Science Fiction

Lawrence Watt-Evans

Jim looked up as Sandy poked his head in.

“What’re ya doing?” Sandy asked.

“Reading,” Jim said, holding up the book.

“Reading what?” Sandy demanded as he climbed into the old packing tube that served the boys as a refuge from their families and the outside universe in general.

“Science fiction,” Jim said. “It’s a real old book my mother found somewhere, about two kids who build a spaceship and fly to the moon.”

Sandy blinked. “What would they want to go to the moon for? And how would they get home again?”

“The ship takes them both ways, of course. It’s got some sort of special nuclear drive—it’s called ’atomic propulsion.’“

“Sounds fake to me,” Sandy replied, “Like the author was making it up.”

Jim shrugged. “He probably was.”

“So what did they want to go to the moon for?” Sandy asked.

“Well, ’cause no one had ever done it,” Jim answered.

Sandy stared. “Aw, come on,” he said.

“Hey, I told you it was a real old book. Real old.”

“It must be a hundred years old, if no one had gone to the moon!”

Jim nodded solemnly. “About that, yeah.”

Sandy was silent for a moment in awestruck silence. “You’re reading a book a hundred years old?”

“Yeah.”

“How’d it get here?”

“I don’t know; my mother just found it somewhere. I guess somebody brought it along when they built the place.”

Sandy started to accept this, then stopped. “Wait a minute,” he said. “If this book is from before anybody even went to the moon, then where are these two kids who build the spaceship in their backyard?”

Jim grinned. “On Earth,” he said.

Sandy stared at him in disbelief for a moment, then snickered.

Jim snickered back, and in a moment both boys were rolling around the tube, hysterical with laughter.

“On Earth?” Sandy gasped. “Two kids...build a spaceship...in their back yard...on Earth?”

Jim managed to stop laughing long enough to reply, “That’s what it says!”

“But Earth’s at the bottom of the biggest gravity well in the inner system! Except the sun, anyway.”

“I know, I know!” Jim replied, chortling.

A new wave of hysterics swept over them.

It took the boys several minutes to calm down, but at last they managed it, and lay quietly side by side, getting their breath back.

“Y’know,” Sandy said, as he stared at the curving steel overhead, “I bet we could build a spaceship in my back yard.”

“Sure,” Jim replied, “If we wanted to. We aren’t in any gravity well!”

“We could even launch it—my yard’s right above the Number Three emergency lock.”

Jim considered. “We’d need to put it on maglev or wheels or something to get it to the lock, though,” he pointed out.

“That’s no problem,” Sandy said. “We couldn’t go to the moon, though. Or if we did it’d be a one-way trip, and probably a rough landing.”

“No,” Jim agreed, “but if we had maneuvering jets we could probably go to one of the other colonies.”

Sandy nodded. “If they’d let us in. They probably wouldn’t.”

“’Course not. We wouldn’t have clearance from ISA. They don’t allow direct flights between colonies.”

“Why not, anyway? I never understood that.”

Jim shrugged. “Me, either. My Dad says it’s just politics. He’s been to one of the other colonies—Shepard, I think it was. Had to go to Earth first, then back up. Seems stupid.”

They lay quietly for a moment, and then Sandy said, “I’ve never been to any of the other colonies.”

“Neither have I,” Jim said. “I’ve never even been to Earth. But I was outside once.”

Sandy lifted his head and stared at his friend in surprise. “You were?”

“Sure—just out on the shell, though. Mom took me along on an inspection tour once.”

“Wow, neat.”

“Yeah, it was.”

“I’d like to see outside,” Sandy said, lowering his head again.

Another silent moment followed, and Jim recovered his antique volume. Before he could find his place, Sandy remarked, “If we did build a spaceship, we could just cruise around a little, maybe do a single orbit, and then come back aboard. They’d have to let us aboard our own colony!”

Jim put the book down and considered.

“It’d be a neat thing to do,” Sandy pointed out.

Jim had to agree.

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At first Jim had hoped that they would be able to use the old book as a sort of guide, but that didn’t work out; the descriptions in it were insufficiently detailed, and most of the equipment described was either totally fanciful or hopelessly outdated.

Still, he read it cover to cover twice. His father, in a moment’s distraction from his work, noticed the flamboyant little volume.

“Where’d you get that?” he asked.

“From Mom,” Jim told him.

His father picked the book up and looked it over curiously. “From Earth,” he said. “Someone wasted part of his lift weight allowance on that?” He shook his head. “What an idiot.”

This gratuitous remark rankled, and Jim made it a point from then on not to mention the spaceship project to anyone.

Work proceeded. The packing tube, hauled from the empty lot where it had been ditched to Sandy’s yard, made a fine main hull. Jim bought a bubble of polarizing plastic from the colony’s salvage dump; that would close off the open end when the time came.

Emergency oxygen tanks were easy to come by; the colony had them in every room and on every walkway corner, far more than the present population would ever need. The colony had been designed for a much larger population, but Earth had stopped sending volunteers, and natural increase still hadn’t come anywhere near filling the available space.

It wouldn’t any time soon, either, since the colony was short on necessities other than air and space, and meanwhile no one was going to miss an oxygen tank or two.

Jim had an old algae tank his sister had built as a school project two years before; he cleaned it out and restocked it. That would help with the air and provide a back-up food supply.

