

# **BREAK MY FALL**

THE FIFTEENTH STEPPING Stone came into view behind the Baza, pairs of spokes glinting as they caught the sun. At this distance nothing else was visible, but Heng had no trouble picturing the Stones topography from these flickering splinters of light. Each turning spoke whose anchor point lay in the asteroids day side was partly hidden behind the rock as it crossed the angle where it offered its mirror flash, while its opposite number rising up from the night side lay partly in shadow. A perfect sphere would have taken equal bites out of the two lines, but the Stone revealed its misshapen peanut form in the dark gaps cycle of shifts and asymmetries.

Heng glanced away from the window towards Darpana, two couches from his own in the square of nine bunks. Most children enjoyed a fairground ride, but this roller-coaster was relentless, and her vitals log showed that she still hadn't slept in the twenty four hours since boarding. With one elbow propping her head up from the couch against the elastic tug of her harness, Darpana did not look tired, let alone distressed. But if she didn't nod off soon Heng would have to talk to her grandmother about giving her a sedative.

The Stones rocky core was visible now, its outline mutating as it spun, like a pallid grey half-moon reflected in a trembling puddle. The asteroid was approaching at an absurdly slow rate by astronomical standards, outpacing them by a mere fifty metres a second; they might have been back on Earth, hurtling along a railway line albeit in some surreal ghost train ride where a turnstile wrapped around a giant boulder threatened to block their way. But as the boulder drew closer and the Baza passed between the two layers of cables that stretched out from the rock, any sense of a horizontal passage skirting the obstacle vanished. They were swerving around it, but they were swerving upwards.

Darpana's gleeful cry was barely audible, but to Heng it sounded subdued more out of consideration for her fellow passengers than from any lack of energy or enthusiasm. As their weight shot up from nothing towards a gee and a half he could see her grimace with delight, as if the visceral thrill that had gripped her the first time remained as intense as ever. The portions of the cables nearest to them were travelling backwards with the asteroids spin, putting them almost at rest with respect to the Baza, and the eddy currents induced in them by the ships magnets served as a brake, quickly dragging the relative velocity down to zero. Within seconds the Baza was firmly locked to the cables at two points, swinging along with them but still free to pivot around its centre of mass and stay true to its original alignment. While the stars beyond the window remained serene and motionless against the frame of the cabins interior, the nine bunks turned like roasting spits, swivelling to remain horizontal under the shifting centrifugal gravity. The view that had lain to Heng's left was dropping below him; the whole ship, and the whole cosmos beyond, seemed to be rotating around the fixed axis of his spine.

In ten seconds they'd completed half a circle, and the stars were rising on his right. He tensed himself for the fall of release, but the navigator opted for another full turn as it worked to refine their course, ensuring that the next encounter would be as perfectly aligned as this one. As Heng gazed up at the stars they were replaced by a blur of rock, sunlit for a moment then fading to black and slipping away.

When the stars rose for a second time the navigator finally broke its grip on the cables, and Heng's

surroundings stopped tumbling. The Stone came into view on his right, retreating, the stars behind it unchanged.

The Baza had performed a U-turn around the Stone, but with respect to the Earth, rather than reversing its motion it had just gained an extra hundred metres a second. Over the next hour the Stone would give a similar boost to every ship in the convoy and then it would be free to spend a couple of years harvesting sunlight, replenishing its spin and tweaking its orbit until it was back in position to reprise its role for another group of travellers. It had taken three decades to nudge this rock and its companions out of the Amor group and into their tailored orbits, but the foresight of the pioneers who had begun the process had paid off for the generation that followed. The Baza was not so much a spacecraft in its own right as a life support capsule being tossed from Stone to Stone, but this choreographed relay race would deliver it to Mars in just four and a half months.

Rohini addressed her granddaughter calmly. You should sleep now, darling, if you can.

But its exciting! Darpana protested.

It is, Rohini agreed. But we have thirty more days just like this ahead of us, and if you make yourself sick you won't enjoy them at all.

Darpana was silent, but then she seemed to accept the argument. I'll try to sleep before the next one.

Good girl. Rohini relaxed back onto her couch.

Darpana looked past her and caught Heng's gaze. He smiled, then let his eyelids grow heavy, hoping the action would be as contagious as a yawn but less obviously manipulative. By the time he thought it might be safe to check whether he had any success, he had fallen into a warm half-sleep himself, ready to wake in an instant if the Baza required it but unwilling to surface for anything less.

