



Illustrated by Kurt Huggins

# The Tinker and the Timestream

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The Taghrib Colony had existed for almost two hundred years, and all that time it had been waiting to die. Then one night Rustem, tinker of Biskra, discovered a nova in the sky.

The beautiful, deadly sun had just gone down, and the twilight air was intoxicating with the breath of plants exhaling in relief when Rustem climbed the clock tower to make his nightly measurements. He had done so almost every night for the last twenty years—first toddling up the stone steps with his mother, and then, when she had grown too weak, on his own. Now, what had started as her pet project was his.

On the roof, the radio dish was a giant ear listening to the cosmos. As he looked up, a bright, slow-moving star arced overhead—the orbiting colony ship that had brought his ancestors, still lit by the sun. It had been mothballed for a century, but still lifted hearts when people saw it, a symbol of possible escape. Aside from symbolism, the ship was almost useless—so low on fuel

that there was just enough left for one more burn of the engines before it became a piece of space junk.

In the northern and southern sky lay the stars Rustem had come to measure—Tiaret and Chlef, the closest stable stars to Taghrib but still light-years distant. He was building a record of their motions and spectra in hopes of determining whether either one might have a habitable planet. His equipment was not quite up to the task, but he was constantly working to improve it.

He started up his small generator and proceeded with his readings. A light breeze stroked his cheek as if trying to distract him. The vegetation smelled especially sweet tonight. All his life he had known that any day might be the last, and tomorrow the unstable sun might flare and incinerate them all—plants, people, cats, carpets, spoons, shoes, all fused into a red-hot layer of melted silica. Then, once the planet's surface cooled, the resilient plants would creep out from the crevices and recolonize. And in 20,000 years or so it would all smell just as sweet.

First he measured Tiaret, then Chlef, then the unnamed star that lay even closer—a neutron star/white dwarf pair that he kept an eye on in case gravitational disturbances from it were what set off the sun. When he was done he still lingered, gazing upward, thinking about the noble, foolish optimism of plants and people. And as he watched, a new star appeared in the sky, like a light switching on.

It was such an extraordinary event that he scrambled to aim his small reflector telescope at it. Under magnification the nova did not resolve into a disc, as the planets did, but remained a light-emitting point. So he hurried to start up his generator again in order to bring the large telescope with the spectrograph to bear on it. He worked fast, fearing it would disappear again before he had a chance to capture measurements. But it remained steady at around magnitude 1, outshining the stars around it.

When he had a spectrum downloaded onto his battered electronic tablet, he hurried down the steps to bring it to the only person alive that he trusted to tell, his tutor Mustafa.

The town's electricity had gone off an hour ago, so the only light in the main street was a single streetlamp running on batteries. As he passed down the street, the habitations all lay on his left—multistory stacks of apartments carved into the rock cliff. Living underground would not, of course, save them if the sun did flare; but at least it gave people a feeling they had taken some precaution. For half a mile, windows and doorways pocked the cliff, a chaos of overlapping arches that defied geometry. They all faced the souq and the river, flowing soundlessly on his right.

Mustafa's door was on the ground floor, as befitted his age and profession. Rustem knocked on the metal-veneered wood.

"Who is it?" Mustafa's voice came from within.

"It's Rustem. There is something I need to show you, something extraordinary."

"I'm asleep."

"Then I need to come in and wake you up."

With a rattle, the door came open. Mustafa was not even close to asleep. There was an oil lamp burning and a disassembled machine spread out on his worktable. He was the town's current tinker, soon to retire and pass his duties on to Rustem.

"There's a new star!" Rustem blurted out as soon as he saw Mustafa's face.

"A what? That's impossible."

"Nevertheless, it is there. Come see for yourself."

The old man searched around for some shoes, grumbling under his breath, but he followed Rustem out onto the street.

"There it is," Rustem said, pointing. "In the constellation Vahna."

Mustafa peered up, blinking.

"You've got your glasses on," Rustem pointed out.

"Oh. So I do."

He took them off and looked up again. "Well. I'll be . . ."

"Don't blaspheme. Not now." The old man was an unbeliever, and it distressed Rustem.

"We've got to take a spectrum," Mustafa said.

"I've done that. Here it is."

Mustafa studied the display on Rustem's screen. "Hmm," he said. He was clearly seeing what Rustem had also seen. "This is not normal."

"I know. We need to analyze it to be sure, but it looks like the light's blueshifted."

Mustafa nodded. "Whatever it is, it's coming toward us."

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The colonists had never intended to come to this planet. The story everyone told was that a navigational error had occurred during the long years of cryogenic sleep, and by the time the automated system woke them, they were not approaching their new home, or anything else; they were marooned in a starless stretch of space without any clear destination. They spent years getting to the closest star, only to find the planets uninhabitable. So they set out again, searching. Finally, their fuel almost spent, they arrived in the Taghrib system and landed joyfully to set about creating a new home. It was twenty years before they began to suspect that the regular layers of melted rock underfoot were not volcanic, and another twenty before the evidence became conclusive that the sun was unstable. At that point, factions formed: one argued for leaving again and using the last remaining fuel for a trip to a new star that might or might not have a livable planet; the other favored staying and hoping for the best. Neither choice was good: a fast death by fire, or a slow death in a failing ship unable to reach a haven. As they debated, inertia and denial weighed in, and "hoping for the best" won out. From time to time, the argument still flared again.

As a child, Rustem always zeroed in on the beginning of the story. He had a recurring nightmare of floating in black space, nothing but distant stars below, above, and around him. He would try kicking to move in some direction, but it just sent him spinning. And all the while he knew he was drifting farther and farther away from home and everything he knew. He would wake up sweaty and tense and have to light the bedside oil lamp to reassure himself he was really back home—where the sun might kill him tomorrow. It was hard to get back to sleep.

As he grew older, he tried to tame the problem with logic. "How could they make a navigational error?" he asked his mother and Mustafa on one of the nights when they were relaxing over chorba, flatbread, and tea. It seemed to him that between mathematics and the stars, they ought to have steered better.

The two adults exchanged a look to see who would answer. They were old friends. Later, Rustem would wonder why they had never married. Both too independent, he supposed.

"Stellar navigation isn't easy," his mother, Ayala, said. "The problem is, everything in space is moving—the ship, the star it is heading for, the light from the stars, and every landmark along the way. There are no fixed points for measuring your position."

"What about distant galaxies?" Rustem demanded. He was proud of his knowledge then.

"That might tell you where you are in the abstract, but not in relation to anything you could hope to get to. It's not like navigating on a planet. Imagine that the hills and rivers were all moving around like clouds."

"Maybe they did steer by distant galaxies," Mustafa said. He was always trying to deflate Rustem's certainty, even as Ayala tried to encourage it. "Maybe they reached the exact point in space they were aiming at, and their destination star had actually been there when it emitted the light they saw when they set out. But nothing in the sky is really where it appears to be. Even when they started toward it, it had moved on, and when they arrived centuries later, it was nowhere to be seen."

"They should have known that," Rustem said, still convinced he would have done better.

"I'm sure they did," Ayala said. "But to intercept a moving star, you have to aim for where it will be in the future, and for that you have to know precisely how far away it is, what direction it is going, and how fast it is. It takes years of observation to determine stellar motions and velocities—and of course, the place you're observing from is moving as well. The tiniest error can throw you off by parsecs. You might not have enough fuel to chase your destination down."

Years later, when he was resurrecting some old archival data, Rustem came across a 500-year-old table of stellar velocities and directions of motion, measured from some other planet whose location had long since changed. There was a range of uncertainty in all the measurements. Looking at it with adult eyes, he thought it was a miracle they had ever reached any place at all.

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“We need to consult the archives,” Mustafa said.

It was morning, and they had reconvened after a break for a nap and a change of clothes. Since seeing the nova, Rustem had been so absorbed in the mystery that he couldn’t think of anything else. Now, mention of the archives brought back the memory of his mother with a pang.

She had been the archivist. It had been more than a job for her. She had believed that residents of the Taghrib were living in a shadow age, the grandeur and enlightenment of the colonization era long past. Her mission had been to bring some of the lost knowledge of the Founders back, to recapture their learning and wisdom.

Everyone had thought it was a quaint, hopeless cause, but they had so admired her dedication and indomitable spirit that they said nothing to her face. Rustem had seen the head-shaking and eye-rolling that went on behind her back, and it had stung him.

Now he gave a heavy sigh. Finding information in the archives was like one of the impossible labors of Hammad in the folktale. And yet, he saw Mustafa’s point.

“The nova could be something relatively close by, or it could be far away and very bright,” Mustafa said. “We need to compare this spectrum to an exploding star, an approaching spaceship, a comet, and other possibilities we have not thought of. The archives may contain spectral records to reference.”

Bitterly, Rustem said, “Finally, we have an urgent need of something in the archives, and my mother will never know her work was vindicated. Only months after she dies, she is proven right.”

Mustafa was gazing at him sadly. He also had mourned Ayala’s death, Rustem knew, but would not talk about it. Now, the old man just said, “She knew she was right. She never needed others to tell her.”

“They still should have honored her more. It was her life’s work.”

Slowly, Mustafa shook his head. “No. You were her life’s work.”

“What a waste of time,” Rustem said.

Mustafa was gazing thoughtfully past him. “Your mother burned brightly, like the sun. She nourished and warmed but also concealed. Now that she no longer shines, we can see the true Rustem revealed, like the night sky.”

“Dark and empty.”

“Full of stars and mysteries.”

When Rustem left Mustafa’s house, the Biskra souq was coming to life outside. Farmers were arriving with baskets of cucumbers and radishes, and vendors were setting up bright-patterned cloth tents for their displays of handicrafts. In the food stalls, men were firing up grills for roasted meats to be ready by midday.

“Rustem!”

He cringed on hearing that voice and pretended he hadn’t heard. But it was no use. The girl was persistent as a blackfly.

She caught up and fell into step beside him. “Where are you going?” she demanded.

Firni had always been the outcast of his generation, the odd and awkward girl no one wanted around and everyone picked on. They called her a moron, but it wasn’t true. She was smart in many ways, just not in the ways of navigating normal life. Rustem had once made the mistake of sticking up for her when she was being unjustly tormented, and she had decided he was her friend. He didn’t want her around but couldn’t bring himself to be cruel enough to shake her off.

“Where are you going?” she asked again.

“To the archives,” he said.

“Why?”

“To look something up.”

“What?”

“It’s really none of your business, Firni.” You had to be direct with her.

She considered his answer, then asked, “Do you still work there, even though your mother’s dead?”

He was losing patience. “A tinker has to go everywhere,” he said.

“To fix things, you mean?”

“Yes. Don’t you have something to do?”

“Of course. They want me to look for an iron mine.”

It was Firni’s one remarkable ability that she could see magnetic field lines, and thus locate buried anomalies. Long ago, someone had thought it was a good idea to introduce an avian protein into the human genome to allow people to see magnetism the way migratory birds did. The gene still turned up from time to time.

