

The Joy of Fishes

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Dedication

To Dr. Mark D. Lupton (1946–2012).
I hope he would have been proud.

*if you can read cracks,
like in a tortoise shell, they'll tell you
to make a fast choice:*

*I'll tell you how much
you're worth, or I'll tell you where
you're going, but I can't*

do both

—Sebastian Bitticks, from “Still Life With Heisenberg”
Tianjin, Summer 2005

*When they came to Bethlehem, the women said to them, “Is
this Naomi?”*

*And Naomi said to them, “Do not call me Naomi, call me
Mara, for God has made things very bitter for me.”*

—Ruth 1:19–20

Chapter 1

When she opened her eyes, Mara was standing in the middle of a vacant lot, her back to the street. There were tall concrete and brick buildings on either side of her; the surface of the lot was covered with scrubby grass and broken bottles. A brick wall ran along the back edge of the space, its red surface tantalizingly devoid of graffiti that might have revealed where she was. China? Back home in Chicago? The air smelled like car exhaust, but underneath there was something familiar, like—

Like the ocean. She frowned, her gaze falling on a well in the far corner of the lot. It was a round circle of bricks that stuck up a foot or so above the ground, with a little pointed roof at the top of four poles, which gave the whole business a strange fairytale look despite being made from sheet metal.

As her eyes fell on it, the noises from behind her ceased; the cars stopped, the unseen birds fluttered away, and the chirping frogs broke off their calls. In their place was just blank white noise, like a radio tuned between stations, like she was suddenly in a bubble. She took a step toward the well, then another.

The bricks were rough and worn, and the wooden poles holding up the roof were weathered to a light brown, the grain prominent. Mara could see the sea at the bottom of the well. *It was a long way down*, she thought, then she tripped on the edge and fell in. The brick scraped her shins. She scabbled at the wall and screamed as her nails ripped, but gravity had taken charge, and there was nothing to be done. She gave herself over to the fall.

The well was straight for a while, and dark. She felt like she'd fall forever, the wind whistling past her face. Then the walls began

to open out like an Erlenmeyer flask, and there was more light. She managed to roll over in the air so she could see the retreating mouth of the well glowing in the night sky like the moon.

She landed on her back on the beach and lay for a while looking up at the moon, panting. The landing had hurt, but not as badly as she'd expected it to. Perhaps the night breeze had slowed her fall.

She could hear the sea and smell it in the air.

Gradually her heart rate settled down, and her ribs ceased their aching. When she sat up, she saw six people, wading into the sea, chanting in a language that sounded something like Japanese, something like Chinese, and something like neither. The stretch of beach looked barren and familiar. Mara got to her feet, looking around; the only light was the light of the moon, but it cast an eerie glow on the water and sand.

When she turned around, Zhu was standing there, water dripping off his hair. His eyes were shadowed and dark, his face set in a scowl she had seen only a few times. There was a gash on his forehead, and the blood shone black in the moonlight.

Mara took a step back. Zhu grabbed her wrist.

She woke up, biting her lip to keep from screaming.

According to the bedside clock, it was four in the morning and dark in the room. When she sat up and pushed the blankets off, the cool air made her shiver; the nightmare had left her pajamas soaked with sweat, but it was better to get up than to go back to sleep. Last time she'd tried that, the nightmare that had followed had made her scream loud enough to wake David in the next room.

Her face stung; she pressed a knuckle to her mouth. It came away dark and slippery. Her lip was bleeding, though not a lot.

At least she'd gotten *some* sleep. This way she wasn't an insomniac, just a habitually early riser.

She found her blue robe without turning on the light and shuffled out into the living room. The fish tank cast an eerie blue pallor over the sofa and the coffee table, making the kitchen seem darker by comparison. The streetlights outside painted the carpet a sickly orange, but the streets were silent in testament to the hour. Had the

window been open, she would have been able to hear the distant rattle of the “L” as it left the Jarvis Street station.

Mara filled the tea kettle and turned on the light above the kitchen table. The most recent issue of *Physics Today* was on the table, awaiting her perusal. After the water had boiled, she took her mug over to the table and sat down, opening the journal to an article about women in science so absurd that, had Zhu been alive, she would've left notes in the margins for him.

Three hours later, she opened her eyes to the sound of David's alarm clock going off for the third time, her head spinning and stuffed with noodles, neck aching from sleeping on the table. This time, there had been no dreams.

Chapter 2

Zhuangzi and Huizi were out walking one day when they stopped on the Hao Bridge. Zhuangzi looked down into the water and said, “The small fish wander about so happily. That is the joy of the fishes.”

Huizi said, “Master, you aren’t a fish, so how do you know the fish are happy?”

Zhuangzi said, “You are not me, so how do you know that I don’t know that the fish are happy?”

Huizi said, “I’m not you. I assuredly don’t know you. But you are not a fish, so how could you know that the fish are happy?”

Zhuangzi said, “Let’s return to the beginning. You said, ‘How do you know the fish are happy?’ When you said that, you already knew that I knew, so you asked me. And I know because I am standing on the Hao Bridge.”

Chapter 3

“Stop me if you’ve heard this one.”

The sky outside was a breathless, clear, vivid blue, and Mara couldn’t turn away from the window. In the park below, a man was working slowly through a tai chi form, moving silently and effortlessly from pose to pose. Beyond, at the edge of her vision, the sunlight sparkled on the lake.

“I said, stop me if you’ve heard this one.”

People were jogging through the park or biking, solo, in pairs, with dogs. Another man joined the first, and they began a new form. A woman drifted up, another man. Five people all moving in unison, like daffodils in the breeze.

“I’ve heard this one,” she murmured. It seemed to take a long time from the time she thought the words to the time she said them.

“That’s not fair. It’s new.”

If she strained, she could imagine that was Alex leading the forms, but her eyes felt gritty and tired. It could have been any black-haired man.

“Your coffee is going to get cold if you continue sitting there.” David sounded bitter, and she made an effort to focus.

Mara lifted the mug to her lips. “It’s tea,” she said, making a face. It had gone cold. And it was her second cup of the day, not that she was going to mention that. He’d only ask how long she had been awake.

David made a face. “Dried leaves in boiled water. I can see the appeal when your expressions look like *that*.”

“Yes.” She smelled the tepid liquid, closing her eyes in concentration. It smelled faintly of grass. “Would you like some? I

got this one at a little import store down in Chinatown, but I think it's from Indonesia, not China. "

"Could we *not* discuss the finer points of tea making at this hour?"

Mara shrugged and got up to put her mug in the microwave. It was a thick clay vessel with a shiny olive green glaze. David had once said it looked like something someone's mother had made in pottery class.

"So, what's this joke?" she asked, leaning against the refrigerator and watching the cup rotate on the turntable. She could picture the radiation bouncing around, hitting the glaze, the walls, the handle, the molecules of water.

"Joke?"

"You said—"

"Oh yes." David paused to take a bite of his oatmeal, chewing it thoughtfully, although it was already mush and didn't require mastication. "So a dog walks into a post office, all right?"

"I *have* heard this one before."

"Be fair," he said, reproach plain in his dark eyes.

"All right, all right." The microwave beeped, and she took the tea out.

"The dog walks into the post office. He picks up a telegram blank and writes, 'Woof woof woof woof woof woof woof woof.' This completed, he brings the form over to the clerk, who looks at it and says, 'You know, there are only nine words here. You could add another woof for the same price.' And the dog says, 'But that would make no sense at all.'" He grinned and made a hand motion that seemed to indicate "ba-dum-bum." It looked more like he was peeling an invisible banana. What the effect was supposed to be, Mara wasn't sure.

She was silent too long, and his face fell. "You don't like it?"

"No, it's very funny." Mara tried to smile. "It *is* supposed to be like that, right?"

David's crooked mouth quirked up at the corner. "It's supposed to be like that."

Mara nodded thoughtfully. "It's very postmodern. Abstract. It reflects the essential hopelessness of life in a world without meaningful choices, right?"

He glanced at his watch, then got up to get another cup of coffee.

Mara added, "Perhaps now is not the moment to quit your day job." She scooped a teaspoon of sugar into the tea in her cup and watched the steam curl out in silent parabolas.

He made a face. "Always the critic."

Mara smiled slightly into her cup. Her face reflected in the dark liquid, dark hair in disarray falling into wide eyes.

"You look tired," David said, sitting back down at the table. "Did you sleep last night?"

"Some." She sat down next to him in the seat by the window. "Enough."

His eyes were red-brown and searching in the morning sun. "What time did you get up?"

"Four."

David was still eying her. "Have you ever considered seeing a doctor?"

"Another one?"

"For your insomnia. I mean, you get, what, four—"

"Five."

"Five hours of sleep a night. That's not normal."

Mara's lips tightened. "It's enough. I'm fine; I'm just busy."

"What with?"

"Grading. Research." She looked down, unwilling to continue the conversation. The table had a lovely strong grain, the wood almost red in the sunlight. Zhu had picked it out at that thrift store when it was still covered with paint and grime. He'd stripped all that off like in one of those dumb do-it-yourself TV shows and, suddenly, there was a nice table in their little hole of an apartment, one of the only good-looking pieces of furniture they owned.

After the accident, she'd moved it to David's apartment in Rogers Park, which was less of a hole and had more nice furniture, because he had an actual job instead of working part time at a bookstore. The table was less distinguished in its new home, but no less useful.

David sighed, but there wasn't anything he could do. He couldn't make those kinds of demands of her; he was just a roommate, not a boyfriend, not even a friend of hers, just an old friend of her brother who'd had a room to rent.

It was nice that he worried. Just not necessary.

“How’s your research going?” he asked at length, taking one of the grapefruit that rose like small suns above the rim of the blue ceramic bowl in the center of the table.

Mara finished her tea and got up to rinse out her mug. “Not so bad. I’ve been getting some interesting data in my simulations, and we’re possibly heading out to Fermilab in a couple of weeks to run some more tests, so—”

“Sounds fun,” David said. He picked up a knife and began to peel the grapefruit like an orange, inserting the blade between skin and fruit.

“I guess you’d call it fun.” Mara frowned.

“That bad?”

“It’s not *bad* exactly,” she said. She set the mug on the counter by the sink and returned to her chair by the table. “It’s just slow, and I’m not really sure all the time what direction I’m going in or even why I’m doing what I’m doing.” She accepted half of the grapefruit. “Graduate school is just designed to grind your self-esteem into tiny pieces.”

“Maybe you just need a break.”

The fruit was tart and the juice stung the spot where she’d bitten her lip earlier. “Perhaps.”

“Classes are finishing up pretty soon. You could go on vacation.”

“I could.” A sudden wave of fatigue washed over her. Mara turned to look out the window again, pushing away thoughts of the last vacation she’d taken. Thoughts of that beach tangled with the dream like seaweed in the surf.

“Mara?”

“How did it get to be spring again?” she murmured. She realized she was holding a second piece of grapefruit halfway between table and mouth, apparently forgotten.

“It does that,” David said, glancing at his watch. “Time is always on the march. Speaking of which, we have to get going or we’ll miss the train.”

“Ah,” Mara sighed, “cliché.” She popped the last section of grapefruit into her mouth. “Let me grab my bag.”

Mara had an orange messenger bag, size extra-large, still stenciled with the name of a courier service she'd once worked for. As an afterthought, she grabbed her beat-up, old army coat as well.

"It could rain," she told David, draping it over her arm.

"What've you got in there?" David asked, poking the bag as she turned around to lock the apartment door.

She followed him down the stairs. "Notebook, lab notebook, the novel I'm reading, a particle physics textbook I'm *supposed* to be reading, couple pens, Rubik's cube, duct tape, water bottle." Her cheeks flushed slightly at his amused look. "You never know."

"How many lectures do you have today?"

"Just one. And I'm working this afternoon."

They stepped out of the building and started towards the "L" station. At ground level, she could no longer see the lake, but she imagined she could smell it, high and fresh above the car exhaust.

"There's your friend," David said as they passed the park. It *had* been Alex leading the forms. Mara waved at him.

"How is he?"

"He has a name." When David didn't reply, she sighed. "This is really childish. Just ask him out."

David's cheeks reddened.

Mara rolled her eyes. "You're so self-defeating."

"Someone's got to do it."

Mara dug a sharp but well-meaning elbow into his ribs.

They were nearing the station from which David took the red line downtown to the Loop. Mara was still a five-block walk away from the station that would take her to the south side.

"What time does your lecture get done?" There was something odd and veiled in his face that made her curious. He looked away.

Mara paused in the search through her wallet for her Metra card. "Eleven. It's nine-thirty to eleven."

"Can you get away after and meet me downtown for lunch?"

"Well—"

"Come on. We can go somewhere in the Gold Coast. My treat." The puppy dog eyes didn't really work with his thin, sardonic features, but she smiled anyway.

“All right,” she said, shaking her head ruefully. “I have to be at work by two, but... What’s the occasion?”

David was already halfway up the stairs. “I just have something important to tell you.”

She ran after him. “Hey,” she called, emerging onto the platform. “I’ll meet you at the aquarium at eleven-thirty, okay?” Mara had to shout as the train roared in.

“Fine,” he called back. A moment later, she watched as the train whisked him away.

Chapter 4

Einstein's twin paradox goes like this: take two people, identical twins. Put one in a spaceship heading away from Earth at a close approximation of the speed of light. Ten years later, have him turn around and come back. Only ten years will have passed for him, but more than twenty will have gone for his twin on Earth, because of time dilation that occurs when traveling near the speed of light.

Time is relative. There is no absolute measurement of it, and it dilates at speeds approaching the speed of light.

This is, therefore, a form of time travel. But not a terribly useful form, all told. Traveling from the past to the future is the one thing anyone can accomplish, and you don't know if whatever is in the future is going to be worth it.