Both had their own pressure suits, of course. Everyone in Havel Colony had a suit. Jim and Sandy were well aware, as they sat on Sandy’s back lawn, that under the oxygen-producing grass lay a few centimeters of topsoil, and below that about a half-meter of metal hull, and below that—nothing.

Nothing but the emptiness of space, emptiness where the occasional meteor or chunk of space rubbish stood a finite chance of whacking into the colony.

So everyone in Havel Colony had a suit.

Neither boy was willing to risk his personal AI to provide an on-board computer, so Sandy’s old nursery computer was brought out of storage and installed, with the operating system hotrodded and with navigational software off the public net. Wheels, for maneuvering inside the colony, were provided by the simple means of bolting the boys’ outgrown toy wagons to the handling loops on the packing tube.

The hardest physical labor in the entire project was levering the tube up high enough to work the wagons underneath; it took most of an afternoon.

Propulsion and steering were the big problems, though.

“All we need is something under pressure,” Sandy said, as he lay in the partially-finished hull, his feet propped up on the algae tank.

Jim snorted. “Sure. Like what? We don’t dare swipe any more oxy bottles, and those wouldn’t last long enough to do any good, anyway—this thing we’re building must weigh a tonne!”

Sandy didn’t argue with that; instead he suggested, “Maybe we could make something.”

Jim didn’t bother snorting again. “Like what?” he asked.

“I don’t know,” Sandy admitted.

“We don’t need pressure, anyway,” Jim pointed out a moment later. “All we need is reaction mass and some way of throwing it. Doesn’t have to be pressurized.”

“How else are you going to throw it?”

“I don’t know, but it seems like we ought to be able to rig up something,” Jim replied. “Look, if we don’t need to pressurize it, we can use any old thing—we can just take all the junk from the salvage dump that nobody wants, the stuff that would be going into the furnaces anyway. Then we just throw it away when we need to steer.”

“Yeah,” Sandy said, “But we’re either going to need a lot of mass or a lot of speed, if we want to move the whole ship! Pressure’s real good for building up speed. Stuff comes out fast.”

“There are other ways, though. Suppose we put a piece of scrap on a big flywheel and spun it up? I mean, we’re planning to use the colony’s spin to launch in the first place, right? Why not do the same thing to steer?”

“I dunno,” Sandy said. “How would it work? I mean, how would you control what direction it went? How would you get something to stay on while you spun it up?”

Jim rolled over, blinking, then got to his knees. “Let’s see,” he said. “Well, suppose you had strings, with pieces of scrap tied to them, and when you needed to turn you tied the other end of the string to rim of the flywheel. Then you’d spin it up fast as you want, and then cut the string as it went by.”

“When you spin the flywheel, the rest of the ship’s going to turn the other way, you know.”

“Yeah, I know,” Jim admitted. “You’d have to allow for that. Shucks, you could use it—you could get yourself pointed in the right direction that way.”

“And how are you going to cut the string at exactly the right instant? How do you know the mass of the scrap you’re using?”

Jim stopped and considered that with mounting annoyance.

“All right,” he said, “It wouldn’t work. Not with anything the two of us could build.”

“Nope,” Sandy agreed. “I like the flywheel for rotating the ship, though—I think we should do that.”

“That’s easy enough. A bike wheel with weights along the rim should do fine, and it can go inside with us.”

Sandy nodded.

For a moment they sat, thinking silently.

“What about a crossbow?” Sandy said, suddenly. “Or a catapult? Something with a spring in it? We can put a winding motor on it, and load it with a remote grappler—tie a big bag of scrap alongside, and when we need propulsion we just haul a piece out of the bag with the grappler, load it in the catapult, and let fly.”

“We couldn’t put them on every side, though!”

“No, of course not. We mount one big one, on a swivel. Then we use the flywheel to rotate the ship to the right direction, the grappler to load the catapult and point it the right way, and there we are!”

Jim blinked, and tried to imagine such a thing.

“No,” he said, “you’d need at least two, because if there’s only one you’ll just wind up spinning around. You’d need to fire off two at once, on opposite sides.”

Sandy struggled with the physics for a moment, then nodded. “I guess you’re right,” he said. “So we build two.”

“They’d need to be balanced.”

“So?”

Jim had no direct answer to that. “Even if it worked, it’d be awfully slow and clumsy,” he remarked.

“So what?” Sandy asked. “We aren’t going anywhere, just around the colony. Who needs speed? And we’ll take a radio and call for help if it breaks down.”

Jim nodded, and grinned.

“It’s going to look really stupid,” he said, “But I don’t see why it wouldn’t work.”

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It did look stupid. When the catapults were built a tangle of machinery projected from either side of the hull at a ninety-degree angle. It looked stupid, and it also took months to scavenge the parts that could be scavenged, and save up enough to buy the parts that couldn’t. Two radio-controlled remote grapplers with video hook-ups cost a good bit, and spring steel was also at a premium aboard Havel Colony just then.

When Jim first heard the prices for the steel and the grapplers he balked.

“I don’t want to waste all my money on this! I mean, what good’s this ship gonna be, really?”

“It’ll be neat, Jim,” Sandy said. “Really! Something to tell your grandkids, y’know? How you built your own spaceship?”

Jim relented, reluctantly.

Assembling the whole contraption was, like most engineering jobs, much more complicated and difficult than expected.