“You want to come?” she asked.

“No, I’m busy. You’d better go do it.”

That finally got through to her. “I’ll see you around,” she said.

“Right.”

He continued on down the road. The archives lay just outside the town, in a large, dry cave carved from the bluff. The entrance was adorned with a grand arch of the local caliche, fashioned into reliefs of calculus equations. Once, someone had felt awe for the repository of so much lost learning.

Inside, the archive was cool and dim. As his eyes adjusted, he saw around him the familiar heaps of old electronics—drives and memory cylinders, backups and distributors, some of which hadn’t been looked at since the day they were salvaged from the ship. Ayala had put young Rustem to work fixing some of the old machines, and that was how she had discovered his aptitude for tinkering. He had scavenged enough old parts to get some of the information machines running again for the first time in decades.

The results had been disillusioning. Most of what the Founders had stored in their memory devices was useless garbage. Large parts of it were simply random gibberish. The parts that could be read at all were mostly trivial or irrelevant. Ayala had found no libraries of classics, no wisdom of the ages. Every now and then there had been a useful jewel in the slag heap—enough to keep her going, hoping to hit a vein of hidden treasure, some message from the golden age. As for Rustem, his opinion of the Founders had declined sharply. How could you respect people who didn’t sort the significant from the trash, but simply kept it all?

Ghalib, her apprentice, came out from the back to see who had come in. He was archivist now, unworthy as he was. Rustem suspected him of sleeping most of the day. He had never made any discernable headway in sorting and cataloging the data.

“Oh, it’s you,” he said when he saw Rustem. “What do you want?”

“I came to see if you have any spectral records.”

“Sure,” the archivist said, waving a hand at all the wrecked hardware. “I’ve got heaps of ghost data.”

“I meant spectra, not specters.”

“Oh. No idea. You’re welcome to look.”

Rustem often wanted to break something over Ghalib’s head. But not something fixable.

He went on into the brightly lit inner workspace where his mother had toiled and sat down at one of the old terminals. He ran some obvious searches and found nothing, so he studied the structure of the catalog to narrow down his search to astronomical data.

Soon he was sucked in by some salvaged information he had never seen before, an article on cosmology. It was completely useless to him, but he loved the way the Founders had thought—so logical, so rigorous, so backed up by evidence. They had lived in a more orderly universe than his—one that was understandable, not full of injustice and senseless discontinuities.

Ghalib had come up behind him, so he went back to the catalog, guilty to have gotten distracted. When he glanced up, Ghalib was holding an ancient book—a physical book with paper pages. He held it out, open to a page of diagrams. “This might be helpful,” he said.

It was an old astronomy text, still in remarkably good condition. The page Ghalib had found showed sample spectra of various sorts of novae. Rustem took it eagerly. “Thanks, Ghalib. This is really helpful.”

“You don’t need to sound so surprised,” Ghalib said drily.

Rustem *was* surprised that Ghalib knew the archives better than he did, but he shrugged and started reading. With growing excitement, he took out his tablet and compared the spectrum he had observed to the ones in the book. Then he took a picture of the page and stood up. He was absolutely certain now. What he had seen was no nova, no comet, but an approaching spacecraft.

The Founders were coming back to rescue them.

The idea made him feel quivery. What had changed in the centuries since the Taghrib colonists had left? What new wonders would the Founders bring? He felt lucky to experience this moment—then came a pang of regret, that his mother hadn’t lived to see it. What a reward it would have been for her to meet the very people she had devoted her life to studying.

“Got what you wanted?” Ghalib said.

“Yes,” Rustem answered. *What I’ve wanted all my life.*

Everything was about to change.

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A month later, Rustem stood again on his tower overlooking the town, but this time Mustafa was with him. The dish of the radio antenna was now aimed at the ship-star, broadcasting a message of welcome.

The radio had been surprisingly controversial. The town’s governing Shura was dominated by cautious traditionalists, and when Mustafa and Rustem had gone to them with the momentous news, they had not received it with jubilation. Rustem had brought along all his evidence to convince them it was a spacecraft; but that turned out to be easy. If Mustafa said it was a ship, it was a ship. What was difficult was to convince them it was the colony’s salvation.

“What do they want with us?” demanded old Ahlam, the imam. “Have they come to conquer or rob us? What if they attack? Let us conceal ourselves until we know they are friendly.”

The members of Shura had argued back and forth, as they always did. Other villages called them Bickering Biskra because they could never agree on anything. Finally, when it looked as if they might deadlock, Rustem had spoken out of turn: “What do we have to lose? We’re all going to die anyway. This might be our last chance to get help.”

That blunt argument had finally turned the scale. Biskra would try to attract the heavenly visitors.

So the two tinkers had set up the radio and gotten it broadcasting. So far, they had received no message in return. Every night the ship-star had grown measurably brighter. “They are probably decelerating,” Mustafa said. “The night when you first saw them was when they turned on their engines to start slowing. It will take a long time. Then they will go into orbit and look for a place to land. That is when we will have to redouble our effort to signal them.”

Accordingly, they were now assembling a laser device, in case radio was not the wavelength the outsiders used. Rustem had been working on it all day, and now he straightened up to rest his back and look at the sky.

It was a spectacular sight. The ship-star had grown so bright that it was visible by day, easily the brightest thing in the sky. In the street below, the anticipated arrival had given extra gaiety to the annual tafsut festival. The electric lights were on for the occasion, and the sounds of music, dancing, and rowdiness filtered up from below. Most of the celebrants were Rustem’s age, letting loose on the first occasion they had ever had for genuine optimism.

“You ought to be down there with your friends,” Mustafa said.

Rustem shook his head. “I don’t want to celebrate yet. Not until we’re sure.”

In the tower below them, the clock struck eleven.

On the last reverberation of the bell, the ship-star flared, growing bright enough to cast a shadow.

“What’s happening?” Rustem said.

Mustafa looked dumbfounded. “I don’t know. It shouldn’t be doing this.”

Rustem had a panicky thought that it might not be a ship at all, but an asteroid about to annihilate them. But no, an asteroid wouldn’t have been glowing, not out in space. Then it occurred to him that it had exploded on entering the atmosphere, and flaming debris would soon rain down on them.

“We ought to ring the alarm bell,” he said.

There was no need. Down on the street, everyone had noticed. The music faltered to a stop. There were oohs and aahs of wonder; then, when the star flared even brighter, cries of alarm.

It all happened too fast to react. The point of light became a ball, clearly visible now, smaller than the sun but almost as bright, descending through the atmosphere straight at them.

Down on the street, the partygoers screamed as they ran for shelter. Rustem and Mustafa were too stunned to move. They watched as the flaming sphere hurtled down till it seemed to hang directly over the village; then, without a sound, it slowed, hovered, and delicately came to rest on the clifftop plateau above the valley. Then, as if a switch had gone off, it stopped glowing.

Still blinking away afterimages, Rustem dashed for the stairs. Reaching the street, he found people still cowering or peering out from windows where they had taken shelter. He raced through the remains of the festival—fallen decorations, lost shoes, overturned tables—toward the stone stairs that led up the cliff to the plateau.

A few others, mostly his age or younger, had had the same idea and now joined him racing up the steps. When he emerged, winded, onto the level plain above the town, there was already a small group of children and dogs gathered, staring.

The sphere towered silently above them, the size of a four-story building, gleaming gray in the starlight. Where it rested in a slight depression, the ground looked scorched, but now moisture was condensing on the surface of the globe and beginning to trickle down.

It was, Rustem realized, the largest manmade thing he had ever seen. He felt uplifted at the sight, as if a curtain obscuring the unimagined had opened, showing the landscape of beyond.

And yet, it was smaller than any spacecraft Rustem had ever imagined—unless this was the shuttlecraft of an unseen orbiter. There were no visible engines or thrusters, no windows, just that seamless, glossy surface, fogged and sweating a little.

No one dared to approach it. A dog wandered forward, ignoring its owner’s calls, smelling the ground. Then it crouched and started barking.

An oval flaw had appeared in the shell of the sphere. Then an extrusion the shape of a flower petal bloomed from it, drooping gracefully onto the ground so that it formed a ramp. The oval spot dissolved away and light spilled from inside the spacecraft. Then, outlined against the door, appeared the most outlandish creatures anyone had ever seen.

They were tall and spindly, dressed in form-fitting suits. At first Rustem thought they were wearing helmets or masks, since their faces and hairless heads were so smooth. He quickly realized it was their skin; but it seemed to be a strange gray-green color in the light escaping from the craft.

There were three of them. They descended and stood at the base of the ramp looking around at the crowd of children, young people, and dogs gaping at them from a safe distance.

Then one person broke from the crowd and walked fearlessly toward them. It was Firni. People called out to her to stop and come back, but she ignored them. A few feet away from the visitors, she halted and stared at them. All around Rustem, people were muttering about what an idiot she was. But then she asked what everyone was wondering.

“Are you *aliens*?”

The three visitors conferred with one another, consulting a small device one of them held. At last they seemed to reach consensus, and the one holding the device spoke stiffly, with an odd

accent.

“Howdy do, honored lady.”

There was a stir of surprise among the onlookers, that anyone should mistake Firni for a lady, much less honored. Rustem felt embarrassed that his village had made itself a laughing-stock with such an envoy.

“Of human people are we,” the visitor went on. “Your family.”

“Then why do you look like grasshoppers?” Firni demanded.

The visitors took even longer to answer this question. At last the spokesperson said, “Hop grass not do we. Hop stars, yes.”

“You’re starhoppers?” Firni said in amazement. They responded by pumping their fists up and down as if pounding invisible nails.

“Idiot girl!” Dihya hissed. She was standing beside Rustem. “Somebody get her out of there.”

“Can I go inside your ball?” Firni asked.

No one else seemed willing to take responsibility, so Rustem stepped forward. As he walked toward the spaceship, people behind him actually applauded. Later, they would tell him what a historic moment it was; but at the time it just seemed like he needed to do something practical to keep Biskra from shaming itself.

Close up, the visitors looked even odder; their eyes were too big and their noses almost bridgeless. It was impossible to tell if they were male or female. He said slowly, “Welcome to Biskra, voyagers! We are pleased to see you. My name is Rustem.”

“Howdy do, honored sir. I am Kanakamana-ano. This is Pikake-apikaila and Onaona-keola.”

The names sounded like water trickling over rocks. They were unlike any Founder names in the records. “Where are you from?” Rustem said.

Their translation device seemed to be catching on. “Wayfarers are we,” said the spokesperson, Kanakamana-ano. “From beyond the slowtime. Our home here see you, our skipjack.” They gestured at the ship.

One of the silent starhoppers whispered something to their spokesperson, who then said, “Where are we?”