Traveling from the future to the past, on the other hand, would seem to be more useful, more desirable. The future holds a vague intellectual curiosity; the past holds tight to your emotions. People live in a world of regret, a feeling linked inevitably to the past, to "if only I'd had more time."

The past remains remote, final, something you cannot change and must live with. Its ghosts haunt you.

Ghosts, unfortunately, are stagnant. Dead, they can only echo themselves. The perennial desire to tell someone off one last time can never be truly satisfied without time travel.

As Einstein observed to Bertrand Russell during a late-night snooker game in a forgotten dive bar in Princeton, "Thought experiments are easy. But practical application, that's where the real money is."

Chapter 5

“Next week, we’ll finish the section on electromagnetism and move on to a brief introduction to optics, so make sure you finish the problem sets on sound and get them to your TAs *this* week,” Dr. Kendall was saying. Mara sat up a little bit, trying to make it look like she was paying attention, and then looked back to the Rubik’s cube she held in her lap.

On her right was an empty seat; on her left sat Brian, her co-TA, hunched over a thick, unlined notebook. She couldn’t tell what he was working on, but she’d bet it wasn’t class-related. Around them, hapless undergraduates stared at the blackboard with sick expressions. One or two, probably math fiends, were playing solitaire on their laptops or cell phones. Mara guessed that there were going to be a lot of anxious physics majors in discussion section come Monday.

Brian wasn’t a bad guy to work with, if getting together to go over the problem sets once a week counted as working together. The rest of the time, she took the early Monday sections, he took the late Friday sections, they split the other discussions and labs and mostly saw each other only in passing or in lecture, when they sat sequestered at the back of the lecture hall.

She had TA’d the class once before with Zhu. That had been different. They’d spent hours together working out answers and discussing the labs. She’d sat around in the office the teaching assistants all shared while he held office hours, and he had done the same during hers. And in lecture, they sat in the back, passing the Rubik’s cube back and forth.

“Here,” he’d hissed at the beginning, “the rule is, you get one move, and then you have to hand it back.”

She smiled to herself. They'd solved it three times that quarter.

"We should come up with an algorithm for it," Zhu whispered.

She shook her head. "That's cheating," she said and handed it back.

It clattered on the wood of the empty seat, and she blinked.

A couple of students nearby whipped around to glare at her, and Brian was giving her a strange look. She ducked her head, blushing.

At least when he turned, she got a glance at what Brian was working on: aerodynamics equations.

"Building a better paper airplane?" she whispered.

He smiled warily. "You okay?"

"I'm fine."

He nodded finally. "What did you—"

The bell rang. She shrugged and sat back, waiting for the tide of students to ebb. At the front of the hall, Kendall shuffled his papers together and said into the microphone, "Ms. Daniels, could I see you for a moment?"

Mara stuck the puzzle in her bag then made her way down to the front of the room. "Sir?"

He was putting things in his briefcase and glanced up at her. "Ah, Mara," he said, as if she'd appeared spontaneously. "Walk with me a moment."

She wondered if this was about disrupting class. Dr. Kendall had a reputation as a pretty fierce guy, but once she'd gotten to know him, she realized that mostly he had a low tolerance for stupidity.

Dr. Kendall was, strictly speaking, brilliant, and unlike many of the professors in the physics department, he hadn't settled into his tenure. He was also bad at remembering promises, gave feedback on drafts infrequently, unkindly, and belatedly, and had a habit of jumping up during faculty meetings and running off to the lab, scattering papers to the winds.

As his student and teaching assistant, Mara's job included re-filing his notes, shrugging apologetically to his colleagues, and patting the undergraduates on the head when he missed office hours for the fourth time that semester. Dr. Kendall didn't particularly like undergrads, since they tended to be either excessively cocksure or

annoyingly slow on the uptake, but teaching them was the price he paid for having been an ass to the department head's husband at a drunken Christmas party one year. Or so the rumor ran through the student body. The undergrads didn't seem to grasp that being friendly and being a good teacher were not the same thing.

Mara didn't especially care for the students either, come to think of it.

Kendall's lectures tended to range widely between droning recitation of things he felt were self-obvious and excited monologues on obscure topics the honors students could *almost* follow. He had a couple of students whose theses he was advising, including Brian, Mara and, until last August, Zhu, and he dressed like his wife had once bought him a couple of nice sweaters and shirts and had then been unable to convince him why one color should not be worn with another.

Mara liked him.

He started down the corridor toward the elevators, limping on his right knee. He was leaning on a cane, which was new, and she wondered when he had injured himself and whether she should have noticed sooner. "Mara, I've been thinking about your dissertation," he said.

Her stomach twisted horribly, and she wondered if it was too late to revise her opinion of him.

"Sir?" she said, keeping her voice carefully bland.

"It's been on my desk since November. Professor Whitehead and Professor Moore have looked at it as well, and we all agree it doesn't need any more revisions."

Mara nodded, then realized she was lagging behind and couldn't be seen. "Okay."

"It is the department's opinion that you should do your defense before the summer quarter begins."

Mara stopped, blinking. "Sir, that dissertation was one of a proposed pair that I was supposed to write with Benjamin Zhu. The other hasn't—"

"We realize," Professor Kendall said dryly, "that your co-author is not exactly available to work on the other one. However, I was lead

to believe that the paper I have in hand was approximately seventy-five percent your work. True?"

"Yes," she said. "But I thought—"

He cleared his throat. "In lieu of another full dissertation, therefore, we are willing to accept the paper you submitted last week for the SPaOAB conference in July as proof of your competency and let you do the defense on the first one."

Mara silently added Dr. Katz, the professor who was organizing the conference, to her revised opinion list. "I—"

"How's the first of June?"

"I don't...I can't possibly..." He was staring at her, one eyebrow cocked, and she realized it wasn't really a question. "It's fine."

"Good." The elevator pinged slightly as the doors slid open, and he stepped in.

She was damned if she was giving up. She took five quick steps down the hall and slipped in after him. "Sir, why now? The department could have decided this months ago."

Kendall stared straight ahead at their fuzzy reflection in the elevator's metal doors. "There are two reasons. One is that the applications for the post-graduate fellowship are due the eleventh, and we'd very much like you to apply." He paused and glanced sideways at her. "You realize, this is all off the record, don't you?"

"Sure." Someone had scratched "Simon divides by one" in the metal by the buttons. The light behind the sixth floor button had gone out, giving the eerie impression they were going up and up without destination.

"The other reason is that, despite the best efforts of myself and the rest of your committee, the university has decided to end your funding at the end of the current term."

Mara tried to say, "Really?" but wound up making a sort of choked noise.

Kendall sighed. "I realize that after Zhu's...after he—"

"Yeah."

"—that you would need some time. But it has been nearly eight months, and I'm worried that if we continue to mollycoddle you, you're never going to get to it. And you're too smart to commit that

kind of professional suicide over this.” Over a boy, he didn’t say.

In her head, Zhu snorted at this. “Anyone getting their Ph. D. at twenty-five is not committing any sort of suicide by delaying their defense by a year.” She didn’t say anything out loud, just nodded.

“Thank you,” she said and paused. “I guess I’m just...I’m worried I’ll be unprepared.” Which was both far from the truth and nearer than she wanted to admit and probably as good of a red herring as she was likely to come up with on short notice.

She was standing to his right, so he couldn’t pat her shoulder without passing the cane to his other hand, but it was obvious from the way he shifted his weight that he wanted to.

“Everyone feels that way. But you know the material, *and* you’ve got a month to review.” The elevator opened and they stepped out onto the sixth floor.

“Seriously, Mara: if not now, when will you do it?” When he turned to look at her, she couldn’t tell if he was answering her voiced objections or her unvoiced ones.

Mara nodded slowly, feeling as though the weight of her entire life up to this point was pushing her forward.

“Excellent!” Kendall turned and started down the hall towards his office. “Are you holding office hours tonight?” he asked when he reached the door and saw her still standing in the middle of the hall like a lump.

She blinked, surprised into movement again. “No. Today Brian has discussion sections, but we never hold office hours on Fridays. Who would come?”

Dr. Kendall clicked his tongue and muttered something under his breath. “Still, I always hear good reports of your teaching,” he said. “They tell me you’re very helpful and good at explaining things.”

Despite herself, Mara blushed. “Thank you.”

He took a few halting steps down the corridor toward her. “No false modesty. You do it well.” He stopped and observed her a moment. “At the risk of sounding mawkish, I’ll tell you that you have a bright future ahead of you here. Don’t ruin it.” Kendall turned again. “Have a nice weekend.”

“Thanks.”

He limped off down the hall. She, unmoving but moved, stood motionless and watched.

Mara's desk was one of three in the TA office. She had pushed it into the far corner and stuck one of her bookcases between it and Frannie's desk to try to give herself the illusion of privacy. Brian's desk was kitty-corner to the other two, nearer the door; he'd tried a similar trick but they'd found that putting a shelf just inside the doorway made people nervous on entering. Undergraduates were nervous enough without something to fluster them.

Mara dropped her bag on the floor and slumped into her chair, running her hands through her hair. Her computer occupied most of the surface of her desk, with stacks of papers taking up the rest of the space. A small snapshot of David and her brother Adam in Central Park was taped to the front of the computer tower; they were reclining on the grass in the mid-summer light. She tried to remember when it had been taken: April, just after they'd gotten accepted to medical school and before David decided to defer? Another photograph showed Zhu and her lying in a hammock during a trip to the lake later that summer, before they'd left for Japan and parts east and gotten engaged and things had gone awry. On top of the tower, three or four texts were stacked, with titles like *Black Holes: An Introduction* or *Extremely Complicated Non-Homogenous Complex Differential Equations*. Brian had left a note taped to the monitor about trading office hours the next week. Dr. Katz had left another note about the symposium stuck to the center of the screen, so that there was no possibility of missing it. And Dr. Kendall had left a folder wedged partially under the monitor with a note labeled "to be analyzed" stuck to it. Terrific.

Mara leaned forward and rested her head against the desk's metal edge, trying to slow her racing heart. It was just a defense. She didn't have a lot of time to prepare, but Kendall was right: She knew the material inside out and backward. So why the panic?

She sat up and rubbed at the thin scar hidden just under her hairline. This was what she'd been working toward for the five years since finishing her undergrad.

There was a creak as the door opened and a hollow thump as Brian set his backpack on his desk. “Hey Mara, you in here?” he called, coming around the corner of her shelves.

“Hi,” she said weakly, pulling her hand away from her forehead.

He was about six feet tall and thin, with a prematurely receding hairline that he usually kept under a baseball cap. Today he was wearing a T-shirt that said “Resistance is futile (if less than one ohm),” which in Mara’s mind pretty much summed up his chances of ever reproducing with someone who wasn’t a scientist. “You okay?”

“I’m fine.” She frowned; Brian wasn’t exactly known for his powers of observation. “What’s up?”

“You just...You look pale, is all.”

Mara folded her hands across her stomach to stop them from shaking and sat back in her chair. “I’m okay. I missed breakfast.”

“That sucks,” he said, already moving on to the next problem. “Hey, I left you a note about next week. I’ve got this project due to Weismann, and—”

“It’s fine,” she said, cutting him off. “I’ll take office hours for you on Thursday. Do you have time to take mine the following Wednesday?”

“No problem.”

“All right.” She sighed and leaned over to hunt through her bag for a bottle of water. “Do you know what time it is? My watch seems to have stopped.”

She sat back, water in hand, and looked up in time to see his eyes track from her to his wrist.

“Almost eleven-thirty.”

Mara choked and jumped to her feet, swiping one arm across her mouth. “Shit.”

“What, you got a date for lunch?” He sounded vaguely put out by the idea, which, in turn, grated on her nerves a bit.

She picked up the “to be analyzed” file and stuffed it in her bag. “Yes, something like that,” she said, grabbing up her messenger bag. “I’ve got to run.”

“Are you going to be back this afternoon?” he called after her. “I wanted to ask you some questions about some weird results that

turned up the other day—”

“I won’t be back,” she said, hand on the doorknob. “Have a good weekend. I’ll see you Monday.”

He leaned out the door and shouted down the hall, “I’ll send you an email.”

“Right, whatever. I won’t read it.”

She had to sprint across the quad and down the street to make the next bus, but she arrived downtown with two minutes to spare, so she decided to forgive him.

Chapter 6

Einstein established that the speed of light is both constant and finite; 299,792,458 meters per second (in a vacuum) is very fast, but, over interstellar distances, the lag time is very real. Light leaving the sun takes approximately eight minutes and eighteen seconds to reach the Earth. The nearest stars are four light years away, meaning that light leaving them will be visible to observers on the Earth four *years* later.

This has an interesting implication. When the light from Alpha Centauri reaches Earth, observers see the star not as it is at the moment the light arrives, but as it was four years previously. This has to do with how the human eye sees things—light reflects off an object (or is produced by it) and reaches the eye, where it creates nerve signals that travel the optic nerve and allow the brain to interpret what the object being seen is. Over short distances, there is no appreciable difference in the object between the time the light reflects and the time it reaches the eye (and then brain); since the speed of light is so fast, the process is essentially instantaneous.

But suppose that, light years away, there's an alien with his telescope trained on Earth. It's a very powerful telescope, and right now he's watching Europe gearing up for World War One. Eventually he will see the entire twentieth century and beyond, if he watches long enough, has a good telescope, and feels particularly voyeuristic. The whole progression of human history, a century after the fact. After the light passes by him, some more remote observer will see it as well, and onward and onward, into a small, contained type of immortality.

Chapter 7

The Shedd Aquarium was home to more than 22,000 animals in over 750 species, housed in more than three million gallons of salt water. Mara had never been much interested in it until David had landed the internship that had brought him to Chicago for the summer and then the full time job that had kept him on.