The project kept the boys busy enough that they didn’t worry about the latest ISA rulings; they were probably the only people in the colony old enough to understand what was happening who didn’t worry. They noticed that dinners were getting smaller and less interesting, and that prices on everything were rising, but with the self-centered confidence of youth they assured each other that everything would work out all right.

“It always does,” Sandy pointed out. “I mean, nobody blew up the world back in the Cold War, did they? And the biocrisis got fixed up by the genetic engineers, right? It’ll turn out okay.”

“Sure,” Jim agreed, remembering, but not mentioning, plenty of cases where things had not turned out okay for one group or another. Yes, the human race as a whole survived and flourished—but did Carthage? Or the Polish Jews?

Of course, those were a long time ago. Nobody had attempted genocide in half a century.

Not that wiping out the orbital colonies would necessarily even constitute genocide. And nobody wanted to wipe them out, Jim’s father assured him. The ISA just wanted to bankrupt them, not kill them—force most of them to go back to Earth. The colonies were profitable, and the ISA wanted all that money for itself. If the colonists were to give up and go home, the factories and farms aboard could be automated and made far more profitable.

Jim didn’t really worry about it, though—not when he was welding the grapplers onto the hull, or loading the bolted-on wagons with netbags of scrap, or testing the winding motors, or building catapult frames around their precious strips of spring steel.

He was far more concerned with getting the catapults to work. His test shots sent various debris sailing every which way, once putting a marble clear into the zero-gee zone overhead, so that it never came down at all, so far as the boys could see.

And Sandy wasn’t even as worried as Jim. He paid no attention at all as he mounted the flywheel he had constructed out of an old bicycle, with lead scrap mounted along the rim where the tire used to be, or while bolting Jim’s catapults onto their swivels.

It came as a shock, therefore, when Sandy’s mother announced at dinner one night, “We’ll have to leave.”

Sandy looked up from his burger. “Leave what?” he asked.

“Leave the colony,” she said. “Go back to Earth.”

“Back?”

She frowned. “All right, go to Earth, then. I know you’ve never been there. But it would be going back for me and your father—we grew up there.”

“I know that. But why should we?”

“Because we can’t afford to stay here any more, that’s why. Look at what you’re eating!”

Sandy looked. He didn’t see anything very unusual about it. The burger didn’t have any cheese on it, and there weren’t as many french fries on the side as usual, but it looked okay. “What about it?” he asked.

“What about it? Sandy, this is the third night in a row we’ve had nothing but those damned fake burgers for supper!”

“Is it?” Sandy tried to see why this was important.

“Yes, it is! Because they’re all we can afford! Maybe if we had our own garden we could scrimp a little and get by, but I don’t have time to work a garden, and we don’t have enough money for seeds or topsoil or fertilizer anyway, and what could we grow in the five centimeters of sod they gave us?”

“The Wangs have a garden,” Sandy mentioned, and immediately wished he hadn’t.

His mother exploded, and he excused himself and slipped out before she could work herself up to sending him to his room, or even slapping him.

He didn’t make out much sense in the explosion, but apparently his mother had talked to the Wangs, and they weren’t interested in sharing their garden.

He went to the spaceship in the back yard and crawled in. There wasn’t anything in particular to work on in there, but it was somewhere to go.

He sat down on one of the cushions they had recently installed and began idly working one of the winding motors, cranking the catapult back and then letting fly, while he tried to think.

Leave Havel Colony?

That was a scary thought. He’d always lived here, after all. He was born in the very house he still lived in. And Earth? With the open sky, and the dirty air, and that stuff that fell out of the sky—rain, and snow, and wind? Where it got colder than a freezer some places, and hot as blood in others?

He didn’t think he would like that.

And he particularly didn’t think he would like living there forever, never going anywhere else.

Could you see the stars from Earth?

Oh, of course you could—half the time, anyway. Some of them.

He looked around at the bizarre, jury-rigged spacecraft he and his buddy had assembled. They hadn’t had a chance to fly it yet, but it was just about done. All that was left was a little debugging—there were bound to be plenty of bugs.

Speaking of bugs—they had bugs on Earth, not just the planned and engineered ones in the agricultural areas, but wild ones that could bite or sting. And they had diseases there, where your body would stop working right because there were parasites inside it trying to eat you alive—yuck!

He wanted to take the ship out for its maiden voyage before he had to leave, to get a good look at the stars. Would there be time? Or did Mom mean to leave right away?

Why did they have to leave, anyway? Just because the ISA had raised prices? “Cutting the subsidy,” they called it on the vid news—“passing on transportation costs.”

Well, who asked the International Space Agency to do all the transporting in the first place?

Mr. le Beau, two doors over, always said that if the ISA didn’t insist on doing all its own transportation and supplying all the colonies from Earth that there wouldn’t be any problem. If they let private companies launch stuff up unmanned, instead of putting everything on the shuttles, or if they let the colonies trade directly with each other...

But that wasn’t allowed. The ISA didn’t want the colonists getting out of hand. They didn’t really want the colonists here at all.

Sandy spun the flywheel. It whirled smoothly, with only the very faintest whirring sound.

Jim’s dinner was more peaceful. Nobody shouted or ran off. Instead Jim’s father held forth in a long, heartfelt lecture, while Jim, his sister, and their mother listened.

They’d heard most of it before, of course.

There was one new element, though.