IT ONLY TOOK a small change to the sun-side windows tint to brighten the cabin and bring on a notional dawn. Heng rose before any of the passengers to use the toilet, sponge his body and change his clothes. When the Baza finally reached the hundredth Stepping Stone and they climbed aboard for the middle stage of the journey it would feel as if they had gone from a shanty boat to a luxury ocean liner, but until then these few minutes each day would be the pinnacle of privacy.

As he swung out of the ablutions room he was hit by the glorious aroma of someone's breakfast sizzling in the microwave. Only Iqbal and Noor were in the kitchen nook, but the other passengers were stirring, woken by the smell.

Do you feel like sharing? Heng inquired. The couple's meal looked like some kind of spiced omelette rotating in its sealed bag under the lights, and though Heng had dozens of cherished recipes of his own, the sensory appeal of this visible, olfactible reality was far stronger than any remembered culinary delight.

Of course. Iqbal turned towards the couches, swivelling on his hand-hold. Anyone else?

There was a deafening chorus of requests, and Iqbal waved the count up from two to nine. Heng was pleased; so far as he knew there was no acrimony between any of the families travelling on the convoy, but the smallest sign that they weren't going to turn cliquey on him was welcome. Company policy was to allow no more than three related people on the same ship to ensure that a single ruptured hull could take only a limited toll from each family but the resulting assortment of travelling companions had made his last outward journey an ordeal, as he'd struggled to keep the members of two rival clans from goading each other into violence. Whether Mars itself would prove big enough for both of them was, mercifully, not his problem.

Everyone managed to get through breakfast before the klaxons warned that Stone nineteen was on its way. Heng looked on solicitously as Rohini helped Darpana into her harness, but they didn't need his assistance; they'd both been rated as diligent by their trainer in the course back in Shanghai. Dozens of children had made the trip over the years, and Heng had flown in convoys with a few of them, but he'd never had anyone so young on his own ship.

The log showed that Darpana had slept deeply, and as they tumbled around the first Stone of the new day she whooped with unabashed pleasure. Once they were weightless again Heng climbed free and set about the first round of system inspections, starting with the laundry press and moving through all the water-recycling components. It was tedious work, and this early in the trip it was hard not to assume complacently that nothing could yet have grown clogged, infested or leaky, but he had his cans improvise some rousing percussive music, invigorating but not catchy enough to be distracting, and he managed to get through the tasks without a single nagging beep from the overseer.

When he was done, Heng cast his gaze around the cabin, reassuring himself that everything was in order. Akhila was using the spring set, grunting softly as she forced her legs straight against the machines tug, then fighting just as hard to bend them again. Heng's exercise of choice was running in the middle stage, when he had the freedom of the Stones corridors but the Bazas zero-gee treadmill was a poor substitute, and in a space as small as this it just left him feeling more hemmed in. The drugs that lied to his muscle fibres and osteocytes, assuring them that they were still bearing their usual loads, seemed to be enough to keep him from any drastic decline in his weightless months.

Everyone else remained on their couches. Iqbal and Noor were facing each other, smiling slightly, conversing privately or sharing an overlay. Rohini had her eyes closed, but Heng had no reason to snoop on her vitals to check if she'd dozed off or was merely engrossed in some study or entertainment. Punita, Aabid and Chandrakant were all clearly in that state, staring attentively into the middle distance. Only Darpana was looking out the window.

She saw Heng's reflection in the glass and turned towards him. Are we in front of the Tragopan, or behind now? I've lost track.

In front.

My cousin said he'd aim his laser pointer out the window.

Heng doubted that she'd be able to spot it, but if hunting for a faint red speck against the stars helped her pass the time he wasn't going to disillusion her.

Darpana had another question for him. Why do the orbits for the Stepping Stones stick out so much?

Ah. Heng summoned an overlay of the asteroids trajectories. Darpana joined the view, and gestured at the largest of the ellipses traced out on the illusory pane between them. We only want to get from Earth to Mars! she said. So why do half the orbits go further?

What do you think would be more sensible? he challenged her.

Darpana replied boldly, Just start with Earths orbit and make it bigger, step by step, until youve reached Mars.

Show me, Heng suggested. He cleared the Stones from the pane, leaving only the two planets.

Darpana drew a sequence of a dozen concentric circles, bridging the gap in equal increments. If I draw hundreds it will be hard to see whats going on, she explained.

No, thats fine, I get the idea. Heng waited to see if shed spot any problems for herself, then he pointed out gently, None of these orbits cross each other, do they?

No. Darpana didnt understand the complaint. Why should they? The Stepping Stones dont need to meet up! If the orbits are close enough, they could still throw the ships to each other.

So the Stepping Stones have one kind of orbit these circles but the ships move between them on different kinds of orbits?