A job he had been willing to delay medical school for: doing things with fish. Mara shook her head as she climbed the steps. It didn't make much sense to her. At least medicine had some science involved. Fish were just...fish. But then, Mara had chosen physics as a career field at least in part because biology was too squishy, chemistry tended to explode in her face, and she didn't have the necessary amphetamine addiction to succeed in pure mathematics. In addition to having a good collection of eccentrics and slightly saner working hours, physics could be done lying in bed.

Some of it, anyway. Sooner or later, you needed to actually go down to the lab, but Mara saw that as a technicality.

She thought about the folder in her backpack and sighed.

One of the benefits of David working at the Aquarium was that Mara now had a free membership. She had never especially wanted a membership, and she had a sneaking suspicion that he had told them she was either his wife or his half-sister to get it, but she *had* one, and free was free.

"Spoken like a true graduate student," Zhu said. "Don't pretend that you haven't been using it."

She didn't jump. "All right, I have enjoyed wandering the galleries a time or two."

"Was that so hard?"

She ignored him, instead looking around as she passed through the entry hall and into the first gallery. It had a high ceiling, but the ornate skylights made it much lighter than any of the other galleries in the Aquarium. The center of the room was dominated by a huge tank filled with tropical fish and sea turtles. The light filtering through it painted the faces of the schoolchildren who were gathered there with a strange bluish glow.

It was a pretty thin crowd, since it was lunchtime on a Friday; Mara was able to step near to the glass and look up as a shark swam past. One of the smaller children gasped.

"The older ones look blasé about it, don't they," Zhu said.

Mara shrugged. "They're just fish."

"Don't say that too loud," David said from behind her. "The donors will be so disappointed if you break the spell."

She pressed a hand to her chest, feeling her heart racing. "Don't sneak up on me like that."

"I didn't sneak up on you. You're just losing your edge." He grinned obnoxiously. "Ready?"

"Where are we going?" she asked, following him back past the ticket kiosk and down the steps.

"How about the Pump Room?"

"Classy. But we need a reservation."

He shrugged and grinned in an "aw shucks" sort of way that would have been annoying in nearly any other context. "I made reservations two days ago."

"Wow, this *is* premeditated. You want to get a cab there, too? Or is that too much?"

David chuckled. "I wouldn't want you to get spoiled."

"You're buying me lunch at the Pump Room, and you don't want me to get spoiled." She started off down the street, ignoring the laughter from behind her.

The Pump Room was one of Chicago's big-deal famous restaurants, the sort of place with elegant tablecloths, Limoges china, crystal glasses, and signed photos of Frank Sinatra and David Bowie on the wall. The real tip off, though, was that the menu listed dishes

like “Carrot-Truffle Gnocchi” and made no mention of the price.

She smiled tensely as she handed her menu back to the waiter, who pointedly wasn't looking at her khakis and the blue sneakers that had seemed professional enough that morning. “This place is something, all right.”

“Haven't you been here?” David asked, sipping his water.

“This isn't the sort of place they take young physics students.” She glanced around. “I'm not sure they'd even let me stay if they knew my true profession. Academics aren't known for their accumulation of wealth.”

David shrugged. “Education is supposed to be an automatic ‘in’ into the fine dining class, isn't it?”

She shook her head. “Cocktail parties, maybe occasionally. But we tend to be congenitally ruffled. It makes it difficult for a place like this to maintain the requisite atmosphere of old money and young power brokers.”

He glanced reflexively at his suit, which was still perfectly pressed despite him probably spending the morning running around medicating fish and throwing bits of tuna to the sharks. “It's a talent. What can I say?” He laughed at Mara's scowl. “I've got the rays to look after this afternoon; I'm sure one of them will manage to ruin yet another of my ties.”

“That's a small consolation.” Though she had only been sitting in lecture, her T-shirt was creased and her trousers wrinkled like they'd spent the night on the floor of her room. She sipped her water and tried to organize her thoughts. “So how was your morning?”

“Not bad,” David said, nodding as the waiter deposited the iced tea he'd ordered. “I did paperwork, mostly, and taught a couple of the interns what not to feed the sea turtles.” The waiter arrived with their salads. Mara's involved pine nuts, pears, and Gorgonzola cheese on a bed of highly fancy lettuces.

She speared a slice of pear on her fork and sat for a moment, fascinated by its thin yellow-brown skin, the pale textured flesh, the curve of the outer edge. “Kendall wants me to do my defense on the first of June. Oh, and I'm covering Brian's office hours next week, so I won't be home for dinner on Thursday.”

"I wasn't going to cook for you anyway," he retorted. Then his brain caught up with him and he said, "Your defense?"

"That." Pine nuts were hard to pick up with a fork. "Defend my diss, get my degree."

"Your degree," he echoed.

"That thing," she agreed.

"I didn't realize you had, uh, finished writing your dissertation."

"At the end of October. I don't think I told you." She hadn't mentioned it, at least in part because she was still spending a lot of her time sleeping on his sofa and having panic attacks and occasional migraines that left her locked in his bathroom. Not to mention the screaming night terrors. They were her sofa and her bathroom as well, since she had been paying half the rent since September, but they hadn't felt like hers yet. Her life felt like it should be going on elsewhere. It had made talking seem a little awkward. "I was distracted."

"And you're going to defend it? That's awesome." David speared a piece of lettuce. "Have you called Adam yet?"

"I just found out this morning." She put down her fork, rubbing her hands together. "It was kind of weird. Kendall was *really* encouraging and excited."

"What did he say?"

"He thought I had a bright future and I shouldn't keep putting this off. But coming from him—"

"That's practically a proposal. I remember you complaining about him two months ago. And a few weeks before that. And about a month and a half before that. And—"

Mara rolled her eyes. "Point taken. I just keep wondering what he's up to with this."

"Maybe you should be like everyone else and take a compliment as such, not as some sort of underhanded way to con you into getting out of his hair." David raised one dark eyebrow at her before going back to his salad. "Congratulations, anyway."

"Thanks." She glanced at the remains of her salad, then looked up at him. "Why are we here?"

"Philosophically speaking?" he began.

“You had something you wanted to tell me. An announcement of such caliber that you had to treat me to lunch.”

“That.” He put down his fork. “I deferred medical school last fall. You may recall.”

“I recall.” Her hands were cold, and she folded them in her lap. “You walked away from a fairly nice deal for an MD/Ph. D. program, didn’t you?”

“I’ve really been enjoying my job here at the Shedd.”

Mara thought, *God knows why*, but did not say it aloud.

“But I’ve had a lot of time to think, and I decided that helping *people* is important to me. So I’m going to matriculate this coming fall.” He grinned; she smiled too, as the tension dissolved. “I just wanted to tell you alone because you, with your head thing and, well, it kind of helped—”

Mara did not roll her eyes, but only barely. “Spare me, David. Albert Schweitzer, I am not.”

“What’s that supposed to—”

“I mean, I’m not really an inspiration.” She smiled again to take the sting out of her words. “But I *am* happy for you, and I think you’re making the right decision.”

He frowned at her for a moment. “Fine. I won’t mention you when I win my Nobel Prize.”

Mara laughed. “I bet I get one first.”

“Yeah, right. They don’t give Nobels for being annoying.”

“That’s exactly what I was going to say.”

The waiter arrived to confiscate the salads and deliver a plate of gnocchi for Mara and a BLT for David.

“Bacon?” Mara said, raising an eyebrow. “That’s not kosher.”

He opened his eyes wide. “It’s turkey bacon.”

“Sure,” she said. “I’m not judging you.”

He ignored her. “Oh,” he said, picking up one of his fries, “before I forget, Dr. Wallace’s office called yesterday to remind you of your appointment today.”

Mara paused with her fork halfway to her mouth, trying to remember her schedule. “Oh, damn. I’d forgotten about that.”

“Is it important?”

She chewed contemplatively on the gnocchi. "Not really. Just a... just checking up, you know?"

He nodded.

"Hey, so are you going to California? Have *you* told Adam yet?"

David shook his head, mouth full of tomatoes and bacon. "I mean, he knows, but I'm enrolling at U-Michigan."

"So I have to find a new place to live?" Her stomach turned over, the gnocchi turning to little rocks.

"I can ask around and see if anyone is looking for a roommate." He coughed. "Unless you're leaving for a postdoc somewhere else..."

That was an interesting idea. She could pick up and go somewhere else, somewhere with new problems to solve, new bus systems to learn to navigate, and people who didn't look at her with sorrow and pity in their eyes.

"I haven't given it much thought. But I think I'd stay here, if they'll have me. I'm pretty caught up to some of Kendall's research... plus the timing would be a problem. Most places have probably closed applications already." Mara glanced down at her half-empty plate. She looked at her watch. "I'd better get going."

"That's not cool. Can't you turn up a little late? I thought we could go for dessert."

"Rain check?" She thought about it a minute. "We could go out tonight. Someplace good. I'll buy you a drink."

David glanced up, thinking. "We could go to Ali Baba's."

"Good call. Meet at six?"

"Seven-thirty. I want to shower first."

"Sure. I'll see you then." She got to her feet, collecting her bag. "Thanks for lunch."

David cleared his throat. "You spend so much time rushing from place to place, Mara."

"What?" Mara felt hamstrung halfway between leaving and her seat.

"You only live once," he said without looking up.

She sat down again, spending one moment glancing up at the gilt and glittery ceiling. "I've got five minutes for you, David. Is that enough?"

He smiled.

Chapter 8

The first car Mara ever owned was a '77 Ford F-150 pickup. It had been a shiny color at one point, possibly gray, to judge from the interior, but by the time she bought it for fifty dollars from her boyfriend's father, it had been spray-painted a matte, camouflage green. It got about five miles to the gallon and the stick shift was backwards, ensuring that no one else could move it without about fifteen minutes of patient explanation. She loved it in the fierce, uncompromising way teenagers form attachments, with a come-hell-or-high-water stubbornness that dictated that she would never get rid of it.

She drove that truck from the time she was sixteen until one day in mid-January about three weeks after her nineteenth birthday when she crashed it into a tree on the outskirts of Milwaukee and totaled it.

Certainly the roads had been icy, but Mara thought, as she stumbled away, the biggest factor was fatigue. She'd thought she was sleeping enough because she was getting five hours a night, and most of the people in her dorm slept less. A lot less, some of them.

There was something warm on her face, and she swiped at it, coming away with blood on her fingertips. She didn't remember hitting her head, but she apparently had a cut directly under her left eye.

It was the fifteenth; she was flying back to Boston at the end of the week. Hardly enough time to get the insurance things settled.

Poor truck.

It was cold, but she couldn't feel it; the sun shining off the snow hurt her eyes, and she could hear the wail of sirens in the distance.

What seemed right to one person was completely wrong for someone else. She supposed it was a pretty good demonstration of relativity.

That probably wasn't as profound as it seemed to her for a moment. She was aware that she wasn't really thinking clearly.

The glare off the snow was really bright.

Mara sat down on the tailgate to wait.

Chapter 9

Conroy's Bookstore was one of a handful of eccentric used book shops that cropped up in Hyde Park around the university. Ayush, called Alex, specialized in the obscure, the out of print, and especially foreign books in non-Romance languages. He was, as far as Mara knew, the only shop outside of Chinatown that kept any Chinese novels in stock, and possibly the only place in the city that carried things in Mongolian.

Alex was sitting in front of the counter when she came in, checking something in a cardboard box against a printout. "You're early," he said, looking up. His dark hair was pulled back in a queue, but some was leaking out and falling against his tan skin.

"Am I?" she picked her way through the small stacks of books surrounding him and dropped her messenger bag behind the counter.

"It's one-thirty and you aren't scheduled until two." His dark eyes met hers for a moment. "What's up?"

Mara shrugged. She stepped over to the main display table that held the books that had been last month's "books of the month." It had been her turn to choose them, and they were mostly popular science and science fiction. "Am I so suspicious?"

"I'm smart about figuring this sort of stuff out," he said, looking back at his clipboard. "It's what I learned in college, along with differential equations, supply and demand curves, and that no sane person should enter a Ph.D. program."

"Touché."

He snorted. "Do you see a copy of *Sons and Lovers* anywhere? The invoice says they sent four, but I'm only seeing three."

"It's on the counter behind you." She picked up a copy of *Can You Forgive Her?* thick enough that it might have done serious damage if dropped on a foot and flipped carefully through the pages. "What's your theme this month? Stuff they make you read in your British Lit class if you're really unlucky?"

"Trollope was a very popular novelist in his day, I'll have you know." He took back the volume and set it on one of the piles. "The theme is Victorian love stories."

"Lawrence was an Edwardian, wasn't he? I thought he was about fifteen when Queen Vic died. And I've definitely been working here too long, if I know that." She sighed and began to pile up the unsold sci-fi novels that remained on the table.

"I care less about historical minutia than I care about selling books," Alex said, waving a hand dismissively. "Why are you early?"

She sighed, putting down the books. "I need to leave early to go to a doctor's appointment."

He made a "go on" gesture, like he was turning a crank. "What time?"

"Three-thirty." It took her exactly fifteen seconds of him standing there in silence before she abandoned all pretense of coolness. "I'm sorry, I meant to bring it up before, but it slipped my mind. I'll come in on Sunday and do inventory."

He got to his feet, wincing as his knees cracked audibly. "Inventory is done. You came in and did it *last* Sunday. You were bored." He paused. "It's worrying. Who does inventory for fun?"

"I remember." She worried her lower lip, finding the sore spot where she'd bitten it that morning. "What else could I do? I'll make up the time, it's not—"

Alex picked up a stack of the old books and moved them to the counter. "Forget about it. Come in Sunday, and you can mind the front end while I do the books."

"All right." She took the last stack of old '30s sci-fi and moved it to the counter. "Are we sending these back?"

"No, stick them in the sci-fi section. Why don't you make up displays card for the new books?"

"Sure." She went around the desk to look for a piece of paper.