“They’re cutting off our supplies of fuel, did you know that?” Jim’s Dad said, slapping a hand on the table. “They say it’s too dangerous, storing large quantities of volatile materials up here. Dangerous! And it isn’t dangerous having short fuel supplies for the stabilizing rockets? It isn’t dangerous being so short-handed all the time, because they won’t send up more people? They don’t care about the danger, anyway—they’re just worried that we’ll start building our own ships up here, and break their monopoly!”

Jim looked up, interested. Building ships?

Dad was off onto something else already, though, something that didn’t interest the boy.

Jim pushed back from the table. “Excuse me,” he said. “I’d like to take a walk while my food settles.”

“Go ahead,” his mother said.

His father didn’t seem to notice.

Jim wandered out the front door, then paused and looked around.

The prefab house shells stood in neat rows along the street, curving up in either direction until the circle closed overhead—at that distance they didn’t look much like houses, just like little boxes. Half of them were empty and unfinished. Way off in the distance he could see some of the framework of the colony’s solar reflectors, but the bright light made it hard to make out any details. The other end of the cylinder, with its offices and elevators and the access to the zero-gee zone in the colony’s center, was much closer than the mirrors.

It looked very solid and comfortable, each house set in its lawn of genetically-engineered grass, designed and bred for maximum oxygen production. Someone had told Jim once that natural grass, back on Earth, was a different color, a much less intense shade of green, but he wasn’t sure he believed it.

Under that grass were a few centimeters of earth, a fraction of a meter of steel, and then all the infinite void, spattered with stars and other bodies—and except for that one brief trip out onto the shell, long ago, he had never seen those stars with his own eyes. What good was living in an orbital colony if you never even saw the stars?

The kids in that book had certainly been eager enough to go adventuring, no matter how dangerous it was. And they hadn’t had the advantages of a hundred years’ experience in building spacecraft.

He turned and headed for the ship.

He was startled to find Sandy already there, crouched inside, playing with the flywheel.

“What’s up?” he asked.

“Hi, Jim,” Sandy replied. “It’s my Mom.”

“What about her?”

“She says we have to go to Earth, that we can’t afford to live here any more.”

“What?” Jim exclaimed.

Sandy shrugged.

“Really? You’re going to Earth?”

“I guess so, yeah.”

“When?”

“I dunno; soon.”

“Hey, that really sucks!”

“Yeah. And we didn’t even get the ship out yet.”

Jim looked around.

“We could do that, you know. It’s almost ready.”

Sandy blinked. “I thought you were still having trouble aiming the catapults.”

“Not really; I’ve gotten pretty good.” Jim flushed slightly. “I was just nervous, you know? Launching this thing’s a big experiment. It could be dangerous. We could get killed.”

“Yeah,” Sandy agreed. “I guess so.”

“If you’re going to Earth, though—well, that sucks. I think we should take it out for a spin before you go.”

“Yeah,” Sandy said, thoughtfully. Then, more enthusiastically, “Yeah! Yeah, let’s do it! Right now!”

Jim hesitated.

“Now?” he said. “Right now?”

“Sure, why not?”

Jim had no answer to that.

In point of fact, though, there were several last-minute things to be done beforehand—tying nettings across the heaps of scrap so they wouldn’t come loose during launch, hauling stocks of food out from the boys’ respective kitchens, and a great deal of checking things over.

Then they pushed the contraption across twenty meters of lawn onto the Number Three emergency airlock; it bumped down onto the bare metal of the airlock door, rolled a few centimeters, and stopped. The boys donned their pressure suits, and set their throat mikes to feed to external speakers, external pick-ups to feed to earphones. They ran through a final systems check—and discovered a small problem.

“How do we work the airlock from inside the ship?” Sandy asked.

Jim considered the situation, gauging distances by eye.

“If we set it right in the corner, here, and run the set-up routine, and put everything on automatic,” he said, “I think I can hit the cycle switch with the starboard grappler.”

He fit actions to his words, typing the appropriate commands onto the airlock control panel; then he climbed aboard the makeshift spaceship and closed and sealed the hatch.

Sandy was already at the grappler’s controls.

“Hey,” Jim protested, “I was gonna do that!”

Sandy shrugged. “You did the pre-set, so I get to push the button.”

He did just that.

With a rumble, the airlock cover began to slide out from under them.

At first it carried the boys’ spaceship with it, but in a moment the craft bumped up against the edge and stayed there, the wheels turning and squealing as the door slid along underneath. The wheels were not aligned exactly at right angles to the door’s movement, which created the squealing and also caused the ship to creep slowly along, sideways along the edge of the airlock.

Then the edge of the door passed the first of the eight wheels, and the ship wobbled slightly.

Another wheel, and a shudder ran through the vessel.

“I just thought of something,” Jim said, his expression worried.

“What?” Sandy asked, grabbing at the flywheel for support as a third wheel came free and the ship began to lean noticeably.

“We’re going to drop down into the airlock at the equivalent of just over one gee, aren’t we?”

“Um...” Sandy said. “Yeah, I guess we are.”

The fourth and last wheel on the forward wagon came free, and the ship toppled over until it hung from the next pair of wheels. Every loose object aboard, including the two-man crew, plummeted into the plastic bubble that served as a nose. The algae tank sloshed noisily, but the seals held, and it and its contents stayed put.

The entire assembly then hung, swaying back and forth, as the door continued to retract.

Then the door vanished into the frame and the converted packing tube tumbled down into the body of the airlock.

It crashed against the outer door with a deafening metallic noise that left Sandy and Jim unable to think or hear as they tumbled about.

