

## Breaking Strain

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Grant was writing up the Star Queen's log when he heard the cabin door opening behind him. He didn't bother to look round-it was hardly necessary for there was only one other man aboard the ship. But when nothing happened, and when McNeil neither spoke nor came into the room, the long silence finally roused Grant's curiosity and he swung the seat round in its gimbals.

McNeil was just standing in the doorway, looking as if he had seen a ghost. The trite metaphor flashed into Grant's mind instantly. He did not know for a moment how near the truth it was. In a sense McNeil had seen a ghost-the most terrifying of all ghosts -his own.

"What's the matter?" said Grant angrily. "You sick or something?"

The engineer shook his head. Grant noticed the little beads of sweat that broke away from his forehead and went glittering across the room on their perfectly straight trajectories. His throat muscles moved, but for a while no sound came. It looked as though he was going to cry.

"We're done for," he whispered at last. "Oxygen reserve's gone."

Then he did cry. He looked like a flabby doll, slowly collapsing on itself. He couldn't fall, for there was no gravity, so he just folded up in mid-air.

Grant said nothing. Quite unconsciously he rammed his smoldering cigarette into the ash tray, grinding it viciously until the last tiny spark had died. Already the air seemed to be thickening

aroundhim as the oldest terror of the spaceways gripped him by

thethroat.

He slowly loosed the elastic straps which, while he was seated, gave some illusion of weight, and with an automatic skill launched himself toward the doorway. McNeil did not offer to follow. Even making every allowance for the shock he had undergone, Grant felt that he was behaving very badly. He gave the engineer an angry cuff as he passed and told him to snap out of it.

The hold was a large hemispherical room with a thick central column which carried the controls and cabling to the other half of the dumbbell-shaped spaceship a hundred meters away. It was packed with crates and boxes arranged in a surrealistic three-dimensional array that made very few concessions to gravity.

But even if the cargo had suddenly vanished Grant would scarcely have noticed. He had eyes only for the big oxygen tank, taller than himself, which was bolted against the wall near the inner door of the airlock.

It was just as he had last seen it, gleaming with aluminum paint, and the metal sides still held the faint touch of coldness that gave the only hint of the contents. All the piping seemed in perfect condition. There was no sign of anything wrong apart from one minor detail. The needle of the contents gauge lay mutely against the zero stop.

Grant gazed at that silent symbol as a man in ancient London, returning home one evening at the time of the Plague, might have stared at a rough cross newly scrawled upon his door. Then he banged half a dozen times on the glass in the futile hope that the needle had stuck-though he never really doubted its message. News that is sufficiently bad somehow carries its own guarantee of truth. Only good reports need confirmation.

When Grant got back to the control room, McNeil was himself again. A glance at the opened medicine chest showed the reason for the engineer's rapid recovery. He even assayed a faint attempt at humor.

"It was a meteor," he said. "They tell us a ship this size should get hit once a century. We seem to have jumped the gun with ninety-five years still to go.,,

"But what about the alarms? The air pressure's normal-how could we have been holed?"

"We weren't," McNeil replied. "You know how the oxygen circulates night-side through the refrigerating coils to keep it liquid? The meteor must have smashed them and the stuff simply boiled away."

Grant was silent, collecting his thoughts. What had happened was serious-deadly serious-but it need not be fatal. After all, the voyage was more than three quarters over.

"Surely the regenerator can keep the air breathable, even if it does get pretty thick?" he asked hopefully.

McNeil shook his head. "I've not worked it out in detail, but I know the answer. When the carbon dioxide is broken down and the free oxygen gets cycled back there's a loss of about ten per cent. That's why we have to carry a reserve."

"The space-suits!" cried Grant in sudden excitement. "What about their tanks?"

He had spoken without thinking, and the immediate realization of his mistake left him feeling worse than before.

"We can't keep oxygen in them-it would boil off in a few days. There's enough compressed gas there for about thirty minutes merely long enough for you to get to the main tank in an emergency."

"There must be a way out-even if we have to jettison cargo and run for it. Let's stop guessing and work out exactly where we are."

Grant was as much angry as frightened. He was angry with McNeil for breaking down. He was angry with the designers of the ship for not having foreseen this God-knew-how-many-million-to-one chance. The deadline might be a couple of weeks away and a lot could happen before then. The thought helped for a moment to keep his fears at arm's length.

This was an emergency, beyond doubt, but it was one of those peculiarly protracted emergencies that seem to happen only in space. There was plenty of time to think-perhaps too much time.

Grant strapped himself in the pilot's seat and pulled~ out a writing-pad.

"Let's get the facts right," he said with artificial calmness. "We've got the air that's still circulating in the ship and we lose ten per cent of the oxygen every time it goes through the generator. Chuck me over the Manual, will you? I can never remember how many cubic meters we use a day."

In saying that the Star Queen might expect to be hit by a meteor once every century, McNeil had grossly but unavoidably oversimplified the problem. For the answer depended on so many factors that three generations of statisticians had done little but lay down rules so vague that the insurance companies still shivered with apprehension when the great meteor showers went sweeping like a gale through the orbits of the inner worlds.

Everything depends, of course, on what one means by the word meteor. Each lump of cosmic slag that reaches the surface of the Earth has a million smaller brethren that perish utterly in the no man's-land where the atmosphere has not quite ended and space has yet to begin-that ghostly region where the weird Aurora sometimes walks by night.

These are the familiar shooting stars, seldom larger than a pin's head, and these in turn are outnumbered a million fold again by particles too small to leave any visible trace of their dying as they drift down from the sky. All of them, the countless specks of dust, the rare boulders and even the wandering mountains that Earth encounters perhaps once every million years-all of them are meteors.

For the purposes of space-flight, a meteor is only of interest if, on penetrating the hull of a ship, it leaves a hole large enough to be dangerous. This is a matter of relative speeds as well as size. Tables have been prepared showing approximate collision times for various parts of the Solar System-and for various sizes of meteors down to masses of a few milligrams.

That which had struck the Star Queen was a giant, being nearly a centimeter across and weighing all of ten grams. According to the table the waiting-time for collision with such a monster was of the order of ten to the ninth days-say three million years. The virtual certainty that such an occurrence would not happen again in the course of human history gave Grant and McNeil very little consolation.

