**Marooned off Vesta**

Isaac Asimov

“Will you please stop walking up and down like that?” said Warren Moore from the couch. “It won’t do any of us any good. Think of our blessings; we’re airtight, aren’t we?”

Mark Brandon whirled and ground his teeth at him. “I’m glad you feel happy about that,” he spat out viciously. “Of course, you don’t know that our air supply will last only three days.” He resumed his interrupted stride with a defiant air.

Moore yawned and stretched, assumed a more comfortable position, and replied. “Expending all that energy will only use it up faster. Why don’t you take a hint from Mike here? He’s taking it easy.”

“Mike’ was Michael Shea, late a member of the crew of the Silver Queen. His short, squat body was resting on the only chair in the room and his feet were on the only table. He looked up as his name was mentioned, his mouth widening in a twisted grin.

“You’ve got to expect things like this to happen sometimes,” he said. “Bucking the asteroids is risky business. We should’ve taken the hop. It takes longer, but it’s the only safe way. But no, the captain wanted to make the schedule; he would go through’-Mike spat disgustedly-’and here we are.”

“What’s the "hop"?” asked Brandon.

“Oh, I take it that friend Mike means that we should have avoided the asteroid belt by plotting a course outside the plane of the ecliptic,” answered Moore. That’s it, isn’t it, Mike?”

Mike hesitated and then replied cautiously, “Yeah—I guess that’s it.”

Moore smiled blandly and continued, “Well, I wouldn’t blame Captain Crane too much. The repulsion screen must have failed five minutes before that chunk of granite barged into us. That’s not his fault, though of course we ought to have steered clear instead of relying on the screen.” He shook his head meditatively. The Silver Queen just went to pieces. It’s really miraculously lucky that this part of the ship remained intact, and what’s more, airtight.”

“You’ve got a funny idea of luck, Warren,” said Brandon. “Always have, for as long as I’ve known you. Here we are in a tenth part of a spaceship, comprising only three whole rooms, with air for three days, and no prospect of being alive after that, and you have the infernal gall to prate about luck.”

“Compared to the others who died instantly when the asteroid struck, yes,” was Moore’s answer.

“You think so, eh? Well, let me tell you that instant death isn’t so bad compared with what we’re going to have to go through. Suffocation is a damned unpleasant way of dying.”

“We may find a way out,” Moore suggested hopefully.

“Why not face facts!” Brandon’s face was flushed and his voice trembled. “We’re done, I tell you! Through!”

Mike glanced from one to the other doubtfully and then coughed to attract their attention. “Well, gents, seeing that we’re all in the same fix, I guess there’s no use hogging things.” He drew a small bottle out of his pocket that was filled with a greenish liquid. “Grad A Jabra this is. I ain’t too proud to share and share alike.”

Brandon exhibited the first signs of pleasure for over a day. “Martian Jabra water. Why didn’t you say so before?”

But as he reached for it, a firm hand clamped down upon his wrist. He looked up into the calm blue eyes of Warren Moore.

“Don’t be a fool,” said Moore, “there isn’t enough to keep us drunk for three days. What do you want to do? Go on a tear now and then die cold sober? Let’s save this for the last six hours when the air gets stuffy and breathing hurts-then we’ll finish the bottle among as and never know when the end comes or care.”

Brandon’s hand fell away reluctantly. “Damn it, Warren, you’d bleed ice if you were cut. How can you think straight at a time like this?” He motioned to Mike and the bottle was once more stowed away. Brandon walked to the porthole and gazed out.

Moore approached and placed a kindly arm over the shoulders of the younger man. “Why take it so hard, man?” he asked. “You can’t last at this rate. Inside of twenty-four hours you’ll be a madman if you keep this up.”

There was no answer. Brandon stared bitterly at the globe that filled almost the entire porthole, so Moore continued, “Watching Vesta won’t do you any good either.”

Mike Shea lumbered up to the porthole. “We’d be safe if we were only down there on Vesta. There’re people there. How far away are we?”

“Not more than three or four hundred miles judging from its apparent size,” answered Moore. “You must remember that it is only two hundred miles in diameter.”

“Three hundred miles from salvation,” murmured Brandon, “and we might as well be a million. If there were only a way to get ourselves out of the orbit this rotten fragment adopted. You know, manage to give ourselves a push so as to start falling. There’d be no danger of crashing if we did, because that midget hasn’t got enough gravity to crush a cream puff.”