Darpana hesitated. Yes.

How different?

Darpana sketched a short line from one circle to another. Thats the kind of path we should take. Straight out to the next Stone like throwing a ball up to your friend on a balcony. Then she throws it to someone on the balcony above... and on it goes, all the way to the roof.

Heng could see the appeal of this metaphor, but the reality wasnt much harder to grasp. One small problem, he said, is that youd need a phenomenal velocity to go straight up like that. Remember, these Stones are in orbit, so your first one will be moving sideways at about thirty kilometres a second.

Right. Darpana took his point and erased her original line, replacing it with a curve that spiralled around at a modest pitch on its way out from the sun. Hows that? The Stone above is moving sideways too, so it still ought to be able to catch the ship.

How far apart are these orbits? Heng asked.

Im not sure, Darpana confessed. How far can a Stone throw us?

If you throw something at fifty metres a second from the Earths orbit, it will travel a quarter of a million kilometres outwards before it starts falling back towards the sun.

Thats plenty! Darpana replied. A few hundred steps like that would get you to Mars.

The catch, Heng said, is that each step would take about three months. Darpanas spiral had an implausibly steep ascent; he sketched in an elliptical arc that hewed closer to the initial circle, wrapping a quarter of the way around the sun before reaching aphelion. Of course you could always space your Stones closer than this and catch the ship while its still moving outwards... but so long as the Stones themselves arent moving outwards, the ships cant build up speed in that direction. Theyll be forced to cross the whole gap between the orbits at fifty metres a second, or less.

Darpana gazed at her concentric circles: an endless set of speed bumps if you tried to cut across them. So the trip would take decades this way?

Yes. Heng brought back the real Stones orbits. We want to head out as fast as we can which in the middle stage is so fast that if we kept it up wed overshoot Mars completely. The Stones need to move on similar orbits to us, so some of them do need to overshoot Mars. You cant just take Earths orbit and enlarge it step by step; you need to squeeze it, making it longer and skinnier so it carries you away from the sun.

I think I understand now. Darpana smiled. Ill try explaining it to Lomash, and if I can make him believe me then Ill know Ive got the hang of it.

Heng closed the overlay and left her to commune with the Tragopan, her lips moving silently. It was a shame that her cousin couldnt have been on the same ship, but the two could still chat endlessly and compare their different views of this leg of the voyage. Heng couldnt understand how the girls parents could have left her behind in the first place, but theyd all be reunited soon enough. The ever-growing warrens of Cydonia Station would be a rich playground for an imaginative child, and if in adulthood she wanted to return to Earths wider horizons there'd be nothing stopping her.

His overseer buzzed a reminder: it was time to start checking the air scrubbers.

THE WEATHERS TURNING, Liana announced grimly. Theres still a chance that youll be able to ride it out to the mid-stage, but youd better start getting the passengers accustomed to the possibility of taking shelter early.

Heng stared at the delicate yellow lacework of coronal loops beside her on the overlay. Before theyd set out, the models had promised them a quiet journey with just enough solar activity to limit the incursion of cosmic rays. A healthy solar wind repelled a fair proportion of the high-velocity particles from interstellar sources, and the trade-off was usually worth it, with the suns own slower protons not too hard to block. But a coronal mass ejection could form shockwaves that accelerated the normally tolerable wind up to energies that would penetrate the ships hulls. If that happened, only metres of solid rock could protect them.

Whats the worst case? Le asked. His worried face faded into view beside Lianas as he spoke.

Two days warning, she replied. The models arent perfect, but theyve never failed to spot an impending CME once it was that close.

Heng listened as the other captains questioned her, seeking reassurances that she could not provide. Nobodys life was in danger; the next Stepping Stone would never be more than twenty hours away. But if the travellers were forced to accept the nearest sanctuary, theyd have no hope of reaching their scheduled mid-stage ride. At best theyd face a massively expensive extraction mission a fully powered ship launched from Mars orbit, if the families could afford it. If not, all the company itself could offer them was two years or more hunkering down in their shelter, until enough Stones could be brought into position to allow them to resume their journey, or to form an off-ramp taking them back to Earth.

When the conference ended, Heng was left staring at the grid of couches in front of him. There werent enough cubic metres of air in the Baza to dissipate the stench of his sweat. I have an announcement, he said, more loudly than hed intended, but no one showed any sign of having heard him. He gestured to shut off their overlays and cans, and the passengers shifted in surprise on their bunks.

Heng explained the forecast, and the possibilities ahead. The one sure thing is that we wont be taken by surprise, he stressed. The conditions on the sun are being monitored in real time by a dozen satellites, and the models can predict these mass ejections very reliably, days in advance. Whatever is coming our way, well know about it in plenty of time.

