



THE
GIRL

WHO
BROKE

THE
SEA

A. CONNORS

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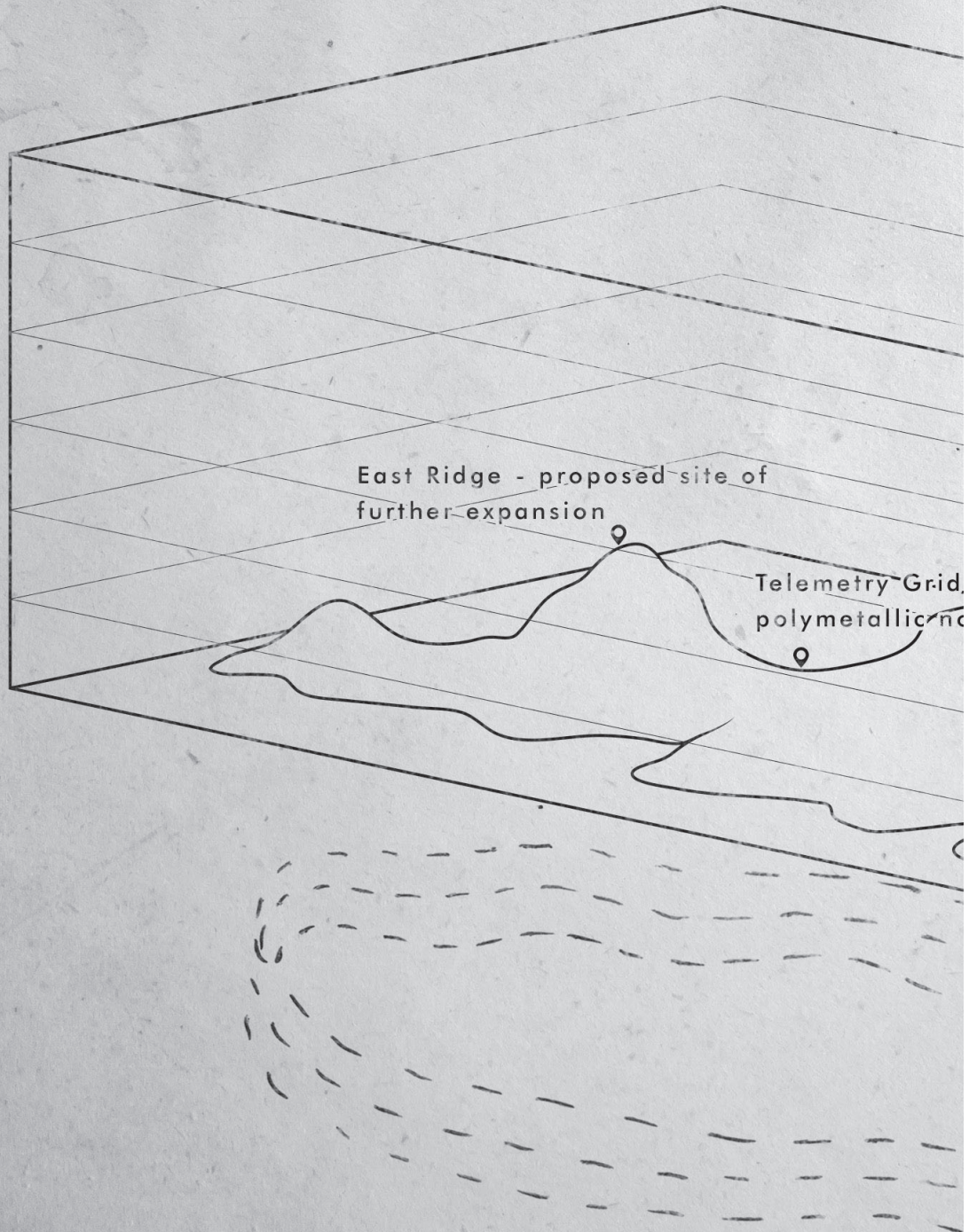


*For Meg, Gilbert and Evan...
No one I'd rather be stuck at the bottom of the ocean with.*