The craft did not land on its wheels or right itself; it struck nose-first, bouncing on the plastic bubble, rocking for a moment, then falling heavily onto its back.

Fortunately, no catapult or grappler had been mounted on what had been the ship’s top.

The boys lay in their tiny cabin, stunned, as the inner door began to slide closed again above them.

“Uhh...” Sandy asked, still slightly dazed. “What did you set the auto cycle for?”

“Ten seconds,” Jim answered, holding the side of his head where it had whacked against the inside of his helmet when the helmet struck the hard metal of the tube.

“Shit,” Sandy said.

“Why?” Jim inquired, without looking at his comrade.

“That’s not time enough to get out and abort it.”

Jim glanced out through the bubble and saw nothing but the metal walls of the airlock; the door overhead was almost closed, and most of the illumination now came from the airlock’s own internal lights—which were a dull orange color, not the natural bright sunlight of the colony’s interior.

“I guess not,” he said. “Why would you want to?”

Sandy let out an exasperated sigh. “To see if anything busted when we fell,” he said. “Like the seal on the hatch.”

Jim looked at the bubble again. “It looks okay,” he said uneasily.

A loud hiss came from outside as the lock’s atmosphere was either pumped out or vented—neither boy knew which. It faded quickly to silence.

“I guess we’ll find out in a minute,” Sandy said.

With a rumble, the outer door began sliding away beneath them.

This time the ship wasn’t on its wheels, so it didn’t roll; instead it was pulled to the side of the lock, where it clanged against metal. As the door continued to pull, the ship was twisted around until it was flush against the airlock wall; again, fortune favored the enterprise, and the catapults and grapplers weren’t crushed. The airlock door dragged its way under the little ship’s hull with a shuddering vibration that Jim feared would shake loose every bolt or wire that hadn’t been jarred loose in the crash.

“We didn’t plan this very well,” he remarked.

Before Sandy could answer the door slipped away, and with a final bump of uncertain origin the tiny spaceship fell out and away from Havel Colony.

The instant contact with the airlock was lost, the instant of that final bump, silence fell, total and startling. To each boy it seemed as if he had suddenly gone deaf—and then a moment later realized he hadn’t, that he could hear his own breathing, the blood beating in his veins.

“Well, nobody thinks of everything,” Sandy said. “Except maybe the guys in that book you read.”

Before Jim could reply the view outside the bubble caught his gaze, and he stared out at the stars, stars brighter and more numerous than he had ever seen them, ever imagined them.

Then he started giggling, just slightly at first, but finally in uncontrollable gusts.

Sandy, without knowing why, joined in.

Jim reached up to wipe his eyes and found himself slapping the faceplate of his suit instead, triggering a whole new round of hysteria. It also sent him bouncing around the ship, since they had been weightless from the instant they left the airlock.

Weightlessness was not new to either boy—they’d both taken several trips to the hub over the years—but it added to their hilarity.

Finally, however, the two boys managed to calm down.

“We not only didn’t think of everything,” Jim said, “we hardly thought of anything! I mean, we didn’t even name our ship!”

“That’s right!” Sandy exclaimed. He looked around the tube, at the algae tank glued to one section of wall, the flywheel bolted to another, while tools, cushions, their on-board radio, the computer, the controls and video monitors for the grapplers, and dozens of other objects drifted freely and randomly about. A haze of dust and debris filled the air. A conic section of sunlight blazed across one side, pouring in through the bubble at an angle; it moved around the cylinder, shortening and lengthening, showing that their little craft was tumbling through space. The boy thought he could hear a faint hissing, as if some of their air were escaping, but it might have just been the sound of his suit’s systems going about their business.

“I hereby dub thee the I.S.A.S. Mistake!” he announced.

“Hey, no,” Jim protested. “We’re not I.S.A.S., we’re an independent—the I.S.S. Mistake, Independent Space Ship!”

Sandy grinned. “Right!” he said. “My mistake!”

Jim smiled back, but did not laugh. Their previous bout of hysterics had been sufficient, and besides, the reality of their situation was beginning to sink in.

“Okay,” he said. “I.S.S. Mistake, James Iovino and Szandor Bardossy, Co-captains, current location—where? Where the hell are we?”

Sandy shrugged. “I don’t know,” he said. “Somewhere near Havel Colony, in cislunar space, I guess. Take a look.”

Jim looked, but could make no sense of the starscape wheeling past the bubble. He located a grappler console, snared it, and turned on the video.

That gave him a lovely view of the portside catapult, but nothing else.

He worked the controls and swung the little claw outward; all that gave him was a view of stars sailing by far too quickly to be identified.

“Use the flywheel,” he said. “See if you can slow us down.”

“Right,” Sandy agreed. He thought about removing his pressure suit, for ease of work, but decided to play it safe—even if the seals had held so far, that didn’t mean they always would.

He looked out the bubble, checked the drive chain to make sure the flywheel would be spinning the right way, and began working the crank that had once held a bicycle pedal.

The parabola of sunlight gradually slowed in its movement around the interior of the ship, but did not stop, even when Sandy had worked the flywheel up to the maximum speed its bearings would permit.

Sweating inside his suit, he released the crank.

“Best I can do,” he said, apologetically. The cylinder was still turning at more than half its initial speed.