Chandrakant was indignant. In time for what? To imprison ourselves! Why didnt your astronomers see this coming before we left?

Im very sorry, Heng said. He doubted that it would help to start debating the reasons why the long-range forecasts couldnt be perfect. We still have a chance of reaching the mid-stage, but we need to be ready either way.

What kind of facilities do the other Stones have? Punita asked anxiously. What kind of food, what kind of space for us?

The interiors are all identical, Heng assured her. And theyre all stocked with supplies... He almost said to last for decades but thought better of it. For as long as we could possibly need.

But this is nothing for you, Chandrakant declared bitterly. Where else would you be? Its just life as normal.

His brother Aabid muttered something to him in Gujarati; Heng only knew Hindi but the tone sounded reproving. Aabid addressed Heng in English. This is nobodys fault. Every traveller faces these risks.

Its a shock, Heng said. But what can we do?

Well make the best of it, Rohini replied firmly. Hope for a reprieve, and make the best of what comes.

Heng finally dared to glance towards Darpana. She was ten years old; two years cooped up inside an asteroid would feel like a lifetime to her.

Would the whole convoy end up together? she asked. Or would it be some of us in one Stone, some in

another?

Heng said, There's a good chance we'd all be together. If the warning came as early as expected they wouldn't have to settle for the very next Stone on their itinerary, regardless of whether or not the rest of the convoy had already left it behind.

That's all right then, Darpana ruled amiably. On Mars we'd be underground most of the time anyway. She gripped the sides of her couch and turned her body around to face the window.

Heng watched the other passengers dialling down their angst. If this child wasn't going to shed a tear or throw a tantrum, it would be shameful for them to make a greater fuss themselves.

DO YOU HAVE a big family? Akhila asked Heng as she moved a piece across the backgammon board overlaid between them.

Just my parents, he replied. I can't afford to marry yet. Maybe after a couple more trips.

Akhila looked surprised. Perhaps she'd overestimated the portion of her fare that was ending up in his pocket. And then you'll settle back on Earth?

Yes. I'm not the pioneering type.

Ha! She gestured at their spartan surroundings.

This is a job, Heng replied. I don't mind a few small hardships for myself, so long as there's an end in sight.

In twenty years Cydonia will be more liveable than Shanghai, Akhila boasted, rather implausibly.

You can send me a postcard when it happens. He hesitated. So what's the attraction for you? Elbow room, or ideology?

She laughed softly. Both. Humanity needs a permanent settlement away from Earth, and though some people want to postpone that until our descendants are bitstreams with much lower shipping costs, I don't think we should pass up the chance we have right now.

But you'll have no relatives on Mars?

No, thank goodness. Akhila smiled. I come from a family of infuriating meddlers, who delight in being up to their elbows in each other's business. I love them all, but it's exhausting. On Mars, I'll finally have a chance to breathe.

Heng's cans chimed with an incoming call. Please excuse me. He turned to face the wall.

Liana appeared in front of him, and she wasted no time on pleasantries. There's a CME coming, she said. We expect the protons to hit you in about fifty-three hours.



Is it worth waiting for a later Stone? Xun asked. In terms of the eventual reconfiguration? Heng was impressed by her calm demeanour; he could feel his own jaw locked tight, his own thoughts still trapped in a bitter wail of resentment. Could they shorten their time in exile by a judicious choice of Stone, right now?

No, theres nothing to be gained by a delay, Liana replied. Were advising you all to dock with seventeen forty.

That was the very next Stone theyd encounter, scheduled to catch up with the convoys hindmost ship in about four hours. But the Baza was currently leading the pack, and as ever the first would be last.

When Heng made the announcement most of the passengers seemed resigned to their fate. Is there anything special we need to do to prepare? Punita asked.

Everyone needs to be suited in advance, he said. I know its awkward doing that weightless, but its even harder at a gee and a half.

Heng looked to Darpana. She was dutifully trying to appear solemn, but he could tell that she was excited by the news. They were fleeing for their lives from a surge of radiation but the race was fixed squarely in their favour, and it would soon reunite her with her beloved cousin. With all the thrill of the chase but no real danger, why shouldnt she revel in it?

He struggled to quell his own anger and disappointment, to be grateful for the prospect of safety and put the rest of their problems aside. Hed even ended up with a reasonably harmonious group of inmates to share his sentence in the rock; if this had happened on his last run it might have led to civil war.

Noor said, My parents went around the world twice on their honeymoon, but it looks like Ill be setting a new family record.

