

SACRIFICIAL IRON

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Ted Kosmatka lives in the Midwest, not far from Lake Michigan. His brilliant new tale challenges comfortable historical assumptions and reveals the excruciating cost of . . .

SACRIFICIAL IRON

Space is to place as eternity is to time.

—Joseph Joubert

* * *

The mission went wrong early.

Only nine years out. Past the Kuiper and deep into the Oort.

The tone of the transmissions had changed over time—the complaints small at first, then growing more heated. More personal.

“Doctor Nasmeth hasn’t seen fit to perform equipment checks.”

“Doctor Nasmeth skipped his turn at the air purifiers.”

“Doctor Nasmeth . . .”

“Doctor Nasmeth.”

For his part, the good doctor brooded but did not complain. Quiet and contemplative, he focused on the mission: a plan to carry three thousand cryogenically suspended blastocysts safely across the black, along with frozen crew. It would take the better part of a century, if all went well, an exploratory expedition to one of three candidate exoplanets and a mission like nothing humanity had ever before attempted.

The two men kept watch. Doctor Nasmeth and Jason Zaya. Sentinels of the long night; they updated the cryo-systems, prepped the saturation engines, and walked like ghosts among the frozen cells.

Back home, a dozen psychologists studied Nasmeth’s every word, every gesture, and none saw the breaking point until it came—revealed in an unplanned communication when on the twenty-sixth of December he took a seat at the comm’s desk, logged onto the transmission channel and spoke casually into the feed. The message was short. Two simple sentences, but they sent a shock wave through mission control and began a series of events that would shake the world and leave thousands dead.

Nasmeth keyed the mic, looked into the camera and whispered, “I’m going to tell you something, because there’s nothing you can do to stop it now. I’m going to kill Jason Zaya.”

* * *

The mission had begun in earnest more than a decade earlier. A thousand candidates tested and discarded—Nasmeth and Zaya the best of the best. Three sigma, whole-spectrum, with specialties off the scale.

The public loved them. Two explorers who'd hold the fate of thousands in their capable hands.

When the rockets lifted skyward, the people of Earth were divided, not by race, or nationality, or ideology. They were divided between those who loved Dr. Nasmeth, the quiet, studious biologist, and those who loved the flamboyant engineering specialist, Jason Zaya. There had been a dozen psychological exams. A dozen tests for temperament, intelligence, and mental stability.

There was one test they'd never thought to conduct. They never asked them if they liked each other.

* * *

The people of Earth followed the crew's advance across space and time through a series of video transmissions. The faster the ship accelerated, the more attenuated the messages—arriving at first every two weeks, then every three, then five, then eight. All the while, for the astronauts aboard the *Novus Initus*, the pattern never varied. Their messages were sent like clockwork, and to them, it was the replies that took longer and longer to arrive.

It was as if time itself was attenuating, stretching thin and weak, along with their link to the world they'd left behind.

The fan clubs started in the schools for the most part. The children watched the broadcasts, and the fanbases grew—the two men like ascendant gods, safe to revere. Their mission, a new start for humanity. New territory. A place to do it right.

The kids picked their favorite and followed him closely. Nasmeth or Zaya. Zaya or Nasmeth. As opposite in appearance as personality. Nasmeth stiff and blond as a reed; Zaya brown-haired, wider, with a neck like a bull. A hundred thousand, a million, ten million fans, from Chengdu to Chicago. A whole generation grew up listening to their video talks, these men who didn't seem to age—transmissions arriving like mini time capsules, growing further and further out of sync.

"The future is about choices," Zaya said once, smiling into the feed. "You have to be willing to do the hard thing, or you end up erased from history."

Future historians would take note.

The men gave talks on the saturation engines, the Big Bang, and universal inflation. Nasmeth a biologist. Zaya engineering. Between the two of them, you picked your hero.

* * *

The first hints went public slowly. A comment here, an odd facial expression there, revealed in the slow evolution of the video feeds. Only the most astute caught on. Perhaps the fans knew it first—even before the scientific teams.

"He's a control freak," they said of Zaya in a thousand pubs.

"What? Are you kidding? Nasmeth is a slacker."

"They don't put slackers in charge of the saturation engines. He's just following the routines."

"The routines don't matter."

"Routines are *all* that matter light-years from Earth."

And in one sense, it was true. Attenuated that finely, small things came to matter much.

* * *

The saturation engines. Those miracles.

Not really engines at all, but something stranger. Something that touched the black itself.

Nasmeth had explained it to the news shows before the launch, sitting awkward in suit and tie while smiling hosts fed him rote questions beneath studio lights. Audience looking on.