Rustem hesitated, uncertain what this meant. At last he said, “This town is called Biskra. You are in the Taghrib system. Our planet used to be known as Eta Chingobo 2.”

They indicated no recognition of any of these names. Rustem said, “How did you find us?”

“Scouting the upstream islands are we. Of inhabited timewells there are rumors. Obviously, true are they.”

“Did you know we were here?”

They made a gesture with one hand held horizontal, swiping back and forth as if polishing a surface. Maybe their odd necks didn’t allow them to shake their heads.

“Then why did you come?”

“Wonder vendors are we. To the curious dicker we the unexplored and unexpected. Unexpected is this place.”

Firni whispered loudly, “Ask them if we can go inside.”

“Not now, Firni. Later, maybe.” Right now, he needed to get someone in authority to take charge. “Would you like to speak to our Shura?” he asked.

They raised their hands and wagged their fingers. Did that mean assent? Assuming so, he turned and gestured them to follow him. But when the strangers took a step forward, the dog took a stance in their way, growling ominously, its hair bristling.

“Your noise-making device is going off,” the starhopper observed.

Apologetically, Rustem explained, “It’s not a device, it’s a dog.”

“Really? Alive is it? Can we have it?”

“Uh . . . we have better ones than this.” He grabbed Firni by the arm and whispered to her, “Run down and tell the Shura we’re bringing the visitors to see them. Take the dog with you.”

She nodded and dashed off, whistling to the dog. It hesitated a moment, then chased her to the head of the stairs, where they both disappeared.

The rest of the onlookers parted silently as Rustem led the starhoppers toward them, then fell



in behind, so that they formed a procession.

When they reached the edge of the cliff and could see the main street all lit up for the festival, the visitors made noises of astonishment. For a moment Rustem thought Biskra had impressed them; then Kanakamana pointed at the river. "Is that *water*? Out in the open leave it you?"

"Yes, I guess we do," Rustem said.

The visitors talked animatedly amongst themselves. Then the starhopper said, "Where is the city?"

"This is the closest thing we have to a city," Rustem said. He realized he sounded apologetic, so he added, "The planet's not very densely populated. We mostly live here and in a few other villages, strung out along the river."

"No city?"

"No. Sorry."

They conferred with each other in perplexity.

As he led the way down the steps, Rustem had a thousand questions he wanted to ask: What had happened since the colonists left? How did the starhopper ship work? How many could it carry? But it was not his prerogative to ask questions; that was the duty of the Shura, and he had to respect that.

By the time they got to the bottom of the steps, word had spread and the festival crowd had gathered to gawk at the strangers. The musicians started to play, and the celebratory mood spread to the dancers. Soon the procession from the cliff top was surrounded by a boisterous welcoming party. Celebrants tossed clouds of sparkling mica flakes in the air, which made the visitors gape and laugh at each others' glittery appearance.

Firni pushed through the crowd and came to Rustem's side. "The Shura is waiting," she said, pointing to the tent that had been erected on the riverbank for the festival.

When they arrived, the elders were seated in a circle, with another circle of the town's older generation around them. Rustem was cheered to see that Mustafa was present. He led the guests forward to the three seats set aside for them in the center circle, then withdrew to his proper place among the observers, standing behind Mustafa.

The pace slowed dramatically as the Shura greeted the visitors with much formality and tea-drinking. When the welcoming ceremonies were over, old Ghair stood to give a speech telling the history of the colony, from their setting out to the present day. In his stylized telling it sounded like a folktale, but without a good ending. At last he said, "We wish to show our appreciation to you for coming. Please, tell us what you seek."

The voyagers conferred amongst themselves before answering, "Water need we, and food."

Ghair nodded and waved a hand. By custom, food and water were never sold, only given. "You shall have both. What else?"

"In knowledge trade we," Kanakamana said. "Novelties, innovations, amazements."

The onlookers stirred and exchanged looks. There was absolutely nothing novel or amazing about Biskra; everyone liked it that way. Their dreams of aid from above were evaporating. Then Rustem remembered something.

"They wanted a dog," he said.

The starhoppers pumped their fists eagerly. "Amazing is the dog."

Ghair gave a dismissive gesture. "You may take as many as you like. They eat us out of house and home. There are far more valuable things here."

The visitors looked inquisitive, but Ghair found it difficult to think of anything.

"We keep a great deal of ancient historical information in our archive," Ahlam said, stroking his beard. The starhoppers looked politely uninterested.

"Our artisans are very skilled," suggested another elder.

"We have metals to spare. Gold, silver, uranium, iron. We even have a girl who can find them, like a dowser."

The starhoppers consulted their translator for the word "dowser."

"That's not exactly true, Laila," Ghair said. "She can only find magnetized ores, because she sees the magnetic field lines."

“Truly?” The starhoppers looked up, fascinated and suspicious.

“It’s a recessive gene, but every now and then someone has it.”

“Can we have her?” the spokesperson said.

Ghair looked like he was on the verge of dismissing Firni the way he had dismissed the dogs, but caught himself in time. “It would depend on what you can offer us.”

Rustem felt a little indignant that Ghair should use Firni as a bargaining chip.

“The knowledge of the galaxy bring we. Arts, sciences, history, bakery. Whatever want to know you, name it.”

The members of the Shura exchanged a look. Ghair said, “Can you stabilize our sun?”

The starhoppers looked at each other, weighing how to respond. At last one made a back-and-forth hand motion. Kanakamana said, “Regretful apologies. Repair flaming stars not do we.”

The crowd gave out a breath like something deflating. Rustem gave a mental shrug. It had been worth asking. At least the traders were honest.

The elders made a show of being disappointed. It was a good bargaining tactic. “Well then,” Ghair said, “How many would you be able to transport to a safer planet?”

“Transport?” The starhopper looked startled. “In our skipjack? Two or three. Large not is it.”

“Can you sell us fuel for our own ship, then?”

“What sort of fuel?”

The elders looked nonplussed, as if there were only one kind of fuel. Rustem waited for Mustafa to clarify, but when he stayed silent, Rustem spoke up: “Combustion fuel.”

“Ah.” Kanakamana glanced at one of the others, who made the negative gesture. “Flaming fuel not carry we.”

“It seems you have little to offer us,” Ghair said.

Rustem knew it wasn’t true. Surely it was just a bargaining ploy. The starhoppers were conferring. Rustem felt a hollow anxiety that they would move on.

“Unless . . .” Ghair said thoughtfully.

The starhoppers looked up.

“Have you scouted the nearest star systems to us, Tiaret and Chlef?”

“Possibly,” said Kanakamana.

“Then you can tell us if their planets are habitable.”

“Many are the habitable planets.”

“But the close ones. Have you investigated them or not?”

The starhoppers held up their hands in a gesture that required no translation: it was the universal shrug. The audience stirred restlessly, suspecting a ruse. How could they not know?

Rustem could contain himself no longer. “Elders, may I speak?” he said.

Ghair frowned, but gave him a wave of permission.

“Our visitors will not know the stars by name, of course. But I have spectra of all the nearby stars. They are as good as fingerprints. If our guests have documented the systems nearby, we can find the planet we seek, if there is one.”

Ghair turned to the starhoppers. “There it is. Will you allow Rustem to view your records?”

The starhoppers looked agreeable but puzzled. “Of course, if prefer you. Or just go and visit the stars could we.”

As if it were that simple. Rustem said, “The closest one is three light-years away. The other is five.”

“And too long to wait is ten years?”

Rustem’s mind was crowded with all the impossibilities of making a five light-year round-trip journey in ten years when he stopped. “Wait. How fast does your starship go? For that matter, if it doesn’t use fuel, how does it work?”

“Ah,” said the starhopper. “Reveal that can we, in exchange for the dog and the dowser.”

Ghair said sternly, “We need planetary profiles. Atmosphere, temperature, existing ecosystems, magnetic fields, gravity of any habitable planet within five light-years. Give it to us now or give it to us in ten years, and you have a bargain.”

“Wait a minute!” Rustem protested. “You can’t just trade Firni away like that. She’s a human

being, for God's sake."

Ghair frowned at him. "This information could be the salvation of the colony. It's a fair trade."

"But it's immoral!"

"Shut up, Rustem," came a voice from the back of the crowd. He turned to see Firni pushing forward through the onlookers, a look of determination on her face. "I want to go with the starhoppers. No one likes me here. I'd rather go with them."

"Firni, you don't understand," he said.

Irritated, Ghair said, "Do you want the colony to survive or not?"

"You can't tell me not to go," Firni declared. She pushed her way over to stand by the strangers.

Rustem stood speechless, stinging as if he'd been slapped. The transaction was practically human trafficking.

Kanakamana stood and held a palm out upright for Ghair to touch. The bargain concluded, the starhopper turned to the crowd with a genial gesture. "Provide planetary information will we. And now of the skipjack tell you I, as a friendship gift."

Rustem still felt unsettled, but he was not about to object now. He had asked, after all.

"At the beginning of the universe starts my story."

In the surrounding crowd, people began settling down, since this promised to take a long time.

"In the beginning, there was no time, and so no motion, no space, no light. A one-dimensional point was all."

"We know this," Rustem said defensively. Biskra was not such a backwater as not to have heard of the Big Bang.

"Ah, but did know you that when began time, running was it at all possible rates?"

Rustem was silent. The starhoppers evidently told the story differently.

"At first, intermingled were all the rates of change," Kanakamana continued. "Eventually, into pockets and clumps collected the slowtime, for attractive force has it. Slowtime loves matter and itself, say they. Around it formed stars and galaxies. But unfriendly is the quicktime, so quicktime pockets stayed smaller than atoms, repelling the whole universe, and expanding everything. Like a sea are they, permeating all."

They were telling the story backward, just like they talked, Rustem realized. The way he had learned it, matter played the starring role, attracting other matter through gravity, and forming stars and galaxies, which had the incidental effect of slowing time in their vicinity by bending spacetime. The starhopper version made matter just a bystander to the real cosmic drama of slow and quick time. Time influenced matter, not the other way around.

The starhopper continued, "A dynamic landscape is timespace today. Hills there are of quicktime, and valleys of the slow. Winds of quicktime blow away from matter, rivers of slowtime flow toward it. Matter collects in the slow valleys and shuns the quick peaks, for it seeks the slow, as if searching for a place where time stops and change ends. Ever more big and heavy becomes the slow, tiny and light is the quick. But in the end, they say, what will win is quick."

Thoughtfully, Rustem said, "So this sea of quicktime particles . . ."

"Not particles are they," the starhopper corrected.

"All right, these tiny pockets of quicktime—that's what dark energy is? The quicktime sea distributed everywhere, repelling itself? And the slowtime would be dark matter?"

The starhoppers had to consult their translator for "dark energy" and "dark matter." "Ancient is your language," one of the hitherto silent ones remarked. At last, the spokes-starhopper made the nail-pounding gesture a little hesitantly. "Alike seems it."