XUNS SHIP, THE Monal, was the first to dock with their heavenly Alcatraz. Harnessed to his bunk, Heng watched an overlay of telemetry from the ship as it locked onto the whirling cables and then applied its ion thrusters to end its tumbling relative to the rock. Before the cradle had been winched down from the asteroid to start bringing the passengers inside, the Lapwing had joined the Monal on the opposite spoke.

Heng was always nervous when he was approaching a crowded Stone, even if the satisfaction of having reached the mid-stage usually took the edge off it. The navigators had had plenty of time to determine the best spoke for each ship and tweak their precise moments of arrival accordingly, but there was no denying that the safety margins shrank each time another obstacle lodged itself between the cables.

The Snipe docked smoothly, followed by the Curlew. As Heng watched a schematic of the Stone spinning towards the Tragopan he found himself extrapolating the motion in his minds eye, picturing the inevitable meshing of ship and reserved parking space. The Bazas fit would be no tighter, with neighbours sixty degrees away on either side. In twenty minutes all the stress would be over; in

twenty more had be sitting around a table joking with his colleagues about their long internment and the challenges of remote sex with distant partners as the light-speed lag grew longer.

The schematic began blinking, and a list of mismatches between the docking plan and real-time sensor readings began scrolling across the margin. Les voice came over the link. Were not holding! The magnets have no, the magnets are holding. The cables come free, and theres rock with it. Weve torn off a piece of the asteroid.

Heng switched to a radar image of the Tragopan falling away from Alcatraz, a four-hundred-metre length of cable twirling lopsidedly around it. He couldnt tell if the cable had swiped the Curlew on its way into the void, but Doppler annotations on the image warned that all the remaining spokes were now swaying dangerously, pendulums set quivering by this seismic disruption.

Shen spoke from the Curlew. Were all right here. Swinging like a chandelier, but nothings broken. Xun?

The Stones maintaining pressure, she replied. One airlock is gone, but the bulkheads have sealed the breach. Le, whats your status?

Shutting down the magnets, Le replied tersely. Though both ship and cable were in free fall, the combined system had been rotating; severing the link would fling them apart, with no guarantee of a clean separation. Heng stared at the radar for a few tense seconds as Le fired his ion thrusters and managed to manoeuvre the Tragopan out of harms way.

Hengs attention snapped back to his own problems. The pair of cables that the Baza had been meant to grab were oscillating back and forth, and though the radar could track this motion and the navigator could model its gradual damping, the uncertainties were so great that if the ship tried to dock now there was no guarantee of completing the process safely. Heng absorbed the numbers and then issued the command himself before the navigator intervened and made the decision for him. Abort docking, he subvocalised.

He waited for confirmation that they were steering clear of Alcatraz, then he banished the overlay and pulled himself out of his harness. Weve had a change of plan, he announced. Well be docking at the next Stone instead. The passengers had trained for this scenario in Shanghai, so they all knew exactly what it would entail.

Why? Darpana demanded. You said wed be with everyone else!

The cables have developed a problem. Heng saw a flag in his peripheral vision; Darpana was requesting a passenger-to-passenger link with the Tragopan. He refused it. We have two hours, so you can de-suit for a bit if you want to.

Rohini was looking worried, but she turned to her granddaughter. Will you help me get out of this suit so I can wash? I want to feel fresh before Im stuck in it again for who knows how long.

Once Rohini and Darpana were in the ablutions room, Iqbal approached Heng. What happened,

exactly?

The Tragopan broke its mooring.

Was anyone hurt?

No.

So how do they get back to the Stone? Akhila asked.

They still have their ion thrusters. Heng couldn't meet her gaze.

But that will take forever, she said.

It will take days, Heng replied. They'll get back, but it's going to take days.

HENG TRIED TO push the fate of the Tragopan out of his mind and focus on his own responsibilities. The passengers had been assigned partners to check each other's suits, but he followed up with checks of his own. The suits were meant to be able to monitor their own integrity, but then, so were the Stones, and if the smallest leak could be perilous in a normal disembarkation, the harsher version they were about to attempt could turn any flaw into a fatality.

As they took their places in the bunks, he could see the grief in Rohini's posture and the confusion and resentment in Darpana's. Rohini had told Heng that she'd explain everything to her granddaughter once they were out of the Baza; until then, the other passengers were doing their best to conceal their own distress.