"It's like weather," he'd said at one point, going off script. "As air rises, it cools and can hold less moisture, so humidity precipitates out as rain. Vacuum is like that, too."

Deer-in-the-headlights. The host blinked. "Vacuum . . ." he'd said under his breath, looking through note cards for where he'd lost the thread.

Nasmeth nodded. "As space-time has inflated, it has thinned and can hold less energy, so vacuum precipitates out new matter. You get Hawking radiation, particles flashing in and out of existence. The saturation engines work because they take advantage of universal inflation." He paused, giving the host time to catch up to the right note card. "It's like a triangle," he said finally, pointing to the video display behind him. "Three corners on the same phenomena. Matter, inflation, and the speed of light."

* * *

As they approached the Kuiper belt and prepared to fire the saturation engines for the first time, the timetable for transmissions shifted. The replies from Earth would take exponentially longer. After the Kuiper, after the Oort, it would be years between messages. Whole decades of silence. Two men alone on the ship—taking turns on watch. A month asleep, a month awake. Overlapping only for hours at a time. Trading places over and over as the *Novus Initus* streaked its way across the endless night.

* * *

In 1980 a cosmonaut wrote of his time aboard Sulyut 6, "All the conditions necessary for murder are met if you lock two men in a cabin measuring eighteen feet by twenty and trap them for two months."

It was likely on mission control's mind when they went over the protocols before the big jump, iron sublimate already primed and ready. Only two more transmissions before the long silence.

At the end of their latest message, mission control raised a question—the carefully worded product of a team of psychologists, calibrated to slice through the formality. "Are you sure everything is okay?"

The men stood side by side in the control module.

"It's fine," they both said, though Nasmeth sported a new black eye.

"A fall," he explained. "Nothing serious."

"How do you fall in zero gravity?" Came the reply three weeks later.

To which no response ever came.

* * *

Nasmeth drifted through the corridor, making no sound.

The white walls formed a pale, glossy tube, hexagonal in cross section, as if the tunnels of the ship were part of some colorless, bled-out beehive, and him the last worker bee. Winter coming on.

Fluorescents hummed from the creases, throwing milky white light. He carried a wrench in his hand as he moved down the corridor, thinking of his enemy: the man who'd made his life a living hell.

It was the intractability of the situation that got to him. The idea that there was no escape. No retreat. No getting away from the constant needling of this, and then *this*, and then this, one thing after another, onward forever.

"Zaya," he said the name softly to himself.

There was a freedom in finally drawing a line. Beyond here, no more. Beyond here, he would discover that ultimate rebuke of which he was capable. He and Zaya would learn it together.

Nasmeth stopped in the tunnel. He closed his eyes and willed himself to feel the ship moving around him. In old seafaring vessels, zinc anodes were attached to the hulls of boats to protect their metalwork from corrosion. They called these anodes

sacrificial zincs, because the salt water would preferentially strip the ions from the zinc and leave the ship's steel unscathed. At the end of a year's journey, the sacrificial zinc might be reduced to nothing, in need of replacement, but the ship would be whole. The Universe could be like that, too, preferentially trading one thing for another. A man could trade the years of his life.

He turned and made his way to the end of the corridor where he stood before the glass port and watched the stars. The view never got old. He could see only two things—a vast, dark emptiness and starshine. Light itself, traveling at 299,792, 458 m/s. That's all there was—only blackness or light. All or nothing. No in between.

Faster than light travel was an impossibility. All the math said so. It was a universal constant, the final unbreakable limit.

Sometimes in moments like this, the enormity of the mission struck him. The sheer beauty of it. Humankind against all that endless night. The purest kind of struggle, and the oldest.

Like a hearth fire pushing back against the darkness.

Sometimes he dreamed of killing him.

And woke drenched in sweat. Not from guilt over the act, or from any instinctual abhorrence of violence, but from the knowledge that he was breaking the rules. Maybe the oldest rule.

Nasmeth liked rules. They defined the social space. If those rules didn't come naturally, you could study them, learn them. Rules made sense of life. But what do you do when the rules are at odds with the mission? What do you do when the last line is crossed?

* * *

When the final message arrived at mission control, it hit like a bomb. There were phone calls in the middle of the night to the head of psychology. Then to the head of NASA. And on up the chain of command, all the way to the president.

"What the hell does that mean?" The president asked groggily. Three A.M. in the White House.

"He says he's going to kill Jason Zaya."

"But he doesn't mean that literally."

"He seemed pretty literal."

"Jesus. Get a message to them immediately. Tell him he's under direct orders not to kill Jason Zaya. Tell him the president said so."

"We'll do that, sir."

There was a pause on the line. The president didn't like the tone in the other guy's voice. Something about it. "When will he get the message?"