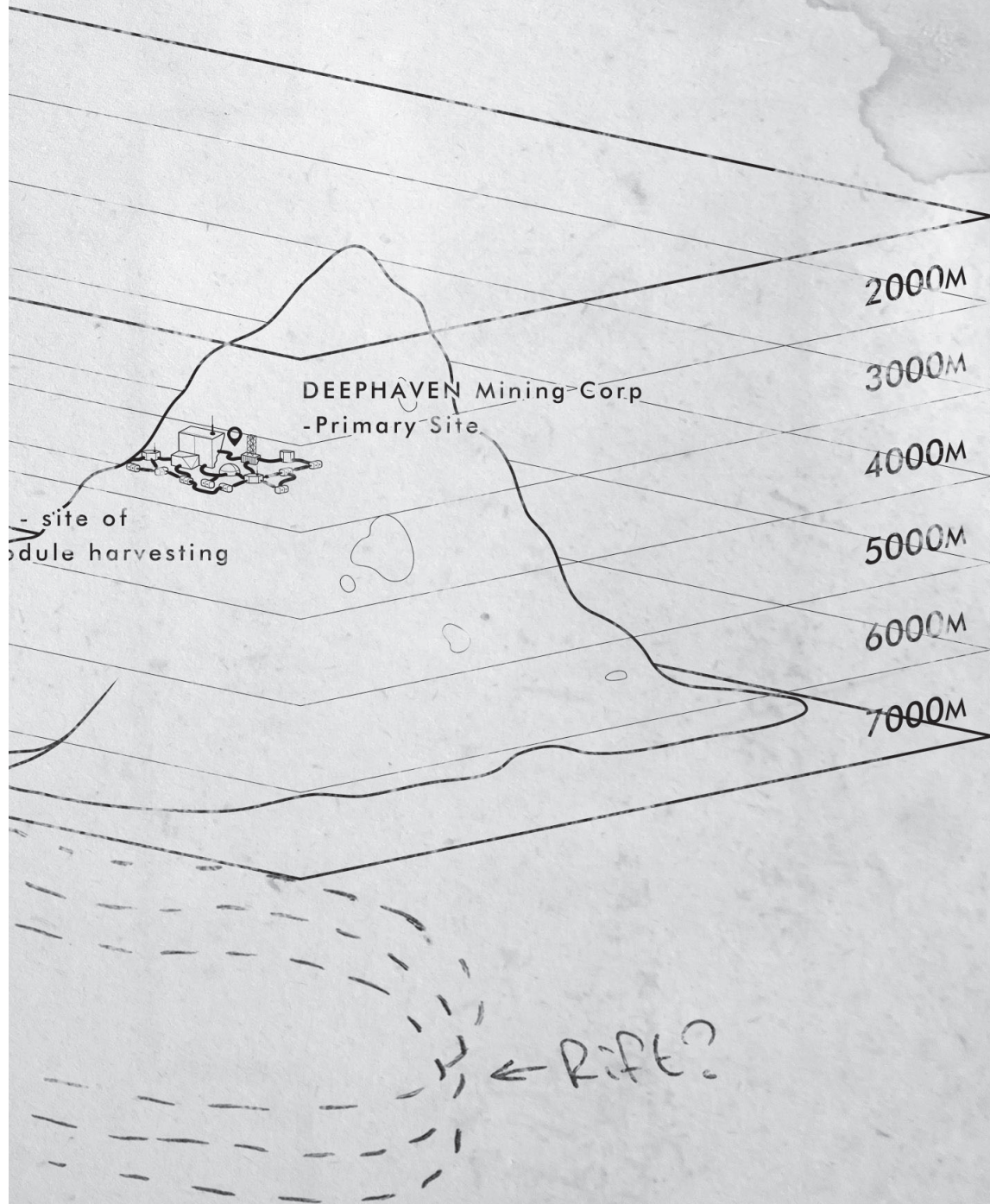
DEEPHAVEN ADVANCED DESIGN





DEEP WATER MINING FACILITY

FAO Dr. Ruth Fawcett







CHAPTER 1



LILY FAWCETT: DEEPHAVEN PERSONAL LOG DAY 1



They say you'll never cross the ocean until you have the courage to lose sight of the shore. I was fine when we lost sight of the shore.

It's losing sight of the surface that bothers me.

Ch-cluunk! Claank—

“Mum?”

Ch—ch—ch—ch—ggrrrr—

“Mum, I changed my mind. I don't want to go.”

Chraank—!

“I want to stay topside with Dad. I don't even *like* the sea.”