“Hey,” Alex said, looking at her. “This doctor’s visit—”

“It’s nothing.” She found a marker and a sheet of printer paper.

“Seriously?”

“It’s just a checkup. They did an MRI on Wednesday. This is just a follow-up.” She half-smiled at the concern on his face. “I don’t even have headaches anymore.” His eyes stayed on her and her hand strayed to her forehead. “Really.”

Something in his posture relaxed. “Good.”

Chapter 10

The day Mara met Zhu had begun badly, with Mara on the phone to Dr. Katz apologizing for missing a meeting. She'd been in bed with the flu for thirty-six hours, she told him, leaving out that she still felt pretty miserable.

"It's okay," he assured her. "Just get down to the Doane this evening and see if you can get some usable data tonight, then bring it by here in the morning."

"I don't have any time booked," she protested. "I can't just walk in and—"

"I would be doing you a professional disservice if I didn't teach you how to bully people out of their time." There was enough of a pause to suggest that was a joke. "There's some time booked on the telescope in my name. I'll call and let them know to expect you."

Mara sighed in assent and hung up.

She borrowed a car from one of her roommates, because even if she was getting suckered into an all-night observing run for a paper she wasn't going to get her name on, she wasn't the sort of fool who braved the "L" at ten o'clock at night.

There was a slight hold up while the night security guard scrutinized her ID, and she tried not to roll her eyes.

"You can never be too careful," he said, hanging up the phone and handing her driver's license back to her. "You can go on through." Mara was tempted to ask him *too careful about what*, because getting into Fermi Lab had been easier, but time was slipping away.

Up in the observatory, she found a guy in the chair in front of the telescope displays. He was Asian, with shiny black hair that fell across his forehead and into his eyes.

“Hey,” she said, frowning at him.

He glanced up at her. “Hello.” He didn’t have an accent, and he looked oddly familiar.

“Are you in that lecture that Peterson hasn’t been giving?”

He nodded. “I thought I’d seen you somewhere,” he said. “What brings you up here?”

“Doing some work for Katz.”

“I’m sorry.” He smiled half-heartedly. “My name’s Zhu. Benjamin.” His eyes were a very light brown, almost yellow.

“I’m Mara Daniels.” She was standing too far to offer to shake hands, so she raised one hand in an awkward wave. It was strange to have another person around, and she half wished he’d leave.

“Nice to meet you,” he said, essaying a little wave of his own, and added, “I work here. Let me know if you need help with anything.” He reached over and picked up a little device about the size of a Walkman. It had a pair of headphones plugged into it, one side of which he pressed to his ear, frowning as he listened.

“What’s that?” Mara asked. It had a row of partially lit red lights at the top.

“It’s a portable EMF detector. I built it myself.” He grinned.

“Why would you want to detect electro-magnetic fields?” she said. “Or do you mean it’s a radio?”

“It doesn’t detect radio frequencies.” He was still grinning, and it was beginning to get to her. “It detects ghosts.”

“You don’t seriously believe in ghosts?” She thought for a moment and added, “With all the equipment in here, you’re not likely to get much of a reading.” She put her bag on the desk and dug around for her notebook.

“*Jing gui shen er yuan zhi.*” He grinned. “Which means—”

“Confucius, right?” She found a pen at the bottom of the bag and set it and the notebook on the desk. “It means something like ‘Respect ghosts and spirits to keep them far away.’”

“Very good.” He looked at her with a newfound respect. “You speak Chinese?”

“It made a nice diversion from particle physics when I was doing my undergrad work.”

Zhu smiled. "I took it because it was an easy A."

"I bet." Mara found the novel she'd been reading and shut her bag. "So tell me again, what're you doing here?"

"I work here." He put the EMF detector down. "It's a work-study thing."

"That must suck."

He got up and fetched a second chair. "It's only a couple nights a week, and I get to meet some interesting people." He paused and added, "The pay's good."

"It'd have to be." Mara sat down in front of the controls and pushed a couple of buttons, frowning. "I bet you meet some weirdoes, though, even by astrophysics standards."

"One or two. There's this guy, a grunt from UIC, who likes to dress up like a fox on weekends and run around the Lincoln Park Zoo with his buddies."

Mara wrinkled her nose. "Performance art?"

He shook his head. "I think it's just a thing. He brought me pictures one time." Zhu watched her push buttons for a moment. "Do you need help?"

"No." She stopped herself. "Actually, I might. I'm supposed to be taking some images of Io for Dr. Katz, to test out his new mirror configuration."

"That project," Zhu said, making a face. He pulled the keyboard toward himself and began typing.

"Bad?"

"He was in here kicking up a fuss about image resolution last week." Zhu rolled his eyes. "As if it was my fault the lenses were fuzzy, and not the smog."

Mara laughed, feeling the awkwardness evaporate.

The conversation went on most of the night and into the next day, through a late night pizza the delivery boy got lost delivering, the early drive back to Hyde Park, breakfast at an all-night diner, class, and the delivery of the data to an amused-looking Dr. Katz, who seemed to be on the verge of saying something arch, but then didn't. Mara found she couldn't quite look Katz in the eye; she and Ben had started their discussion with Katz and his habits, worked

their way through Catalan numbers and Goldbach's conjecture, then tackled Professor Peterson, who hadn't been out of his office in two months and was sending his senior student to teach the graduate thermodynamics seminar. Mara's theory was that it was somehow related to his divorce, though cause and effect were hard to assign.

"It's not as if he's a bad guy," she murmured, nodding toward Michael O'Connell at the front of the room, where he was busily covering himself and everything around him with chalk dust. "But his math is pretty sloppy, and he wouldn't know an Onsager relation if it bit him."

Zhu laughed loudly enough that the harried student lecturer threw him an annoyed glare.

Around two in the afternoon, Mara found herself absolved of her responsibilities for the day.

Then she met Zhu in the quad.

"Hey," he said. He had a cup of something hot from the café in the basement of the Divinity School. "Heading out?"

"I'm done for the day." She yawned. "And pretty done in. You?"

"I'm leaving as soon as I get my lab report printed out." He stopped abruptly, shifting from one foot to the other. "You busy tonight?"

Mara shrugged. "I was going to sleep for a couple of hours, then do some reading. So no, not really."

"You want to get dinner later?"

"Sure," she said, surprising herself, and gave him her address. "Around seven?"

"See you then."

She toddled homeward and climbed the stairs to the flat she shared with two young mathematicians. Jamie was curled up on one end of the sofa when Mara came in, dropped her bag on the floor, and flopped dramatically on the other end.

"You all right?" Jamie looked over the tops of her glasses. "You're pale. You should have told that bastard Katz you were still too sick to go out. You'll never get well if you don't take some time off."

Mara shrugged. "Actually I feel pretty good." She let her head fall back so she was staring up at the ceiling. The feeling of the sofa

against her tired body was the greatest thing she had ever experienced in her life.

“How was the observing run? Did you get any sleep?”

Her eyes began to drift shut of their own accord. “It went well.” She yawned. “Ask me again later.”

Chapter 11

“I have an idea,” Mara said. “David and I are going out tonight to celebrate. Why don’t you come with? I’ll buy you a drink.”

Alex frowned. “I don’t think David likes me much.”

“No?”

He was skeptical. “You don’t get that vibe from him?”

Mara coughed. “No, not at all.”

The claim was met with suspicion, which Mara ignored. “Where are you going?”

“Ali Baba’s.” It was one of Alex’s favorite night spots. She could see him wavering.

“Come on, it’ll be fun. Free drink, good company...David...”

Alex sighed. “Fine, fine.”

“Seven-thirty, okay?”

“I’ll meet you there.” There was a long pause during which he picked up a terribly old-looking copy of something that had probably cost about two dollars and fifty cents when it was new, ran his fingers down the binding, opened it and touched the end papers. “What’s the celebration for?”

“David’s decided to go to medical school next year.”

“Mm.” He flipped through the book carefully, checking for any highlights, underlines, or small facetious comments in the margins. It was clean, so he took a pencil and wrote faintly a price on the last end page. “That’s it?”

Mara shrugged and looked down at the desk, where she had been trying to make up her schedule for the week after next. “I’m going to do my defense.”

“Really?” He closed the book and pressed the gray cloth cover to his lips thoughtfully, as though he were smelling the musty pages. “When?”

“Beginning of June.”

It was actually pretty nice, Mara thought, *to have a friend who understood what it meant to be finishing her program*. Not just in terms of graduating—she was pretty sure she couldn’t have explained the sense of loss that echoed in her chest when she thought about not being a graduate student anymore, not studying under Kendall, not tinkering every couple of weeks with the wording of her diss. Being a student and being with Zhu had become so intertwined in her head that giving up one felt like giving up the other, even though she had already given that up months ago when they buried him.

“I miss him, too,” Alex said, so soft Mara almost didn’t hear it.

There was suddenly a lump in her throat, but she forced herself to look at him and nod.

Alex said, “It’ll be okay.” She didn’t believe him, and it probably showed on her face, because he snorted and said, “Don’t give me that look.”

She opened her eyes wide. “What look?”

Alex shook his head and stood up to shelve the book. “Look, there’s a story. When Zhuangzi’s wife died, Huizi came to pay his respects, only to find Zhuangzi sitting around singing and playing a drum. Huizi had to reprimand him. ‘You lived together! She raised your children and grew old with you. Don’t you have an ounce of feeling for this woman who shared your life for so long? Why do you have to be such a jackass?’ Zhuangzi fell silent while he thought about this, and finally he replied, ‘When my wife had just died, I was heartbroken. But then I thought about the time before she was born, before she had a body. Before she even had a soul. Then there was a change and she had a spirit, and then another change and she had a body, and another and she *existed* in a way she hadn’t before. Now there has been another change and she’s dead. These transformations are normal and natural. If I were to go running around sobbing, it would show that I didn’t understand her fate. So I stopped.’”

“And this story helps you, does it?”

Alex smiled a small, peculiar smile. “Sometimes. Zhu was like my brother, and now he’s dead. There’s nothing I can do to change that, so shouldn’t I try to accept it?”

“There are no words,” Mara said at last, “except to say that you’re overeducated, and I have to go because I’m going to be late.”

He nodded. “Good luck.”

She paused at the door, slinging her messenger bag over her shoulder. What a peculiar idea, to wish someone luck at a doctor’s appointment. “Thanks. See you tonight.”

Chapter 12

“A doctor’s appointment,” Zhu said from somewhere behind her. Mara tried to ignore him, but she did get the sense he was choosing his words with care. “What’s that about?”

“It’s just a check-up,” she sighed, pausing a moment to let him catch up. “Dr. Wallace had some concerns when I last saw her. She just wants to be sure that...she wants to be sure.”

“That seems unusual,” Zhu said. He glanced sideways at her. “Are you sure you don’t have a brain tumor or something?”

She rolled her eyes. “Pretty sure, yes.”

“How would they know, though?”

“Well, they *did* do an MRI earlier this week, I’m sure it would show up on that.” Mara looked over at him. “Not that it should matter much to you either way.” They turned the corner, and she saw the clinic midway down the street. It wasn’t a far walk.

“I care.” He made an affronted face at the look she gave him. “What? I do care.”

“Why?”

She left him standing in silence in the middle of the road as she went into the clinic.

All waiting rooms, in Mara’s experience, were dull places, devoid of any interesting or up-to-date reading material; in this particular office, the most recent magazine was dated October of the previous year. She wasn’t sure if this was because people were stealing the newest ones, or because the doctors never got around to bringing the best ones into the office.

Mara glanced with a jaundiced eye at a cover. The headline's bold letters read, "Five Great Indoor Flowering Plants for Winter." She opened her bag and dug through it, but the battered copy of *Bleak House* that she had been working her way through was too complicated to dip into for five minutes, so she settled on glancing through the folder of data she had been given.

The results were usually fairly consistent from session to session as they tweaked one variable at a time. The pages she'd been given contained lists of numbers giving the movement of electrons with coordinates on three axes and were fairly easy to follow, so as she glanced down the column of data she jumped in her seat as she saw that one of the results was different.

The page itself was unmarked, without even a small penciled star in the margin to draw her attention, but she was sure this was what Kendall had wanted her to notice when he left the folder on her desk. He wouldn't have just handed over the results without glancing at them himself.

Hands shaking, she flipped through the rest of the print out, noting seven more times when the same thing had happened. Part of her was shouting that this was what they had been looking for, but the rest was more sensible. Computer programs were designed by people and thus flawed. It could very well be a mistake.

A mistake that recurred eight times?

She shook her head. It was a mistake to think errors were impossible, and it was a lot more likely than the idea that the program had actually turned up—

She realized that she was on her feet, shoving the folder back into her bag, ready to run out to find Kendall. Part of her wondered if she had a future as a distracted professor, always running off when some new idea took her mind. Maybe that's why she'd always gotten along so well as one of Kendall's advisees...

"Ms. Daniels?" the nurse said, appearing at the door before Mara could actually leg it. "If you'd just come on back, Dr. Wallace will be with you in a few minutes."

Chapter 13

According to the American Neurological Association, very few concussions are actually serious enough to warrant sustained medical care. If they were, wards would be clogged with football players, the outpatient clinics full of returning boxers and car accident victims. Mara Daniels was one of the latter who unfortunately fell into the very small category of people whose injuries and symptoms were severe enough to justify a number of follow up appointments.

Emergency Room chart

International Medical Center, Beijing, China

Sx: Mara Daniels, a twenty-four-year-old Caucasian female, presented to the emergency room at 23:00 on 13 August 2004.

PE: On admission she was partially conscious, with a Glasgow Coma Scale rating of 10, with responsiveness to voice commands, confusion, and a withdrawal response to pain stimuli. Interviews suggested that she was unable to account for a large amount of time pre- and post-accident. CT scans confirmed traumatic brain injury and negated fears of epidural or subdural hematoma.