"Well, assuming he lives a normal lifespan . . ."

"Son of a—" the line went dead.

* * *

The message was composed anyway. "Doctor Nasmeth, you are hereby under direct orders from the president of the . . ."

They sent it.

The head of NASA called a special meeting and spoke to his teams. "Under no circumstances is this information to get out. Do you all understand? This is top secret, need-to-know only. The public must never hear of this."

"Yes," they all agreed, nodding their heads. Within sixteen hours, it was worldwide news.

Audio of the transmission leaked to a dozen outlets and played over and over. On the screen in Time Square, ninety feet tall, Nasmeth faced the camera. His eyes serious.

"I'm going to tell you something, because there's nothing you can do to stop it now."

I'm going to kill Jason Zaya."

The crowd stood in stunned awe, faces slack with disbelief. These heroes from their childhoods. These ascendant gods, safe to revere.

It was broadcast on every radio station. Every daytime talk show. Every nightly news report.

* * *

An investigation was launched into the evaluation procedures. Friends and colleagues were brought in to help see what mission testing had missed.

"Nasmeth was a quiet guy," his old colleagues said. "He follows the rules. This makes no sense."

"This isn't like him," others agreed.

"Nasmeth just likes being left alone. That's why he wanted the mission. No people, just science."

Zaya's brother refused to comment, but his old roommate spoke. "He's a piece of work, that guy. I wouldn't piss on him if he was on fire."

"What?"

"Oh, you didn't know? You never asked? Zaya is certifiable."

Faces paled across the table. "But our testing . . ."

"That's the problem with people who test off the scale," the old roommate said. "They know what answers you want."

"You think Zaya is unstable?"

"A nice guy when you meet him, but then eventually . . ."

"Eventually what?"

"He *finds* problems to get worked up about. He's a shit starter." The roommate looked away, as if remembering a bad dream. "He's like this unstoppable force, always pushing. I wanted to kill him myself, and I was only his roommate for a semester."

* * *

The psychologists had meetings to discuss it.

There were fights in bars and pubs. Fans of Nasmeth versus fans of Zaya.

"He was pushed too far!"

"He's a murderer!"

"Criminal!"

The semanticists among them responded, "Criminal? In what jurisdiction? He's beyond the reach of any law. He'll never be on Earth again."

The two sides fought like football hoodlums. Scrapes, bruises, busted knuckles. Busted skulls. Blood on the sidewalks. People died. It was because the truth was unknowable that the fights were so vicious. They fought to convince themselves—some blaming Zaya, others Nasmeth; and always there was the question: "When will we hear from them again?"

"Not till after the jump. Not in our lifetimes."

"By then it will be done."

Nodding wisely. Sipping a beer. "What's done is done."

* * *

It had begun with small things. Notes. Passive aggressive notes typed onto his work screen for him to find. Then the notes had escalated. A page taped to his locker.

It was the provocation of it that took Nasmeth's breath away. The sheer unmitigated gall. To tape the note over his locker:

"Please leave the fixative where I put it next time."

But he had. The same shelf anyway, if not the exact same spot.

Notes about the scrubbers and the filters and the endless, pointless routines.

Finally, there came the argument over the door. Such a little thing. Nasmeth liked

the steel door closed between the workroom and the mess hall; Zaya wanted it open, the difference amounting to a few degrees of ambient air temperature, if it amounted to anything at all.

“Why do you care what I do during my shift?” Nasmeth asked. “You do your shift, and I’ll do mine.”

And so it had gone, until finally Nasmeth had arrived on his shift to find the door wired to the wall—a twist of copper cable looped through the handle and wrapped to a pipe. Door stuck open.

He stared at the door, barely believing it. “What the hell?”

Nasmeth cut the wire. Then closed the door.

Next shift came a chain. Door chained to the wall.

Nasmeth cut the chain.

Then a steel bar. Welded to the floor.

On the door, his name had been scratched. *Nasmeth*. Block letters six inches high, and beneath that a sentence: *Keep door open*.

Nasmeth wondered at the effort it would have taken to weld the steel bar. He got the reticulating saw, and he cut through the bar. Then closed the door.

When he saw Zaya in the mess hall four weeks later as their shifts overlapped, he didn’t speak. Just met his eyes and kept walking.

There might have been a moment of sanity then. A moment when either of them asked, *What am I doing? It’s just a door. Who cares?*

When Nasmeth next woke for his shift a month later, he entered the workroom, and the door was missing. Missing altogether. The hatch *gone*. Taken off its hinges. It didn’t seem possible. It wasn’t safe.

How do you lose a door? Where do you hide a door on a ship?

He confronted him in the mess at the end of his shift. “Are you out of your mind? What if there’s a fire? What if there’s an explosive decompression?”