However, things might have been worse. The Star Queen was 115 days on her orbit and had only 30 still to go. She was traveling, as did all freighters, on the long tangential ellipse kissing the orbits of Earth and Venus on opposite sides of the Sun. The fast liners could cut across from planet to planet at three times her speed and ten times her fuel consumption-but she must plod along her

predetermined track like a streetcar, taking 145 days, more or less, for each journey.

Anything more unlike the early-twentieth-century idea of a spaceship than the Star Queen would be hard to imagine. She consisted of two spheres, one fifty and the other twenty meters in diameter, joined by a cylinder about a hundred meters long. The whole structure looked like a match-stick-and-Plasticine model of a hydrogen atom. Crew, cargo, and controls were in the larger sphere, while the smaller one held the atomic motors and was-to put it mildly-out of bounds to living matter.

The Star Queen had been built in space and could never have lifted herself even from the surface of the Moon. Under full power her ion drive could produce an acceleration of a twentieth of a gravity, which in an hour would give her all the velocity she needed to change from a satellite of the Earth to one of Venus.

Hauling cargo up from the planets was the job of the powerful little chemical rockets. In a month the tugs would be climbing up from Venus to meet her, but the Star Queen would not be stopping for there would be no one at the controls. She would continue blindly on her orbit, speeding past Venus at miles a second-and five months later she would be back at the orbit of the Earth, though Earth itself would then be far away.

It is surprising how long it takes to do a simple addition when your life depends on the answer. Grant ran down the short column of figures half a dozen times before he finally gave up hope that the total would change. Then he sat doodling nervously on the white plastic of the pilot's desk.

"With all possible economies," he said, "we can last about twenty days. That means we'll be ten days out of Venus when.

His voice trailed off into silence.

Ten days didn't sound much-but it might just as well have been ten years. Grant thought sardonically of all the hack adventure writers who had used just this situation in their stories and radio serials. In these circumstances, according to the carbon-copy experts-few of whom had ever gone beyond the Moon-there were three things that could happen.

The popular solution-which had become almost a cliché-was to turn the ship into a glorified greenhouse or a hydroponic farm

and let photosynthesis do the rest. Alternatively one could perform prodigies of chemical or atomic engineering-explained in tedious technical detail-and build an oxygen manufacturing plant which would not only save your life-and of course the heroine's-but also make you the owner of fabulously valuable patents. The third or deus ex machina solution was the arrival of a convenient spaceship which happened to be matching your course and velocity exactly.

But that was fiction and things were different in real life. Although the first idea was sound in theory there wasn't even a packet of grass seed aboard the Star Queen. As for feats of inventive engineering, two men-however brilliant and however desperate were not likely to improve in a few days on the work of scores of great industrial research organizations over a full century.

The spaceship that "happened to be passing" was, almost by

definition, impossible. Even if other freighters had been coasting

on the same elliptic path-and Grant knew there were none-then by the very laws that governed their movements they would always keep their original separations. It was not quite impossible that a liner, racing on its hyperbolic orbit, might pass within a few hundred thousand kilometers of them-but at a speed so great that it would be as inaccessible as Pluto.

"If we threw out the cargo," said McNeil at last, "would we have a chance of changing our orbit?"

Grant shook his head.

"I'd hoped so," he replied, "but it won't work. We could reach Venus in a week if we wished-but we'd have no fuel for braking and nothing from the planet could catch us as we went past."

"Not even a liner?"

"According to Lloyd's Register Venus has only a couple of freighters at the moment. In any case it would be a practically impossible maneuver. Even if it could match our speed how would the rescue ship get back? It would need about fifty kilometers a second for the whole job!"

"If we can't figure a way out," said McNeil, "maybe someone on Venus can. We'd better talk to them."

"I'm going to," Grant replied, "as soon as I've decided what to say. Go and get the transmitter aligned, will you?"

He watched McNeil as he floated out of the room. The engineer was probably going to give trouble in the days that lay ahead. Until

now they had got on well enough-like most stout men McNeil was good-natured and easygoing. But now Grant realized that he lacked fiber. He had become flabby-physically and mentally living too long in space.

A buzzer sounded on the transmitter switchboard. The parabolic mirror out on the hull was aimed at the gleaming arc-lamp of Venus, only ten million kilometers away and moving on an almost parallel path. The three-millimeter waves from the ship's transmitter would make the trip in little more than half a minute. There was bitterness in the knowledge that they were only thirty seconds from safety.

The automatic monitor on Venus gave its impersonal Go ahead signal and Grant began to talk steadily, and he hoped, quite dispassionately. He gave a careful analysis of the situation and ended with a request for advice. His fears concerning McNeil he left unspoken. For one thing he knew that the engineer would be monitoring him at the transmitter.

As yet no one on Venus would have heard the message, even though the transmission time had been over. It would still be coiled up in the recorder spools, but in a few minutes an unsuspecting signal officer would arrive to play it over.

He would have no idea of the bombshell that was about to burst, triggering trains of sympathetic ripples on all the inhabited worlds as television and newssheet took up the refrain. An accident in space has a dramatic quality that crowds all other items from the headlines.

Until now Grant had been too preoccupied with his own safety to give much thought to the cargo in his charge. A sea captain of ancient times, whose first thought was for his ship, might have been shocked by this attitude. Grant, however, had reason on his side.

The Star Queen could never founder, could never run upon uncharted rocks or pass silently, as so many ships have passed, forever from the knowledge of man. She was safe, whatever might befall her crew. If she was undisturbed she would continue to retrace her orbit with such precision that men might set their calendars by her for centuries to come.

The cargo, Grant suddenly remembered, was insured for over twenty million dollars. There were not many goods valuable enough

to be shipped from world to world and most of the crates in the hold were worth more than their weight-or rather their mass-in gold. Perhaps some items might be useful in this emergency and Grant went to the safe to find the loading schedule.

He was sorting the thin, tough sheets when McNeil came back into the cabin.

"I've been reducing the air pressure," he said. "The hull shows some leaks that wouldn't have mattered in the usual way."

Grant nodded absently as he passed a bundle of sheets over to McNeil.