Dx: Moderately traumatic brain injury with suspicion of Post Concussion Syndrome.

Rx: Hold under observation for twenty-four hours to confirm/disprove PCS. Suggest if concussion symptoms do not improve she seek further care upon return to the United States.

University of Chicago Student Health

Dr. Wallace, Neurology

Sx: Mara Daniels, a twenty-four-year-old woman, came to see

me this afternoon, at 3pm on 27 August 2004. She complained of migraine headaches with associated sensitivity to light, anxiety and panic attacks, occasional dizziness with loss of balance, irritability, visual and auditory hallucinations, and what she referred to as “changes in thinking patterns. It’s not like it’s worse, it’s just... different, you know?” She reported receiving a moderate concussion two weeks previously and supplied the records which are attached.

Phys. ex.: Physically Mara was quite pale and withdrawn, with dark rings under her eyes. She appeared to have lost weight, but when I asked what her normal weight was she was unsure and claimed she does not weigh herself regularly. Her clothing was clean but wrinkled and her hair was messy. The Mini Mental State Exam suggested some short-term memory difficulties. Neuro exam confirmed reported balance problems.

Dx: Symptoms result from moderate concussion sustained two weeks previously.

Rx: We agreed that her headaches are neither frequent nor severe enough to risk the side-effects associated with preventative migraine drugs. I have instructed Mara to contact the office if she starts having migraines more frequently. Otherwise, her symptoms should resolve spontaneously without medical intervention. Suggested sleep, caffeine, and OTC NSAIDs as needed. Psychiatric assistance was suggested as a way of coming to terms with the trauma and shock of the accident, but she refused. The suggestion that she take a semester off teaching was better received but also rejected. Follow-up appointment set for one month from now.

University of Chicago Student Health

Dr. Wallace, Neurology

Sx: Mara came to see me on 25 September 2004 at around 2pm. She reported the hallucinations and irritability had receded, and the dizziness and balance issues were much better, but said she was still suffering migraines and panic attacks, as well as nightmares and difficulty sleeping. When pressed, Mara stated she had not sought psychiatric help.

Phys. Ex: Physically Mara looked much less pale and was of generally more cheerful demeanor, though psychologically she still seemed disengaged from her surroundings to some extent. The MMSI suggested that her short-term memory problems had resolved. N. exam suggested continuing problems with balance, but otherwise patient is healthy.

Dx: Balance problems may be due to damage to inner ear as a result of car accident. Her other symptoms (viz. migraines, panic attacks, nightmares, etc) may be due to post-traumatic stress syndrome.

Rx: I will set up an appointment for Mara with Dr. Lempp for early next week. She seems to be doing well with the migraine treatments we discussed. Suggested she avoid caffeine in the evenings and have a cup of herbal tea around half an hour before bed. Follow-up appointment set for two months.

University of Chicago Student Health

Dr. Lempp, Psychiatry

Sx: Mara was referred to me by Dr. Wallace. She arrived for her appointment today (2 October 2004) slightly late (1:35pm). She was apologetic and said that she had been busy in the lab. Physically she presented a neat appearance, with clean if rumpled clothing and hair brushed and styled. She wore no make-up and had dark circles under her eyes, suggesting that it has been a while since she last slept well. When asked, she reported migraine, panic attacks, nightmares, and difficulty sleeping. She chose her words with some care. While she was happy to discuss her work with me, she steered the conversation away from the topic of the accident and her boyfriend, who was killed in it. Suspect a strong patient-doctor trust would be necessary for her to feel comfortable discussing it.

Dx: I find no evidence of post-traumatic stress syndrome, owing to lack of flashbacks and dissociative behavior which are necessary for diagnosis. This does not rule out some kind of anxiety disorder, but more time with patient will be necessary to make a conclusive diagnosis.

Rx: Fluoxetine, 20mg/day with increase to 30mg/day if no improvement shown within two-three weeks. I suggested to Mara

that she might benefit from continued psychological care, especially talk therapy. She smiled and thanked me, but I do not think she will return.

University of Chicago Student Health

Dr. Wallace, Neurology

Sx: 15 November 2004, 3:00 pm. Mara arrived promptly, presenting a neat and well-groomed appearance. She seemed to engage more with her surroundings; I noted she was meeting not just my eyes but those of the receptionist and the nurses, and she no longer stares at her feet when she walks. She reported that the panic attacks were gone and the migraines increasingly rare. Nightmares remain. When questioned about her appointment with Dr. Lempp, she admitted she had neither filled the prescription he gave her nor made another appointment. She did not say why.

Phys Ex: MMSI normal. Neuro exam: balance problems improved but persist, otherwise normal.

Dx: Mara's symptoms should continue to resolve spontaneously.

Rx: Final follow-up in six months, with MRI.

Chapter 14

Dr. Therese Wallace was a friendly, middle-aged neurologist who wore her tortoise-shell glasses on a cord around her neck; her curly red hair was streaked with silver. On this day, she was wearing a pair of dark trousers and a soccer jersey from Brazil that her son had brought back, and her white lab coat because it had big, useful pockets and it helped keep out the chill of the exam rooms. Mara liked her a lot as a human being.

As a doctor, she wasn't so sure. The woman was certainly competent, even brilliant in her own way—she had written at least one acclaimed book on Broca's aphasia—but Mara always felt every conversation with her was a mine field, like if she answered one of the questions wrong, she was going to get lectured about something. Or worse, like she was a tree and Dr. Wallace was some sort of woodpecker, ready to winkle out all her secrets one at a time. And the fact that she had just thought that, sitting hunched in her T-shirt and khakis on the thin paper of the exam table, gave her serious reasons to question her sanity.

Dr. Wallace bustled in, carrying Mara's chart in one hand, a pen in the other. Her stethoscope was coiled up neatly in the front right pocket of her coat and there was a prescription pad in the other, with what looked like about forty ballpoint pens crammed into the chest pocket. "Hello, Mara," she chirped, flipping open the chart. "Haven't had you in here for a while. How have you been?"

"Not bad," she said. Her hands were cold, and she rubbed them together. "How are you?"

"I'm fine, fine." She flipped to the newest page of the chart, nodding at the blood pressure and pulse readings. "Are you still having headaches?"

“No,” Mara said. “The last one was in March, I think.”

“Good, good. And...no more panic attacks?”

“Nope.”

Dr. Wallace nodded, writing something down. “How are you sleeping?”

Mara shrugged, and then, because Wallace wasn't looking at her, she said, “Not bad.”

The doctor did look up at her then, taking in her thin face and pale skin, the rings under her eyes. “But not well.”

She sighed. “Not well, no. I'm...I just have these nightmares.”

Another note in the chart. “Is it always the same dream or different ones?”

“Sometimes the same, sometimes not. Why, what would it mean?”

Dr. Wallace chuckled. “Nothing in particular. There aren't a lot of psychologists out there who still give much credence to the theory that dreams have meaning, and I can't think there are many neurologists who believe that, either. I certainly don't.” She paused and clicked the pen off and on. “But if you're remembering them, it does rule out night terrors, which is good.”

“Oh.” Mara wasn't sure what night terrors were or what it would mean if she had them, but she knew enough about the way doctors worked to refrain from asking. Simple questions often led to twenty minute answers. “That's good.”

Wallace nodded. “It is.” She shuffled through the papers. “You're still living in Rogers Park with that young man?”

“David.” She tried to relax. They were moving into the mental status exam part of the proceedings, something which had become so ritualized it was like a catechism now.

“That sounds nice.” She put down the chart and picked up a reflex hammer. “What day is it today?”

“Friday.”

“Good, and the date?”

“The sixth of May, 2005.”

“What season is it?”

“Spring.”

“Please tell me where you are.”

“Chicago, Illinois, United States, on the second floor of the student health services building of the University of Chicago.”

“Remember these three words: pencil, shark, table. Recite.”

“Pencil, shark, table.”

“Starting at one hundred, please count backwards by sevens, through five iterations.”

“One hundred, ninety-three, eighty-six, seventy-nine, seventy-two, sixty-five.”

“Please repeat the three words you were asked to remember.”

“Pencil, table, shark.”

“Can you identify this object I am holding?”

“It’s a wrist watch.”

“And this?”

“A pen.”

“Please repeat the sentence ‘No ifs, ands, or buts.’”

“No ifs, ands, or buts.”

“Good,” Dr. Wallace said, and hit Mara in the knee with the small rubber mallet. Mara blinked, surprised; simultaneously, her leg jerked. They ran through the three step command test (take this paper, fold it, put it on the ground); the reading test (read what is written on a sheet of paper and perform that act); the writing test (write a sentence); and the copying test (copy two geometric figures the doctor has drawn) relatively quickly.

“You know what comes next,” Dr. Wallace said, turning to rummage in the drawers behind her.

“The cranial nerves,” Mara said with a sigh.

The cranial nerves and the motor system and the sensory system, and more reflexes. She was feeling increasingly irritated with Dr. Wallace. This was a waste of time.

“Any plans for the weekend?” Wallace asked, and added, “If you could stand up?”

Mara stood. “I haven’t really thought about it. More work, I guess.” There was a niggling sensation that she had forgotten something.

“Close your eyes.” Mara did. “Good. You can hop back up on the table there.” Dr. Wallace scribbled something in the chart and nodded to herself. “You work a lot, don’t you?”

"I like my work." Mara scrubbed the palms of her hands on the thighs of her trousers and stared down at her tennis shoes.

"I like my work, too, but I take weekends off occasionally." She looked at whatever list she had been following. "All right, that's it."

"That's— Really?"

"Unless you had something else you wanted to discuss?" Wallace pursed her lips. "I could still refer you to a psychiatrist, if you'd like."

Mara looked at the wall, which had a helpful diagram of a brain, with the different parts labeled. "No, thanks."

Wallace made a noise in the back of her throat. "Well, that's everything, then. I could give you something to help you sleep a little—" She nodded as Mara began to shake her head. "That's what I thought."

"How did I do?"

"On the tests?" Dr. Wallace, halfway to the door, stopped and flipped the chart open again. "Very well. Your balance is still a bit shifty, but you already knew that, and everything else seems to be functioning perfectly." She closed the chart and smiled brightly. "You can call anytime if something comes up, but I don't need to see you again. I think you'll be fine."

The words echoed in her head and Mara had to blink and look away. "Thanks."

Chapter 15

Mara left the clinic in a daze and wandered down the street. She'd never thought that the words, actually hearing someone tell her she was all right, would be so upsetting. But there she was, with the idea bouncing around inside of her like she was hollow. She considered going back to Dr. Wallace's office but discarded the idea. Even beginning to describe how she felt seemed like a Sisyphean endeavor.

Maybe she would never truly mend. Maybe she was condemned to spend her life adrift, a nebulous collection of parts that never quite worked right together.

The road came to a dead-end. Beyond the brownstone building at the end of the cul-de-sac was a small public park with the bushes and flowers set around a central clearing with a copper sundial long green from exposure. She followed the small, pebbled path and put her bag down, lowering her body to the sun-warmed stone bench.

Someone had planted dark tulips near the bench, a purple so dark it was nearly black, like blood in the moonlight.

Her stomach lurched halfheartedly, something in her mind screaming out at the idea of *black blood, the way it looked on her hands*, and she wondered if she would be the first person ever driven to vomit by the sight of flowers.

Behind her, she sensed more than heard a quiet presence, and something in her relaxed. The color of the flowers was just pretty again, rather than threatening.

"You didn't tell her about me," Zhu said.

Mara looked at some of the other flowers near where she sat. More tulips in dark reds and yellows. "Didn't I?" she murmured.

“You know you didn’t,” he said, sitting down on the bench next to her. She didn’t look toward him, closing her eyes instead to enjoy the late afternoon sun on her back. “Why didn’t you?”

Mara concentrated on the muscles in her back, willing them to relax, one vertebrae at a time. “I don’t know. I’ll introduce you next time I see her, if you want.”

“Not what I mean, and you know it.”

Some pollen in the garden was beginning to make her eyes itch. “What *do* you mean, then?”

He shifted next to her, shoulder brushing hers. She felt no warmth through his T-shirt. “I just worry about you.”

Mara clamped down hard on the impulse to lean into his seemingly solid form. “As soon as I decide whether you’re a hallucination or a ghost, I’ll let her know, all right?”

Zhu didn’t say anything for nearly a minute. “You haven’t decided yet?”

“Well...” She drew the word out. “The hallucinations, when I knew what they were, were usually all bloody and...unpleasant. You’re not. But, I don’t believe in ghosts.”

“Oh.” He cleared his throat. “Tricky.”

“I haven’t considered it too closely, actually. I’m not the world’s most introspective person usually, and I was afraid that if I overthought it...” she trailed off.

“You were afraid you’d figure it out?”

“Maybe. Maybe I was just afraid.” She rubbed her eyes. “What was I thinking about before that blasted appointment? I remember it was important.”

“The results from that experiment you and Kendall have been running. It showed—”

“Unexpected signs of electron warping,” Mara said, sitting up straighter.

“Electron *warping*?”

“For lack of a better word.” She rubbed her eyes again and looked out toward the east, where the lake would be if she could see it; behind her clouds were gathering in the southwest. The breeze gusted, colder than it had been before. There was still late afternoon

sun on her back, but in less than an hour, the coming rain would drive it away. Her eyelids itched. “Why are you giving me that look?”

“I don’t know what you mean,” he said primly.

“Sure.”

His thin, pointy face didn’t hide anything, his strange yellowy eyes twinkling behind the small round glasses that still perched on his nose. “Well, what do you think?”

“What about?”

She wanted to punch his shoulder but restrained herself. “The results. That can’t be right, can it?”

“Why not? It’s a hell of a multi-verse out there. If I told you even half of what I’ve seen—”

She wasn’t listening. “Because if it is...we’ve discovered a way to change the face of space travel as we know it. We may have proven string theory and a dozen other things. And that sort of thing—” she bit her tongue.