“Try to close it now,” was all Zaya said.

Nasmeth’s memory of the next few seconds was fractured. In his mind, he saw it clearly, Zaya jabbing his chest with his finger, and then him swatting that away, which led to a push, which left him against the wall, and then he’d kicked off—harder than he meant to, harder than needed, and then they were in each other’s faces, screaming full blast, until he pushed again, and spun away, and his eye hit the bulkhead. Zaya kicked off and left the pod—leaving Nasmeth floating on the other side of the room, where he watched his blood spooling out before him into beautiful spiral shapes in the zero-g.

* * *

“The discovery was based on the principle that light has not always behaved the same,” Nasmeth had said to the TV host two weeks before the launch. “In the cosmological past, light moved faster. Why?”

On the TV screen, Nasmeth held up a small-scale model of the ship—like a slender silver wand, lined on one side with windows, slightly curved around the mass of the captured iron bolus, gray and oblong. All of it cast in plastic, like a child’s toy.

Psychologists watched the tape, rewound, watched again. Looking for clues. Early hints for where things went wrong.

“We know it from measurements of early inflation,” Nasmeth continued. “The speed of light c in Einstein’s equations turned out to be not so universal as people hoped. And if the speed of light has changed over the course of the Universe—even just a millionth of a decimal—then it changes everything. If the speed of light has changed, then it isn’t a constant at all.”

The host nodded. Brow suitably furrowed.

“The math might not let you break the speed of light,” Nasmeth continued, then

paused thoughtfully. "But what if there was a way to cheat it?"

* * *

The saturation engines fired.

Nasmeth lay in his fibrigel cockpit and watched the outside feed—watched the stars dim and shift colors, black night gone sepia and strange. A prism of charged particles like the aurora borealis streamed past the camera and blanketed the hundred and ten tons of sacrificial iron that extended alongside the ship, their silent companion.

Outside, Nasmeth knew, the iron was losing mass. Sublimated to the big Empty, to space-time itself. It was the opposite of Hawking radiation. Instead of particles appearing out of nothing, the valence of the vacuum fluctuation was reversed. Matter fed *into* the system.

The shape of space-time hadn't changed. They were still traveling at the same fraction of the speed of light: $1/3 c$. It was the *speed of light* that had changed. A local phenomenon.

Inside the arcing fissure of the iron's halodisc, the speed of light was now much, much faster.

* * *

"What was Aaron Nasmeth like growing up?" The interviewer asked.

"He was a quiet kid," the old man said, sitting across the table. White room.

"Did he have a lot of interests?"

"He loved anthropology, history, physics. Anything with systems."

"He's been described as a rule follower."

"Yeah, you could say that."

"But it says in his school records that he was expelled from eighth grade."

The old man said nothing.

"What happened?" The interviewer asked.

"A fight."

"Did they normally expel a child for a fight?"

"Well, not for a *normal* fight. No."

"This wasn't a normal fight?"

"He just wanted to be left alone."

"So this wasn't a normal fight?" The interviewer repeated.

"No," his father said. "No, I wouldn't say it was normal. I wouldn't say that at all."

* * *

He found the missing door in one of the peripheral storerooms, wedged behind a rack. The scratched message facing outward.

The door was large and cumbersome and must have taken huge effort to move this far.

Nasmeth considered taking it back and reattaching it, but saw the hinges had been cut away. He could always just weld it to the doorframe, seal it shut for good and all, but that would be as crazy as Zaya taking the door in the first place. He imagined all the trouble Zaya had gone to. He imagined him pushing the huge door up through the connecting tunnels and out through the four hatchways. Hours of effort. Hours of work. He wondered for the first time if Zaya was crazy. Actually crazy, and not something else.

If Zaya had ejected the door into space, it might have changed the mass of the ship in small, subtle ways, so it was a relief, at least, to find the door still on the ship and to know the equations weren't compromised.

Nasmeth left the door where it was.

He would give in, he decided, let Zaya have this victory. Let him win. He didn't want to, but he could do that. Take one last step back from the edge.

One last step before it all went too far.

* * *

The ship drive worked on a simple principle. You can't travel faster than the speed of light, but the speed of light can change. No longer 299,792, 458 m/s, but something else, governed by the field-state of the space-time through which light propagates. The engines didn't change the shape of space, only shifted its internal calculus. Same energy, new form; Einstein's famous E translating across the whole range of that ancient theoretical triangle: matter, space-time, and the speed of light.

Since the Big Bang, particles have precipitated out of the vacuum as the Universe inflated, bleeding excess field density into the real while the speed of light slowed over billions of years—if only ever so slightly. But what if you could reverse it? Sublimate matter *into* the system, increase the field-state of the local vacuum. Invert the trend-line.