"Here's our loading schedule. I suggest we both run through it in case there's anything in the cargo that may help."

If it did nothing else, he might have added, it would at least give them something to occupy their minds.

As he ran down the long columns of numbered items-a complete cross-section of interplanetary commerce-Grant found himself wondering what lay behind these inanimate symbols. item 347 - 1 book - 4 kilos gross.

He whistled as he noticed that it was a staffed item, insured for a hundred thousand dollars, and he suddenly remembered hearing on the radio that the Hesperian Museum had just bought a first edition Seven Pillars of Wisdom.

A few sheets later was a very contrasting item, Miscellaneous books - 25 kilos - no intrinsic value.

It had cost a small fortune to ship those books to Venus, yet they were of "no intrinsic value." Grant let his imagination loose on the problem. Perhaps someone who was leaving Earth forever was taking with him to a new world his most cherished treasures-the dozen or so volumes that above all others had most shaped his mind.

Item 564 - 12 reels film.

That, of course, would be the Neronian super-epic, While Rome Burns, which had left Earth just one

jump ahead of the censor. Venus was waiting for it with considerable impatience.

Medical supplies - 50 kilos. Case of cigars - I kilo. Precision instruments - 75 kilos. So the list went on. Each item was something rare or something which the industry and science of a younger civilization could not yet produce.

The cargo was sharply divided into two classes-blattant luxury or sheer necessity. There was little in between. And there was

nothing, nothing at all, which gave Grant the slightest hope. He did not see how it could have been otherwise, but that did not prevent him from feeling a quite unreasonable disappointment.

The reply from Venus, when it came at last, took nearly an hour to run through the recorder. It was a questionnaire so detailed that Grant wondered morosely if he'd live long enough to answer it. Most of the queries were technical ones concerning the ship. The experts on two planets were pooling their brains in the attempt to save the Star Queen and her cargo.

"Well, what do you think of it?" Grant asked McNeil when the other had finished running through the message. He was watching the engineer carefully for any further sign of strain.

There was a long pause before McNeil spoke. Then he shrugged his shoulders and his first words were an echo of Grant's own thoughts.

"It will certainly keep us busy. I won't be able to do all these tests in under a day. I can see what they're driving at most of the time, but some of the questions are just plain crazy."

Grant had suspected that, but said nothing as the other continued.

"Rate of hull leakage-that's sensible enough, but why should anyone want to know the efficiency of our radiation screening? I think they're trying to keep up our morale by pretending they have some bright ideas-or else they want to keep us too busy to worry."

Grant was relieved and yet annoyed by McNeil's calmness relieved because he had been afraid of another scene and annoyed because McNeil was not fitting at all neatly into the mental category he had prepared for him. Was that first momentary lapse typical of the man or might it have happened to anyone?

Grant, to whom the world was very much a place of blacks and whites, felt angry at being unable to decide whether McNeil was cowardly or courageous. That he might be both was a possibility that never occurred to him.

There is a timelessness about space-flight that is unmatched by any other experience of man. Even on the Moon there are shadows that creep sluggishly from crag to crag as the sun makes its slow march across the sky. Earthward there is always the great clock of the spinning globe, marking the hours with continents for hands.

But on a long voyage in a gyro-stabilized ship the same patterns of sunlight lie unmoving on wall or floor as the chronometer ticks off its meaningless hours and days.

Grant and McNeil had long since learned to regulate their lives accordingly. In deep space they moved

and thought with a leisureliness that would vanish quickly enough when a voyage was nearing its end and the time for braking maneuvers had arrived. Though they were now under sentence of death, they continued along the well-worn grooves of habit.

Every day Grant\*carefully wrote up the log, checked the ship's position and carried out his various routine duties. McNeil was also behaving normally as far as could be told, though Grant suspected that some of the technical maintenance was being carried out with a very light hand.

It was now three days since the meteor had struck. For the last twenty-four hours Earth and Venus had been in conference and Grant wondered when he would hear the result of their deliberations. He did not believe that the finest technical brains in the Solar System could save them now, but it was hard to abandon hope when everything still seemed so normal and the air was still clean and fresh.

On the fourth day Venus spoke again. Shorn of its technicalities, the message was nothing more or less than a funeral oration. Grant and McNeil had been written off, but they were given elaborate instructions concerning the safety of the cargo.

Back on Earth the astronomers were computing all the possible rescue orbits that might make contact with the Star Queen in the next few years. There was even a chance that she might be reached from Earth six or seven months later, when she was back at aphelion, but the maneuver could be carried out only by a fast liner with no payload and would cost a fortune in fuel.

McNeil vanished soon after this message came through. At first Grant was a little relieved. If McNeil chose to look after himself that was his own affair. Besides there were various letters to write though the last-will-and-testament business could come later.

It was McNeil's turn to prepare the "evening" meal, a duty he enjoyed for he took good care of his stomach. When the usual

sounds from the galley were not forthcoming Grant went in search of his crew.

He found McNeil lying in his bunk, very much at peace with the universe. Hanging in the air beside him was a large metal crate which had been roughly forced open. Grant had no need to examine it closely to guess its contents. A glance at McNeil was enough.

"It's a dirty shame," said the engineer without a trace of embarrassment, "to suck this stuff up through a tube. Can't you put on some 'g' so that we can drink it properly?"

Grant stared at him with angry contempt, but McNeil returned his gaze unabashed.

"Oh, don't be a sourpuss! Have some yourself-what does it matter now?"

He pushed across a bottle and Grant fielded it deftly as it floated by. It was a fabulously valuable wine-he remembered the consignment now-and the contents of that small crate must be worth thousands.

"I don't think there's any need," said Grant severely, "to behave like a pig-even in these circumstances."

McNeil wasn't drunk yet. He had only reached the brightly lighted anteroom of intoxication and had not lost all contact with the drab outer world.

"I am prepared," he said with great solemnity, "to listen to any good argument against my present course of action—a course which seems eminently sensible to me. But you'd better convince me quickly while I'm still amenable to reason."

He pressed the plastic bulb again and a purple jet shot into his mouth.

"Apart from the fact that you're stealing Company property which will certainly be salvaged sooner or later—you can hardly stay drunk for several weeks."