Jim nodded. He was already at work with a grappler, trying to load an irregular chunk of steel scrap into the bucket of the portside catapult. “That was a rough take-off,” he said. “I’ll try and reduce the spin and the wobble, and then you can take a look out the bubble, see if you can spot the colony so I can head us back.”

He turned the catapult on its swivel, doing the best he could to judge the direction of the ship’s movement, and then hit the release.

The spring steel whacked against its frame, sending the chunk of debris off into the void, and with a slight jar the ship’s motion changed. Sandy looked at the bubble; the sky beyond was still turning, but he thought there was some improvement.

“Hey, Jim,” he said uneasily. “What if one of those things hits somebody?”

Jim looked at him, then back at the grappler’s video monitor. “Um...” he said. “Well, it isn’t very likely. If they hit Earth they’ll just burn up in the atmosphere, which I guess won’t hurt anybody, and there’s an awful lot of empty space out there. I doubt they’ll hit anyone.” He shrugged. “I guess we’ll just have to hope they won’t. I mean, it’s no worse than meteors or the debris from all those old probes, is it?”

Sandy nodded. “I guess you’re right.”

Jim didn’t answer; he was reloading the catapult.

It took twenty-two shots, by exact count, and another cranking of the flywheel, before the ship’s rotation was slowed to a manageable level.

Jim looked about uneasily.

“What’s the matter?” Sandy asked.

“That took a lot of junk,” Jim replied. “About a fourth of what we started with. I must have under-estimated the ship’s mass pretty badly, or over-estimated the catapults’ force.” He shoved at the flywheel crank in annoyance. “Find the colony, will you? I think we’d better head straight back.”

Sandy nodded, and launched himself gently toward the nose, catching himself just before his faceplate smacked against the plastic.

He looked out at the universe.

To one side he could see the Earth, a gigantic blue crescent, the dark within the crescent’s curve sprinkled with yellow dots of light that he knew were cities, though he had trouble imagining just what a city could be like.

About 150º around from that was the Moon, a half-circle white as death.

And the Sun was out there, too, at an angle he couldn’t judge, because he dared not look directly at it. The bubble had no shielding, and he didn’t trust his suit’s faceplate to handle the full radiation.

Nowhere could he see Havel Colony, or for that matter anything man-made except those tiny golden lights.

He knew what the colony looked like; he’d seen plenty of pictures of the outside, the great cylinder with its docking complex at one end and its intricate array of solar mirrors at the other.

He didn’t see anything like that out there now.

“I don’t see it,” he said, feeling his chest tighten as he spoke.

“Let me look,” Jim said, scudding forward.

Sandy dropped back out of his companion’s way and hung more or less motionless, waiting.

Jim looked for a long, long time before admitting, “I don’t see it, either.”

“What do we do now?” Sandy asked.

Jim chewed his lip. “It might be off that way,” he said, pointing astern. “We couldn’t see it then.”

“So we should turn the ship around.”

“Yeah,” Jim said. “But that’s not gonna be easy.”

Sandy’s nerve broke. “Oh, shit, Jim,” he said, his eyes tearing up. “We’re gonna die out here, aren’t we?”

“Nah,” Jim said, his own voice not terribly steady. “I mean, we brought a radio; we can call for help.”

Sandy brightened, his tears stopping, at least for the moment. “That’s right!” he said. “Why aren’t we using it?”

“Because if they have to send a rescue party out after us we’re gonna be in really big trouble, that’s why! I want to get us back under our own power, if I can.”

Sandy looked at the radio, and then at the bubble, where the stars continued to move in slow arcs.

“Maybe we could use it to home in on the colony, without telling them we’re out here?” he suggested. “See, when we’re pointing one direction the signal would be stronger?”

Jim glanced at the bubble and then shrugged. “It might work,” he said, “I don’t know. Won’t hurt to try.”

He turned on the radio, receive only, on the colony’s exterior traffic frequency.

“...oh, damn it, they’re not listening. They probably didn’t even take a radio, those fool kids!” someone was saying.

Jim and Sandy looked at one another.

“Does he mean us?” Sandy whispered.

The radio muttered for a moment as someone spoke outside the effective range of the microphone on the other end. Then the voice returned.

“Jim, Sandy, if you’re listening, can you signal? We’ve got you on radar, but we don’t know your condition. Jim, Sandy, are you listening?” The voice let out a loud sigh. “Damn fool kids.”

“They know it’s us,” Sandy said, his eyes wide.

Jim frowned. “Yeah,” he said. “I guess they must have gotten some kind of signal when we went out the airlock, and it wouldn’t be hard to figure it out after that.”

“What are we gonna do?” Sandy’s moment of panic had passed; he was no longer worried about dying, only about staying out of trouble with the colony authorities.

“Maybe we should call, tell ’em we’re all right,” Jim said, looking about as if hoping to find useful information somewhere in the drifting dust.

“Yeah,” Sandy agreed, “I think we should.”

Hesitantly, Jim pressed the Send button.

“Havel Colony, this is Jim Iovino, co-captain of the I.S.S. Mistake,” he said. “We’re both fine, but we’re having a little navigational difficulty.”

“A little...” Sandy began, but Jim shushed him.

For a long moment there was no answer, but at last the voice replied, “I’ll be damned. You’re okay?”

“Yeah, we’re fine,” Jim said. Before he could say anything more the voice on the other end interrupted.

“Navigational difficulties? What kind of navigational difficulties?”