“It has enough to keep us in the orbit,” retorted Brandon. “It must have picked us up while we were lying unconscious after the crash. Wish it had come closer; we might have been able to land on it.”

“Funny place, Vesta,” observed Mike Shea. “I was down there two-three times. What a dump! It’s all covered with some stuff like snow, only it ain’t snow. I forget what they call it.”

“Frozen carbon dioxide?” prompted Moore ’Yeah, dry ice. that carbon stuff, that’s it. They say that’s what makes Vesta so shiny.”

Of course! That would give it a high albedo.”

Mike cocked a suspicious eye at Moore and decided to let it pass. “It’s hard to see anything down there on account of the snow, but if you look close’-he pointed-’you can see a sort of gray smudge. I think that’s Bennett’s dome. That’s where they keep the observatory. And there is Calorn’s dome up there.

That’s a fuel station, that is. There’re plenty more, too, only I don’t see them.”

He hesitated and then turned to Moore. “Listen, boss, I’ve been thinking. Wouldn’t they be looking for us as soon as they hear about the crash?And wouldn’t we be easy to find from Vesta, seeing we’re so close?”

Moore shook his head, “No, Mike, they won’t be looking for us. No one’s going to find out about the crash until the Silver Queen fails to turn up on schedule. You see, when the asteroid hit, we didn’t have time to send out an SOS”—he sighed—“and they won’t find us down there at Vesta, either. We’re so small that even at our distance they couldn’t see us unless they knew what they were looking for, and exactly where to look.”

“Hmm.” Mike’s forehead was corrugated in deep thought. Then we’ve got to get to Vesta before three days are up.”

“You’ve got the gist of the matter, Mike. Now, if we only knew how to go about it, eh?”

Brandon suddenly exploded, “Will you two stop this infernal chitter-chatter and do something? For God’s sake, do something.”

Moore shrugged his shoulders and without answer returned to the couch. He lounged at ease, apparently carefree, but there was the tiniest crease between his eyes which bespoke concentration.

There was no doubt about it; they were in a bad spot. He reviewed the events of the preceding day for perhaps the twentieth time.

After the asteroid had struck, tearing the ship apart, he’d gone out like a light; for how long he didn’t know, his own watch being broken and no other timepiece available. When he came to, he found himself, along with Mark Brandon, who shared his room, and Mike Shea, a member of the crew, sole occupants of all that was left of the Silver Queen. This remnant was now careening in an orbit about Vesta. At present, things were fairly comfortable. There was a food supply that would last a week. Likewise there was a regional Gravitator under the room that kept them at normal weight and continue to do so for an indefinite time, certainly for longer than the air would last. The lighting system was less satisfactory but had held on so far.

There was no doubt, however, where the joker in the pack lay. Three days’ air! Not that there weren’t other disheartening features. There was no heating system-though it would take a long time for the ship to radiate enough heat into the vacuum of space to render them too uncomfortable. Far more important was the fact that their part of the ship had neither a means of communication nor a propulsive mechanism. Moore sighed. One fuel jet in working order would fix everything, for one blast in the right direction would send them safely to Vesta.

The crease between his eyes deepened. What was to be done? They had but one spacesuit among them, one heat ray, and one detonator. That was the sum total of space appliances after a thorough search of the accessible parts of the ship. A pretty hopeless mess, that.

Moore shrugged, rose, and drew himself a glass of water. He swallowed it mechanically, still deep in thought, when an idea struck him. He glanced curiously at the empty cup in his hand.

“Say, Mike,” he said, “what kind of water supply have we? Funny that I never thought of that before.”

Mike’s eyes opened to their fullest extent in an expression of ludicrous surprise. “Didn’t you know, boss?”

“Know what!” asked Moore impatiently.

“We’ve got all the water there was.” He waved his hand in an all-inclusive gesture. He paused, but as Moore’s expression showed nothing but total mystification, he elaborated, “Don’t you see? We’ve got the main tank, the place where all the water for the whole ship was stored.” He pointed to one of the walls.

“Do you mean to say that there’s a tank full of water adjoining us?”