"That," said McNeil thoughtfully, "remains to be seen."

"I don't think so," retorted Grant. Bracing himself against the wall, he gave the crate a vicious shove that sent it flying through the open doorway.

As he dived after it and slammed the door he heard McNeil shout, "Well, of all the dirty tricks!"

It would take the engineer some time—particularly in his present condition—to unbuckle himself and follow. Grant steered the crate

back to the hold and locked the door. As there was never any need to lock the hold when the ship was in space McNeil wouldn't have a key for it himself and Grant could hide the duplicate that was kept in the control cabin.

McNeil was singing when, some time later, Grant went back past his room. He still had a couple of bottles for company and was shouting:

"We don't care where the oxygen goes. If it doesn't get into the wine."

Grant, whose education had been severely technical, couldn't place the quotation. As he paused to listen he suddenly found himself shaken by an emotion which, to do him justice, he did not for a moment recognize.

It passed as swiftly as it had come, leaving him sick and trembling. For the first time, he realized that his dislike of McNeil was slowly turning to hatred.

It is a fundamental rule of space-flight that, for sound psychological reasons, the minimum crew on a long journey shall consist of not less than three men.

But rules are made to be broken and the Star Queen's owners had obtained full authority from the Board of Space Control and the insurance companies when the freighter set off for Venus without her regular captain.

At the last moment he had been taken ill and there was no replacement. Since the planets are disinclined to wait upon man and his affairs, if she did not sail on time she would not sail at all.

Millions of dollars were involved—so she sailed. Grant and McNeil were both highly capable men and they had no objection at all to earning double their normal pay for very little extra work. Despite fundamental differences in temperament, they got on well enough in ordinary circumstances. It was nobody's fault that circumstances were now very far from ordinary.

Three days without food, it is said, is long enough to remove most of the subtle differences between a civilized man and a savage. Grant and McNeil were still in no physical discomfort. But their imaginations had been only too active and they now had more in

common with two hungry Pacific Islanders in a lost canoe than either would have cared to admit.

For there was one aspect of the situation, and that the most important of all, which had never been mentioned. When the last figures on Grant's writing-pad had been checked and rechecked, the calculation was still not quite complete. Instantly each man had made the one further step, each had arrived simultaneously at the same unspoken result.

It was terribly simple—a macabre parody of those problems in first-year arithmetic that begin, "If six men take two days to assemble five helicopters, how long . . .

The oxygen would last two men for about twenty days, and Venus was thirty days away. One did not have to be a calculating prodigy to see at once that one man, and one man only, might yet live to walk the metal streets of Port Hesperus.

The acknowledged deadline was twenty days ahead, but the unmentioned one was only ten days off. Until that time there would still be enough air for two men—and thereafter for one man only for the rest of the voyage. To a sufficiently detached observer the situation would have been very entertaining.

It was obvious that the conspiracy of silence could not last much longer. But it is not easy, even at the best of times, for two people to decide amicably which one of them shall commit suicide. It is still more difficult when they are no longer on speaking terms.

Grant wished to be perfectly fair. Therefore the only thing to do was to wait until McNeil sobered up and then to put the question to him frankly. He could think best at his desk, so he went to the control cabin and strapped himself down in the pilot's chair.

For a while he stared thoughtfully into nothingness. It would be better, he decided, to broach the matter by correspondence, especially while diplomatic relations were in their present state. He clipped a sheet of note-paper on the writing-pad and began, "Dear McNeil . . ." Then he tore it out and started again, "McNeil . . ."

It took him the best part of three hours and even then he wasn't wholly satisfied. There were some things it was so darned difficult to put down on paper. But at last he managed to finish. He sealed the letter and locked it away in his safe. It could wait for a day or two.

Few of the waiting millions on Earth and Venus could have any idea of the tensions that were slowly building up aboard the Star Queen. For days press and radio had been full of fantastic rescue schemes. On three worlds there was hardly any other topic of conversation. But only the faintest echo of the planet-wide tumult reached the two men who were its cause.

At any time the station on Venus could speak to the Star Queen, but there was so little that could be said. One could not with any decency give words of encouragement to men in the condemned cell, even when there was some slight uncertainty about the actual date of execution.

So Venus contented itself with a few routine messages every day and blocked the steady stream of

exhortations and newspaper offers that came pouring in from Earth. As a result private radio companies on Earth made frantic attempts to contact the Star Queen directly. They failed, simply because it never occurred to Grant and McNeil to focus their receiver anywhere except on Venus, now so tantalizingly near at hand.

There had been an embarrassing interlude when McNeil emerged from his cabin, but though relations were not particularly cordial, life aboard the Star Queen continued much as before.

Grant spent most of his waking hours in the pilot's position, calculating approach maneuvers and writing interminable letters to his wife. He could have spoken to her had he wished, but the thought of all those millions of waiting ears had prevented him from doing so. Interplanetary speech circuits were supposed to be private-but too many people would be interested in this one.

In a couple of days, Grant assured himself, he would hand his letter to McNeil and they could decide what was to be done. Such a delay would also give McNeil a chance of raising the subject himself. That he might have other reasons for his hesitation was something Grant's conscious mind still refused to admit.

He often wondered how McNeil was spending his time. The engineer had a large library of microfilm books, for he read widely and his range of interests was unusual. His favorite book, Grant knew, was *Jurgen* and perhaps even now he was trying to forget his doom by losing himself in its strange magic. Others of McNeil's books were less respectable and not a few were of the class curiously described as "curious."

The truth of the matter was that McNeil was far too subtle and complicated a personality for Grant to understand. He was a hedonist and enjoyed the pleasures of life all the more for being cut off from them for months at a time. But he was by no means the moral weakling that the unimaginative and somewhat puritanical Grant had supposed.

It was true that he had collapsed completely under the initial shock and that his behavior over the wine was-by Grant's standards -reprehensible. But McNeil had had his breakdown and had recovered. Therein lay the difference between him and the hard but brittle Grant.

Though the normal routine of duties had been resumed by tacit consent, it did little to reduce the sense of strain. Grant and McNeil avoided each other as much as possible except when mealtimes brought them together. When they did meet, they behaved with an exaggerated politeness as if each were striving to be perfectly normal-and inexplicably failing.