Jim looked at Sandy, who shrugged. Jim shrugged back and said, “Well, frankly, Havel Colony, we had some trouble when we launched, and we don’t know where the heck we are.”

After another pause, the voice replied, “That figures.” She sighed again. “You’re about forty kilometers away, with a relative velocity of about eight meters per second; your current course will put you in a long elliptical orbit around Earth, about a forty-hour period. You’ll get low enough at perigee for braking effects, so the orbit’s not stable.”

Jim and Sandy looked at one another.

“I never thought about that,” Jim said.

“There’s a whole bunch of stuff we didn’t think about,” Sandy replied.

“Maybe we should give up and ask them to send out someone to get us.”

Sandy looked around.

The air in the ship was dirty; the spin had thinned some of the particulates out of the air for a time, but since they had slowed the spin down and bumped the ship around in doing it, all manner of dust and slime and crud was now drifting about. The algae tank appeared to be leaking slightly; a thin mist was emerging from one corner, adding to the mess. Sandy saw now why real spaceships always had vents and filters and blowers, and wished they had some way to move the air around. A regular household air cleaner, like the one in his mother’s kitchen, would have done fine. Without it, the shipboard environment was not very pleasant.

They had undoubtedly forgotten other things, as well.

The kids in the book hadn’t forgotten any little details like that—but that was science fiction, Sandy reminded himself, not real life.

One of the grapplers was pointed toward the wagonloads of debris that served as fuel, and the video screen showed a distressing empty space where some of that fuel had been before they threw it away.

And the view out the bubble didn’t include the colony, even though it was only forty kilometers away.

“Yeah,” he said, “I think we should.”

Jim pressed the Send button. “Hello, Havel Colony,” he said, “I think we’re in trouble out here. Can you send a rescue?”

“Negative, Mistake,” said a new voice, a masculine one this time. “You’re on your own for the moment. We have nothing spaceworthy aboard, and no reserve fuel.

Jim looked up from the radio; Sandy’s expression was grave.

“Now what?” Sandy asked.

Before Jim could respond, the radio said, “Mistake, do you boys have maneuvering capability?”

“Yes, sir,” Jim answered. “But it’s not very precise.”

“Hm. I was thinking that maybe you could intercept Atanasoff Colony, but... how are you fixed for air and water?”

Jim and Sandy exchanged glances.

“I’m not sure, sir,” Jim admitted. “We’re not running short of anything yet.” He hesitated. “Please, sir,” he said, “we’d like to come home, but we can’t see it. We ought to be able to, if we’re only forty klicks out!”

“You sure ought to. Take another look, all around.”

Sandy tossed himself into the nose and did just that. “Still nothing out this way,” he called.

Jim frowned, and swung a grappler to point astern. He wished the video lens had a wider angle. He studied the starscape.

“If it’s any help,” the voice from the radio said, “We’re in Earth’s shadow right now, so it’s probably pretty dark. We went in about an hour ago.”

That information was what Jim needed; he swung the grappler and shrieked, “I see it!” Then he calmed and said, “At least, I think I do. There’s something occluding a patch of stars there.” He left that grappler where it was and reached for the other set of controls.

A moment later he had both catapults cranked back and loaded, and aimed directly forward. He knew he would need to adjust course later, but right now he just wanted to make a start.

He tripped the releases, and two chunks of metal sailed off into empty space.

He started to reload, then paused. “Havel Colony,” he asked, “Are you tracking us?”

“Of course we are, Jim,” answered the voice, the original female one again. “What kind of stupid question is that?”

Jim ignored the annoyance and said, “We just fired our main drive, such as it is—you guys see any change?”

A moment later the radio said, “Not much. Possibly a slight decrease in relative velocity.”

Jim frowned, and reloaded.

A dozen shots later the woman on the other end acknowledged, “You’ve killed about half your relative speed, but you’ve added a little drift, too—your trajectory’s changed.”

Jim continued loading, aiming, and shooting. The aft wagon was now almost empty, and he began to use the forward fuel supply instead.

An hour later Sandy was curled up in mid-air, trying to sleep, and the Mistake’s fuel supply was reduced to half a dozen large chunks and a scattering of little bits. Jim was hot and sweating, despite his suit’s temperature controls, as well as hungry and very thirsty.

And the Mistake was on course to intercept Havel Colony, or at least pass very close—but with a relative velocity of scarcely two meters per second, with fifty kilometers of intervening space.

That meant seven more hours of travel time. Jim didn’t dare use any more fuel. It was becoming impossible to match the loads in the two catapults, which meant each shot was likely to make the craft wobble or spin, and they might need to maneuver later.

He looked around, and checked his suit read-outs.

The helmet sipper was empty; the water recirculation wasn’t working properly. And they hadn’t brought any plain old water.

Their supplies did include boxes of synthetic fruit punch, though. Jim considered the fog of debris and concluded that the ship must be holding air just fine; he found a punch box and then popped his faceplate.

Hot air blasted in at him, and the accumulated stench made him gag. The ship was obviously gaining heat from the sunlight much faster than it could dissipate it, and Jim realized they hadn’t even thought to bring a thermometer. Their suit refrigeration systems must be working near capacity, which would, of course, be adding to the heat in the ship.

He had never thought about heat build-up, all those weeks they were assembling the ship. The kids in the book thought of everything—but he and Sandy were only human.