Heng caught sight of the fallback Stone, approaching at three times the usual speed. It was like being strapped to a bullet that had been aimed at the edge of a throwing star. The Baza was on a trajectory that would pass between the cables almost at their tips, so there was no margin for error: if they were half a metre further from their target than intended, the magnets would get no purchase and they'd pass on by, as doomed as the Tragopan. He watched an overlay of the navigator iteratively refining its model of the encounter as better radar measurements came in, and the ghostly blue error cone around the trajectory grew ever narrower. But the error that would kill them would be invisible: an undetected crack deep in the machinery that would announce itself only at the instant it became impossible to rectify.

The Stone's core shot out of view from the window beside the bunks, and the sun-side window on the adjoining wall was too heavily tinted to reveal anything meaningful. Heng held his breath and desperately willed his body to be crushed.

The four and a half gees slammed him down instantly: as the magnets grazed the cables' extremities they'd had no chance to ease the ship smoothly up to the full centrifugal weight. The Tragopan had torn free at a third of this load; what right did he have to expect the Baza to hold?

But it did.

Heng lay pinned to his couch, his ribs burning with the effort of each breath, the cabin turning around him. Gradually the ion thrusters killed the spin; the room stopped moving, and there was a satisfying thud as the docking magnets gripped the cables at two more points, doubling the strength of the Bazas hold.

There was nothing to do now but wait for the Stone to invite them in. Heng's status overlay showed the cradle inching its way down from the rock towards the ship. Strange bright points streaked across his vision, but he couldn't tell if it was his contacts or his retinas that were hallucinating fireworks under the strain. He wondered what kind of light show they'd see on the Tragopan, when solar protons boosted by the CME shock wave crashed through their vitreous humour and into their brains.

Heng felt his suit puff out around his forearms, the air it contained no longer opposed by the cabin's pressure. The Bazas hatch slid open, admitting a silver light reflected from the rock above that cycled between full-moon brightness and pitch black three times a minute. According to the overlay, the cradle was almost in place. Heng was half-tempted to send Darpana up first, to spare the girl any more time under the punishing gravity, but the protocols were clear: if anything was amiss up on the asteroid it couldn't be a passenger dealing with it, let alone a child. The captain had to be the first to leave the ship, however unchivalrous that seemed.

A chime sounded in his cans, and he focused on the flashing message in his overlay. The cradle was touching the Bazas hull, but it was misaligned by a few centimetres, stopping it from passing through the hatch. The fucking thing had an air jet to deal with that kind of problem; what did the Stone expect him to do? Not even Akhila could have climbed up and helped the cradle through the entrance. Heng squinted at the image his contacts were painting until the final line of text became clear. The air jet had been tried but it wasn't working; either the nozzle was blocked or a control wire had been severed.

Navigator, he subvocalised. Compute the thrust to reposition us ten centimetres along the y axis. They were hanging from the asteroid like a dead weight on a string, but they ought to be able to shift the equilibrium.

The force required was within the thrusters' capacity. Heng had it build up as slowly as he could bear, giving time for the cables to dissipate energy so he wouldn't set the Baza swinging.

After ten minutes, the cradle dropped down into the cabin and the winch positioned it next to Heng's bunk. His harness disconnected from the couch beneath him; the cradle locked onto it at the side and slid him over into the suspended sling.

He rode up in airless silence, unable to turn his gaze to the side to look across at the stars. All he could see was the rock straight above him, cycling through its ten-second days and nights: a lighthouse, a prison, a safe port for all the loneliness and grief to come.

WILL YOU TALK to her? Rohini pleaded. She trusts you.

Trusts me? Heng was confused. She can't believe you'd lie about something like this. He could hear Darpana's wailing, rising and falling like a song.

Not deliberately, Rohini replied. But you're the expert. If you explain to her why there's nothing we can do, she'll believe you. When I tell her the same, she just screams that I don't know what I'm talking about.

Heng gathered his courage and strode down the corridor.

The child had brought joy and innocence to the Baza, but now it was his duty to help her understand her cousin's fate. He knocked on the door of Darpana's cabin. She stopped her keening and he heard her spring up off the bed. When she slid the door open she did not look surprised; Rohini must have promised to send him to talk to her.

Why aren't we rescuing them? she demanded. Why aren't we going after them?

If we met up with them, how would that help? Heng asked gently. Our thrusters are no stronger than theirs.

Darpana stared at him contemptuously. We don't just have our thrusters! she replied. We have this whole Stone! We can throw the Baza in any direction at a hundred and fifty metres per second!

Yes, Heng agreed. So we could reach the Tragopan quickly, but what good is that if we can't match its speed? And if we did match its speed, we'd all be in the same boat. Darpana said, We don't match speed with the Stones, do we?

Heng rubbed his eyes; he was still giddy from all the changes in weight. We do, though: we match speed with the cables. She knew that perfectly well, but he couldn't blame her for saying or thinking anything as she sought some miraculous reprieve.