Kanakamana resumed, "Difficult is travel. The quicktime sea resists matter in motion, so massy and slow becomes the moving body. The faster try you to go, the more slowtime collect you, and the heavier becomes your skipjack."

Mentally translating, Rustem thought: kinetic energy increases mass, and therefore slows time. Or the other way around. Did he believe this?

"Guessed the obvious solution, have you?" The starhopper looked at him expectantly.

Nothing was obvious at all. Rustem glanced at the elders. They looked baffled, but no more so than if the conversation had been about electric generators.

"No, what's the solution?" he said.

"Why, make quick your skipjack!" The starhoppers all wiggled their fingers as if playing invisible pianos. Were they laughing at the ignorant rustics—or pulling their legs?

"A bubble of quicktime around our ship generate we. The quicker our bubble, the lighter are we, and unhindered pass we through the sea, quick as a photon."

"Literally?" Rustem said. "You travel at light speed?"

"Well, very close. Disadvantages are there."

Rustem was thinking it through, trying to spot the flaws in the story. "Wait. If you are in a bubble where time is passing very fast, don't you age and die very fast, too?"

The starhopper looked pleased. "Aha, the problem see you. Generate a second bubble must we, inside the first, so for us can last the journey as long or as little as prefer we, regardless of what passes outside."

"But on the planet you left behind . . ."

The starhopper gave a dismissive gesture. "Nothing can we do for planets."

So, if he could believe them, it was possible to cross the immense distances between stars by light speed in a subjective second—as long as one was willing to dismiss the planets, and let them go along at their own pokey pace. Rustem looked at Firni. "Firni, are you understanding this?"

"Of course I am," she said defensively.

"Then you understand that if you leave with them, all the rest of us could be elders by the time you come back."

She looked defiant. "What do I care? That's your problem."

Rustem turned back to the starhoppers. "How do you generate the time bubble?"

They conferred amongst themselves. "That have we to show you. Tomorrow, perhaps."

"Promise."

Kanakamana drew up straight, hands held at shoulder height. "Honorable dickerers are we."

"And your propulsion system. I'd like to see that."

They had to look up "propulsion" and confer. One of them made the flat-handed polishing gesture. Kanakamana said, "Propulsion not have we."

"Then how do you take off and accelerate? How do you steer?"

"Easy is takeoff. Quicktime repels. If quick is our skipjack, repel the slow planet will it. More complicated is steering. Great skill requires it. Long time will take explanation."

At that, Ghair interrupted. "Then we will agree that you will show Rustem what he wishes to see tomorrow. Until then, we would like to offer you the hospitality of our village. There are people who will be happy to host you in their homes."

The watching crowd stirred, all looking at one another, as if hoping someone else would volunteer.

The starhoppers put their hands together in a praying gesture, and the spokesperson said, "Give you great thanks, but to our skipjack must return we before sunrise."

"Very well. Someone will escort you back. In the meantime, the Shura will confer."

The crowd began to break up. Rustem was preparing to walk back to the spacecraft with the visitors in hopes of getting some more questions answered when Ghair said, "Rustem, stay here. You too, Mustafa."

Ghair gestured him to one of the seats that the visitors had just occupied, and Rustem sat and waited for the crowd to clear out. When the elders were alone, Ghair said, "What is the sense of the Shura? Can we trust them? Will these vagabonds play fair with us, or give us nothing for something?"

There was a silence. Rustem looked from face to aged face. In the light of the bulb hanging from the tent peak, they looked carved of grained mahogany.

At last Ahlam said, "They are glib and flippant creatures. Flighty, not trustworthy."

"Firni called them grasshoppers," Laila said.

The elders looked amused at what an apt description this was. Ghair said, "If they are grasshoppers, then we are the ants."

"You mean, small and black?" Laila said drily.

"Provident and hardworking."

"They do not think much of us if they thought we would believe them," Tahar said.

"Yes. Their tale of time running at different rates was sheer nonsense."

Rustem looked at Mustafa, willing him to say something, but the tinker was silent. Rustem was learning that his tutor had an aversion to getting involved. So he spoke up. "That part was perfectly true."

The elders turned to him, startled. "Time *does* run at different rates," he said.

"Not in Biskra," Ahlam said.

"Yes, it does. It runs at a different rate on top of the clocktower than it does on the riverbank. It's just that the difference is so small we can't tell, not without better clocks. The farther away from the planet you go, the faster it runs. It's basic relativity."

"Mustafa, is this true?"

Mustafa nodded. "Yes. Rustem is correct. It is the science of our Founders."

The elders were silent then, looking as if the familiar world had betrayed them by being stranger than they realized.

"What else that they said was true?" Ghair asked.

Rustem scratched his forehead, grappling with his own perplexity. At last he said, "They explain the universe differently than our Founders did, and I don't know what their evidence is. Perhaps it's just a different way of looking at things. Simpler in some ways."

"Simpler?" Laila demanded. "Maybe they thought *we* were simple, so they told it as a child's tale."

"Or perhaps they don't understand it fully themselves," Tahar said.

Rustem was nodding. "Both could be true. What I meant was, our Founders thought matter and energy, which are the same thing down deep, were what drove the evolution of everything. But that left a lot of loose ends. For one thing, at the fundamental level matter just dissolves into a forest of particles and fields so complex it's hard to make sense of them. And at the biggest scales it's necessary to make up mysterious forces like inflation, dark matter, and dark energy to explain what we see. Maybe the Founders should have turned it around and looked at it differently. Maybe they should have looked at time instead. We'd have to know a lot more to be sure."

There was a long silence. Then Ghair said, "Do you think it is possible they can actually fulfill their bargain, and bring us information within ten years?"

Cautiously, Rustem said, "I may know more tomorrow. But without seeing the ship in operation . . ."

Laila said, "We ought to send someone with them to make sure they actually go to a star our colony ship can reach, and actually return with information we can trust. And if we can learn more about how their technology works, all the better."

Part of Rustem was yelling, *Me! Send me!* But another part was appalled at the idea. To embark on a journey into the void, in a craft he did not understand, with a set of people so unlike anyone he knew . . . no, it did not sound like something he wanted to do. Especially knowing that Biskra and everyone in it would move on, change, and forget him.

Ghair was studying him critically. "You're a good boy, Rustem," he said. Inwardly, Rustem winced and thanked the stars that no one of his generation was present; he never would have heard the end of the teasing. Ghair went on, "Your mother raised you well. But we need you here. I think Mustafa is the one who must go. He understands these matters and can get to the bottom of things."

A mixed wave of relief and disappointment washed over Rustem. But when he looked at Mustafa, he saw a look of perfect horror crossing the old man's face before he composed himself and murmured, "I will do as my duty requires." Rustem felt a pang for him. If missing ten years would be difficult for someone young, it would be wrenching for someone Mustafa's age. Everyone the old man knew might be dead by the time he returned.

The meeting did not go on long after that. It was late and everyone was tired. Rustem left the tent along with Mustafa. The old man looked beaten and despairing.

"I'll help you prepare," Rustem said as they walked down the empty but still-lit street. "I'll compile my spectral records for you. There are texts in the archive that will be helpful, and instruments you should take along."

They reached the door of Mustafa's house. The tinker still looked as if he had received a death sentence.

"We'll still be here when you get back," Rustem said to encourage him.

"If I get back."

"You will. The trip will take no time at all for you. It is we who will have to wait."

After Mustafa had gone inside and left him alone, Rustem looked up at the stars. Everything that had seemed so settled the day before was now in question. The whole creation story had shifted in his mind, and he might never know which version was true.

\* \* \*

The next morning, Rustem saw time wherever he looked. It was in the flowing river, the opening leaf buds. Yesterday it had run fast, as if the visitors had extended one of their quick-time bubbles over Biskra. When they left, it would run slow again. Ten years would seem like an eternity. He would grow older, mature, and become Mustafa.

The town was abuzz with activity when he returned from visiting the archive. He had gotten up early to compile his spectrographic data and collect what he hoped would be useful information on the stellar neighborhood. By now, word of what the strangers had agreed to do for them had spread, and residents seemed to be outdoing themselves to express gratitude by bringing food to restock the spaceship larders. Rustem watched as workers winched heavy bags of lentils and couscous up to the top of the cliff. Waiting in a heap were coils of sausage, jars of oil, olives, dried tomatoes, and squash.

He spotted two of the three visitors, looking even odder than last night, wearing broad-brimmed straw hats from the market. Firni was leading them around, apparently showing them every random thing that attracted her attention: snails, discarded pot lids, seed pods. They seemed to be enjoying themselves, as if Biskra were the most novel place in the galaxy.

He caught up to them on the riverbank as Firni was showing them how to press their hands into the soft mud to leave a long-fingered print.

"Where is your companion?" he asked the starhoppers.

Kanakamana looked up from having made a hand print, gray-green palm covered with mud. "Onaona-keola is stowing supplies on the skipjack." Then, distracted by the fascinating subject of mud, "This memory-substance, intelligent is it?"

"No," Rustem said. Those prints would wash away by tomorrow, he thought. Would the memory of the visitors also wash away? It gave him a melancholy feeling, like grief.

"How long will you stay?" he asked.

"Not long," said the starhopper. "Slowtime drags."

"Yes," he agreed. "But I need to visit your skipjack before you leave. Can I meet you in half an hour? I need to drop some things off with Mustafa first. You know he's coming with you, right?"

"Welcome to take passage are you."

"No, it's my tutor Mustafa who is going."

"Oh, of course."

He set out for Mustafa's house again. He found the old man sitting in his chair, just staring at his cluttered workshop, making no attempt to prepare for departure. "I have some files for you," Rustem said. "All the spectra from the nearby stars, and observations of their positions and motions. You'll be able to help the travelers lay in a course from these."

Mustafa said nothing, just stared at all his unfinished projects. Rustem waited a few seconds, then said, "Mustafa?"

"I'm running down, like an old clock," said the tinker.

"Well, wind yourself up. There's a job to do."

"You can't defy entropy."

There were all sorts of ways to defy entropy, Rustem thought. But that wasn't what Mustafa had meant. Rustem sat down and looked at his tutor's face. Quietly, he said, "Do you want me to go instead?"

Mustafa did not reply, just looked at him with eyes that were twenty years older than yesterday. "I have never disobeyed an order of the Shura," he said.

"Neither have I," Rustem answered. Mentally, he added, "Yet." He didn't dare say it aloud because then Mustafa would feel obligated to admonish him to respect his elders, and for the first time in his life, Rustem felt that duty was at odds with love, and he needed to work it out for himself.

\* \* \*

When he came out, the starhoppers were already waiting for him at the base of the steps. Firni was with them, now leading a dog on a rope—a different, better-behaved dog this time. As Rustem came up, she said, "Where's Mustafa?"

"Hiding," he said. Ordinarily, he would not have spoken frankly to her, since she could be counted on to blab it all over the village. But now that she was leaving, he would never have to worry about her indiscretion again. It was one count in favor of staying.