Mike nodded vigorously, “Yep! Cubic vat a hundred feet each way. And she’s three-quarters full.”

Moore was astonished. “Seven hundredand fifty thousand cubic feetof water.’Then suddenly:’Why hasn’t it run out through the broken pipes?”

“It only has one main outlet, which runs down the corridor just outside this room. I was fixing that main when the asteroid hit and had to shut it off. After I came to I opened the pipe leading to our faucet, but that’s the only outlet open now.”

“Oh.” Moore had a curious feeling way down deep inside. An idea had half-formed in his brain, but for the life of him he could not drag it into the light of day. He knew only that there was something in what he had just heard that had some important meaning but he just could not place his finger on it.

Brandon, meanwhile, had been listening to Shea in silence, and now he emitted a short, humorless laugh.

“Fate seems to be having its fill of fun with us, I see. First, it puts us within arm’s reach of a place of safety and then sees to it that we have no way of getting there.

“Then she provides us with a week’s food, three days’ air, and a year’s supply of water. A year’s supply, do you hear me? Enough water to drink and to gargle and to wash and to take baths in and-and to do anything else we want. Water-damn the water!”

“Oh, take a less serious view, Mark,” said Moore in an attempt to break the younger man’s melancholy.

“Pretend we’re a satellite of Vesta-which we are. We have our own period of revolution and of rotation.

We have an equator and an axis. Our "north pole" is located somewhere toward the top of the porthole, pointing toward Vesta, and our "south" sticks out away from Vesta through the water tank somewhere. Well, as a satellite, we have an atmosphere, and now, you see, we have a newly discovered ocean.

“And seriously, we’re not so badly off. For the three days our atmosphere will last, we can eat double rations and drink ourselves soggy. Hell, we have water enough to throw away-”

The idea which had been half-formed before suddenly sprang to maturity and was nailed. The careless gesture with which he had accompanied the last remark was frozen in mid-air. His mouth closed with a snap and his head came up with a jerk.

But Brandon, immersed in his own thoughts, noticed nothing of Moore’s strange actions. “Why don’t you complete the analogy to a satellite,” he sneered, “or do you, as a Professional Optimist, ignore any and all disagreeable facts? If I were you, I’d continue this way.” Here he imitated Moore’s voice: The satellite is at present habitable and inhabited but, due to the approaching depletion of its atmosphere in three days, is expected to become a dead world.

“Well, why don’t you answer? Why do you persist in making a joke out of this? Can’t you see- What’s the matter?”

The last was a surprised exclamation and certainly Moore’s actions did merit surprise. He had risen suddenly and, after giving himself a smart rap on the forehead, remained stiff and silent, staring into the far distance with gradually narrowing eyelids. Brandon and Mike Shea watched him in speechless astonishment.

Suddenly Moore burst out, “Ha! I’ve got it. Why didn’t I think of it before?” His exclamations degenerated into the unintelligible.

Mike drew out the Jabra bottle with a significant look, but Moore waved it away impatiently. Whereupon Brandon, without any warning, lashed out with his right, catching the surprised Moore flush on the jaw and toppling him.

Moore groaned and rubbed his chin. Somewhat indignant, he asked, “What was the reason for that?”

“Stand up and I’ll do it again,” shouted Brandon, “I can’t stand it anymore. I’m sick and tired of being preached at and having to listen to your Pollyanna talk. You’re the one that’s going daffy.”

“Daffy, nothing! Just a little overexcited, that’s all. Listen, for God’s sake. I think I know a way-’ Brandon glared at him balefully. “Oh, you do, do’ you? Raise our hopes with some silly scheme and then find it doesn’t work. I won’t take it, do you hear? I’ll find a real use for the water-drown you-and save some of the air besides.”

Moore lost his temper. “Listen, Mark, you’re out of this. I’m going through alone. I don’t need your help and I don’t want it. if you’re that sure of dyingand that afraid, why not havethe agony over? We’ve got oneheat ray and one detonator, both reliable weapons. Take your choice and kill yourself. Shea and I won’t interfere.” Brandon’s lip curled in a last weak gesture of defiance and then suddenly he capitulated, completely and abjectly. “All right, Warren, I’m with you. I—I guess I didn’t quite know what I was doing. I don’t feel well, Warren. I—I—”

“Aw, that’s all right, boy.” Moore was genuinely sorry for him. “Take it easy. I know how you feel. It’s got me too. But you mustn’t give in to it. Fight it, or you’ll go stark, raving mad. Now you just try and get some sleep and leave everything to me. Things will turn out right yet.”