“That sort of thing what? Doesn’t happen by accident? Doesn’t happen in Chicago?” He paused and pinned her with a look like a lepidopterist might pin a dead moth. “Doesn’t happen to you?”

Mara looked away. “Something like that,” she muttered, unsure of which one she meant.

His eyes were warmer than the fading sun, drilling radiation into the side of her head, in contradiction of how eyes were supposed to work. She expected him to say something like, “Why would you think that?” but he just turned away eventually as well, staring at the bush across from them. “There’s only one way to know for sure, isn’t there? If it’s true.”

Mara’s eyes tracked a bee as it moved from one of the big white blossoms to the next. That flower—she bet that was what was making her itch. “Surely that would be very expensive, just to test a theory.”

“What?”

“What?” she echoed.

“What are you—”

“Building a space-going prototype,” she said. “What are *you* talking about?”

“Going to see Kendall.”

“Oh, that too.” She started to get to her feet and hesitated. “Do you think it’s worth it? It could just be a glitch or something.”

Zhu made a face. “Come *on*, Diogenes, recognize an honest man when you’re hit over the head with one.”

Mara rolled her eyes, and for a moment, it was just like before, and she would tackle him in a minute and kiss him.

She cleared her throat. “Right,” she said, and glanced at her watch. It was nearly five o’clock, and she made an undignified squeaking noise. “I’ve got to run if I’m going to catch him.”

She jumped to her feet, but Zhu’s voice arrested her flight. “Mara? You really don’t believe in ghosts?”

She looked back over her shoulder towards him. “No. Maybe. I don’t know what I believe, Zhu.”

There was a silence long enough that she started feeling twitchy before he nodded and said, with a touch of his old humor, “I won’t take it personally.”

Chapter 16

Mara sprinted across the quad, scattering the Divinity School students who had emerged from their hiding places into the cooling air and let herself into the physics building as a few early raindrops splattered on the bricks. The last lectures of the day were done and lab groups had long since broken up, leaving the building with a deserted feeling despite the well-lit halls.

She hesitated between the elevator and stairs for a moment, but the elevator door sliding smoothly open made up her mind. The ride up to the fifth floor was slow and the small box shook, the old winch complaining somewhere above her head. The light flickered.

Mara shivered. Should have taken the stairs.

The doors slid open, and she spilled out into another hall, where half the lights had been turned off. She could see thin strips of yellow beneath some of the doors down the hall in the offices of professors who were working late. She turned right.

The department office was closed and dark as she passed it, the mailboxes stuffed with colored fliers for some event or other. The library on the left was closed up and dark, the conference room at the end of the hall silent. She turned the corner and kept going.

From the hall, there were no obvious lights on in Dr. Kendall's office, but the door was slightly ajar, so Mara didn't give up hope.

She took a deep breath, paused to fish the folder out of her backpack, and knocked.

"Come in."

She went in. Dr. Kendall's office was small, made smaller by the sheer number of books that he had fit on the bookcases, the shelves of which were bowed under the weight. His desk took up most of the

rest of the floor space, arranged so as to be between him and whoever happened to come in the door. It wasn't intimidating, but it wasn't exactly welcoming either.

At least, it wasn't as intimidating as the small skull that was being used as a bookend on one of the shelves. The small *plastic* skull—or so she hoped.

"Ms. Daniels," Kendall said without looking up from his work, "Please, sit. How may I help you?" His attention seemed to be totally focused on the yellow legal pad in front of him, but she didn't blink when he added, "You seem a bit flustered."

She ran a hand through her disheveled bob and sat down in the only chair available, a small leather number with the sort of ergonomic back designed to make the sitter feel uncomfortable after about ten minutes. "Sir," she began, "I've been going over this data."

He looked up from the figures, his gray eyes glittering behind his glasses. "I was wondering how long it would take you to get back here."

"Really," she said dryly.

He nodded. "I'm impressed. I'd expected to find you here first thing Monday morning."

Mara fought the terrible urge to roll her eyes. "It's just that the data is a bit odd." She opened the folder and scanned the printouts again. "Here. These numbers, shouldn't they be—"

"What?"

"Well, different? As in, not that. As in—"

He took the printout and glanced over it. "It looks fine. That is, it looks as though our program is functioning correctly."

"But the results are suggestive of the creation of vacuum energy. And—" she waved her hands in a way she meant to indicate that they might have accidentally broken modern physics.

She apparently failed to get her point across, as he looked unconcerned. "We've found what we were looking for, you mean," he said mildly.

She studied the top of his desk. There was a name plate that said E. Kendall, Ph. D. There was a green yo-yo, a stack of midterms, a couple of books, and a paper which looked like the one she had

submitted to Dr. Katz, the bastard. "I just think that it might be more plausible that the code was flawed."

Kendall leaned back in his chair, the leather squeaking as he shifted positions. "I thought so too, initially," he said, looking up at the unlit florescent lights. "I spoke with Brian."

He didn't seem inclined to go on, so she said, "And?"

"There's no problem with the code. Brian doesn't have the imagination to be a truly great theorist, but he's a solid programmer." He paused, rubbing at his jaw, the stubble rasping in the still room. "He's actually been doing some interesting work on quantum dots," he added. "I'll have to put him in touch with that guy at Caltech. What was his name? Dr. Angelou, was it?" He cast about for a pencil and Mara realized they were wandering from the subject.

"The code," she said firmly.

He paused, pen halfway to the paper. "The code is fine," he said. "I looked at it, Brian looked at it, and five people in the computer science department looked at it. They all thought it was fine. If there was an error in the program, it would have thrown errors before now. In summary, the code is fine."

"Got it," she sighed. He scribbled a note and stuck it to the computer monitor that sat on the long leg of the L shaped desk. She squinted at him. "If we've just found what we're looking for, why aren't you more excited?" She paused. "For that matter, why are you even here? Shouldn't you be down in the lab?"

"I was," he said, shifting in his seat. "From when I first got the results yesterday morning onward."

Looking closer now, Mara could see the shadows of fatigue in his face. "But you came to lecture."

"Believe me, it wasn't my idea," Kendall said dryly. "Brian tracked me down this morning and swore he would confiscate my coffee maker if I didn't go."

Mara laughed. "So what now?"

"Now, we go home, or rather, you go home, take the weekend off, and we come back Monday morning to begin deconstructing a lot of obsolete cosmological theories." *He seemed far too thrilled about that,* Mara thought sourly. Kendall got to his feet, retrieving briefcase and

cane from a chair behind him. The case opened with a soft *snick*, and he began to sort papers into it.

“You’re not going home?” she asked, taking the folder back.

“Unfortunately, not. It’s my ex-wife’s birthday, so I am going to change and then on to her birthday party. Then I am going to return home, get drunk, and spend the weekend watching the original Star Wars films. If cutting edge physics needs me, it has my number.”

Mara snorted. “You’re going to your ex-wife’s party?”

Kendall shook his head as he added another file to his briefcase. “We maintain a close one-upping relationship. After all, what’s a failed marriage between friends?”

“What indeed.”

He eyed her speculatively, closing and latching the briefcase. “You don’t want to come, do you? That would look pretty good; I get to walk in with a beautiful woman half my age, and she’ll be announcing her engagement to Ernie the dentist.”

She smiled. “Sorry, I have plans.”

“Ah yes, I remember what it’s like to be a graduate student. The parties, the drinking, the casual sex, the stiletto heels that could gut a man, the carefree lifestyle of the single young person in the big city.” It sounded like an episode of a sitcom, but Mara decided not to ruin the fantasy.

“You can tell her you were going to bring me, but I got sick and couldn’t come,” she said mischievously.

He looked intrigued but sighed after a moment’s consideration. “No, she’d expect me to bring you to the wedding next fall.”

Mara shrugged. “So bring me. I don’t have any other plans for September, and I’ve never found it a hardship to hang around in a gown.”

“I’ll keep that in mind.” Kendall stepped past her and waited in the hall to lock the office door. Mara walked with him back toward the elevators.

“I hope it goes...not too badly,” she said at last.

He made a dismissive motion with his free hand. “Don’t worry about it.” His pace was unhurried, the cane taking most of his weight off his right knee. “I think it would be best if you refrained from mentioning the project to anyone for a couple of weeks.”

“Why?”

“I’m just worried that if the government decides to step in and classify this, it may be difficult to keep you on the project before you’ve got your degree. I’d like to avoid it becoming an issue.”

The elevator door opened when he pressed the button; no one had called it in the twenty minutes Mara had been on the floor.

He stepped in but held the door open until she stepped in as well. It felt like coming back to something, coming full circle. There was the *divides by one* graffito, and another one that said *Greg Wilson obfuscates his code*, and one that said *For a good time call 127.0.0.1*, which was kind of disturbing.

“Undergraduates,” she muttered, tracing the G in Greg with her finger.

The elevator chimed. The doors slid open revealing the first floor, and Kendall limped out. “Look,” he said, stopping near the door. “Get some rest, okay? Physics on Monday.”

“Sure,” she said, and watched him leave. “I’ll see you then.”

She stood for a moment listening to the rain ticking fitfully against the windows in the hall. Then she turned around and went back up to the lab.

Chapter 17

The lab was a quiet room between the fourth and fifth floors and therefore unreachable either by elevator or by the main staircase, a fact that deterred the janitorial staff and therefore attracted Kendall's group, though since he'd injured his knee, he could be heard suggesting other labs might be more useful. It was reached by wandering through a number of labyrinthine fourth floor halls with autographed pictures of famous physicists on them. Opposite the main staircase was a heavy fire door with a sign on the door that read: "Alarm will sound." No alarm would actually sound, since the sign had been stolen from a different door and never replaced.

The row of windows on the room's eastern side had a nice view of the quad and made the whole place feel less cut off than the basement labs.

Currently the room was pretty empty, considering its size. In one corner, ten PCs were linked together to form the mainframe they used as the primary simulation machine. In front of the windows, Mandy, the project's engineer, had left a small device set up. Mara wasn't exactly sure what it did—obviously, light coming through the windows hit the photosensitive cells of a radiometer, making the small coated panels spin and transmitting some sort of data to a box of electronics about the size of an old reel-to-reel tape player. What kind of data it transmitted was a mystery, though sometimes Mara suspected Mandy left it there mostly to annoy Kendall. Since joining the project the previous May, Mandy had configured and maintained the distributive computing array, made herself available as tech support, and not much else. Her main hobby seemed to chiefly involve the manufacture and detonation of small explosive

devices. Somewhere in the back of her head, Mara was terribly glad that they finally seemed to have something to occupy her. Bored engineers were scary engineers.

Mara spun in her lumpy desk chair as the main server booted, watching the walls flash by. On one of them was an artist's representation of a star going supernova that Brian had hung up. On another was a print of *The Vinegar Tasters* that had been there so long no one remembered where it was from.

The computer let out an a musical blat to let her know it was finished loading and she turned back to the screen and logged in.

"What are you looking for?" Zhu said, crouching down by her chair.

Mara looked up at his arrival. "This and that," she said, not glancing at him while he rolled his eyes so loudly she could hear it. "Looking, perhaps merely for the sheer joy of the search."

"You're still a bad liar," he said, "and you're not going to find anything."

Mara gave in and looked at him, then turned back at the monitor. "Ye of little faith."

He sighed breathlessly. "I mean you aren't going to find anything wrong with the program."

"That's as may be," Mara said, feeling more obstinate than she had in a while, "but I have to look."

Zhu got to his feet; she fancied she could hear his silent footsteps as he paced behind her. Ignoring him, Mara pulled up the simulation code.

It was slow going. Brian had commented the whole thing almost to death, because he was a good, little ex-comp sci guy who'd had his lessons beaten into him early, but Mara had never picked up more than basic Perl coding skills. Interpreting some of the more obscurely concatenated lines was troublesome, like translating a text with a dictionary and no real knowledge of the original language's grammar. She could discern the meaning of many individual functions, but as the variables passed from one to the next, she started to lose track of what was going on.

Still, there were no obvious errors, like forgetting about entropy or making gravitational acceleration equal to five meters per second or pointing it up instead of down.

She compiled the code and set it to run with the same initial parameters as the last trial had used and sat back.

It was raining in earnest outside now; she could see the occasional lightning bolt flicker and hear brief thunder. On the screen, the numbers flashed by, increasingly anomalous, smashing the hell out of probability. Every falling raindrop that hit the sidewalk outside splashed; its atoms did not line up correctly to allow them to integrate with the atoms of pavement or to move between them. And yet the screen said they could...

Mara started at a noise from behind her. She hadn't heard anything from Zhu in several minutes. When she turned it was with a wary tension in her spine.

Zhu wasn't there.

On the nearest lab table, its red lights flickering, was a small device that looked a lot like a handheld radio.

Mara picked it up and watched the lights flash. It was the ghost detector.

"Hello?" she called, looking around the lab. The sun had set at some point, leaving the room bathed in weird, flickering shadows from the computers. "Is anyone there?"

Something in her heart lurched as she said it. She sat on the edge of the table, waiting; there was no response, and she wondered if she'd been expecting one.

Chapter 18

Mara didn't remember the accident. Sometimes, mostly in the small hours of the morning, she wished that this was not the case. When the vague, gnawing panic came, settling at the bottom of her rib cage, she thought anything would be better than not knowing. Anything to clear up the vague, lingering doubts.

Most of the time, she understood that this was stupid. Since the day she woke up in the hospital and read the truth in the face of the sad-eyed Australian doctor, she'd known that knowledge did not entail absolution any more than its absence did.

She did remember waking in the hospital, disoriented. The disinfectant smell, high and sharp. The doctor with the blond hair in the doorway. It was dark beyond the windows.

"Do you know where you are?"

"A hospital." It was pretty obvious; he was wearing a stethoscope.

"What city?"