The five of them climbed the stairs together. "They let me come inside the skipjack this morning," Firni said to Rustem. "They don't have floors and walls like we do. Everything is curved. They say you can walk on the walls and ceiling when they're traveling. These two are women, the other one's a man. They all sleep together, all three of them. Have you heard of that before?"

Rustem had, but he didn't trust her to have gotten her information straight. "Don't gossip," he said. Then he increased his pace to come up beside Kanakamana. He didn't want to waste the little time he had talking to Firni. "Are ships based on your time-technology common in other parts of the galaxy?" he asked.

"Oh yes, very common. Full of them are the skies."

"If the technology is within our reach, we would like to build one for ourselves. Do you think that is possible?"

"Ah. Speak to Pikake-apikaila must you. She is our expert." Rustem looked at the other starhopper, memorizing the name this time, and noting that Firni had been right about the gender.

"Your ship was glowing when it came in. Why was that?"

Kanakamana handed the translator unit to Pikake-apikaila. The technician studied the translator, then said haltingly, "At quicker time than you were we, in deceleration. Repelling the photons was the quickness."

So Mustafa had been right, they had been decelerating. It just wasn't engines firing.

When they reached the top of the cliff there was still a scattering of onlookers gathered about, gawking at the spacecraft. As the little group approached the enormous globe, some of the workers who had been bringing supplies exited down the ramp.

"All done?" Rustem asked.

One of the workers grinned at him. "They can't possibly get hungry now."

Firni raced on ahead with the dog, and stopped at the top of the ramp. "Come on, Rustem! I'll show you around!" Rustem stayed at Pikake-apikaila's side. He was here for information, not sightseeing.

As they entered, the two starhoppers with him called out, "Hoo-hoo!" and the one they had left behind answered "hoo-hoo" from somewhere inside.

The interior layout of the ship was spacious and open. The inside of the sphere formed the floor, which curved away from them on all sides, divided up into functional units by low, curved partitions. At the moment, in the planet's gravity, only about a quarter of the space was accessible—the parts that lay on the bottom. Other rooms climbed the walls sideways or hung overhead. In the very center, suspended overhead on struts, was another sphere polished to a mirror brightness. It obscured the view of the opposite side of the ship.

Firni was trying to get him to follow her, and he had to say, "No, Firni. I'm here to find out how it works." He turned to Pikake, who led the way down toward a compartment at the lowest point of the ship. Rustem would have called it a cubicle except that it was circular—a

curvicle, perhaps. In the center stood a round pedestal supporting a domed, semispherical screen displaying a slowly rotating star pattern. The surrounding walls held an array of viewscreens, dials, and switches. Chairs fixed to the floor swiveled to allow operators to face either in toward the sphere or out toward the screens. The place was unmistakably some sort of control center.

“You will need to explain some simple basics,” Rustem said. “Perhaps you could start by telling me your power source.”

This question seemed to puzzle the technician, and Rustem realized he also needed to speak very simply. “I assume you need energy to generate a time bubble.”

Pikake made the “no” hand gesture. “Not energy in the way mean you. Not mass-energy. Time potential.”

The technician turned out to be quite willing to explain, but either the translation machine was not up to the task, or Rustem’s brain was not. From the flood of slightly garbled technical language that followed, he gathered that they harvested something called time potential from their motion as they traveled and stored it in a device that the translator called a “chronodynamic battery,” which was not a chemical battery, but more akin to a flywheel or a spring, temporally speaking. When Rustem asked how the bubble was generated, the explanation went miles over his head.

Having given up the idea of building a timeship without a better understanding of the underlying theory, Rustem tried for something more practical. “Where is the machinery located?” There was none visible.

Pikake made a sweeping gesture that encompassed the entire sphere. “All around.”

“And are these your controls?” Rustem gestured at the domed display before them.

Pikake made the assent gesture and sat down in a chair facing the semisphere, looking like a fortune-teller with a very large crystal ball. The sphere automatically turned transparent, showing a three-dimensional diagram of what Rustem assumed to be local space. Pikake touched the surface, and a screen of data appeared in front of her. She studied it for a few seconds, then said, “A fortunate time is it. Show you will I.”

Rustem felt a little shiver pass through him, and suddenly he seemed to be leaning forward. He grabbed a chair to catch his balance.

“Sorry,” Pikake said. “Warn you should I. See you, evenly pulls the slowtime bubble, not like the planet.”

“What?” It dawned on Rustem what this meant. “You mean you just activated the slowtime bubble? But . . . it doesn’t feel any different.”

“Not within. Slow are we only in relation to outside. Inside, all is normal.”

Rustem looked up to see one of the other starhoppers walking effortlessly up the inside of the sphere to reach a room oriented at 90 degrees to the direction Rustem felt was “down.” The sight made him a little queasy.

“Thought you wanted to see, did I,” Pikake said.

“Yes. Thank you. I didn’t know it was safe to demonstrate.” Rustem gripped the chair to keep his hands from shaking. “So the slowtime bubble is like artificial gravity?”

“Slowtime *is* gravity,” Pikake said patiently. “An antique word is ‘gravity.’”

“Rustem! Look!” It was Firni’s voice, coming from overhead. She was waving at him, seemingly hanging from the ceiling. The dog was at her side, unconcerned at being upside down. “This is so amazing! It’s all down—the walls, the ceiling, everything. It’s all floor. Try it!”

Rustem clutched hold of the chair more tightly. This was profoundly disquieting.

“What are the people outside seeing right now?” Rustem said.

Pikake looked puzzled. “Outside are no people.”

“Yes there are. The ones who were looking at the spaceship.”

“Oh, no longer on the planet are we.”

“*What?*”

“Activate the quicktime bubble also did I. Generated simultaneously must be they, otherwise safe not is it. Especially not on a planet.”



“You’re saying we took off, just like that?” He was tingling with shock. “But there was no acceleration.”

“Not for us. Protect us do the bubbles. Mass have we here inside, but outside very little, so quick are we.”

Rustem wasn’t sure he believed what he was hearing; his senses all argued against it. “If we’re not on the planet, where are we?”

Pikake called up another screen and consulted it. “About halfway to the edge of the star system.”

“That’s not possible,” Rustem said. “Even at the speed of light, it would have taken hours to go so far. It’s only been seconds.”

“Slow are we inside,” Pikake explained patiently. “It is only seconds for us.”

“Then how much time has elapsed outside?”

“Where outside?”

Of course. He had known theoretically that time didn’t pass the same everywhere, but had never been in a situation where it mattered. His common sense rebelled at the rubbery way time really behaved—stretching one place, compressing another. And all without giving him any hint. “On the planet,” he said.

Pikake shrugged. “Days, weeks?”

Weeks since they had left Biskra. The Shura would be furious; they would think he had defied them and absconded deliberately. The fact that he had actually considered it didn’t put his mind at rest.

He still couldn’t shake his disbelief; he needed some sort of sensory confirmation. “Can you show me a view of what’s outside right now?”

“What wavelength?”

“Visible,” Rustem said.

Obligingly, Pikake reached over and called up a different display inside the dome. The starfield diagram winked out, replaced by the true blackness of interstellar space. On the side directly opposite Rustem, a scattering of reddish stars hung in the dark. One star was close enough to be a wan, red disk.

“That’s it? That’s our sun?” Rustem said numbly. There were some tiny pinpricks of light near it. One of them held everything he had ever cared about.

Pikake was nodding. “Redshifted. Traveling fast away are we.”

Rustem sank into the chair he had been holding onto. His childhood nightmare was coming true. He was in a tiny ball out in the void of space, hurtling away from everything he knew, leaving it all behind.

Pikake was looking at him, seeing the expression on his face. “Want to go back do you?”

“Can we?”

“Of course. Bounce back off the nearest star can we. No need to go on.”

Rustem pictured himself returning to Biskra after a month or a year, just to tell them the journey hadn’t yet begun, it had all been a mistake, never mind, he had lost his nerve. He closed his eyes, trying to adjust to the situation. Pikake had misunderstood, or thought nothing of catapulting into space for a mere demonstration; but now that it was done, he couldn’t go back. He had to accomplish the plan.

“No,” he said. “Let’s keep on going.”

“All right.” The pilot seemed just as happy one way as another.

Inside the dome display, the image had slowly rotated, bringing into view another field of stars, this time blueshifted. One of the stars was much brighter than the others. Rustem pointed. “Is that where we’re heading? Which star is it?”

“To the closest wanted to go you.”

It took three seconds for Rustem to process this. “No, not the closest. The closest is a neutron star-white dwarf pair. It won’t have any livable planets. We need to go to Tiaret, or Chlef. I have the data to identify them.”

Nothing seemed to ruffle Pikake’s equanimity. “Oh. Well, no matter. Use the neutron star to

correct our course can we.”

Rustem stared at the blueshifted dwarf star on the screen. “How long will it take to get there?”  
“However long want to take you.”

He had meant in absolute time, not subjective time inside the bubble—but there was no such thing as absolute time, especially not at the speed they were traveling. It was all local and subjective. Rustem felt overwhelmed. Seeing the brain overload in his eyes, Pikake said, “Some leisure like to take we in between timewells. Pleasant is travel, stressful is arriving.”

“Fine. Yes. Whatever you normally do.”

\* \* \*

There was no night or day aboard the skipjack. Everyone ate when they pleased, slept when they pleased, and acted as if they had all the time in the world—which they did, since they could always create more by adjusting their slowtime if necessary. Or, if they became bored, they could arrive at their destination in the seeming blink of an eye.

Rustem’s life had always been structured by immutable day and night, seasons and years, but even more so by obligations—jobs to be done, places to be, preparations to be made. Here, he had only one obligation—to make sure they eventually arrived where they had agreed to go, and then returned. In the meantime he was at loose ends and hated it.

The starhoppers were every bit as carefree and irresponsible as they had seemed. They loved to play games and jokes on each other. The dog gave them endless enjoyment. It taught them to toss balls, tug on improvised chew toys, and romp all over the spaceship in manic games of chase. Watching, Rustem came to realize that their abrupt departure from Biskra had been absolutely in character—an impulsive grasshopper leap into the void, on the assumption that they would land on a leaf and not in a tar pit.

Their casual attitude toward privacy kept him constantly on edge. He never knew when he was going to come on one of them stark naked, or engaged in some activity he really didn’t want to see. Being observed never seemed to bother them in the slightest.

From Firni he learned something about their social system. “They don’t care about men and women,” she said during a moment when they were sitting alone in the curvicle everyone used as a lounge. Her voice was loud enough to carry all over the ship, but she seemed not to care. “They say people are divided into fermions and bosons. Fermions are solid, responsible people that like to be on their own. Bosons are flighty people who love to socialize. Two bosons and a fermion form a triad. They say it’s a stable configuration, perfect for a spaceship crew. They’re happy all cooped up together, but being separated makes them grumpy.” She paused. “They think we’re a triad, too.”