Grant had hoped that McNeil would- himself broach the subject of suicide, thus sparing him a very awkward duty. When the engineer stubbornly refused to do anything of the sort it added to Grant's resentment and contempt. To make matters worse he was now suffering from nightmares and sleeping very badly.

The nightmare was always the same. When he was a child it had often happened that at bedtime he had been reading a story far too exciting to be left until morning. To avoid detection he had continued reading under the bedclothes by flashlight, curled up in a snug white-walled cocoon. Every ten minutes or so the air had become too stifling to breathe and his emergence into the delicious cool air had been a major part of the fun.

Now, thirty years later, these innocent childhood hours returned to haunt him. He was dreaming that he

could not escape from the suffocating sheets while the air was steadily and remorselessly thickening around him.

He had intended to give McNeil the letter after two days, yet somehow he put it off again. This procrastination was very unlike Grant, but he managed to persuade himself that it was a perfectly reasonable thing to do.

He was giving McNeil a chance to redeem himself-to prove that he wasn't a coward by raising the matter himself. That McNeil

might be waiting for him to do exactly the same thing somehow never occurred to Grant.

The all-too-literal deadline was only five days off when, for the first time, Grant's mind brushed lightly against the thought of murder. He had been sitting after the "evening" meal, trying to relax as McNeil clattered around in the galley with, he considered, quite unnecessary noise.

What use, he asked himself, was the engineer to the world? He had no responsibilities and no family-no one would be any the worse off for his death. Grant, on the other hand, had a wife and three children of whom he was moderately fond, though for some obscure reason they responded with little more than dutiful affection.

Any impartial judge would have no difficulty in deciding which of them should survive. If McNeil had a spark of decency in him he would have come to the same conclusion already. Since he appeared to have done nothing of the sort he had forfeited all further claims to consideration.

Such was the elemental logic of Grant's subconscious mind, which had arrived at its answer days before but had only now succeeded in attracting the attention for which it had been clamoring . To Grant's credit he at once rejected the thought with horror.

He was an upright and honorable person with a very strict code of behavior . Even the vagrant homicidal impulses of what is misleadingly called "normal" man had seldom ruffled his mind. But in the days-the very few days-left to him, they would come more and more often.

The air had now become noticeably fouler. Though there was still no real difficulty in breathing, it was a constant reminder of what lay ahead, and Grant found that it was keeping him from sleep. This was not pure loss, as it helped to break the power of his nightmares, but he was becoming physically run down.

His nerve was also rapidly deteriorating, a state of affairs accentuated by the fact that McNeil seemed to be behaving with unexpected and annoying calmness. Grant realized that he had come to the stage when it would be dangerous to delay the showdown any longer.

McNeil was in his room as usual when Grant went up to the control cabin to collect the letter he had locked away in the safe-

it seemed a lifetime ago. He wondered if he need add anything more to it. Then he realized that this was only another excuse for delay. Resolutely he made his way toward McNeil's cabin.

A single neutron begins the chain-reaction that in an instant can destroy a million lives and the toil of generations. Equally insignificant and unimportant are the trigger-events which can sometimes change a

man's course of action and so alter the whole pattern of his future.

Nothing could have been more trivial than that which made Grant pause in the corridor outside McNeil's room. In the ordinary way he would not even have noticed it. It was the smell of smoke-tobacco smoke.

The thought that the sybaritic engineer had so little self-control that he was squandering the last precious liters of oxygen in such a manner filled Grant with blinding fury. He stood for a moment quite paralyzed with the intensity of his emotion.

Then slowly, he crumpled the letter in his hand. The thought which had first been an unwelcome intruder, then a casual speculation, was at last fully accepted. McNeil had had his chance and had proved, by his unbelievable selfishness, unworthy of it. Very well-he could die.

The speed with which Grant had arrived at this conclusion would not have deceived the most amateurish of psychologists. It was relief as much as hatred that drove him away from McNeil's room. He had wanted to convince himself that there would be no need to do the honorable thing, to suggest some game of chance that would give them each an equal probability of life.

This was the excuse he needed, and he had seized upon it to salve his conscience. For though he might plan and even carry out a murder, Grant was the sort of person who would have to do it according to his own particular moral code.

As it happened he was-not for the first time-badly misjudging McNeil. The engineer was a heavy smoker and tobacco was quite essential to his mental well-being even in normal circumstances. How much more, essential it was now, Grant, who only smoked occasionally and without much enjoyment, could never have appreciated.

McNeil had satisfied himself by careful calculation that four cigarettes a day would make no measurable difference whatsoever to

theship's oxygen endurance, whereas they would make all the difference in the world to his own nerves and hence indirectly to Grant's.

But it was no use explaining this to Grant. So he had smoked in private and with a self-control he found agreeably, almost voluptuously, surprising. It was sheer bad luck that Grant had detected one of the day's four cigarettes.

For a man who had only at that moment talked himself into murder, Grant's actions were remarkably methodical. Without hesitation, he hurried back to the control room and opened the medicine chest with its neatly labeled compartments, designed for almost every emergency that could occur in space.

Even the ultimate emergency had been considered, for there behind its retaining elastic bands was the tiny bottle he had been seeking, the image of which had been lying hidden far down in the unknown depths of his mind through all these days. It bore a white label carrying a skull-and-crossbones, and beneath them the words: Approx. one-half gram will cause painless and almost instantaneous death.

The poison was painless and instantaneous-that was good. But even more important was a fact unmentioned on the label. It was also tasteless.

The contrast between the meals prepared by Grant and those organized with considerable skill and care by McNeil was striking. Anyone who was fond of food and who spent a good deal of his life in space

usually learned the art of cooking in self-defense. McNeil had done this long ago.

To Grant, on the other hand, eating was one of those necessary but annoying jobs which had to be got through as quickly as possible. His cooking reflected this opinion. McNeil had ceased to grumble about it, but he would have been very interested in the trouble Grant was taking over this particular meal.

If he noticed any increasing nervousness on Grant's part as the meal progressed, he said nothing. They ate almost in silence, but that was not unusual for they had long since exhausted most of the possibilities of light conversation. When the last dishes-deep bowls with in-turned rims to prevent the contents drifting out-had been cleared away, Grant went into the galley to prepare the coffee.

