strac with varying degrees of horror. All but Jimm, who stood patiently waiting for the others to make up their minds.

"You were not supposed to give up and take us home to die!" Verd snapped. But Strac was ignoring him. Strac was glaring at them all in rage and contempt.

Parliss, normally Nordic-pale, was white as moonlight. "Strac, it's dead! Leave it! We can find another world--"

"You mewling litter of blind idiots."

Even Jimm Farmer looked shocked.

"Do you think I'd kill us all for a twinge of homesickness? Verd, you know better than that, even if nobody else does. They were on your back, twenty-seven adults and all their potential children, all waiting for you to tell them how to die. Then came the mutiny. Now you're free! They've all shifted to my back!"

His eyes left Verd's and ranged over his shocked, silent crew. "Idiots blindly

taking orders from a damaged mechanical brain. Believing everything you're told. Lourdi!" he snapped. "What does 'one face' mean?"

Lourdi jumped. "It means the body doesn't rotate with respect to its primary."

"It doesn't mean the planet has only one face?"

"Wha-at?"

"The Earth has a back side to it."

"Sure!"

"What does it look like?"

"I don't know." Lourdi thought a moment. "The Brain knows. You remember you asked Chanda to make the Brain use the radar to check the back side. Then she couldn't get the Brain to show us the picture. We can't use the telescope because there's no light, not even infrared. It must be terribly cold. Colder than Pluto."

"You don't know," said Strac. "But I do. We're going down. Chanda?"

"Tell us about it," said Jimm Farmer.

"No," said Verd.

He had not known that he was going to speak. He had known only that they had

given Strac the responsibility without the power to match it. But Strac felt the responsibility; he carried it in his bent shoulders and bleak expression, in his deep, painful breathing, in his previous attempts to pass the buck to someone else. Why would Strac want to land on Earth? Verd didn't know. But Strac must know what he was doing. Otherwise he couldn't have moved at all.

Someone had to back him up.

"No." Verd spoke with all the authority he could muster. "Chanda, take her down."

"Tell us about it," Jimm repeated. The authority backing his flat, menacing tone

was his own titanic physical strength.

"No. Shut up, Jimm. Or we'll let you make all the decisions from now on."

Jimin Farmer thought it over, suddenly laughed and sat down. Chanda picked up her stylus and began tapping on the speaker.

The Hogan's Goat lay on her side, nearly in the center of a wide, ancient asteroid crater. There, marring the rounded spine with its long stinger, was the ragged, heat-stained hole that marked a meteor strike. There, along two-thirds of the length of her belly, was the gash a rock

had made in the last seconds of the landing. And at the tail, forward of the braking spine, that static explosion of curved metal strips was where the photon drive had been torn free.

A small, fiercely bright Sun burned down from a black sky.

It had been a bad landing. Even at the start the Brain was a fraction of a second slow in adjusting ship's gravity, so that the floor had bucked queasily under them as they dropped. Then, when they were already falling toward the crater, Strac had suddenly added a new order. The photon drive had to be accessible after landing. Chanda had started tapping and the ship had flipped on its side.

The Hogan's Goat had never been built to land on its side. Many of the passengers sported bruises. Avran Zooman had broken an arm. Without boosterspice the bone would be slow to heal.

A week of grinding labor was nearly over.

Only servomachinery now moved on the crater floor. From Verd's viewpoint most of the activity seemed to center around a gigantic silver tube which was aimed like a cannon at a point ten degrees above the horizon. The drive tube had been towed up against the crater wall, and a mountain of piled,

heat-fused earth now buried its lower end. Cables and fuel pipes joined it higher up.

"Hi! Is that you, Captain?"

Verd winced. "I'm on top of the crater wall," he said, because Strac couldn't locate him from the sound of his voice. The indeterminate voice had to be Strac. Only Strac would bellow into a suit radio. "And I'm not the captain."

Strac floated down beside him. "I thought I'd see the sights."

"Good. Have a seat."