“Let me guess,” Rustem said. “I’m a fermion, you’re a boson. Who’s the third?”

“The dog,” she said, as if he were an idiot not to see it.

He no longer doubted her information. She learned everything she wanted to know about them by simply asking, no matter how intrusive or awkward the question. The starhoppers were never offended; they seemed amused by her. It was Rustem she embarrassed.

And yet, she fit perfectly into the little community of the skipjack, exploring everywhere and joining in all the amusements. He had never seen her so happy. Always before, he had been the one who belonged, and she had been the misfit. Now their roles were reversed. Realizing it made him withdraw even more.

Lying on his berth, tired but awake, his thoughts kept straying back to Biskra. His longing to be back there ached so sharply it brought tears to his eyes, and he covered his head with a pillow to hide it. Homesickness felt like mourning a death—the death of the person he had been. He had lost everything that defined him. He was no longer a tinker, no longer Ayala’s son, no longer respected. He was cooped up with a bunch of carefree pranksters and had never felt more lonely. Eventually, the gentle rocking of the skipjack would lull him to sleep.

The one thing that distracted his mind was learning as much as he could understand about their methods of navigation. Pikake explained that they could modulate the repellent force of the quicktime field to adjust course or carom off concentrations of matter such as stars and planets, like a cosmic billiard game. But like billiards, it required skill to judge the angles and spins

correctly, and to tune the outer bubble's strength just right. There were endless refinements of technique.

"I suppose we'll need to calculate the proper angle to get us to Tiaret or Chlef," Rustem said to Pikake as he studied the starfield display. To him, it seemed like a challenging problem, but the pilot was unconcerned.

"Not always the quickest way are straight lines. Overrated are they." Taking in his look of disbelief, Pikake added, "Worry not you. Get you somewhere will we."

That was not terribly reassuring. "But, Pikake, I don't want to go *somewhere*. I want to go a *particular* where."

"All places are the same down deep, say they."

She was teasing him, Rustem thought, though her delivery was completely deadpan. The starhoppers all said he was too serious and single-minded.

\* \* \*

The ship's rocking became more pronounced as they traveled, to the point where it was making Rustem a little queasy. It was not actually rocking, he realized, but more like expansion and contraction, as if the ship were breathing.

"Is that normal?" he asked Pikake as they sat in the navigation pod.

Pikake gave a gesture dismissing it. "Time waves."

By now he knew some rudimentary commands, so he called up the exterior view in the navigation dome. They had come visibly closer to the neutron star, but not so close that he could see the separation between it and its companion. "I suppose that's where . . ."

The star on the screen flared blinding bright. At almost the same moment a sickening surge made the spaceship buck. Rustem was almost knocked from his chair, and there was a crash from somewhere else inside, as something toppled over. It was like being in a boat on a three-dimensional swell; the waves seemed to be making the skipjack gasp, then exhale. His ears popped.

"Hoah!" Pikake cried out in alarm. The other two starhoppers appeared from wherever they had been, looking at Pikake to find out what was going on. Pikake was calling up screens of data, fingers flying. The dome display had gone dead.

A second surge hit them, even stronger than the first, and all Rustem could do was hang on to the nearest immobile object to avoid being flung to the ground. He could hear the dog whining. *We're going to die*, Rustem thought. The fragile shell of the spacecraft would break open and spill them all into the vacuum. Was that the hiss of escaping air?

The ship was rocking more tamely now. The starhoppers were talking animatedly in their own language. Pikake seemed to be having trouble getting something under control, punching at the screens and adjusting slider bars. The video screens surrounding them had all come on, and several were flashing and making discordant chirping sounds.

"What's going on?" Rustem asked, his mouth dry.

"Time wave," Kanakamana answered. "Big one."

"The neutron star!" Rustem said. "It was a double system. Do you suppose they merged?"

They all looked at him, large eyes staring. "That would do it," Pikake said.

The others started throwing questions at Pikake till the pilot waved them off, showing the first sign of irritability Rustem had seen. The other two started arguing volubly. Not understanding a word, Rustem sat frozen in his seat, his mind back in Biskra. What would happen to the unstable Taghrib star when the gravity waves hit it? He tried to calculate when it would happen. A horrible thought struck him: if the star flared, he and Firni might be the only survivors.

"Rustem?" Firni and the dog had joined them, both looking shaken. "What happened?"

He didn't want to tell her what he was thinking. "We think the neutron star system collapsed and the shock wave hit us," he said.

"Is that bad?"

"I don't know yet."

Onaona-keola sat down and started to take care of some of the alerts on the screens, so that the clamor began to die down. It took several minutes before Pikake sat back and sighed.

“Well?” Kanakamana asked.

“The wave deflected us. Spinning are we, and traveling very fast.”

No one said anything, so Rustem asked, “In what direction?”

Pikake shrugged.

There was a pause. “Well,” Kanakamana said cheerfully, “Explore something new shall we.”

\* \* \*

They were lost. No longer heading for a star but hurtling off into some unknown region at a speed no conventional ship could have achieved.

When they finally got the navigation display running again, the visual-light view was useless; there was nothing but gray haze concentrated in the direction of their motion. “Traveling too fast are we,” Pikake said when Rustem asked. “Blueshifted into X-rays is the starlight before, redshifted into microwaves is that behind.”

“Then what’s that ahead of us?”

“Cosmic background radiation, blueshifted into visible.”

It gave him a strange feeling to be seeing only that primordial glow from the ancient past, as if everything that had happened since had ceased to be, time had reversed, and the beginning was all that lay ahead. At that point, Rustem could see no alternative; they needed to slow down, to reenter their own universe. But the starhoppers still debated about it for what seemed like far too long. Even when they switched into a language he understood, he didn’t understand.

At last there was a lull in the argument and he was able to ask Kanakamana, “What’s the problem?”

Kanakamana sighed. “Dangerous is it to take on mass at this speed, yet the only sure way to slow is it. If too much reduce we the quicktime, the pressure of the radiation will . . . well, unhappy will be the skipjack. At this speed, a proton would hit like a cannonball.”

“Can’t anything else slow us down?”

“Hitting a star. Count on that cannot we.”

It seemed like a bad time to be joking, but that was what starhoppers were like.

“Only how much to slow down is the debate. Too much, and hard to accelerate again will be it. Too little, and where we are cannot tell we.”

In the time that followed, as Pikake gradually braked the ship by reducing the quicktime, the rest of them waited and tried to go about their normal routines, all senses attuned to signs of distress from the ship. There was absolutely nothing Rustem could do, but telling himself that hypervigilance was pointless didn’t help. He still heard every tick and creak, started awake at every shudder and shift.

He had slept and woken several times before the display in the navigation globe began to resemble a universe he recognized. But not, unfortunately, a place.

He stared at the unfamiliar starfield, trying to recognize any pattern, knowing it wasn’t there. But Pikake seemed more cheerful than before.

“Lucky are we,” she said. “Matter is there hereabouts. Time currents.”

“That’s good?” Rustem said. He was still thinking about the proton cannonballs.

“Very good. Something is it to push against, to accelerate once more. To be caught in a time shoal, becalmed, is the worst fate. Where slowtime drives out the quick cannot survive we. Nor where quicktime drives out the slow. The flow need we, the dynamical back and forth. A process need we to live in, not a place.”

“I’d prefer a place,” Rustem said glumly.

“In a place are we. Where, need to figure out we.”

Pikake set about that task in a way that Rustem never would have tried. She ignored the stars and instead looked for nearby gas clouds, ion streams, and other evidence of time in motion.

It turned out that the exterior of the skipjack, which had looked so smooth on the planet, was actually a field of sensors for different wavelengths, fields, and forces. Pikake could display chosen slices of the data inside the navigation globe. In fact, as Rustem watched, he rarely saw her use the star field display. For her, navigation was all about the interstellar weather.

“First must determine we whether upstream or downstream are we from where were we,”

she explained.

“What do you mean, upstream or downstream?”

“Against the rotation of the galaxy is upstream. In the direction of galactic flow is downstream. Many are the currents that go counter to galactic motion, but the prevailing wind is it. Further upstream than usual lies your timewell.”

When Rustem offered her his data on the spectra of stars near the Taghrib system, Pikake seemed indifferent. “Time-dependent are spectra,” she said. “Different are they, taken from a timewell, than for us.”

“But the emission and absorption lines would still form a pattern,” Rustem argued.

“Affected by interstellar medium are they, and on where are we depends that. But welcome to try are you.”

“How else do you identify particular stars?”

“Not do we, usually, at this range.”

“Then how do you set course for your destination?”

“Wherever we go, there we are.”

That encapsulated everything that was driving Rustem mad about the starhoppers. It was supposed to be a philosophy, not a set of directions.

He confided his frustration to Firni, thinking she was the only one who would understand. She didn’t understand.

“I don’t think their methods are going to get us back home,” he said. “They’re so seat-of-the-pants, so qualitative. All Pikake cares about is to be moving, not to get anywhere in particular.”

“Why do you want to go back home?” Firni said.

He looked at her in disbelief. He wanted to say, *because it’s home*, but that wasn’t an answer. “Because everyone is counting on us,” he said. *If they’re still alive*, he thought. And if not, he wanted to know.

“No one’s counting on me,” she said. The dog jumped up onto the couch next to her, and she put an arm around it. “Or on Aarfa.”

Rustem was left brooding about the fact that he really was alone, more a misfit than even the dog—he was the only one who thought ahead in purposeful, sequential ways, and had a goal. If they were ever to get back to the Taghrib, it was going to be up to him.

And so he set about figuring out how to compare his spectra to the stars around them—at first the closest, one by one; then, with some help from Onaona-keola, he automated the process and left the sensors methodically checking a skyful of ever more distant stars. He got no matches, but it made him feel he was doing something.

When, after some time away, he returned to Pikake’s navigation station, he said, “We’re nowhere close to where we were.”

“That could I have told you,” said Pikake.

“Yes, but now we know for sure.”

In his absence, Pikake had found a diffuse plasma stream that meandered through the invisible hills and valleys of timespace. They were now following it. “Going somewhere is it,” she said. “To a pool or river of slowtime, perhaps. If lucky are we, to a well.” There was nothing visible ahead, but she was confident. “Invisible are most things in the time field.”

Rustem sat staring at the blankness of the navigation display, thinking about fields, and field lines, until he said, “If it’s a flow of charged particles, there might be a magnetic field Firni could see.”

For almost the first time, Pikake looked pleased at something he had said. “Kanakamana! Hoo-hoo!” she called out.

Kanakamana answered from directly overhead. “Hoo-hoo?”

“Ought to show we the viewpool to the dowser.”