He took rather a long time, for at the last moment something quite maddening and quite ridiculous happened. He suddenly recalled one of the film classics of the last century in which the fabulous Charlie Chaplin tried to poison an unwanted wife-and then accidentally changed the glasses.

No memory could have been more unwelcome, for it left him shaken with a gust of silent hysteria. Poe's Imp of the Perverse, that demon who delights in defying the careful canons of self-preservation, was at work and it was a good minute before Grant could regain his self-control.

He was sure that, outwardly at least, he was quite calm as he carried in the two plastic containers and their drinking tubes. There was no danger of confusing them, for the engineer's had the letters MAC painted boldly across it.

At the thought Grant nearly relapsed into psychopathic giggles but just managed to regain control with the somber reflection that his nerves must be in even worse condition than he had imagined.

He watched, fascinated, though without appearing to do so, as McNeil toyed with his cup. The engineer seemed in no great hurry and was staring moodily into space. Then he put his lips to the drinking tube and sipped.

A moment later he spluttered slightly-and an icy hand seemed to seize Grant's heart and hold it tight. Then McNeil turned to him and said evenly, "You've made it properly for once. It's quite hot."

Slowly, Grant's heart resumed its interrupted work. He did not trust himself to speak, but managed a noncommittal nod. McNeil parked the cup carefully in the air, a few inches away from his face.

He seemed very thoughtful, as if weighing his words for some important remark. Grant cursed himself for having made the drink so hot-that was just the sort of detail that hanged murderers. If McNeil waited much longer he would probably betray himself through nervousness.

"I suppose," said McNeil in a quietly conversational sort of way, "it has occurred to you that there's still enough air to last one of us to Venus?"

Grant forced his jangling nerves under control and tore his eyes away from that hypnotic cup. His throat seemed very dry as he answered, "It-it had crossed my mind."

McNeil touched his cup, found it still too hot and continued thoughtfully, "Then wouldn't it be more sensible if one of us decided to walk out of the airlock, say-or to take some of the poison in there?" He jerked his thumb toward the medicine chest, just visible from where they were sitting.

Grant nodded.

"The only trouble, of course," added the engineer, "is to decide which of us will be the unlucky one. I suppose it would have to be by picking a card or in some other quite arbitrary way."

Grant stared at McNeil with a fascination that almost outweighed his mounting nervousness. He had never believed that the engineer could discuss the subject so calmly. Grant was sure he suspected nothing. Obviously McNeil's thoughts had been running on parallel lines to his own and it was scarcely even a coincidence that he had chosen this time, of all times, to raise the matter.

McNeil was watching him intently, as if judging his reactions.

"You're right," Grant heard himself say. "We must talk it over."

"Yes," said McNeil quite impassively. "We must." Then he reached for his cup again, put the drinking tube to his lips and sucked slowly.

Grant could not wait until he had finished. To his surprise the relief he had been expecting did not come. He even felt a stab of regret, though it was not quite remorse. It was a little late to think of it now, but he suddenly remembered that he would be alone~ in the Star Queen, haunted by his thoughts, for more than three weeks before rescue came.

He did not wish to see McNeil die, and he felt rather sick. Without another glance at his victim he launched himself toward the exit.

Immovably fixed, the fierce sun and the unwinking stars looked down upon the Star Queen, which seemed as motionless as they. There was no way of telling that the tiny dumbbell of the ship had now almost reached her maximum speed and that millions of horsepower were chained within the smaller sphere, waiting for the moment of its release. There was no way of telling, indeed, that she carried any life at all.

An airlock on the night-side of the ship slowly opened, letting a blaze of light escape from the interior. The brilliant circle looked

very strange hanging there in the darkness. Then it was abruptly eclipsed as two figures floated out of the ship.

One was much bulkier than the other, and for a rather important reason-it was wearing a space-suit. Now there are some forms of apparel that may be worn or discarded as the fancy pleases with no other ill-effects than a possible loss of social prestige. But spacesuits are not among them.

Something not easy to follow was happening in the darkness. Then the smaller figure began to move, slowly at first but with rapidly mounting speed. It swept out of the shadow of the ship into the full blast of the sun, and now one could see that strapped to its back was a small gas-cylinder from which a fine mist was jetting to vanish almost instantly into space.

It was a crude but effective rocket. There was no danger that the ship's minute gravitational pull would drag the body back to it again.

Rotating slightly, the corpse dwindled against the stars and vanished from sight in less than a minute. Quite motionless, the figure in the airlock watched it go. Then the outer door swung shut, the circle of brilliance Vanished and only the pale Earthlight still glinted on the shadowed wall of the ship.

Nothing else whatsoever happened for twenty-three days.

The captain of the Hercules turned to his mate with a sigh of relief.

"I was afraid he couldn't do it. It must have been a colossal job to break his orbit single-handed-and with the air as thick as it must be by now. How soon can we get to him?"

"It will take about an hour. He's still got quite a bit of eccentricity but we can correct that."

"Good. Signal the Leviathan and Titan that we can make contact and ask them to take off, will you? But I wouldn't drop any tips to your news commentator friends until we're safely locked."

The mate had the grace to blush. "I don't intend to," he said in a slightly hurt voice as he pecked delicately at the keys of his calculator. The answer that flashed instantly on the screen seemed to displease him.

"We'd better board and bring the Queen down to circular speed ourselves before we call the other tugs," he said, "otherwise we'll

bewasting a lot of fuel. She's still got a velocity excess of nearly a kilometer a second."

"Good idea-tell Leviathan and Titan to stand by but not to blast until we give them the new orbit."

While the message was on its way down through the unbroken cloudbanks that covered half the sky below, the mate remarked thoughtfully, "I wonder what he's feeling likenow? "

"I can tell you. He's so pleased to be alive that he doesn't give a hoot about anything else."

"Still, I'm not sure I'd like to have left my shipmate in space so that I could get home."

"It's not the sort of thing that anyone would like to do. But you heard the broadcast-they'd talked it over calmly and the loser went out of the airlock. It was the only sensible way."

"Sensible, perhaps-but it's pretty horrible to let someone else sacrifice himself in such a cold-blooded way so that you can live."