Space-time would have to shed the extra energy somewhere.

It sheds it back into the speed of light.

* * *

Sometimes when he lay in bed, he saw things. A part of him wondered if he was going crazy. To only talk to one person for years—it could drive anyone to distraction. But he knew the visions were just radiation. Passing photons. Excited bits of the Universe, so small they might slip unhindered between the molecules of the ship's hull yet still interact with his physiology.

The Universe talking to him.

The rays traveled through the sleepers as well. And the frozen cells. The ones who would be the future. He was the past, he knew, just an usher on this journey.

The real colonists were the blastocysts. The crew would wake still a generation out, facing a full fifty years of deceleration, with human decision-making required in case things went wrong. Only later, when the time was right, would the blastocysts be thawed, the children raised, and their children's children be the first to walk the new world.

Sometimes when he lay in his bunk he thought of other peoples, other migrations. Out of Africa, Beringia, the New World. Sinodonts displacing sundadonts. He thought of the steppe tribes—the people of the horse, and the wheel, expanding out of the Pontic five thousand years ago, bearing with them a new language family and a helpful facility to digest milk. Chromosomal haplogroups moving West, and East, and South. Like all great migrations, written in blood, of both kinds. Passed and bled.

Some lines died out. Some survived.

He stood. He walked to the glass and looked out at the stars. Darkness and light. The great all or nothing.

"Zaya," he said softly.

* * *

The notes continued.

Notes on the filtration system: "*Please return acid fixative to containment with label facing out.*"

A note on the chair: "*Unsanitary. Please wipe the seat after using. If your skin touches it, it's not clean.*"

"This is nothing," he said to himself each time. "Just words. Ignore it. Think of the mission."

Until the final straw.

A dozen red lights flashing on the console when he woke. The air filters maxed. He stumbled forward, panicked, tracking the problem to the workroom. To a single wall unit. Opening the locker, Nasmeth had to cover his mouth with his hand to fight the fumes. He stood there, staring into the small rectangular space.

Like with the missing door, it didn't seem possible at first. It didn't seem possible

that Zaya could have done it.

Had he poured something through the open slots? The clothes were coated and wrecked. Greasy droplets. Choking fumes.

It took a full minute to accept it.

Zaya had poured the acid fixative into his locker.

* * *

The superluminal field extends approximately nine thousand kilometers in front of the sacrificial iron and a thousand kilometers after. The shape like a teardrop, or a cyclist's helmet. In this narrow seam of space-time, light speed had no fixed limit.

The key was to supersaturate the local vacuum field. Pump matter into the black. Make the Universe owe.

Every atom boiled off, an atom of debt.

Warm air picks up moisture over the ocean, rising until it reaches 100 percent humidity and then precipitates out rain. Under pressure though, air can be supersaturated. You can *feed* the system. Force it to carry more.

The ship was a pressure cooker.

* * *

"They picked on him, you see."

"Other students, you mean," the interviewer said from across the table. White room.

"Yeah," the old man said. "Just normal eighth grade bully stuff, I thought at the time. But it really bothered him."

"How so?"

"He wanted to fight back, but it was against the rules, so he wouldn't do it."

"How did this lead to his expulsion?"

"I told him he could fight back. I told him the rules didn't apply, just this once."

"Didn't apply?"

"Yeah. I thought he'd stand up for himself. But I didn't expect him to go so far. I didn't understand."

"What happened?"

There was a long pause before Nasmeth's father spoke. "He brought a baseball bat."

* * *

Nasmeth stood in front of his locker for a long time.

There were rules of engagement, old as religion. He knew them by heart, as every person does, somewhere deep down inside.

Self-defense.

In defense of innocents.

He could do it for these reasons. No other.

Zaya was crazy. A man who would pour acid into a locker was a man who might do anything. A man who couldn't be trusted. A man who was dangerous to the mission.

But how do you weigh a crime that hadn't been committed? How do you levy punishment for something a person might do? You can't. The rules forbade it. The oldest rule. The first rule. Thou shalt not kill.

He thought of the blastocysts, safe in their ice. Part of an unbroken chain of humanity, back to the dawn. Now carried in darkness.

Nasmeth went to the port window and stood for a long time and thought of the rules.

He thought of deep space.

He thought of the speed of light.

* * *

He liked watching the sacrificial iron. The slow sublimation of matter. Paying for all that speed.

In the ship's wake, he knew, as their little teardrop moved through space, the

Universe precipitated the matter back out again behind them in a fine contrail of hydrogen, light-years long. An impossible alchemy. Iron into vacuum. Vacuum into speed. Speed into hydrogen.