Mum leaned over from where she was strapped into her seat and squeezed my hand. Outside, the articulated crane arm reached forward like a massive, yellow, steel wading bird and lowered our submersible on to the surface of the ocean. It had looked gentle in the training video, but in reality there was a jolt as sharp as a car crash, and my jaw snapped shut. I blinked in surprise, tears of shock rushing to my eyes.

Mum drew a nervous lungful of air and let it out in a shaky breath. “A fresh start, right, Lily?”

A fresh start on a mining rig five kilometres under the ocean? A fresh start four and a half thousand kilometres, two boats and a helicopter ride from the nearest landmass? That’s not a fresh start, I thought. That’s desperation.

I twisted in my seat, trying to make myself more comfortable. The straps were designed for someone taller than me, and they chafed against my neck. I watched through the porthole as our logistics ship uncoupled and moved away. Our sub rocked in its wake, the sea rising and falling around us. I felt like a flea riding on the back of an enormous animal, its great grey hide rippling as it walked.

Fifteen people floating in a tin can in the middle of the Pacific. The newest rotation of engineers and scientists on their way to Deephaven for a six-month shift. We didn’t know any of them, and yet we’d signed up to live with them at the bottom of the ocean. *What were we thinking? Had things really been that bad? Was this really our best*



option? I looked across at Mum, her face pale and set in concentration.

Suddenly, a beeping noise ripped through the cabin, so loud and shrill it made my teeth rattle. The rest of the crew started bracing themselves, checking and tightening their straps in a businesslike way. The thrusters roared, vibrating through the hull and my seat.

“What was that?” I breathed in the silence that followed.

Mum looked straight ahead, her jaw fixed. “I think we’re getting ready to drop.”

I took a deep breath and tried to settle the cage full of monkeys in my chest. Yes, I’d agreed to this. Yes, I’d promised Mum I was up for this. *But what had I been thinking?* I couldn’t do it. This was a mistake. A terrible mistake. I was going to mess up, just like I always did, and it was going to be worse than ever this time.

I missed Dad. I closed my eyes and tried to imagine him. His big, soft engineer’s hands, his long fingers. *Chill out, Lilypad*, he’d say.

Mum’s hand closed more tightly around my own, clammy with fear.

“Mum?” I said, turning to her.

“Yes?”

There was a hopeful look in her eyes, like she thought I was going to say something brave and reassuring, something that would let her know I was going to be OK down there after all. I swallowed. I wanted to make her





happy. I wanted this to be the fresh start she desperately needed it to be. But a cold, dangerous feeling had risen in my throat.

“Mum, I feel sick—”

Then, several things happened at once. Outside, eight sets of vertical thrusters burst into life, pushing our submersible downwards in a great *whoosh* of grinding seawater, while inside, the sub became weightless, and in that exact same moment, I threw up.





CHAPTER 2

“Welcome to Deephaven!” Ari swept his arm proudly around the dingy sub bay like an overenthusiastic (and delusional) estate agent. “Two hundred and fifty thousand tonnes of steel, thirty-one kilometres of mechanical piping, four thousand two hundred and twenty-six light bulbs, eleven kilometres of handrails...”

And a Chief Operations Officer who’s clearly been down here too long, I thought.

Ari Sigurðsson was a mammoth of a man. Six foot four at least, he looked like he was made from the same toughened steel as the rig. He’d introduced himself as we stepped off the sub, shaking my hand so vigorously I wondered if there was a piece of chewing gum stuck to my



sleeve that he was trying to shake loose. His copper hair was shaved short, and his florid bronze beard looked like it had exploded from the bottom of his face. He smiled a lot: a bright, optimistic smile.

“We are the world’s first truly sustainable and fully carbon-neutral mining operation,” he continued, gesturing so expansively I was afraid somebody was going to get clobbered. “A unique collaboration of science and industry. A *community* dedicated to understanding the ocean depths while helping to meet the world’s energy needs.”

He led the way, stopping every so often to drop in another technical detail or snippet of information. “Always keep hands, fingers, feet and other appendages clear of pinch points and hinges.” And we trailed after him – me, Mum, and one other family – clanging and clambering through the claustrophobic corridors.

This was our safety briefing apparently. We’d been travelling for eleven hours straight, two of them in a tiny submersible filled with the smell of my sick. I needed a shower and sleep, but regulations stated that we had to go through our safety briefing before anything else.