Brandon, pressing a hand to an aching forehead, stumbled to the couch and tumbled down. Silent sobs shook his frame while Moore and Shea remained in embarrassed silence nearby.

At last Moore nudged Mike. “Come on,” he whispered, let’s get busy. We’re going places. Airlock five is at the end of the corridor, isn’t it?” Shea nodded and Moore continued, “Is it airtight?”

“Well,” said Shea after some thought, “the inner door is, of course, but I don’t know anything about the outer one. For all I know it may be a sieve. You see, when I tested the wall for airtightness, I didn’t dare open the inner door, because if there was anything wrong with the outer one-blooey!” The accompanying gesture was very expressive.

Then it’s up to us to find out about that outer door right now. I’ve got to get outside some way and we’ll just have to take chances. Where’s the spacesuit?”

He grabbed the lone suit from its place in the cupboard, threw it over his shoulder and led the way into the long corridor that ran down the side of the room. He passed closed doors behind whose airtight barriers were what once had been passenger quarters but which were now merely cavities, open to space. At the end of the corridor was the tight-fitting door of Airlock 5.

Moore stopped and surveyed it appraisingly. “Looks all right,” he observed, “but of course you can’t tell what’s outside. God, I hope it’ll work.” He frowned. “Of course we could use the entire corridor as an airlock, with the door to our room as the inner door and this as the outer door, but that would mean the loss of half our air supply. We can’t afford that-yet.”

He turned to Shea. “.All right, now. The indicator shows that the lock was last used for entrance, so it should be full ofair. Open the door the tiniest crack, and if there’s a hissing noise, shut it quick.’—’Here goes,” and the lever moved one notch. The mechanism had been severely shaken up during the shock of the crash and its former noiseless workings had given way to a harsh, rasping sound, but it was still in commission. A thin black line appeared on the left-hand side of the lock, marking where lie door had slid a fraction of an inch on the runners.

There was no hiss! Moore’s look of anxiety faded somewhat. He took a small pasteboard from his pocket and held it against the crack. If air were leaking, that card should have held there, pushed by the escaping gas. It fell to the floor.

Mike Shea stuck a forefinger in his mouth and then put it against the crack. “Thank the Lord,” he breathed, “not a sign of a draft.”

“Good, good. Open it wider. Go ahead.”

Another notch and the crack opened farther. And still no draft. Slowly, ever so slowly, notch by notch, it creaked its way wider and wider. The two men held their breaths, afraid that while not actually punctured, the outer door might have been so weakened as to give way any moment. But it held! Moore was jubilant as he wormed into the spacesuit.

Things are going fine so far, Mike,” he said. “You sit down right here and wait for me. I don’t know how long I’ll take, but I’ll be back. Where’s the heat ray? Have you got it?”

Shea held out the ray and asked, “But what are you going to do? I’d sort of like to know.”

Moore paused as he was about to buckle on the helmet. “Did you hear me say inside that we had water enough to throw away? Well, I’ve been thinking it over and that’s not such a bad idea. I’m going to throw it away.” With no other explanation, he stepped into the lock, leaving behind him a very puzzled Mike Shea.

It was with a pounding heart that Moore waited for the outer door to open. His plan was an extraordinarily simple one, but it might not be easy to carry out.

There was a sound of creaking gears and scraping ratchets. Air sighed away to nothingness. The door before him slid open a few inches and stuck. Moore’s heart sank as for a moment he thought it would not open at all, but after a few preliminary jerks and rattles the barrier slid the rest of the way.

He clicked on the magnetic grapple and very cautiously put a foot out into space. Clumsily he groped his way out to the side of the ship. He had never been outside a ship in open space before and a vast dread overtook him as he clung there, flylike, to his precarious perch. For a moment dizziness overcame him.

He closed his eyes and for five minutes hung there, clutching the smooth sides of what had once been the Silver Queen. The magnetic grapple held him firm and when he opened his eyes once more he found his self-confidence in a measure returned.