The name was gone from her head, and she frowned, reaching up to touch her cheek, the knot of pain on her forehead. Her hair was stiff and sticky. When she took her hand away her fingers were reddish brown.

"What country?" The doctor stepped into the room and pulled a chair over to her bedside, oblivious to her rising panic.

"Japan." He was frowning now, so she tried again. "Australia." But that wasn't right, since she remembered the flight to Japan but not to Australia. "China. What happened to Zhu? Where is he?"

"Are you guessing?" He was making notes on something in the dim light, and she felt entirely frustrated. "Do you remember what happened?"

“Where’s Zhu?” she asked again. “Was he with me? What happened to him?” She couldn’t remember his first name, and the world spun.

Or maybe that was the head injury.

The doctor sat back, putting his pen back in the pocket of his white coat. “So you don’t remember.”

“Remember what?” She sounded cranky and petulant. Fair enough, since that was how she felt.

“There was a car accident,” he said in the gentle, detached tone that doctors adopted to seem sympathetic. “The cab you were in was hit by another car.”

Her heart sped up; she leaned forward, ignoring the pain in her ribs. “Was I alone? Where’s Zhu?”

“Benjamin Zhu was pronounced dead on arrival.”

Mara fell back in the bed, not as far as she’d expected because apparently the nurse had raised the head. The world stopped, everything, including time and the rotation of the stars and her breathing, and she felt a strange cold creeping into her limbs to settle underneath her breast bone. Though she braced for it, there was no immediate desire to run screaming into the night or throw herself off the top of a building, nor even the impulse to spend the rest of the night sobbing. She thought, very clearly, that she would never be happy again, and that knowledge undid her. She felt suddenly very tired.

“I’m sorry,” the doctor was saying. “Were you close?”

“Yes.” She looked down at her hands, thin and papery and clenched on the green blanket. “We were here to see his aunt...” Or great-aunt? No, aunt. Nice woman on the far side of middle aged. Mara didn’t remember her face. “Someone should call...I don’t know her number.”

The doctor put a hand on her arm. “Don’t worry about it for now. We’ve got the emergency contact information that was in your passports.”

Mara couldn’t remember ever filling that out, or putting it in her pocket when they left the hotel, for that matter. Perhaps she had. “But—”

“Get some rest,” he said, getting up. “We’re keeping you under observation for a concussion for the next twenty-four hours.”

“No, I—”

He left, and she was alone.

Chapter 19

A man was running through the woods, pursued by a tiger. As he went crashing through the undergrowth, he became disoriented and ran off the edge of a cliff.

Just before he fell to his death, he managed to grab onto a vine a bit below the top of the cliff.

He hung there a moment, catching his breath. Then he looked down toward the clearing below.

The good news was that he'd probably survive the fall. The bad news was another tiger was prowling around, ready to eat him the moment he hit.

He looked up toward the edge of the cliff, and he could probably have pulled himself back up, but he could hear the first tiger still snuffling around, growling to itself.

He hung there, trying to decide which way to go. And while he hung there, a little black mouse and a little white mouse started to chew on the end of the vine he was hanging from.

What could he do? He couldn't go up, couldn't go down, and all the time the mice were chewing, chewing.

Looking at the cliff face, he saw something red. He held the vine with one hand and with the other reached out and plucked a strawberry and put it in his mouth.

How sweet it was.

Chapter 20

“We were at his aunt’s house,” she told the doctor when he came back. “We had tea. And we stayed pretty late, and she invited us out to dinner, so we went to this restaurant she knew that made...” That was a blank spot. What was its specialty? “*Beijing kaoya*, I think.”

“You think?”

Mara didn’t look at him. “We left the restaurant around eight and decided to go to the train station to buy tickets for Shanghai.” Laughing, she’d made Zhu hail the cab, because Beijing cab drivers didn’t like to stop for *waiyuoren*. The cab was green and air conditioned, but the driver had the window open anyway.

“Then what?”

She shook her head. “Then there’s nothing.” The cab had looked like any other cab. She’d got in after him, laughing about something he’d said. He’d told the driver they wanted to go to the *Beijing zhan*, the train station, and the cab pulled smoothly away from the curb.

Chapter 21

Mara looked up at eight o'clock with the niggling sensation that she was supposed to be elsewhere.

It took her nearly a minute of staring at the glow-in-the-dark numbers of the lab clock before it returned.

"Shit," she said. She was due at Ali Baba's thirty minutes ago, and there was still half an hour of travel time between her and Rogers Park, assuming everything was on time.

In her bag, she heard the high-pitched whine as her cell phone began to vibrate. She ignored it in favor of shutting down the computers and running like hell for the door.

Mara took a bus back to the loop and hopped the "L" towards Rogers Park East.

The train car was warm and stuffy with a lingering odor of sweat, though empty enough after rush hour. Across from her sat a young couple in leather coats, one young woman with long dark hair, dark lipstick, dark eyes, the other slightly older with short purple hair and a nose ring, their clasped hands between them with nail polished fingernails alternating red-black-red-black-red. A few seats down, a balding man in an ill-fitting shirt was having a conversation with himself, but he was doing it softly enough that Mara couldn't make out the words. It looked intense, like he was having an important debate, and she wondered if he was losing, if it was possible to lose.

In her hand, the red lights of the ghost detector flickered and flashed like a oscilloscope, from all to one to half-lit and back to all again.

The whole thing was useless, as she had told Zhu once long ago on an autumn evening. There were electromagnetic fields everywhere

from all the electronics people carried in day-to-day life, to say nothing of people themselves. How would you ever know if you were actually picking up a ghost in the city when it might be your neighbor's television or his pacemaker?

A voice in the back of her head that sounded frighteningly like her own laughed at that thought. As a string theorist, you believe in the existence of thirteen dimensions. Why have you no room for ghosts?

The car rumbled to a momentary stop, and a couple of kids in jeans got on and sat at the back. They were about fifteen or sixteen, one of them wearing a Francis Parker School shirt, and they were laughing.

"Okay, okay. What about ninety-one?" the first boy said. He had messy brown hair and a high-pitched laugh.

"Not prime," his blonder, calmer friend said. "Divisible by thirteen and...seven?"

"You're not sure?"

"I'm sure. It's thirteen and seven."

The dark haired kid laughed again. "You're right."

"Okay. Um, five hundred three."

"Prime," Mara muttered to herself, soft enough that no one could hear it, and got off at the next stop.

The walk to Ali Baba's was ten minutes even if she rushed, and she shivered through it, the drizzle matting her hair and sticking it to her cheeks. It wasn't coming down too hard, just enough to be wet, for which she was thankful. Her bag was waterproof in both directions owing to some sort of plastic in between the layers of cloth. In practical terms, that meant that once water got in through the top flap, it tended not to leave.

The whole thing was absurd. Not what she'd expected when she got up. They'd broken physics. She might be going crazy, they'd broken physics, and she was supposed to defend her dissertation in a month.

A car drove by and splashed her with dirty water from the gutter, its tires squealing loudly as it rounded the corner. A moment later, there was a dull thud of metal on metal and Mara found herself

clutching a tree, eyes closed, breathing raggedly, trying to force back the sour vomit that rose in her throat.

There was silence, and her pulse began to slow. She began to giggle.

There had probably been stranger days, but not many since the day God saw Adam holding an apple behind his back and said, “We have some lovely parting gifts for you.”

She stood for a minute with one hand still pressed against the tree’s bark, trying to catch her breath. Alex and David were waiting for her at the bar down the street, possibly already deeply into one of those terribly snarky arguments they had when she wasn’t there to intercede.

In the background, she began to hear the first sirens as the police arrived.

It took a full minute of standing there, shoulder now against the rough damp tree, before she pulled herself together. The grating around the base of the tree was uneven metal, slick with rainwater; she could see the little plants beginning to work their way up through the bars.

Finally she straightened and made an effort to put her hair in order. She pulled her coat closer around her, doing up a couple of the buttons to keep warm. Projecting significantly more aplomb than she actually felt, she resettled her bag across her shoulders, tugging on the strap to tighten its hold on her, and set off down the street.

In this manner, Mara Daniels entered the bar.

Chapter 22

Her nightmares gave her reason to believe there had been a moon out, but she rarely dreamed about the crash itself.

Sometimes she dreamed about shouting in Chinese and English that they were Americans, and then the same thing in Japanese because no one seemed to understand. There was pain blossoming somewhere in her shoulder, and the ground seemed to swing and pitch beneath her feet like it had when she was a child dizzy from spinning in a chair. Something black on her hands.

That was it.

Mara told herself it was best that she didn't remember.

Sometimes she even believed that.

Chapter 23

Ali Baba's was on the far eastern edge of Rogers Park, near Lake Michigan. It was on the ground floor of a three-story building with splinted blue siding and two floors of apartments above it. The door was dark wood with a small window high up, like the door of a medieval fortress.

The interior was less intimidating. The wallpaper was a cheerful green paisley pattern that dated from the seventies, the carpet was a dirty red, the booths and bar were dark leather. Behind the bar, bookended by a multi-colored collection of bottles, bubbled a fish tank.

Damp, tired Mara paused in the doorway to survey the room. Her hair was clinging to her cheeks, drops of water still arrested in her eyelashes. The room was large and fairly empty. It was early yet, though. Alex and David were at the bar, Alex listening with all apparent amusement to some story David was telling, complete with grandiose hand gestures. Mara caught the concern that flickered across his face when he saw her, though amusement quickly replaced it. He nodded to David and said something pitched low so she didn't catch it, and he swiveled around, grinning.

"Whoa," he said as she came down the three steps to the sunken bar. "Raining much?"

Mara rolled her eyes and climbed onto the stool next to him. "A bit."

Down the bar, Alex gave her a sympathetic look. "Are the buses running late?"

"Yes," she said, opening her bag. "Or rather, they weren't, but I am."

“What were you doing?” Alex asked. She wasn’t sure she liked his tone.

Mara found her wallet and closed her bag, letting it slip to the floor. “I was at the lab.”

The bartender materialized in front of her before either of them could say something sarcastic.

“Can I help you?”

“I’ll have a Jameson’s on the rocks.” She glanced sideways at her companions. “And whatever these two are having.” She dropped a twenty on the counter.

Her whiskey arrived, and she stared into it. Dimly she heard Alex say something like “Another of these,” and David agreed. She picked up the glass, which was cold and damp with condensation. Through the glass, she could see the colored bottles, the distorted shapes of the fish.

“You okay?” David said, putting a hand on her arm. It was warm against her chilled skin; she thought perhaps this was the first time all day that someone had touched her. She felt suddenly grounded.

“Long day.” She glanced at him over the rim of her glass. “*Ganbei*,” she said, and drank it. The whiskey tasted sweet, like desperation and fatigue, dark and smoky, a little like rubbing alcohol. She coughed and made a face.

David was looking at her askance. “How was it?”

“Cold.” It burned her throat, just a bit, on the way down. “Good. How’s your beer?”

He glanced at the glass in front of him. It was a pleasing brown color, almost the same as the wood of the bar, and from where Mara was sitting it smelled yeasty, like bread or...like beer. She didn’t especially like beer. She signaled the bartender for a refill.

“Good. Bitter. It’s a coffee stout.” He tilted his head. “Are you sure you’re okay? You look pale.”

Mara put a five on the bar and took a sip from the new glass, and another; when she looked at it again, there was a lot less whiskey than there had been. “I’m fine. Something startled me outside.”

“Careful there, tiger,” Alex murmured. “Don’t overdo it.”

Mara rolled her eyes. “Sure, Mom.”

“What’s gotten into you today?” David asked.

“We broke physics,” Mara said mournfully, staring into the suddenly refilled glass.

“Really?” David picked up a spare coaster and dropped it. They both watched it fall to the floor. “Gravity’s still working,” he announced. “So which part did you break?”

Mara sighed. “We didn’t *break* it, exactly. We just...look, how much do you know about negative mass propulsion and vacuum energy?”

“I...nothing.”

“Right. Well, we live in an apparently infinite multiverse with at least thirteen dimensions, and sometimes if you try, you can pass from one to another.” She paused, taking in the blank look that had stolen across his features. “It’s just a thing. I’ll draw you a picture sometime, that’ll help.”

“Sounds important, anyway.”

Mara nodded, sipping her drink. “How was work?”

David raked a hand through his energetically messy hair. “I spent all afternoon helping the vet medicate the lungfish and a couple of sea turtles.”

“And yet there’s not a spot on you.”

He grinned. “Some of us got home to change.”

She punched his arm. “Bastard. Some of us could totally have made it back except that we were really busy doing important things.”

From down the bar, Alex smirked into his glass. “Busy running the same tests over and over, more likely.”

Mara made a sour face. “Hey, just because what I do for a living doesn’t involve octopuses or whatever doesn’t mean it’s not—” the bell above the door jangled as someone walked in, and Mara broke off as she turned to see who it was. A familiar figure wandered in, hands in his pockets, unkempt black hair falling into his eyes.

“Now what?” David frowned and looked around. “What are you looking at?”

Zhu walked down the bar past them and vanished into the gloom at the far end.

“—interesting,” Mara finished abruptly. “Do you see— No, never mind.” Her glass was empty again, and she waved down the bartender for another refill.

“What’s going on?” Alex asked.

She paid the bartender and slid off the stool, glass in hand. “I have to,” she mumbled, waving towards the back of the bar. “Watch my bag, all right?”

“Sure thing,” Alex said from her other side. Her head whipped around, making her feel dizzy. “We could watch your drink too, if you want.”

“That’s nice of you,” Mara said, tightening her grip on the glass.

A band was setting up at the back of the bar, and one of the roadies had left the rear door propped open. Mara slipped out, drawn by some unnamable compulsion.