They'd picked up the sacrificial mass just inside the asteroid belt in the second year of the mission. Ninety-eight point four tons of iron-nickel alloy—an M-type meteoroid, dense as they could find. They'd captured it and primed it, and now sacrificed it to the empty.

He watched it go. Bit by bit.

There were theorists who talked about planet eaters. Ships that might use whole planetary masses to hypersaturate the field—reverse Hawking radiation on unimaginable scales. A hundred million years of inflation converted back into the system.

He imagined it. Whole Jupiters of superluminal speed, fed into the black, to be returned as a fine dusting of Hawking precipitate a million light-years long.

Where might they go with that kind of push? How fast might they travel?

Nothing could travel faster than light. And yet from an outsider's perspective, the *Novus Initus* did just that.

Different rules, different places.

"A local phenomenon," he whispered.

Sometimes the rules didn't matter.

* * *

Nasmeth sat in front of the video feed. He keyed the mic, looked into the camera and whispered, "I'm going to tell you something, because there's nothing you can do to stop it now. I'm going to kill Jason Zaya."

He reached over and turned the camera off.

There was a darkness in him. Like the darkness of deep space. A place where the light wasn't. He didn't want to do what he was about to do, but he had to do it. He had no choice.

"Nothing can go faster than the speed of light," he said.

That was still a rule. But the Universe found a way.

If the Universe could break a rule, who was he to say what rules couldn't be broken?

* * *

He went to mechanical, and he got a wrench. It felt strange in his hand. Not heavy, but inertial. To move quickly was to shift his arm around the object, to some extent, as well as moving the wrench around his body. He swung his arm, and his entire position in space changed. Not much, but enough to throw off the aim of any blow.

He thought of migrations again. People spreading far from home. Others lost along the way.

* * *

Nasmeth waited.

He didn't go to sleep like he was scheduled.

Instead he watched the iron through the glass, wrench in hand. He let the hours go by. He watched the iron losing itself—as he was losing himself. Disappearing into kinetic potential.

Finally, he turned. It was time.

Nasmeth drifted down the corridor and found him in the common room. Zaya's eyes met his.

There was a moment of surprise. But just a moment. Zaya's eyes went wide. He'd noticed the wrench. "So you came to fix something," he said. It was the first words exchanged between them in months that hadn't been written in a note.

Nasmeth nodded. "Yeah."

Zaya's mouth went tight. He pulled a long screwdriver from his sleeve. Not a dagger, but it might as well have been. There was no use pretending.

They faced each other.

"The acid," Nasmeth said. It might have been a question. It might have been an answer.

Even then Zaya could have stopped it with the right words. Instead he said, "I told you to put the fixative back how you found it."

Nasmeth lowered his head—rage boiling up inside him. He could still have turned, perhaps. Still have found a different way.

"A little acid in your locker, and maybe you learn," Zaya continued with a smile. It was the smile that sealed it.

Nasmeth kicked off.

And together, they learned this:

To fight in space, you had to clutch your enemy. You had to get close and cling to what you swung at, or your own center of gravity worked against you. You had to grapple, and lever, and still each blow was divided by half, like those nightmares back in childhood, where you dreamed you were in a fight, but your blows were weak and soft—

Until they weren't.

And then, together, they came to learn another thing, too, through hard instruction, these men: that blood spirals away in zero-g. Whole spinning galaxies of it. Shoulder crashing hard against the controls—the screen shattering as the wrench careens off the navigation console.

A kick against dials, and then a push with all his strength, as something broke—alarms sounding now, red lights flashing, and the ship seemed to move differently, face crushed against a row of toggles until a seam opened above his eye. Spiral constellations of red droplets—a grunt, and then a desperate swing, full force—

—and the wrench struck Zaya across his temple.

Sick thudding sound.

He spun away. Silent. Stiff. Drifting.

For a moment, Nasmeth did nothing. Only watched. Then moved.

He caught Zaya by the collar and raised the wrench high for the killing blow. Zaya's eyes came open. He didn't plead. Didn't try to protect himself—blood peeling loose from his temple to form pools in the air.

Zaya turned his eyes away, as if embarrassed by death.

Arm still raised, Nasmeth froze. He couldn't do it.

He needed to. He *had* to. But he couldn't.

Nasmeth threw the wrench against the wall, and it clanged loudly and spun away. The entire ship rotated around them. Nasmeth released Zaya's collar. The man drifted away, kicked off, still trailing blood, down a hall. Gone. Alarms still flashing.

Nasmeth was alone.

He kicked toward the dented navigation console. Surveyed the damage. The ship had moved out of true, come off course.

He rerouted power. Righted the ship. Minutes later, the alarms went silent.