"I find it strange to have to call you

Verd," said the astrophysicist. "It used to be just 'Captain.' "

"Serves you right for staging a mutiny-- Captain."

"I always knew my thirst for power would get me in trouble."

They watched as a tractor-mounted robot disconnected a fuel pipe from the drive, then rolled back. A moment later a wash of smoky flame burst from the pipe. The flame changed color and intensity a dozen times within a few seconds, then died as abruptly as it had begun. The robot waited for the white heat to leave the pipe, then rolled forward to reconnect it.

Verd asked, "Why are you so calm all of a sudden?"

"My job's over," Strac said with a shrug in his voice. "Now it's in the lap of Kdapt."

"Aren't you taking an awful chance?"

"Oh? You've guessed what I'm trying to do?"

"I hope it wasn't a secret. There's only one thing you could be doing, with the photon drive all laid out and braced like that. You're trying to spin the Earth."

"Why?" Strac baited him.

"You must be hoping there's air and water frozen on the dark side. But it seems like a thin chance. Why were you afraid to explain?"

"You put it that way, then ask why I didn't put it to a vote? Verd, would you have done what I did?"

"No. It's too risky."

"Suppose I tell you that I know the air and water is there. It has to be there. I can tell you what it looks like. It's a great shallow cap of ice, stratified out according to freezing points, with water ice on the bottom, then carbon dioxide, all the way up through a thick nitrogen layer to a few shifting pools of liquid

helium. Surely you don't expect a one-face world to have a gaseous atmosphere? It would all freeze out on the night side. It has to!"

"It's there? There's air there? Your professional word?"

"My word as an astrophysicist. There's frozen gas back there."

Verd stretched like a great cat. He couldn't help himself. He could actually feel the muscles around his eyes and cheeks rippling as they relaxed, and a great grin crawled toward his ears. "You comedian!" he laughed. "Why didn't you say so?"

"Suppose I kept talking?"

Verd turned to look at him.

"You'll have thought of some of these things yourself. Can we breathe that air? Billions of years have passed. Maybe the composition of the air changed before it froze. Maybe too much of it boiled off into space while the sun was a red giant. Maybe there's too much, generated by outgasing after the Moon was too far away to skim it off. Lourdi said the Sun is putting out about the right amount of heat, but just how close will it be to a livable temperature? Can Jimm Farmer make us topsoil? There'll be live soil on the nightside, possibly containing frozen live bacteria, but can we get there

if we have to?"

"Worst of all, can we spin the Earth in the first place? I know the drive's strong enough. I don't know about the Earth. There can't be any radioactivity left in the Earth's core, so the planet should be solid rock all the way to the center. But solid rock flows under pressure. We'll get earthquakes. Kdapt only knows how bad. Well, Captain, would you have taken all those risks?"

"She blows."

The drive was on.

Traces of hydrogen, too thin to stop a meteor, glowed faintly in the destroying

light. A beam like a spotlight beam reached out over the sharp horizon, pointing dead east. Anything that light touched would flame and blow away on the wings of a photon wind. The drive nosed a little deeper into its tomb of lava.

The ground trembled. Verd turned on his flying unit, and Strac rose after him. Together they hovered over the quivering Earth. Other silver specks Boated above the plain.

In space the drive would be generating over a hundred savage gravities. Here ... almost none. Almost.

Little quick ripples came running in from

the eastern horizon. They ran across the crater floor in parallel lines of dancing dust, coming closer and closer together. Rocks showered down from the old ringwall.

"Maybe I wouldn't have risked it," said Verd. "I don't know."

"That's why the Brain put me in charge. Did you see the oxygen ice as, we went by the night side? Or was it too dark? To you this frozen atmosphere is pure imagination, isn't it?"

"I'll take your professional word."

"But I don't need to. I know it's there."

Lines of dust danced over the shaking ground. But the ripples were less violent, and were coming less frequently.

"The Brain was damaged," Verd said softly.

"Yes," said Strac, frowning down into the old crater. Suddenly he touched his controls and dropped. "Come on, Verd. In a few days there'll be air. We've got to be ready for wind and rain."