"Don't be a ruddy sentimentalist. I'll bet that if it happened to us you'd push me out before I could even say my prayers."

"Unless you did it to me first. Still, I don't think it's ever likely to happen to the Hercules. Five days out of port's the longest we've ever been, isn't it? Talk about the romance of the spaceways !"

The captain didn't reply. He was peering into the eyepiece of the navigating telescope, for the Star Queen should now be within optical range. There was a long pause while he adjusted the vernier controls. Then he gave a little sigh of satisfaction.

"There she is-about nine-fifty kilometers away. Tell the crew to stand by-and send a message to cheer him up. Say we'll be there in thirty minutes even if it isn't quite true."

Slowly the thousand-meter nylon ropes yielded beneath the strain as they absorbed the relative momentum of the ships, then slackened again as the Star Queen and the Hercules rebounded ' toward each other. The electric winches began to turn and, like a spider crawling up its thread, the Hercules drew alongside the freighter.

Men in space-suits sweated with heavy reaction units-tricky work, this-until the airlocks had registered and could be coupled together. The outer doors slid aside and the air in the locks mingled, fresh with foul. As the mate of the Hercules waited, oxygen cylinder

inhand, he wondered what condition the survivor would be in. Then the Star Queen's inner door slid open.

For a moment, the two men stood looking at each other across the short corridor that now connected the two airlocks. The mate was surprised and a little disappointed to find that he felt no particular sense of drama.

So much had happened to make this moment possible that its actual achievement was almost an anticlimax, even in the instant when it was slipping into the past. He wished-for he was an M\*curable romantic-that he could think of something memorable to say, some "Doctor Livingstone, I presume?" phrase that would pass into history.

But all he actually said was, "Well, McNeil, I'm pleased to see you.))

Though he was considerably thinner and somewhat haggard, McNeil had stood the ordeal well. He breathed gratefully the blast of raw oxygen and rejected the idea that he might like to lie down and sleep. As he explained, he had done very little but sleep for the last week to conserve air. The first mate looked relieved. He had been afraid he might have to wait for the story.

The cargo was being trans-shipped and the other two tugs were climbing up from the great blinding crescent of Venus while McNeil retraced the events of the last few weeks and the mate made surreptitious notes.

He spoke quite calmly and impersonally, as if he were relating some adventure that had happened to another person, or indeed had never happened at all. Which was, of course, to some extent the case, though it would be unfair to suggest that McNeil was telling any lies.

He invented nothing, but he omitted a good deal. He had had three weeks in which to prepare his narrative and he did not think it had any flaws . . . .

Grant had already reached the door when McNeil called softly after him, "What's the hurry? I thought we had something to discuss."

Grant grabbed at the doorway to halt his headlong flight. He turned slowly and stared unbelievably at the engineer. McNeil

shouldbe already dead-but he was sitting quite comfortably, looking at him with a most peculiar

expression.

"Sit down," he said sharply-and in that moment it suddenly seemed that all authority had passed to him. Grant did so, quite without volition. Something had gone wrong, though what it was he could not imagine.

The silence in the control room seemed to last for ages. Then McNeil said rather sadly, "I'd hoped better of you, Grant."

At last Grant found his voice, though he could barely recognize it.

„Whatdo you mean?" he whispered.

"What do you think I mean?" replied McNeil, with what seemed no more than mild irritation."This little attempt of yours to poison me, of course."

Grant's tottering world collapsed at last, but he no longer cared greatly one way or the other. McNeil began to examine his beautifully kept fingernails with some attention.

"As a matter of interest," he said, in the way that one might ask the time, "when did you decide to kill me?"

The sense of unreality was so overwhelming that Grant felt he was acting a part, that this had nothing to do with real life at all.

"Only this morning," he said, and believed it.

"Hmm," remarked McNeil, obviously without much conviction. He rose to his feet and moved over to the medicine chest. Grant's eyes followed him as he fumbled in the compartment and came back with the little poison bottle. It still appeared to be full. Grant had been careful about that.

"I suppose I should get pretty mad about this whole business," McNeil continued conversationally, holding the bottle between thumb and forefinger. "But somehow I'm not'. Maybe it's because I never had many illusions about human nature. And, of course, I saw it coming a long time ago."

Only the last phrase really reached Grant's consciousness.

"You-saw it coming?"

"Heavens, yes!You're too transparent to make a good criminal, I'm afraid, And now that your little plot's failed it leaves us both in an embarrassing position, doesn't it?"

To this masterly understatement there seemed no possible reply.

"By rights," continued the engineer thoughtfully, "I should now

workmyself into a good temper, call Venus Central, and denounce you to the authorities. But it would be a rather pointless thing to do, and I've never been much good at losing my temper anyway. Of course, you'll say that's because I'm too lazy-but I don't think so."

He gave Grant a twisted smile.

"Oh, I know what you think about me-you've got me neatly classified in that orderly mind of yours, haven't you? I'm soft and self-indulgent, I haven't any moral courage-or any morals for that matter-and I don't give a damn for anyone but myself. Well, I'm not denying it. Maybe it's ninety per cent true. But the odd ten per cent is mighty important, Grant!"

Grant felt in no condition to indulge in psychological analysis, and this seemed hardly the time for anything of the sort. Besides, he was still obsessed with the problem of his failure and the mystery of McNeil's continued existence. McNeil, who knew this perfectly well, seemed in no hurry to satisfy his curiosity.

"Well, what do you intend to do now?" Grant asked, anxious to get it over.

"I would like," said McNeil calmly, "to carry on our discussion where it was interrupted by the coffee."

"You don't mean-"

"But I do. Just as if nothing had happened."

"That doesn't make sense. You've got something up your sleeve!" cried Grant.

McNeil sighed. He put down the poison bottle and looked firmly at Grant.

"You're in no position to accuse me of plotting anything. To repeat my earlier remarks, I am suggesting that we decide which one of us shall take poison-only we don't want any more unilateral decisions. Also"-he picked up the bottle again-"it will be the real thing this time. The stuff in here merely leaves a bad taste in the mouth."

A light was beginning to dawn in Grant's mind. "You changed the poison!"