“Wonderful!” Kanakamana said, and just like that, they were both distracted from what they had been doing. Rustem followed as Pikake led the way to a sector of the ship where the equipment for recycling, laundry, food storage, and other life-support functions clustered. This was the domain of Onaona-keola, who performed most of their housekeeping and repair jobs. All

three starhoppers gathered around a spot of metal flooring in the center of which lay a round plate the size of a well cover. Attracted by the noise, Firni and the dog joined them.

Two of the starhoppers attached handles to the round plate and lifted it aside. Rustem peered into the dark hole, and recoiled. There were stars visible in it. "Is that the outside?" he said.

"Fear not you, sealed is it," Kanakamana said.

If it had been a window, it wouldn't have made his instincts quiver so. A hole in the floor was something you could fall into, or out of. Up to now, it had been relatively easy to ignore the fact that he was walking on vacuum.

The dog crept up to the edge, smelling for danger, evidently finding none. The starhoppers were searching for something in the nearby cabinets, and soon Onaona produced a dark-colored blanket to spread over the hole. Then the starhoppers lay down on their stomachs and threw the blanket over their heads so they could peer out into space without the ship's light interfering. Pikake gestured Firni and Rustem to join them under the blanket. Rustem caught hold of the dog, who was eager to play this game, and gestured Firni to go ahead. "I'll hold Aarfa," he said.

At first everyone was silent; then he could hear them conversing quietly—the starhoppers sounding curious, Firni sounding awestruck. Presently she sat up and pulled the blanket off her head. "Rustem, you have to see this!" she said.

"Someone has to hold the dog," he said.

Onaona left the huddle and offered to take the dog. Rustem gave it up a little reluctantly. He really didn't want to look out, but he also didn't want them to think he was afraid. So he lay down, drew the blanket over his head, and wormed forward till he could see over the edge, as if looking into a pool.

It looked like empty space. Even as his eyes adjusted, he saw only a scattering of stars, not as many as on his clock tower in Biskra. The view seemed undistorted by the time fields. "Are we looking through the slowtime and quicktime bubbles?" he asked.

"Yes," Pikake answered. "Cancelling each other out are they."

The thought of the unimaginable forces so close to his face raised the hairs on his arms. It was irrational; he had been living inside them for weeks now. He looked at Firni. "What do you see?"

Dimly lit by starlight, her face looked transcendent. "Colors," she said. "Streaks of color everywhere. Patterns spreading and changing. Ripples, sickle shapes, flames igniting. Oh! There's a field of sparkles, like fireworks. And now it's calm. There's an arc of blue going one direction, and a peach-colored whorl. Now they're piling up like clouds."

She was seeing something of surpassing beauty, he could tell; her voice was reverent, moved.

He stared down into the pool, and all he saw was blackness. Emptiness. Space. For the first time in his life he felt less than her, limited, unable. He had always thought of her as lacking something, some common-sense instinct everyone else had. But at this moment she was able to do what he could not: participate in the beauty of the cosmos, and become elevated by it.

On impulse, he reached out and squeezed her hand. She looked at him, falling silent.

"Go on," he said.

So they lay there while she described a thrilling landscape of colors, a place of visible winds, a bubble chamber revealing what ordinary senses could never know.

Eventually the starhoppers left, but Firni and Rustem stayed, watching as the slow rotation of the ship brought the streak of the galaxy into view, then away again. When they finally sat up with the blanket spread before them as if for a picnic, both of them were silent for a while, thinking. At last Rustem said, "You know, Firni, we didn't treat you very well in Biskra."

She looked at her hands, fidgeting. "You were better than most," she said.

"But I wasn't always very nice. I'm sorry."

She still didn't look him in the eye. "You're impatient, but not mean. That's partly why I asked them to bring you and not Mustafa. He's a nice old man, but he wouldn't have worked out."

She glanced up, saw him staring dumbfounded, and looked away.

"You *asked* them to bring me?" he said. "I'm not here by accident?"

She shook her head, then got up, gathering the blanket. "Help me put the lid back," she said.

Once, he would have furiously resented her interference with his life, but now he decided to let it pass and move on. It was what it was. She had doomed him to exile but might have saved his life. Besides, she was right, he was the person for the job. Someone needed to push the feckless starhoppers to perform their promise despite all that had happened. He had the personality to be that bit of friction that prevented them from drifting off course. The fact that Firni had had enough insight to see that surprised him.

Pikake was slowly building a picture of where they were, and when Firni spotted a magnetar, it clinched the theory that they were too far upstream. The highly magnetized stars were so uncommon that the starhoppers had never seen one nearby, so they knew they were in unexplored space.

"Moving downstream already were we," Pikake said. "Now some slowtime to accelerate against is the only missing thing. Blowing against us is a quicktime wind, so on the right heading are we."

Everyone was cheered when, some time later, Pikake announced that there was a clump of matter ahead. But as they drew closer, sensors showed that the matter was diffuse, not concentrated, scattered in a wide belt. Still, its presence suggested that there was something nearby to orbit, something they still couldn't see.

"Do you have a telescope we could use to have a look at the matter?" Rustem said.

"Telescopic sensors are there, but very little light. Tedious will be it."

Rustem was curious and willing to be patient, so Pikake showed him how to aim the sensors and project the results on the inside surface of the navigation globe. At first, the images were unremarkable: just chunks of rocky rubble left over from some cataclysm, or collected slowly around some seeds of slowtime. But the blurry images from farther away were tantalizing: oddly straight lines and angles. As they drew closer he tried again, and finally managed to capture an image that made him sit back with an exclamation. "That looks human-made!"

It was a slab of smooth surface that had once had rows of square holes, like windows. Soon he started to see more: an arc of metallic-looking casing, an enormous tube, a bridgelike structure. By now, everyone was interested, gathering around to see the latest images as they came in.

"Do you suppose it's the remains of a ship or space station?" Rustem said.

"Very far out are we for that," Pikake said.

"Drifted here from elsewhere could be it," Kanakamana said, looking thoughtful. "Of this place think have heard I. Stories about it tell other wayfarers, but where it is could say no one. Lost were they when they came upon it. Thought it was a legend did I. Keep on searching."

Kanakamana seemed to know something about what they would find, but would not say.

Ahead lay a particularly dense patch of the debris field, made up of small objects intermixed with larger ones. Rustem aimed his telescopes and left them to gather light while he took a sleep break. When he returned, there were several images waiting. He opened the first and leaped to his feet with a horrified exclamation.

The objects floating in space were bodies. Human bodies, dozens of them.

The skipjack was in the middle of a graveyard. Some catastrophe had overtaken a ship or station, and it had spilled all its passengers into space, where there was nothing to make them decay. They could have been floating here in the pitch dark for centuries. Rustem felt queasy. "We've got to get out of here," he said. It felt disrespectful to be looking at them.

Attracted by his exclamation, the others had gathered around to look. At the sight, even the starhoppers were quiet. "Is this what heard you?" Pikake asked Kanakamana, who gave the nodding gesture.

"From where they came, or who they are, knows no one."

Rustem sat down and deleted the pictures, out of respect. No one objected. Silently, he said a little prayer for them. He could not help but think of his friends back in Biskra. Were they evaporated or entombed in melted glass now? Had eternity come on them suddenly, as it had for these poor souls? It was not as easy to erase the morbid thoughts as it was to erase the pictures.

Later, they gathered in the lounge curvicle to assess their situation.

"If others have been here, then not as far upstream are we as thought I," Pikake said. "Above the galactic plane must be we."

"This ring of matter, orbiting something slow must be it," Kanakamana said. "It has to be a quiet time well."

They were all gesturing agreement. Rustem looked from one to the other. "Quiet time well?" he asked.

"What is the old term?" For the first time in a long while, Kanakamana had to consult the translator. "'Black hole.' Hidden, with no accretion disc to reveal it. Just sitting here. But use it can we."

Pikake gestured agreement. "Yes," she said. "First fall into it must we."

"What? You're deliberately going to fall into a black hole?" Rustem said.

"Not all the way," Kanakamana assured him. "Just enough for the quicktime to bounce us out again. Then on our way shall be we."

\* \* \*

It took longer to fall into a black hole than Rustem had expected.

First, a short burst of quicktime against the ring of debris sent them on the proper trajectory; then Pikake actually reversed the outer bubble to slowtime in order to allow the ship to fall inward. Then she spent days making adjustments and calculating the proper timing to fling them outward again in a direction that might take them somewhere.

Firni spent a lot of time gazing like an oracle into the viewpool. Rustem sometimes went with her, but there was little for him to see. The void outside was still empty, dark, cold, and terrifying. They were traveling from a graveyard into oblivion.

But for her, the universe had never been more wondrous. Once, she sat cross-legged on the utility room floor, her hair mussed from the blanket, her face glowing. "It's like the mosaics in the mosque at home," she said. "Up close, the tiles are pretty enough. But far away, they all come together to form patterns."

The old Firni would never have said that, Rustem thought. Had she changed, or had his perspective shifted? They were both like dynamical equations, interacting in complex ways. Trying to see each other while traveling at different speeds.

As the ship drew closer to the timewell, it orbited faster and faster. All of them gathered at the navigation station for the moment when Pikake would reverse the outer time field and send them shooting away into space. In the end, it was anticlimactic. Pikake simply looked up from the screen and said, "Done is it." There had not even been the momentary frisson Rustem had felt when the inner bubble had activated. They all looked at each other and dispersed.

*Let it be right*, Rustem prayed silently as he lay in his berth after dinner. *Let me come home, and I promise never to leave again.*

\* \* \*

Some time later, he was wakened from a sound sleep by a quiet chirping. When he poked his head out from under his pillow, he realized that a raucous game was going on in the skipjack. The starhoppers were hitting a ball to and fro, using the ship as a three-dimensional ball court. When the ball came near the central sphere, it deflected in unpredictable ways, forcing the players to make heroic diving catches, sometimes knocking down partitions and furniture that lay in the way. It was a miracle that he had managed to sleep through it, and odd that a quiet ping-pong had wakened him.

Then he realized what it was: the terminal he had left automatically checking the spectra of stars. It had found a match.

He scrambled out of his berth to check it. Sure enough, a dim star slightly to one side of their direction of motion had matched one of the stars he had seen from Biskra. It was not one of the close-in stars, the ones he most wanted, but it was a start.

"Pikake!" he called out.

The starhoppers paused their game at hearing the excitement in his voice, and Pikake came over.



“Can we change course to head for it?” he asked when he had shown her.

“Best to wait,” Pikake said. “A false positive could be one result. A coincidence could be two. Best is three.”

She was still a little skeptical of his method, but he was more confident than ever.

He refocused his search on the patch of sky around the one positive result and waited. As keyed up as he was, the time that followed seemed interminable, as if someone had maliciously tampered with the time controls to test his patience. But eventually a second match appeared, far enough from the first to make him glad Pikake had made him wait. When the third appeared, it outlined a triangle that Rustem thought of as Taghrib space.