He gazed about him. For the first time since the crash he saw the stars instead of the vision of Vesta which their porthole afforded. Eagerly he searched the skies for the little blue-white speck that was Earth.

It had often amused him that Earth should always be the first object sought by space travelers when star-gazing, but the humor of the situation did not strike him now. However, his search was in vain. From where he lay, Earth was invisible. It, as well as the Sun, must be hidden behind Vesta.

Still, there was much else that he could not help but note. Jupiter was off to the left, a brilliant globe the size of a small pea to the naked eye. Moore observed two of its attendant satellites. Saturn was visible too, as a brilliant planet of some negative magnitude, rivaling Venus as seen from Earth.

Moore had expected that a goodly number of asteroids would be visible-marooned as they were in the asteroid belt-but space seemed surprisingly empty. Once he thought he could see a hurtling body pass within a few miles, but so fast had the impression come and gone that he could not swear that it was not fancy.

And then, of course, there was Vesta. Almost directly below him it loomed like a balloon filling a quarter of the sky. It floated steadily, snowy white, andMoore gazed at it with earnest longing. A good hard kick against the side of theship, he thought, might start him falling toward Vesta. He might land safely and get help for the others. But the chance was too great that he would merely take on a new orbit about Vesta.

No, it would have to be better than that.

This reminded him that he had no time to lose. He scanned the side of the ship, looking for the water tank, but all he could see was a jungle of jutting walls, jagged, crumbling, and pointed. He hesitated.

Evidently the only thing to do was to make for the lighted porthole to their room and proceed to the tank from there.

Carefully he dragged himself along the wall of the ship. Not five yards from the lock the smoothness stopped abruptly. There was a yawning cavity which Moore recognized as having once been the room adjoining the corridor at the far end. He shuddered. Suppose he were to come across a bloated dead body in one of those rooms. He had known most of the passengers, many of them personally. But he overcame his squeamishness and forced himself to continue his precarious journey toward its goal.

And here he encountered his first practical difficulty. The room itself was made of non-ferrous material in many parts. The magnetic grapple was intended for use only on outer hulls and was useless throughout much of the ship’s interior. Moore had forgotten this when suddenly he found himself floating down an incline, his grapple out of use. He gasped and clutched at a nearby projection. Slowly he pulled himself back to safety.

He lay for a moment, almost breathless. Theoretically he should be weightless out here in space-Vesta’s influence being negligible-but the regional Gravitator under his room was working. Without the balance of the other Gravitators, it tended to place him under variable and suddenly shifting stresses as he kept changing his position. For his magnetic grapple to let go suddenly might mean being jerked away from the ship altogether. And then what?

Evidently this was going to be evenmore difficult than he had thought.

He inched forward in a crawl, testing each spot to see if the grapple would hold. Sometimes he had to make long, circuitous journeys to gain a few feet’s headway and at other times he was forced to scramble and slip across small patches of non-ferrous material. And always there was that tiring pull of the Gravitator, continually changing directions as he progressed, setting horizontal floors and vertical walls at queer and almost haphazard angles.

Carefully he investigated all objects that he came across. But it was a barren search. Loose articles, chairs, tables had been jerked away at the first shock, probably, and now were independent bodies of the Solar System. He did manage, however, to pick up a small field glass and fountain pen. These he placed in his pocket. They were valueless under present conditions, but somehow they seemed to make more real this macabre trip across the sides of a dead ship.

For fifteen minutes, twenty, half an hour, he labored slowly toward where he thought the porthole should be. Sweat poured down into his eyes and rendered his hair a matted mass. His muscles were beginning to ache under the unaccustomed strain. His mind, already strained by the ordeal of the previous day, was beginning to waver, to play him tricks.

The crawl began to seem eternal, something that had always existed and would exist forever. The object of the journey, that for which he was striving, seemed unimportant; he only knew that it was necessary to move. The time, one hour back, when he had been with Brandon and Shea, seemed hazy and lost in the far past. That more normal time, two days’ age, wholly forgotten.

Only the jagged walls before him, only the vital necessity of getting at some uncertain destination existed in his spinning brain. Grasping, straining, pulling. Feeling for the iron alloy. Up and into gaping holes that were rooms and then out again. Feel and pull-feel and pull-and-a light.