“Deephaven clings, limpet-like, to the side of the valley in the middle of the Clarion-Clipperton Fracture Zone,” Ari intoned with obvious relish. “Nothing but three thousand and forty-seven toughened steel bolts between us and the fathomless depths of the northern trenches.”



I could feel Mum's eyes on me, gauging my reaction, waiting for me to freak out. None of this was news to us. We'd spent the past six weeks at the training centre in Newfoundland preparing for exactly this, but it was different now that we were actually here.

There was a damp, salty seaweed taste in the air, mixed in with sweat and engine oil and the school-canteen odour of stale vegetables. Everything was hard steel or moulded plastic with sharp, unfinished edges. The floor was a metal grille that rattled when you walked on it. The corridors were slightly too narrow for two people to stand side-by-side, and thick pipes and electrical cables snaked around every corner, perfect for tripping over or banging shins against.

A trembling, tearful feeling quivered at the back of my throat. *This is a mistake*, my brain muttered. I wasn't good with tight spaces, or bad smells, or loud noises, and this place had all of them. *Who were we kidding?* Mum and I weren't world's-first-deep-sea-mining-rig people. Nine weeks ago I'd been a middling student at the world's most ordinary secondary school in Hertfordshire, and now this!

"Twenty-three habitation units – hab units, for short – are connected to the main rig via three and a half kilometres of nanotube polycarbonate polytunnel," Ari prattled on. "The main rig has six floors: Command Centre, Sub Bay, Recreation, Catering, Services and





Engineering. And the hab units house our other key functions: Operations, Reactor Room, Battery Units, Education, Science and Accommodation.”

Ari paused his recital and gazed at a row of domed portholes. They looked out on to nothing but silty nothingness, illuminated by the harsh white glare of the rig’s external floodlights. “You’ll like this,” he said, flashing me a smile and beckoning cheerily for us to gather around him. “Self-healing aluminosilicate windows,” he declared. “State-of-the-art, designed by our very own in-house science team.”

He took an oversized tool, an adjustable spanner of some kind, from one of his many flight suit pockets and gave the porthole a series of swift, enthusiastic whacks.

The *clangs* reverberated around the walls, and I heard Mum let out a short gasp of horror.

“See? Not even a scratch,” Ari said. “I can put a crack in it if you like, show you how well it seals itself?”

“No—” Mum said quickly. She took a breath and continued more calmly. “No, that’s fine, thank you.”

The problem with being at the bottom of the ocean (besides the cold and perpetual dark) is the pressure, or so they told us at the training centre. Water is heavy. Sitting at the bottom of the ocean is like asking somebody to build a skyscraper on top of you. At this depth, the column of water above our heads weighed roughly five thousand tonnes, enough to turn us all into clam chowder in a



nanosecond if the hull was breached or, say, a porthole gave way.

“Four hundred and seventy-two Cardinal Robotic Automated Bionics – CRABs, for short – collect polymetallic nodules from the valley below us,” Ari continued, jostling us down yet another corridor. “We produce four tonnes a day of nickel, two tonnes of cobalt, copper, molybdenum, and a good whack of lithium and yttrium to boot. We have ninety-six rig personnel, forty-five science and technical team and eleven children.”

I glanced around at our fellow newbies: Mike and Janice Rutherford and their son, Jacob. Most of the people on the sub had been returning from shore leave, so it was just the five of us on the safety tour.

The Rutherfords look like world's-first-deep-sea-mining-rig people, I thought. Mike had aviator-style, wire-rimmed glasses and a Leatherman strapped to his waist. He didn't talk much; he was too busy taking notes, devoutly transcribing everything Ari said in a way that made me think I really ought to be paying more attention. Janice was wiry and serious looking, her face etched with a perpetual frown. She was probably a very nice person, I told myself, except that she'd caught the brunt of my zero-gravity vomit in the sub, so now she just kept sniffing her damp hair and glaring resentfully at me.

I fell into step with Jacob as we shuffled through the





pressure door. He looked about my age, sixteen, maybe a year or two younger.

“Hey. Do you think he counted the bolts himself?” I asked.

Jacob blinked at me. “Huh?”