They had been following a current of slowtime, and the adjustment of course was easy to make. As they drew closer, the sensors recognized ever more spectra. When one finally matched a star close to Taghrib, Rustem let out a whoop of triumph. It was Chlef: the farther of the two he had hoped to visit, but still reachable with a primitive starship.

He set about trying to identify the other stars of the local neighborhood.

“There’s something really bright out there,” Firni told him, watching over his shoulder.

For a moment, his spirits sank. Was it possible that the Taghrib star was flaring? But no star looked particularly bright in visible light. “You mean, bright in the viewpool?” he asked.

“Yes,” she said. “It would be about there.” She pointed to a region where no matches had been made.

The neutron star, he thought. The merger had changed it, given it a magnetic field she could see. “Thanks, Firni,” he said. “That helps.”

By now they were on a course for Chlef. Soon he could pick out the Taghrib star, looking as innocent and stable as it must have looked to the original settlers. If it had flared, it was years ago by now. He had to assume the best, because he could soon tell that Chlef had planets, and two were in the habitable zone.

They slowed to come into an orbit around the outer of the two promising planets. Rustem was both cheered and disappointed by the images of it. It had plenty of water, but it was mostly locked up in glaciers that capped the planet from both poles down to about latitude 45. Around the equator lay a strip of frigid, sandy landscape where plant life had evidently taken hold. The atmosphere was thin but breathable.

“The other one is brighter,” Firni said.

Pikake nodded. “This one barely parts the stream from its sun.”

That meant it didn’t have much magnetic field. It would be bombarded with radiation. “Let’s try the other one,” Rustem said.

It was hotter and drier, they saw as soon as they came close. No oceans, but huge canyons and deltas carved by water in the past.

They stayed in orbit, gathering information. Atmosphere, temperature, ground chemistry—everything looked right, except for the puzzling lack of water. There was plenty of it in the atmosphere, but too little on the ground for agriculture. They could see patches of what looked like rust-colored vegetation, but no hint of what water it was subsisting on.

“Can we go down there?” Firni asked. Rustem had been wondering the same, but hesitating to ask.

“Of course,” Pikake said. “Clean up need to do we anyway.”

What she meant was, they needed to put everything away into cabinets fastened to the floor, and make sure there was nothing that could fall when the planet’s gravity turned half their spaceship upside down. The starhoppers could work efficiently when they had a motive, and the preparations for landing were soon completed.

Pikake brought them down with a skillful flourish. This time, when she cut off the time bubbles, Rustem was pleasantly surprised to find the local gravity somewhat weaker than he had become used to. His spirits seemed to grow lighter, as well.

They exited down the ramp into a dramatic red rock canyon that would have been a river bed back in Biskra. The ochre cliffs towered over them, carved into sculptural curves by wind and weather, streaked in layers—but none of melted rock. It was pleasantly cool in the shade, and they

stood marveling at the scene.

“Look! A fly-thing!” Firni exclaimed.

It was like very large insect, swooping aerodynamically down the defile and disappearing into a hole in the cliff. The word “bird” came to Rustem’s mind from old videos. There were no birds in Biskra.

Farther down the valley stood a sentinel row of odd, finger-shaped plants—or at least, he assumed they were plants—taller than a person and covered with what looked like tawny fur. The sparse vegetation growing in crevices on the cliffs was comprised of dry-adapted succulents like jade and cactus. When Rustem started walking down the gorge, the only sound was wind and the low conversation of the starhoppers behind him. No insect buzz, no rustle of leaves, no sign or smell of life. His optimism was flagging. The plant-pillars ahead seemed to be watching, warning him away.

He saw an entry into a narrow side-canyon and took it, climbing upward over what looked like stream-washed rock. Water had been here once; where had it gone? He turned a corner and saw before him a high natural arch framing a cavern mouth. He scrambled up the last, steep path to it, then stopped in amazement.

Inside the cavern was a lake. Vast, unrippled, stretching away into the darkness as far as he could see. And here was all the stir and lushness of life missing outside. Leafy plants, reeds, and mosses ringed the pool; insects droned musically; birds swooped down from nests high on the cavern walls. The cave was an entire ecosystem of itself, entirely different from what lay outside.

The dog came racing up the trail behind him, waded into the lake, and started drinking. “No, Aarfa! Don’t drink that,” he said and had to wade into the pool to haul her back. The water smelled fresh and clean, but they needed to test it to be sure.

Firni came up the trail on Aarfa’s heels and stood staring into the cave.

“What do you think?” Rustem said. “Would our people like it here?”

“It’s not like Biskra,” she said, then turned around to view the sensually curved, russet canyon. “It’s better.”

The starhoppers came up the trail, and Rustem said, “This is where the water is, underground. We need to find out if this is the tip of an aquifer system. And whether the water is pure.” Suddenly he was laying out a long to-do list in his mind.

They spent several days—real days, with sunrise and sunset—exploring. Rustem hiked down the valley and located several other cave openings with pools inside, waiting like giant cisterns. The water turned out to be rich in minerals but otherwise pure. They allowed the dog to drink her fill without any apparent effect. The furry pillar-plants had started to seem like a welcoming committee.

They landed in a few other places to spot check, and found different geologies and plant life, but always underground water. The last night they spent on the planet, Rustem slept outside under the sky. As he gazed up at the spangled stars, he thought, *What if I am too late? What if they are already dead?* Then this beautiful planet would seem like a graveyard of lost chances in his mind. Found too late.

When the starhoppers asked him where he wanted to go next, it was hard to say, “Back to the Taghrib system. Back to Biskra.” He had to know, and didn’t want to know. He wanted to keep thinking of them as alive.

As they neared the home system, the star still looked tame and quiet. “Radio transmissions from the second planet receiving are we, like before,” Pikake said.

“Can you play them as audio?”

Rustem waited on edge until he heard the first voice from Biskra since leaving.

It was his own voice. The message was the same one he and Mustafa had recorded to attract the starship to Biskra in the first place. Confused, he said, “Are they still playing it? Or have we looped back in time somehow?”

“Odd would be that,” Pikake said drily.

But Kanakamana looked thoughtful. “Possible is it, suppose I. All a probability cloud is time until interact we with it, say they.”

Pikake gave an expressive gesture of skepticism.

As they drew closer, they could see that the old spaceship was still orbiting. That was a good sign. And there were ever more electromagnetic signals from the planet.

“Land in the same place shall we?” Pikake asked.

“Yes. Please do.”

The starhoppers made their last preparations for landing, and everyone gathered around the navigation station. Firni took Rustem’s hand; he gripped hers tight.

They set down, the time bubbles cut off, and the planet’s gravity took hold. It was probably his imagination, but it seemed familiar. They gathered by the door. When it opened and the ramp extruded, Rustem stared out in astonishment.

It was nighttime, but bright with electric lights everywhere. The plateau was full of buildings now. And instead of the haphazard collection of dogs and children that had met the spaceship the first time, there was a huge crowd gathered. As Rustem came down the ramp, a cheer arose. Three people came forward to meet him, led by a vigorous-looking man of middling years.

“Rustem?” the man said.

“Yes.”

The man held out a hand in greeting. “I am Aksil, Tinker of Biskra.”

Rustem shook hands with the person he would have become if he had stayed.

“You probably don’t remember me,” Aksil said. “I was a child when you left. But Mustafa trained me.”

“Mustafa! Really? Is he . . .”

“Died ten years ago. He was a great man, our inspiration.”

“He was?” Rustem had to consciously close his mouth.

“He kept saying to his dying day that you would return. He never lost that faith. ‘Just wait,’ he would say. ‘Rustem is coming back.’ And here you are.”

Rustem looked around at the crowd. They looked keyed up, joyful, even a little reverent, as if seeing a prophecy fulfilled.

“Sorry it took so long,” Rustem said lamely. “We had some problems.”

“Yes. When the neutron star collapsed . . .”

“I was afraid it would trigger a flare,” Rustem said.

“Oh, it did,” Aksil said far too cheerfully. “We were unbelievably lucky. It was a lopsided flare, mainly on the star’s other side. This planet still caught some backwash, but it happened at night, so we survived. Hand of God, people said.”

“Not Mustafa, I bet,” Rustem said. The man had been next thing to a pagan.

Aksil grinned. “No. He said it was our warning, our call to action. We had to buckle down and get ready for your return. Then he revealed what he’d been working on for years.” Aksil paused as if expecting Rustem to know what he was talking about.

“What?” Rustem said.

“He didn’t tell you? A method for refining fuel for the spaceship. He wanted us to be ready to leave as soon as we knew where to go. He got the whole community working on it. Five years ago we finally made it back to orbit, and woke up the ship. We’ve been refueling and preparing it ever since. The cockroaches had more or less taken over.”

Rustem was impressed down to the soles of his feet. Sleepy little Biskra had sent people into orbit and renovated a spaceship? This was not the village he had known. There was an energy here, a drive, an optimism, that had been in hiding. “That’s . . . incredibly impressive,” he said.

They all looked as if this was the moment they had been waiting for, when they could reveal what they had accomplished and astonish the legendary Rustem, emissary to the stars.

Still, they were looking at him expectantly. He realized why. “Well then, I guess it’s a good thing I found a place for us to go,” he said.

Their faces lit up. “We knew you would,” Aksil said. “Mustafa said we could count on you.”

Rustem was a little glad he hadn’t known that. “We’ve got a lot of data. I can tell you all about it.”

“First, come down to town, all of you. We have a celebration prepared.”

Rustem became aware that the three starhoppers were standing behind him, and Firni was at his side, with Aarfa on a leash. “This is Firni,” he said. “Do you remember her? She was really helpful to have along.”

The Biskrans glanced at her without much interest, as if she had not been part of the legend. He felt a familiar defensiveness on her behalf. “We all did it together,” he said. “Firni, the starhoppers, they all deserve just as much credit as I do.”

“Your companions will get any reward we can give them,” Aksil said.

He turned to lead the way to this transformed Biskra. Walking at Rustem’s side, Firni whispered, “Will you stay here now?”

“Yes,” Rustem said. He wanted to be a part of this. “How about you?”

“I want to go back to space,” Firni said. “But I want you to come, too.”

Always direct, she never hid anything. Feeling buoyant, he put an arm around her shoulder and squeezed. “Well, pretty soon we can take you back to space ourselves, if you want to take a chance on us.”

There was a railcar that ran down to town now. Before getting on, they all went to the edge of the cliff and saw the new Biskra spread out below, covering the valley, as brightly lit as the sky above them. Looking at it, Rustem felt a twinge of homesickness again. The Biskra he had known did not exist any more, anywhere. Time had obliterated it. He would never be able to come home.

Rustem turned to Aksil. “How long has it been since we left?”

“Twenty-seven years,” Aksil said.

It didn’t seem like enough. Rustem looked at the starhoppers. “It seems like it ought to be more.”

Kanakamana shrugged. “A funny thing is time.”

“Don’t I know that,” Rustem said.

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