"Naturally. You may think you're a good actor, Grant, but frankly-from the balcony-I thought the performance stank. I could tell you were plotting something, probably before you knew it yourself. In the last few days I've deloused the ship pretty thoroughly. Thinking of all the ways you might have done me in was quite amusing and helped to pass the time. The poison was so obvious that it was the first thing I fixed. But I rather overdid the danger signals and nearly gave myself away when I took the first sip. Salt doesn't go at all well with coffee."

He gave that wry grin again. "Also, I'd hoped for something more subtle. So far I've found fifteen infallible ways of murdering anyone aboard a spaceship. But I don't propose to describe them now."

This was fantastic, Grant thought. He was being treated, not like a criminal, but like a rather stupid schoolboy who hadn't done his homework properly.

"Yet you're still willing," said Grant unbelievably, "to start all over again? And you'd take the poison yourself if you lost?"

McNeil was silent for a long time. Then he began, slowly, "I can see that you still don't believe me. It doesn't fit at all nicely into your tidy little picture, does it? But perhaps I can make you understand. It's really quite simple.

"I've enjoyed life, Grant, without many scruples or regrets-but the better part of it's over now and I don't cling to what's left as desperately as you might imagine. Yet while I am alive I'm rather particular about some things.

"It may surprise you to know that I've got any ideals at all. But I have, Grant-I've always tried to act like a civilized, rational being. I've not always succeeded. When I've failed I've tried to redeem myself."

He paused, and when he resumed it was as though he, and not Grant, was on the defensive. "I've never exactly Eked you, Grant, but I've often admired you and that's why I'm sorry it's come to, this. I admired you most of all the day the ship was holed."

For the first time, McNeil seemed to have some difficulty in choosing his words. When he spoke again he avoided Grant's eyes.

"I didn't behave very well then. Something happened that I thought was impossible. I've always been quite sure that I'd never lose my nerve but-well-it was so sudden it knocked me over."

He attempted to hide his embarrassment by humor. "The same sort of thing happened on my very first trip. I was sure I'd never be space sick-and as a result I was much worse than if I had not been overconfident. But I got over it then-and again this time. It

was one of the biggest surprises of my life, Grant, when I saw that you of all people were beginning to crack.

"Oh, yes-the business of the wines! I can see you're thinking about that. Well, that's one thing I don't regret. I said I'd always tried to act like a civilized man-and a civilized man should always know when to get drunk. But perhaps you wouldn't understand."

Oddly enough, that was just what Grant was beginning to do. He had caught his first real glimpse of McNeil's intricate and tortuous personality and realized how utterly he had misjudged him. No-misjudged was not the right word. In many ways his judgment had been correct. But it had only touched the surface-he had never suspected the depths that lay beneath.

In a moment of insight that had never come before, and from the nature of things could never come again, Grant understood the reasons behind McNeil's action. This was nothing so simple as a coward trying to reinstate himself in the eyes of the world, for no one need ever know what happened aboard the Star Queen.

In any case, McNeil probably cared nothing for the world's opinion, thanks to the sleek self-sufficiency that had so often annoyed Grant. But that very self-sufficiency meant that at all costs he must preserve his own good opinion of himself. Without it life would not be worth living-and McNeil had never accepted life save on his own terms.

The engineer was watching him intently and must have guessed that Grant was coming near the truth, for he suddenly changed his tone as though he was sorry he had revealed so much of his character.

"Don't think I get a quixotic pleasure from turning the other cheek," he said. "Just consider it from the point of view of pure logic. After all, we've got to come to some agreement.

"Has it occurred to you that if only one of us survives without a covering message from the other, he'll have a very uncomfortable time explaining just what happened?"

In his blind fury, Grant had completely forgotten this. But he did not believe it bulked at all important in McNeil's own thoughts.

"Yes," he said, "I suppose you're right."

He felt far better now. All the hate had drained out of him and he was at peace. The truth was known and he accepted it.

That it was so different from what he had imagined did not seem to matter now.

"Well, let's get it over," he said unemotionally. "There's a new pack of cards lying around somewhere."

"I think we'd better speak to Venus first-both of us," replied McNeil, with peculiar emphasis. "We want a complete agreement on record in case anyone asks awkward questions later."

Grant nodded absently. He did not mind very much now one way or the other. He even smiled, ten minutes later, as he drew his card from the pack and laid it, face upward, beside McNeil's.

"So that's the whole story, is it?" said the first mate, wondering how soon he could decently get to the transmitter.

"Yes," said McNeil evenly, "that's all there was to it."

The mate bit his pencil, trying to frame the next question. "And I suppose Grant took it all quite calmly?"

The captain gave him a glare, which he avoided, and McNeil looked at him coldly as if he could see through to the sensation mongering headlines ranged behind. He got to his feet and moved over to the observation port.

"You heard his broadcast, didn't you? Wasn't that calm enough?"

The mate sighed. It still seemed hard to believe that in such circumstances two men could have behaved in so reasonable, so unemotional a manner. He could have pictured all sorts of dramatic possibilities-sudden outbursts of insanity, even attempts at murder. Yet according to McNeil nothing at all had happened. It was too bad.

McNeil was speaking again, as if to himself. "Yes, Grant behaved very well-very well indeed. It was a great pity-"

Then he seemed to lose himself in the ever-fresh, incomparable glory of the approaching planet. Not far beneath, and coming closer by kilometers every second, the snow-white crescent arms of Venus spanned more than half the sky. Down there were life and warmth and civilization-and air.

The future, which not long ago had seemed contracted to a point, had opened out again into all its unknown possibilities and wonders. But behind him McNeil could sense the eyes of his rescuers, probing, questioning-yes, and condemning too.

All his life he would hear whispers. Voices would be saying behind his back, "Isn't that the man who-?"

He did not care. For once in his life at least, he had done something of which he could feel unashamed. Perhaps one day his own pitiless self-analysis would strip bare the motives behind his actions, would whisper in his ear. "Altruism? Don't be a fool! You did it to bolster up your own good opinion of yourself-so much more important than anyone else's!"

But the perverse maddening voices, which all his life had made nothing seem worthwhile, were silent for the moment and he felt content. He had reached the calm at the center of the hurricane, While it lasted he would enjoy it to the full.