Something stank horribly, probably something that had leaked from the algae tank—or perhaps some of the food supplies had gone bad in the heat. He almost lost interest in the punch, but he forced himself to jab the pointed straw into the foil circle.

Punch squirted out, adding to the floating mess, and Jim quickly clamped his lips around the straw.

When he had finished, he stuffed the empty box into the food bag, wiped away sweat, closed his faceplate, and joined Sandy in trying to sleep.

\* \* \*

“Hey, boys, wake up!”

Jim started, an arm flying out and bumping a wall, sending him spinning in the opposite direction. He steadied himself and looked around, remembering where he was and what his situation was.

The sunlight was gone; the ship was dim, lit by starlight, the grappler video screens, and various gauges and pilot lights.

Sandy was stirring, rolling and bouncing along one side of the tube; Jim didn’t worry about him. He made his way to the radio as the voice called, “Can you hear me, out there?”

Jim punched Send.

“We hear you,” he said, “What’s up?”

“Not you,” the voice said. “You’re coming down fast. We estimate you’ll make your closest approach to the colony in about twenty minutes, and we thought that you might want to try and adjust your aim. We’ve got people suiting up, and they’ll come out on tethers to try and bring you in, but you’ll have to get within a hundred meters or the lines won’t reach. We estimate you’ll be about a hundred and twenty out if you don’t change course.”

“Oh,” Jim said, a bit sleepily, and then, “Oh!” as the situation sank in.

He began working the grapplers.

The colony was now plain on the video screen for the portside grappler; it gleamed pale blue in the scattered starlight, a gigantic cylinder so big that only a small fraction would fit on the screen at a time. As Jim watched, a row of golden lights blazed, sharp and clear and perfect in the vacuum of space; an airlock was opening.

He had both catapults loaded; he tripped the switches.

The loads weren’t even; the ship turned toward the colony, but it was rotating anew, a slow, graceful roll.

Jim hissed air through his teeth and began reloading, making sure that the heavier load went on the starboard side, so as to slow or reverse the spin.

When he had the catapults loaded again he swung the grapplers out and looked for the colony.

There it was, and he could see tiny figures emerging, their helmet lights white, the brightest things on the screen.

Then the Mistake’s new rotation carried the video pick-up around, and Jim concentrated on his aim.

The catapults fired, and the ship had a new motion, a sort of corkscrewing.

It was also headed more directly toward the colony.

Jim hit Send as Sandy studied the video screens. “How’re we doing?” Jim asked.

“Better,” the now-familiar voice said. “We estimate pericolony at 105 meters, and too far around the curve for the lines we’re using. Keep trying.”

Jim swung a grappler down and looked in the fuel bin that had been his express wagon.

Two more lumps of scrap—and they didn’t even match. After that, nothing but steel shavings and plastic shards.

The kids in the book never had problems like this.

Damn that book, anyway. He should have known that any book that talked about building a spaceship in a back yard on Earth was nonsense right through.

He loaded and fired, and then waited, doing his best to keep both the video pick-ups pointed toward the colony as the Mistake rolled crazily through space. The spacesuited figures had grown from dots into human beings, and he could even see the writing on their helmets, glimpse bits of face through the transparent faceplates.

“Pericolony, eighty-five meters, in two minutes,” the radio said.

Sandy drifted up to the nose to see what he could make out. Jim glanced after him, his pulse racing and his skin crawling with sweat; when he looked back at the video screens the portside view was of an immense hand reaching toward him, like a shot from an old horror movie, and he let out a startled yip.

Then he felt the whole ship lurch slightly as the hand closed firmly around the grappler’s “wrist.” Another hand grabbed the catapult frame.

“Got you!” said a new voice, over their suit intercoms.

Jim let his breath out, realizing for the first time that he had been holding it.

\* \* \*

“That was an incredibly stupid thing to do,” Jim’s father said, as he and the boys stood at the mouth of the airlock, looking down on the battered I.S.S. Mistake. One grappler had been crushed and a catapult frame bent getting her back aboard the colony, and the plastic nose bubble had had to be smashed to get the boys out.

“I know,” Jim agreed.

For a long moment the three of them stood, silently considering.

“On the other hand,” his father said, “I’d say that it did serve as a good, practical demonstration that spaceflight’s possible without rocket fuel, if you’re not at the bottom of a gravity well.”

Jim and Sandy both looked up at him, startled.

“This is just me making guesses, you understand,” Iovino continued, “but I think that the ISA is going to have a few surprises in store for it, when people have had time to think this over. I’ve been thinking about it for eight hours now, ever since I found out you two idiots had gone out that airlock. I’d guess that in a few months, maybe a year, we’ll see inter-colony trade established, without any necessity for trips down to Earth, now that you boys have shown us we don’t need Earth-built equipment to survive out there.”

“Won’t the ISA object?” Sandy asked.

“Probably,” Iovino replied. “They might even cut us off, and we could have some rough times up here. These colonies were deliberately designed not to be completely independent—the Earthpeople were playing politics, scared what might happen up here. But the colonies are all different, and I think what each one lacks, another can make up—if we have some way to reach each other.”

“I don’t know, Dad,” Jim said. “The catapults didn’t really work that well.”

“So maybe we won’t use catapults. Maybe we’ll use solar sails or some other system. People have dreamed up plenty of ideas over the last century; it’s just a matter of finding which one works.” He shrugged. “Not your problem any more, boys.”

He gave the Mistake one last look, then turned away.

“Let’s go home,” he said.