How far? Nasmeth studied their trajectory. How far off course?

Soon, he had the answer. It was a small deviation, but at superluminal speeds, small changes can amount to much. Can amount to years.

Nasmeth hung his head and willed the ship to still around him.

* * *

Hours passed in a haze in which he dressed his wounds, and he eventually found himself down the corridor in the transmission module. He eased himself toward the camera. Sat down. He turned the camera on and tapped the mic.

The light above the camera came on.

* * *

Years later, a red light would flash on the video screen at mission control. “We have a message!”

The entire room would go silent.

A manager would spill his coffee.

“Play it.”

And the technicians would all lean forward as Nasmeth’s face filled the screen.

* * *

On the screen in Times Square, Nasmeth’s face fills the giant screen, ninety feet tall. The crowd below notices—stops in its tracks. There are shouts. Outrage. Pointing. Fans of Zaya. Fans of Nasmeth. The previous message still large in their minds, though it had come two years earlier.

“Murderer!”

“Killer!”

The giant face leans forward. For a moment Nasmeth doesn’t speak—only stares at the camera. There’s a split above his eye seven feet wide. Then he sighs, opens his mouth, and the words come spilling out.

“I couldn’t do it,” he says.

A woman in the crowd puts her hand to her mouth.

“I know it’ll be years before you’ll get this message, but I wanted you to know.” He looks down. “I couldn’t kill him.” When he looks up again, there’s uncertainty in his eyes, and something else. Fear, perhaps. A century of psychologists will study the micro-expressions. “We’re trapped here together,” he continues, face broadcast on screens in Warsaw, Tokyo, St. Petersburg, Hyderabad. “We’re just going to have to find a way to live with each other. This is Nasmeth signing off.”

The screen in Times Square goes black. For a moment, silence hangs over the crowd. The people look at each other, not sure what to say. Fans of the one, and the fans of the other.

It seems the two sides will stop hating each other. For a moment they do.

Then, before a giant screen in Amsterdam, a supporter of Nasmeth slashes a bottle across the throat of someone in a Zaya shirt.

* * *

At mission control, they played the recording again and again.

One tech played the last nine seconds. Nasmeth’s voice: “We’re trapped here together. We’re just going to have to find a way to live with each other. This is Nasmeth signing off.”

The technician replayed it over and over.

“... Nasmeth signing off.”

“... Nasmeth signing off.”

He stopped the tape a second before it ended. It was there if you looked closely. Just a hint of movement.

The technician’s supervisor stepped behind him. “Do you think he’s telling the truth?”

“I think so.”

“But we don’t really know, do we? Zaya could be murdered, with his head bashed in. The ship is in silence now. We’ll be long dead before we know for sure.”

“Zaya’s still alive,” the technician said. He pointed to the shadow at the edge of the screen. The last second of the recording.

The supervisor bent close. There. A sliver in the background. Movement. The edge of a sleeve coming around the corner, just as Nasmeth reached for the off button.

“I’ll be damned. So they’re both still alive.”

The tech started the clip again. “I don’t think this clip proves that at all.”

“What do you mean?”

"See how the shadow creeps? See how he only moves into the frame in the final second?"

"Yeah, so?"

"I think Zaya was waiting," the technician said. "I think he was waiting for the recording to end."

* * *

Out in the distant darkness, the ship sped on. Oblivious. It sped on for years.

When the time came, the *Novus Initus* began to slow.

Deceleration took decades. Whole lifetimes.

The flight crew were thawed, and years later, the blastocysts. People married. Children were born, and lived, and died of old age, and still the ship slowed, until after many years of travel, it came eventually into orbit around the first of the exoplanets towards which it had been launched, Kepler 1186-f. This world proved to be a rocky place, studied and tested and ultimately found wanting.

The ship people mourned.

And then the second exoplanet was chosen, and a new flight commander to replace the old. She gave the order, "Onward," and for a single lifetime they traveled to this second world which, when they arrived, they found hot, and clouded over with gases that melted their probes; and this place, too, was found wanting.

They orbited for weeks, collecting their strength, until a new choice was made, and a final commander selected. He gave the order and the ship set out again across the nothing under decades of propulsion, as the iron dwindled, until they came at last into orbit around the third of the exoplanets promised on their ancient charts.

On that momentous day, a dozen men and women in ship uniforms stood on the bridge and looked out through the glass at the red-brown world which blotted out the stars, and this planet, too, was studied, and found to be cold, though humanity had survived colder; and harsh, though humanity had survived harsher, but never stranger; and here at last was the new place that would be their home.

Because it had to be.