Heng had met Lomash briefly before the convoy set out from orbit, but now he tried to wipe the boy's smiling face from his mind. Le would haunt him; that was hard enough.

So we take some cable with us! Darpana retorted. And spin it as fast as we have to!

Heng stood with his arm resting on the door frame, squinting to try to see past the defects swimming through his eyeballs.

Taking cable with them would have sounded like nonsense a day ago, conjuring up an image of him packing a reel of it in the cabin and then trying to deploy it as the rendezvous approached. But the Tragopan had certainly taken cable with it when it ripped a whole double strand loose from Alcatraz. If they could find a safer way to mimic that feat, could they turn the Baza itself into a kind of impromptu Stepping Stone?

The ship wouldn't need to be crewed; it would merely have to cross paths with the Tragopan, carrying enough speed and spin for the Tragopan to effect the necessary U-turn and get back to Alcatraz. One of the four docked ships could be sent between the Stones to replace the Baza.

Let me think, he told Darpana. He turned and walked away. Heng contacted Liana first, privately. He did not want to give Le and the others false hope if the scheme proved impossible from the start.

You dont have the tools to slice through nanotube cables, Liana declared bluntly.

Are you certain? Heng wished hed queried the inventory first, but if the company didnt want him to have the means to hack a spoke off the Stone, the computer would have lied to him anyway. If this isnt the emergency that justifies some serious vandalism, what is?

Its not about damaging property, Liana replied. Your responsibility is to your own passengers. If you breach the integrity of your living space, youll just kill nine more people.

Youre right. Heng cut the link; he was wasting his time with her. The legal position would be crystal clear: the company could not endorse his plan, let alone facilitate it. And he had no right to endanger the Bazas passengers without their consent. Heng gathered everyone in the conference room, Darpana included, and explained precisely what he wanted to do. We dont have much time to make a decision, he said. If this goes wrong, it might damage the Stone badly enough to kill us. Or we might spring a leak and lose pressure, so wed have to live in suits until we can make repairs.

Or we might get away with it unharmed, Punita suggested. We might, Heng agreed. Alcatraz had survived its own amputation. But dont ask me for the odds.

He passed a sheet of paper around the table, with two columns to record the votes. Everyone would have the power of veto; he couldnt let a mere majority coerce anyone into risking their life. As Chandrakant accepted the ballot he looked up at Heng with an expression of pure loathing. Heng shifted his gaze and stared at the far wall; hed done nothing deliberately to alienate the man, but it was too late now to try to placate him.

Iqbal touched Hengs shoulder; the paper had only taken thirty seconds to come full circle. Heng accepted it and unfolded all the creases that people had made to hide their votes from the next recipient.

There were nine marks in the YES column.

HENG ORGANISED THE passengers into work teams, fetching trolley-loads of rubble from a cul-de-sac that the tunnelling machines hadnt fully cleaned out. Each courier weighed their contribution on a set of bathroom scales, and Darpana had the job of double-checking the readings and the running total.

The company had had the Stones automation disable the motorised winch for the cradle, so Heng and Akhila took turns operating it by hand. A purely mechanical regulator prevented it from unwinding uncontrollably, even as the weight it was bearing quadrupled, and Heng had offset the rope so that the combined centrifugal and Coriolis forces saw it drop squarely into the hatch below. The real effort went into hauling the empty cradle up again.

Safety regulations precluded any interference in the airlocks function, and it opened and closed its doors at the push of a button as always. As they delivered each load through the Bazas hatch spilling it by sheer force of impact, since the cradle was playing dumb Heng waited for the mounting tension in the cables to fracture the stone around him and send him tumbling out into the vacuum. Suitless for

the sake of efficiency, at least he'd have a mercifully quick death.

He had decided to postpone the call to Le until the launch was a fait accompli; he knew that if they spoke any sooner his friend would feel compelled to beg the Baza team not to take this risk. But in purely pragmatic terms an early warning would make no difference; the Tragopans navigator couldn't start plotting a rendezvous before the Baza had actually commenced its flight and its precise trajectory was known.

Akhila said, The cradles stuck. The loads not coming off.

Heng joined her at the winch. They strained together against the handle, and abruptly the drum began to move again.

When they'd wound up all four hundred metres of rope, Heng sprinted down the steps and opened the airlock. The cradle had been torn right off; there was nothing left but frayed strands of polymer.

They didn't have time to try to secure a more robust platform to the rope; they'd have to go ahead with exactly as much rock as they'd delivered.

Akhila caught up with him and took stock of the situation. I'll go down and finish things off, she said.