“The bolts,” I tried again. “Ari said there were three thousand and forty-seven of them. And four thousand two hundred and twenty-six light bulbs. Do you think he...” I trailed off.

Jacob regarded me with a look that was somewhere between blind panic and pity. “I’m sorry, I don’t—”

“Never mind,” I said.

Mum had warned me that Deephaven attracts a particular kind of person: smart, serious, ambitious types. Although she never said it directly, I was sure part of her reason for wanting me to come here was the idea that some of it might rub off on me. But I hadn’t expected the profile to apply to the kids as well. Next to my scrawny, shabby and fidgety self, Jacob was all sun-scorched cheeks, broad shoulders, and a smile that you could use to sell Rice Krispies. He had a stiff, overly grown-up manner about him, and it felt like only a matter of time before he got his own Leatherman and notepad.

Ari swung through the bulkhead door like a gorilla performing a circus trick and the rest of us clambered after him. It was impressive how he manoeuvred himself through the narrow corridors. I was about the size of his



left leg, but somehow, every time I tried to get through the metal pressure doors, I cracked either my forehead or my shin, and sometimes both at once. I was squeezing through a particularly tight spot when I got the pocket of my flight suit snagged on a power box clasp. I tugged, but found that I was caught, twisted at an awkward angle with one leg either side of the bulkhead and the material of my flight suit stretched tight.

“Um, Ari?” I called. “A little help, please?”

Ari bounded over and unhooked me. “Nothing to worry about,” he said warmly. “Done that a few times myself if I’m honest.”

I looked up to find Mum watching me anxiously and Mike glaring at me. For a second I saw myself through his eyes: a “troubled teenager” with ratty hair and an attitude problem, black eyeliner and bitten fingernails. A girl who shouldn’t be here.

I couldn’t agree more, I thought.

“Onwards!” cried Ari.

He paused at the narrow part of the corridor where the steel of the main rig was bolted on to a long black tube lit by two strips of light along the top. I could just see the brighter far end as it opened out into one of the other hab units.

“The hab units are connected via nanotube polycarbonate, another in-house speciality from our science team,” Ari said while Mike scribbled more notes.





“Would you believe, just a four-centimetre shell made of this highly experimental and largely untested material is sufficient to hold back the immense force of the ocean?”

Four centimetres ... highly experimental ... untested...? My stomach heaved. “Um, excuse me, Ari,” I said. “What happens if one of the polytunnels gets a crack? Are they self-healing, like the portholes?”

Ari nodded reassuringly. “Actually ... no,” he said, seeming a little deflated. “But you’re not the first to ask that, young lady.” He slapped the heavy steel bulkhead. “Rest assured, these pressure doors will automatically slam shut the instant they detect flooding.”

Slam shut? Like a coffin lid? I shivered.

“But what happens if you’re *in* a polytunnel when that happens?” I persisted. “If the doors shut, doesn’t that mean you’re trapped?”

Ari didn’t have an answer for that one; his mouth opened and closed thoughtfully. The group shuffled. Mum let out a faint sigh.

“You’re not to worry about that sort of thing,” Ari said at last, giving his beard a nervous rub. “I’m sure our technicians have thought of all that stuff. Let’s head down to the canteen, shall we?” He flashed his searchlight of a smile in my direction. “If we’re lucky, catering might have left a little surprise for us.”

He turned and swung through the pressure door. We followed him down a long polytunnel that opened briefly



into one of the hab units before passing into another section. I was finding it difficult to concentrate on what he was saying; I kept thinking about all those kilometres of ocean pressing down on us, trying its best to crush us.

Mum touched my shoulder, whispering: “Everything OK?”

She adjusted a stray strand of my hair which was turning frizzy in the damp, salty air. Her face was tight, her own hair matted against her scalp with sweat. I could tell she was making an effort, trying to make everything OK because she wanted *me* to be OK. But it was hard because she was so obviously not OK herself.

“Our fusion reactor develops one point two megawatts of power and uses a plasma containment grid in the twenty megatesla range,” Ari said, adding pointedly, “the Emergency Reactor Scram buttons are your friends.”