Moore stopped. Had he not been glued to the wall he would have fallen. Somehow that light seemed to clear things. It was the porthole; not the many dark, staring ones he had passed, but alive and alight.

Behind it was Brandon. A deep breath and he felt better, his mind cleared.

And now his way lay plain before him. Toward that spark of life he crept. Nearer, and nearer, and nearer until he could touch it. He was there!

His eyes drank inthe familiar room. God knows that it hadn’t any happy associations in his mind, but it was something real, something almost natural. Brandon slept on the couch. His face was worn and lined but a smile passed over it now and then.

Moore raised his fist to knock. He felt the urgent desire to talk with someone, if only by sign language; yet at the last instant he refrained. Perhaps the kid was dreaming of home. He was young and sensitive and had suffered much. Let him sleep. Time enough to wake him when-and if-his idea had been carried through.

He located the wall within the room behind which lay the water tank and then tried to spot it from the outside. Now it was not difficult; its rear wall stood out prominently. Moore marveled, for it seemed a miracle that it had escaped puncture. Perhaps the Fates had not been so ironic after all.

Passage to it was easy though it was on the other side of the fragment. What was once a corridor led almost directly to it. Once when the Silver Queen had been whole, that corridor had been level and horizontal, but now, under the unbalanced pull of the regional gravitator, it seemed more of a steep incline than anything else. And yet it made the path simple. Since it was of uniform beryl-steel, Moore found no trouble holding on as he wormed up the twenty-odd feet to the water supply.

And now the crisis-the last stage-had been reached. He felt that he ought to rest first, but his excitement grew rapidly in intensity. It was either now or bust. He pulled himself out to the button-center of the tank. There, resting on the small ledge formed by the floor of the corridor that had once extended on that side of the tank, he began operations.

“It’s a pity that the main pipe is pointing in the wrong direction,” he muttered. “It would have saved me a lot of trouble had it been right. As it is...” He sighed and bent to his work. The heat ray was adjusted to maximum concentration and the invisible enamations focused at a spot perhaps a foot above the floor of the tank.

Gradually the effect of the excitatory beam upon the molecules of the wall became noticeable. A spot the size of a dime began shining faintly at the point of focus of the ray gun. It wavered uncertainly, now dimming, now brightening, as Moore strove to steady his tired arm. He propped it on the ledge and achieved better results as the tiny circle of radiation brightened.

Slowly the color ascended the spectrum. The dark, angry red that had first appeared lightened to a cherry color. As the heat continued pouring in, the brightness seemed to ripple out in widening areas, like a target made of successively deepening tints of red. The wall for a distance of some feet from the focal point was becoming uncomfortably hot even though it did not glow and Moore found it necessary to refrain from touching it with the metal of his suit.

Moore cursed steadily, for the ledge itself was also growing hot. It seemed that only imprecations could soothe him. And as the melting wall began to radiate heat in its own right, the chief object of his maledictions were the spacesuit manufacturers. Why didn’t they build a suit that could keep heat out as well as keep it in?

But what Brandon called Professional Optimism crept up. With the salt tang of perspiration in his mouth, he kept consoling himself, “It could be worse, I suppose. At least, the two inches of wall here don’t present too much of a barrier. Suppose the tank had been built flush against the outer hull. Whew! Imagine trying to melt through a foot of this.” He gritted his teeth and kept on.

The spot of brightness was now flickering into the orange-yellow and Moore knew that the melting point of the beryl-steel alloy would soon be reached. He found himself forced to watch the spot only at widely spaced intervals and then only for fleeting moments.

Evidently it would have to be done quickly if it were to be done at all. The heat ray had not been fully loaded in the first place, and, pouring out energy at maximum as it had been doing for almost ten minutes now, must be approaching exhaustion. Yet the wall was just barely passing the plastic stage. In a fever of impatience Moore jammed the muzzle of the gun directly at the center of the spot, drawing it back speedily.

A deep depression formed in the soft metal, but a puncture had not been formed. However, Moore was satisfied. He was almost there now. Had there been air between himself and the wall, he would undoubtedly have heard the gurgling and the hissing of the steaming water within. The pressure was building up. How long would the weakened wall endure?

Then, so suddenly that Moore did not realize it for a few moments, he was through. A tiny fissure formed at the bottom of that little pit made by the ray gun and in less time than it takes to imagine, die churning water within had its way.