No. I need you up here, to haul me back.

Akhila shook her head. People can work the winch two at a time, even three at a time. If we lose you, we wouldn't last a month in this place.

Heng's skin prickled with shame. He'd seen her vitals log from the docking. There was no doubt that her heart was stronger than his, and her cerebral blood flow would be less compromised by the punishing weight at the rope's end.

I can't let you do it, he said.

I'm terrified enough as it is, she replied. Don't make it any harder.

Heng's shame deepened, but the source had shifted. What mattered to him more: emerging from this disaster with his pride intact, or giving the survivors the best chance he could? He was not indispensable, but he couldn't deny that his absence would make their long exile more dangerous.

All right, he said.

HENG SAT IN the conference room, looking through Akhila's eyes while Iqbal, Chandrakant and Aabid fought her growing weight. The winch's regulator alone would have kept her from falling freely, but her arrival at the Baza would have been fatally abrupt if no other force had slowed her descent.

Akhila was staring straight down from her improvised sling. As the sky reeled past behind the ship's silhouette, her helmet's face plate sent the same rainbow sliver of refracted colours flickering across her vision before it tinted in response to the sunlight, three times a minute. The company had disabled

the utility robots that could have done the job in her place, ensuring that if this folly led to deaths they could not be treated as accomplices.

Are you all right? Heng asked.

Im glad I havent eaten for a while, she replied. If you want to close your eyes until you reach the Baza

No, I want to see where Im going. If I close my eyes Ill feel like Im being lowered down a well.

As her weight approached three gees, Heng saw the sky shudder: the rope had slipped a few centimetres, then been caught. He brought up an inset of all the winch operators vitals. Iqbals heart rate had risen dangerously high, and his breathing was laboured.

Punita? You need to relieve Iqbal. Heng spoke on an open channel to everyone, in the hope of precluding any arguments. Iqbal did not dispute the call.

When the Baza filled the view Akhilas helmet lamp came on, its steady beam drowning out the rise and fall of asteroid-light. Heng gazed down through the hatch. He could see the rubble piled up below, and a hint of white that must have been the broken cradle.

As Akhila drew level with the hatch, Heng called Stop! to the winch team. Her orientation had looked perfect as shed approached, so if her right arm was still resting at the edge of the sling, the lever that would close the hatch ought to be well within her reach.

Akhila?

Im ready, she subvocalised, wasting no breath on speech.

Are you clowns ready to get me clear?

Chandrakant replied, Absolutely.

Heng called out the cues theyd agreed on. One. Two. Lever. Three. Four. Raise.

His viewpoint jerked upwards as the door slid shut, centimetres below Akhilas face. Well done. He could feel his own heart thumping now.

The welding laser tucked under Akhilas left arm couldnt burn through the nanotube cable, but it could certainly raise its temperature. She managed to turn her head to face the cable, switch the laser on at its lowest power, and then nudge the beam back and forth until a small red spot could be seen shimmering on the cable four metres away.

With the Stones computing resources out of bounds, Heng had modelled everything on Darpanas wristwatch. He raised the device from the table beside him and counted down to the moment when the predicted time lag to release would see the Baza move off on a course that the Tragopan could intercept. Three. Two. One.



The laser spot became dazzling for a moment, then Akhilas faceplate darkened to tame it. Heng glanced down at the wristwatch and it streamed an animation to his contacts, showing the modelled temperature profile of the cable and the attached magnets. The magnets could function well above room temperature, so they had no special cooling system, but their superconductors transition temperature was not hard to reach. As a patch of the false colour image shifted from blue to green, Akhilas bright target vanished and Heng heard a high-pitched whine from the rock around him.

The Baza had lost its grip on one half of the spoke to which it had docked but the two pieces formed a continuous length of cable, looped through a U-shaped tunnel in the Stone. Unbalanced, and bearing more weight than it had ever been intended to hold, the cable was unthreading, the unburdened end rushing up towards the rock while the Baza dragged the other end farther away, increasing its centrifugal weight even more.

The noise of the cable scraping through the rock stopped abruptly. The Baza would be falling free now, with luck still attached to the cable. The timing looked good: within half a second of the models prediction. The trajectory would lie within the Tragopans reach. Le and his passengers would have a second chance of reaching shelter.

Heng called out triumphantly, We did it! Exuberant cheers came back from the winch team, from Iqbal and Noor, from Rohini and Darpana. Akhila was silent, but shed be saving her breath for the celebrations when she returned.

Heng looked through her eyes again as he prepared his words of thanks. He saw the stars and then he saw the Stone, its spokes glinting in the sunlight as it receded into the distance.