* * *

"Put me on intercom," the commander said. Then he gave the speech that had been written before he was born: "We are at the end of our long journey," he said. "Many lives and years were spent in the effort, and though hundreds of us now survive among the stars, soon there will be more. We will increase, as we have always increased. We will keep the promise made to people who came before us. We have left the cradle, and now make a new settlement, in a new place, and call it *Far Harbor*."

He cut the intercom.

Beyond the glass, just visible alongside the ship, the last of the sacrificial iron hung beside the ship's frame. Almost gone. Less than a thousandth the mass it had been when he was a child running the corridors.

He would see the end of the iron.

"Send our data back to Earth," he said. "So they'll someday know where to find us."

* * *

Later, a red light flashed at the ship's comm desk. At first, the tech didn't know what to do.

"Problem?" the commander asked.

"No, sir," the tech said. "An incoming message. From Earth."

The bridge went quiet.

"From *Earth*? They sent us a message?"

"Well, not *us*, exactly," the tech said. "Whoever this message was to has been dead for a while."

"Play it."

The message played: "Doctor Nasmeth, you are hereby under direct orders from the President of the United States. Do not kill Jason Zaya. I repeat. Do not kill Jason Zaya. That is a direct order from the president."

Nervous laughter broke out around the bridge. One head snapped around. A young man. On his chest, a nametag read *Zaya*.

"Well that's a hell of a first contact," the commander said. "Play it again."

The message played again. Two names mentioned. One common, the other not. The commander tuned to the crew. "Have any of you heard of a Nasmeth?"

"No."

"No," they all said. "Never heard that name."

But it sounded familiar to the commander. Something he couldn't put his finger on.

"Zaya," he said, turning to the young man with that name on his chest. "Your grandfather's first name?"

"It was Jason," the young man said. "Or so my mother said."

"And no one in your family ever mentioned a Nasmeth?"

He shook his head. "I've never heard the name in my life."

* * *

In the commander's quarters, the computer screen lit up. "Do a name search," the commander said. "Nasmeth."

There was a momentary pause and then a synthetic voice: "There's no crew by that name."

The commander scowled. They all knew the history. Or thought they did. There were only so many names aboard the ship, and Nasmeth wasn't among them. Then why did it seem familiar? "List all crew rated active at launch."

There was another pause. "Ship's manifest lists Jason Zaya."

"Only him? One name?"

"Jason Zaya is the only name listed."

* * *

Sometime later, on the bridge, another flashing red light appeared on the comm desk. Another message from Earth.

Mission control again.

"Play it," the commander said.

There was a moment of static, and then the message played, same voice as before: "We're happy to hear that, Doctor Nasmeth. You had us worried there. We realize you're unlikely to get this message, but if you do, we want you to know that you made the right decision. Safe travels, Doctor."

* * *

"Safe travels, Doctor," the commander whispered to himself as he crawled among the endless peripheral racks.

It had been decades since he'd played here as a child, when he'd explored every nook of the ship, and made forts among the climbing places where no one ventured. In these deepest racks piled with equipment, he'd found something once that didn't fit.

He found it again. A door.

He froze when he saw it, still on his hands and knees, holding the light.

The words, *Keep door open*, scratched into the surface. Along with a name he'd only half-remembered. *Nasmeth*.

He touched the scratches. "So you were here after all," he whispered.

There were no other clues. Nothing. Just those letters scratched into the surface to show the man had ever existed. The rest of him erased from history. But why?

The commander went back to his quarters, expression troubled. His wife smiled

when she saw him. She kissed him on the cheek. The name badge on her uniform said *Zaya*. Another grandchild of the great man, like a dozen others aboard the ship. Those descended from early crew. Those from whom so many were descended.

At dinner she spoke, "I heard there was another message today."
"Just a jumble of words," he said. "It's of no importance."

* * *

Later that night, at the view-port window again, he watched the iron. The last of it. They didn't need it anymore.

Then he crawled back to the racks where the scratched door was hidden. He found the name. They didn't need that anymore either.

He scratched it out. All of it. Until every bit was gone.

He was a good commander. Being a commander was about making decisions. The hard choices. The future belonged to the survivors, the ones who made it. And never mind why. Never mind how. There were *Zayas* onboard. There were no *Nasmeths*. In the end, that's what mattered.

Later that night, the last of the iron was released. It uncoupled from the frame, and with a clang of steel, it drifted loose.

He stood at the glass and watched it fall. The iron died as a fiery meteor, burning its way down to the planet's surface.

Their new home. A place to do it right. To start over. To escape what they'd been and become something new. He wanted to believe it was possible.

He went back to bed and slid beneath the thin covers, while all around him in the ship, untroubled by lost names or lost iron, his crew slept soundly and dreamed of a new world.