He slapped the wall, nerve-wrackingly close to a large red button that was mounted there. It was behind a Perspex panel, like something you’d see in a bad sci-fi movie, and beneath it an embossed sign read:

**EMERGENCY REACTOR SCRAM — ERS
DO NOT PUSH THIS BUTTON EXCEPT
IN EXTREME EMERGENCY.**

I glanced at Mum and then looked meaningfully at the ERS, hoping to coax a smile from her. It was funny, wasn’t



it? A big red button with a sign underneath saying *do not push this button*. They'd told us about these so many times in Newfoundland it had become a bit of a running joke between us. But I should have known Mum wouldn't be in the mood right now. Her face stiffened, and she gave a short, sharp shake of her head to warn me off.

OK, I deserved that one. I could be an idiot sometimes. My being an idiot was part of the reason we were here, actually, so it wasn't unreasonable for Mum to worry about how it was all going to work out. I'd messed up pretty badly at home, lots of times in fact, but one time in particular. If following Mum to this new job, to her *fresh start*, as she put it, and not screwing up was the best way to make it up to her, then so be it.

“In the unlikely event of a containment field collapse, the untethered magnetic flux will try to rip us out of the ground like a daisy,” Ari said, a little too enthusiastically for my taste. “The ERS buttons provide our last opportunity to eject the plasma core before that happens.”

I shuddered. They'd told us about the ERS buttons in training, but they'd been careful to avoid graphic turns of phrase like *rip* and *daisy*. I reached out for balance and let my hand rest against the uncompromising metal hull. The steel was cold to the touch, wet with condensation, indifferent. It was practically *designed* for someone to pound their fists hopelessly against it as the water level rose around them. A slight vibration (the fusion reactor, I presumed),



trembled inside the metal, as if the whole rig was holding itself tensely, waiting for something to happen.

“Why the signs?” I asked.

Ari scratched his beard in a way that looked like frustration. “Well, it’s an expensive thing, dumping the plasma core,” he said. “Not everyone could agree on how ... well ... *pressable* they wanted the buttons to be.” He flashed me a wink and I forced a smile in response. “So? What do you think of your new home, young lady?”

Mum gave me a panicky look. *Be nice*, her eyes pleaded. Ari’s face blazed with renewed optimism.

What was I supposed to say? The tight dampness of the rig crawled over my skin. The jangling noise of the place vibrated in my bones. When Mum had first told me she was considering a job on an experimental, first-of-its-kind rig, I’d naively assumed it would be slick and high-tech. In reality, it had a bolted-together, homemade feel, as if somebody had built it as they went along, adding hab units and new wiring as it became necessary. It had only been operational for ten years (still new by experimental deep-sea-rig standards), but the action of the sea had aged it prematurely, turning every corner and cranny a kind of cancerous brown, forming livid stains at the connection points between pipes and bulkheads.

“It’s, um... It’s a bit cramped,” I said truthfully.

Ari’s face didn’t change – he still beamed at me – but it



was like someone had popped a valve inside his head and let the positivity drain out.

“Well – er... Well, yes, it is a little, I suppose...” Ari gave his beard a reassuring rub, like he was comforting a nervous pet. Then he brightened: “But it’s cosy, right? And it’s home! Come on. Canteen’s this way.”

Mum bristled as we padded through another polytunnel, the smooth polycarbonate flexing worryingly beneath us. This was more than just a *fresh start* for her, it was the *opportunity of a lifetime*. The kind of fantasy job she wouldn’t even have considered if Dad hadn’t moved out and I hadn’t been kicked out of school. The pressure not to screw up was high.

We popped back out into the main rig on the opposite side, where the metal flooring clanged and rattled like a steel band.

Three of Ari’s ops team (distinctive in their grey flight suits and blue hard hats) bustled down the corridor in the opposite direction, squeezing past us with a practised shimmy and a nod to Ari. Two men and one woman. They hammered past so quickly they made the pipes on the walls shudder.

The corridor opened out into a larger space filled with long tables and velour seating, big enough for thirty or forty people to hang out in. Another row of domed portholes studded the far wall, but I could see nothing through them except more silty greyness. The ceiling was



low, the colour of old newspapers. There was a self-service food counter on the left, and a row of ancient-looking arcade machines on the right.

Looking around, I was struck by how weird it was that we should find ourselves in this place: on the one hand, we were utterly alone, surrounded on all sides by nothing but rocks and a mountain of water that wanted to kill us; on the other hand, it looked like we'd just stopped off at a motorway service station on the M40.

“Here we are!” Ari exclaimed joyfully. “Cupcakes!”