The soft, liquid metal at that spot puffed out, sticking out raggedly around a pea-sized hole. And from that hole there came a hissing and a roaring. A cloud of steam emerged and enveloped Moore.

Through the mist he could see the steam condense almost immediately to ice droplets and saw these icy pellets shrink rapidly into nothingness.

For fifteen minutes he watched the steam shoot out.

Then he became aware of a gentle pressure pushing him away from the ship. A savage joy welled up within him as he realized that this was the effect of acceleration on the ship’s part. His own inertia was holding him back.

That meant his work had been finished-and successfully. That stream of water was substituting for the rocket blast He started back.

If the horrors and dangers of the journey to the tank had been great, those of the way back should have been greater. He was infinitely more tired, his aching eyes were all but blind, and added to the crazy pull of the Gravitator was the force induced by the varying acceleration of the ship. But whatever his labors to return, they did not bother him. In later time, he never even remembered the heartbreaking trip.

How he managed to negotiate the distance in safety he did not know. Most of the time he was lost in a haze of happiness, scarcely realizing the actualities of the situation. His mind was filled with one thoughtonly-to get back quickly,to tell thehappy news of theirescape.

Suddenly he found himself before the airlock. He hardly grasped the fact that it was the airlock. He almost did not understand why he pressed the signal button. Some instinct told him it was the thing to do.

Mike Shea was waiting. There was a creak and a rumble and the outer door started opening, caught, and stopped at the same place as before, but once again it managed to slide the rest of the way. It closed behind Moore, then the inner door opened and he stumbled into Shea’s arms.

As in a dream he felt himself half-pulled, half-carried down the corridor to the room. His suit was ripped off. A hot, burning liquid stung his throat. Moore gagged, swallowed, and felt better. Shea pocketed the Jabra bottle once more.

The blurred, shifting images of Brandon and Shea before him steadied and became solid. Moore wiped the perspiration from his face with a trembling hand and essayed a weak smile.

“Wait,” protested Brandon, “don’t say anything. You look half-dead. Rest, will you!”

But Moore shook his head. In a hoarse, cracked voice he narrated as well as he could the events of the past two hours. The tale was incoherent, scarcely intelligible but marvelously impressive. The two listeners scarcely breathed during the recital.

“You mean,” stammered Brandon, “that the water spout is pushing us toward Vesta, like a rocket exhaust?”

“Exactly-same thing as-rocket exhaust,” panted Moore.

“Action.and reaction. Is located-on side opposite Vesta- hence pushing us toward Vesta.”

Shea was dancing before the porthole. “He’s right, Brandon, me boy. You can make out Bennett’s dome as clear as day. We’re getting there, we’re getting there.”

Moore felt himself recovering. “We’re approaching in spiral path on account of original orbit. We’ll land in five or six hours probably. The water will last for quite a long while and the pressure is still great, since the water issues as steam.”

“Steam-at the low temperature of space?” Brandon was surprised.

“Steam-at the low pressure of space!” corrected Moore. The boiling point of water falls with the pressure. It is very low indeed in a vacuum Even ice has a vapor pressure sufficient to sublime.”

He smiled. “As a matter of fact it freezes and boils at the same time. I watched it.” A short pause, then, “Well, how do you feel now, Brandon? Much better, eh?”

Brandon reddened and his face fell. He groped vainly for words for a few moments. Finally he said in a half-whisper, “You know, I must have acted like a damn fool and a coward at first. I-I guess I don’t deserve all this after going to pieces and letting the burden of our escape rest on your shoulders.

“I wish you’d beat me up, or something, for punching you before. It’d make me feel better. I mean it.” And he really did seem to mean it.

Moore gave him an affectionate push. “Forget it. You’ll never know how near I came to breaking down myself.” He raised his voice in order to drown out any further apologies on Brandon’s part, “Hey, Mike, stop staring out of that porthole and bring over that Jabra bottle.”

Mike obeyed with alacrity, bringing with him three Plexatron units to be used as makeshift cups. Moore filled each precisely to the brim. He was going to be drunk with a vengeance.

“Gentlemen,” he said solemnly, “a toast.” The three raised the mugs in unison, “Gentlemen, I give you the year’s supply of good old H2O we used to have.”