The courtyard was a narrow space with a large tree in the center, encircled by a brick wall with a wrought iron gate in it so that those who lived above the bar could come and go more easily. The ground was paved with the type of cobblestones that turn the ankles of the incautious, with a thick layer of damp leaves on top. The air smelled of rain, moldering leaves, and drowning worms. A breeze rustled the tree, spattering her with rain drops. Mara shivered in the quiet.

She took a few unsteady steps forward and slipped on the leaves, catching herself against the trunk of the tree with one hand, her other steadying her drink. The air was cool on her face, and she closed her eyes.

In the street beyond the wall, a car drove past, muffler grumbling like a B52, and the moment was gone. Mara opened her eyes.

Turning back towards the bar, she noticed the building’s fire escape. Unlike many, its stairs came all the way to the ground, ending in a locked gate. The bars weren’t very close together, and though there was some wire grating immediately around the lock, she thought she could probably get her hand through and reach the—

There.

The gate creaked softly as it swung open, and Mara stepped through, closing it behind her. The black iron stairs shone wetly

in the streetlights, rainwater beading on their lower edges; they stretched upward like she stood at the foot of the 7,200 steps leading up to the top of *Taishan* in *Shandong* province, waiting to ascend.

It was not an unapt comparison. Mount Tai was believed by the Daoists to be a sacred place, where the Jade Emperor, ruler of heaven and earth, kept his court.

She started up.

Chapter 24

In the West, ghosts are traditionally viewed as souls which could not find peace after death. The reasons why rest escapes them differ widely—a longing for revenge, unfinished business of some sort, or a desire to protect those they left behind. Some appear only once, at the time of death, perhaps as a way of bidding farewell to those they are leaving behind. Others appear again and again, repeating the same actions each time, searching endlessly for some token that would allow them to find peace.

It has also been hypothesized that ghosts are created by a tremendous outburst of psychic energy occurring during a traumatic death. The energy colors the place in which the person died, leaving a trace that can be felt by those so sensitive. This theory also attempts to explain why ghosts tend to haunt places where they died rather than where they lived. Thomas Beckett, killed by Henry the Second, will forever walk the Tower of London.

The Chinese character meaning “ghost” and the character meaning “soul” are very similar, and the ideas themselves are related. When a person dies, two lords called *bai hei wu chang*, the black and white uncertainties, escort the person’s soul to hell to be judged and reincarnated. Ghosts are souls that refuse to go, often because they have unfinished business on Earth. Unlike Western spirits, which mindlessly echo the events of their lives, forever reliving the torments they suffered in some place, Eastern ghosts have consciousness and agency. Some ghosts, especially those who died in violent ways such as drowning, can kill people and rob them of their right of reincarnation.

Doubt exists on both sides of the Pacific. Around the year 100 C.E., skeptic Wang Chong wrote that ghosts are never the result of the spirit of a dead person, but the projections of the things people imagine, especially when they are ill, worried, or frightened. In the West, the modern response is to apply Occam's Razor and say that people who claim preposterous things are usually foolish.

Chapter 25

Mara mounted the top step. Then, with a certain sense of foreboding, she stepped onto the roof. It was a wide, flat space, with a hut-like structure in the middle for maintenance staff. In the far corner lurked the great bulk of an industrial air conditioner, its pipes jutting off at random angles. There was a ledge running all the way around at hip level. Two pigeons in the corner aside, Mara was alone.

She sat down on the ledge and looked out at the city. Down the shore, the Ferris Wheel at Navy Pier was lit up though unmoving; she could see the Sears Tower and the Hancock Building farther inland, and she imagined that in the darkness she could make out the jet of land where, unlit, the Adler Planetarium lurked.

There was no sound of warning, but Mara didn't jump when Zhu sat down next to her.

For several minutes, they sat in silence, staring out at the city. Mara turned her half-empty glass in her hands. A breeze blew in off the lake and she shivered, pulling her coat closer around her shoulders.

There was something lumpy in the pocket. She set her glass on the ledge next to her and pulled out whatever it was.

The ghost detector. Its lights were flashing madly. She glanced at Zhu and then back at it, then looked out towards the lake, the green afterimages floating in front of her eyes.

"Well?" he asked.

"It could be that storm," she said, pointing at clouds to the southeast. They were close enough that the lightening was visible, but she couldn't hear the thunder yet. "Lightning also sends out radio waves."

Zhu snorted and looked back at the lake. To Mara's eye, it was dark and oily under the stormy sky. "What are you trying to prove?"

Mara shook her head and thumbed the off switch. Nothing happened, and she frowned at the detector before setting it down. "I wish I knew what you wanted."

"Is it really that hard?" he muttered, getting to his feet. Mara turned to watch him as he paced the rooftop, hands in his pockets; the concrete of the ledge was rough against the backs of her knees, and her feet dangled a few inches above the roof. He looked like he had the last time she saw him alive, in a T-shirt that said something clever in binary code and neatly creased gray-green trousers. Maybe he was glowing faintly around the edges, but maybe that was her eyes playing tricks. "Kendall was awfully friendly," he said, stopping abruptly.

She didn't try to deny it. "Heard that, did you?"

"Hard to miss."

"Are you worried about it?"

He seemed surprised by the idea. "Worried?" he said, and lapsed into silence for a moment. "Not exactly. I'm...Say I'm curious as to what you're going to do about it."

Mara smiled mirthlessly. "Liar." Thunder grumbled off in the distance.

"I trust you."

She picked up the glass again, just to have something to hold. "Why?"

Zhu rocked back on his heels and forward to his toes while he considered it. "Because I love you. I mean, I think that's a pretty good reason."

"For most people." Mara sipped the whiskey, which was becoming increasingly watered down as the ice melted. "Our...I don't know if I would call it a relationship at this point, but it isn't exactly typical."

He laughed, and Mara relaxed slightly.

She closed her eyes. "I'm not going to do anything."

"About Kendall?" There was a pause and a rustle as he stepped closer. "Why?"

“What do you want from me?” she asked. “You’re dead. Nothing can change that. I can’t—” her voice broke and she stopped, clearing her throat. “You’re dead, Ben.” Mara opened her eyes. “Eight months I’ve been alone now. What do you want from me?” Zhu was standing much closer than she’d thought, a strange sad look on his face. She would have pulled back, but there was nothing behind her but empty air. “There are two types of ghosts,” she whispered. “Which are you?” Nearer now, lightning flashed, and the thunder grumbled a few seconds later.

He took another step forward, wrapping one hand around the lapel of her coat. “I want you to stay with me,” he hissed, so softly she nearly missed it, even with his face nearly touching hers. She didn’t feel his breath on her face. His right hand crept up and took her other lapel.

“I can’t do that,” Mara said, throat dry.

“I could make you.” It wasn’t a threat, exactly, because Zhu would never have been so indelicate as to offer threats, but it was almost more frightening as a statement of fact. She forced herself not to tense up, even as her heart kicked and redoubled its pace.

“You could,” she said. “But you won’t.”

“How do you know?”

How did she know? The wind whistled around her ears, plucking at her damp hair, making her shiver. Lightning flashed and Zhu’s eyes burned with a strange new light. The concrete she was sitting on felt cold and unyielding beneath her legs; the ledge grew distant as she became aware of every inch of the drop from rooftop to cobblestones behind her. The hair on her arms stood up.

Mara set down her glass. “I trust you,” she said and leaned back over the vast yawning drop. “I think that you know that at the bottom of it all, I want to go on living.”

The next thirty seconds lengthened and stretched away towards infinity as he considered this, only his hands on her lapels keeping Mara from a painful fall. Her gray eyes locked with his yellow ones and neither of them looked away as the lightning flashed overhead. She counted the time to the thunder in heartbeats that seemed to come far too slowly. The thunder was loud in her ears, less than two miles away. She shivered again, staring up defiantly.

He relaxed and stepped back, pulling Mara back up, and she let out a breath she hadn't known she was holding. "I'm sorry," he murmured, letting go of her lapels and smoothing them out. She shivered at the non-heat of his touch then pulled him in and hugged him.

She pulled him down so she could whisper "It's all right" into his ear. "It'll be all right. I'll see you again someday, won't I?"

Zhu's lips ghosted across hers before he stepped back, out of reach. "I don't know. I hope so." He was already looking faint around the edges.

Mara swallowed around a large lump. "I'm going to miss you."

He smiled, a sad parabola as the rest of him became mist. "Goodbye," he said simply, and then he was gone.

Mara stared at the spot where he had been for a minute, then another. The storm was all around her and with a sigh and a whisper, the rain began to rush towards the ground. She picked up her glass in mute salute and downed the rest of the whiskey.

When she stood, it was on rubbery legs, though from drink or shock she wasn't sure, and she was obliged to spend a moment leaning against the ledge. She picked up the now-silent ghost detector and returned it to her pocket. Then, weaving only slightly, she started for the stairs.

Chapter 26

Some philosophers postulate that time travel is impossible, on the grounds that it circumscribes free will.

The example goes like this:

Suppose Brian is waking along one day, minding his own business, when a wild-haired old man comes up to him and exclaims that he is none other than Brian himself, come back in time from the future.

Brian reacts badly, but eventually goes on his way until the day when he has become a wild-haired old man who discovers the secret of time travel. And then, tramping around his old stomping grounds, when he sees his younger self, doesn't he feel a compulsion to approach him and tell him that he is Brian himself..

A lot of tedious argumentation about epicycles can be avoided by saying simply that those traveling in time must avoid meeting themselves. In fact, it's probably best for everyone involved to avoid meeting anyone they know, or might possibly meet or be related to, which means only the distant past and far future are available. And beyond the educational value, where's the fun in that?

Perhaps it's best to leave time travel to the professionals and stay home with a nice cup of tea.

Another, trickier example concerns a Professor Jamison and his colleagues. They gather around a time transporter with two platforms. Jamison tells them that at three o'clock he will take a silver cube, place it on the right-hand platform, and send it five minutes back in time, where it will materialize on the left-hand platform.

At five to three, the cube vanishes from his hand and appears on the left-hand platform.

“But what happens,” a colleague asks, “if you don’t put it on the platform and send it back?”

“I don’t know,” says Jamison, and consequently he doesn’t.
And *thus* ends the world.

Chapter 27

There were a lot more people crammed into the bar than there had been when she left. Most of them were there for the band, Mara thought. Some of them recoiled as she shoved through, an action she didn't understand until she stopped unsteadily in front of her friends.

"You're *dripping*," David said, raising an eyebrow.

"Are you all right?" Alex was frowning at her as she set the empty glass on the bar. "You were gone a long time. We were going to send out a search party."

"I'm fine," she said, waving David away as she slid back onto the stool next to him. "I figured it out."

"Figured what out?" Alex asked from behind her. She turned and leaned back against the bar.

"Look," she said, gesturing toward the tank. "I know why the fish are happy."

"The fish," Alex said slowly, turning slightly to observe the brightly colored fish behind the bar and then back to look at her. "Are you sure you're all right?"

David just shook his head. "Why are the fish happy, Mara?"

"Remember the story about the fishes? Zhuangzi tells us that... that the fish are wandering, and he says that 'this is the happiness of the fishes.' He means that fish are happy because they're wandering. They don't have anything to tie them down, to the past or the future. They always live in the present." Mara waved her hands for emphasis, feeling like she was rapidly losing control of the situation. "Once Zhuangzi was walking down the road, and when he stopped for the night, he found he was by a skull, and he asked the skull, 'How did you end up like this, in a ditch to be picked clean by vultures?"

Were you arrested for some crime and sentenced to having your head cut off? Was your conduct so unseemly that you contracted some disease? Did you freeze to death while traveling from city to city? Or was it just your time to go?’

“The skull said to him, ‘Those are just concerns of the living. It doesn’t matter once you’re dead.’ He tells Zhuangzi that being dead, he has no one bossing him around and no subordinates to command. Even being a king couldn’t compare.

“Zhuangzi says, ‘But what if you could be given life again? You could return to your family and home.

“And the skull says, ‘How could I give up all of this? This is bliss.’”

They stared at her. Mara reached for her glass, frowning when she found it empty. “Do you see what I’m getting at?” she asked, turning away to wave down the bartender.

“Wait,” David said at last. “The fish are happy because they’re wandering...and the skull is happy because it’s dead...so how is this supposed to apply to humans?”

Mara gave him a severe look. “Don’t be facetious. Okay. So later on, there’s another story, this one about Kongzi, Confucius. He’s travelling and finds a skull, much like the one we discussed before. But he can use magic and restores the skull to the way it was before it died. The only trouble is, the skull doesn’t remember what happened to it. To him. So he comes to the obvious conclusion, which is that Kongzi has robbed him of his clothes and the goods he was transporting. As he sets off to contact the local constabulary, Kongzi has to end the magic spell and change him back in to a skeleton.”

David said, “No good deed goes unpunished.”

“She’s drunk,” Alex whispered.

“Not deaf,” she chirped. “Damn it, where *is* that bartender?”

David put a hand on her shoulder. “I think maybe we should go home instead of having another drink.”

“No, it’s all right,” Mara told him. “I’ve finally figured everything out. I need another whiskey.”

The hand on her shoulder began to exert a more insistent pressure. “You’re going to have a bad headache in the morning as it is.”

She rolled her eyes. "Fine, fine. We can go home." Mara stumbled a little as she slid off the stool, and David caught her.

"Careful there."

Mara made a rude noise and slipped away from him. "I'm fine."

"I've got her bag," Alex said, dropping a bill of some denomination into the tip jar.

Outside, it was cool and still raining, a heavy shower that scrubbed the sidewalks clean. Mara took a deep breath of the wet air, closing her eyes. She remembered that last real day in Beijing, when the rain of the previous week had ended and the sun had come out for a few hours into a blue sky. The pollution that usually shrouded the city had washed away, and the air was clean; the world had seemed remade for her then, and she wondered if that was how Noah felt, standing on Mt. Ararat, looking down at creation.

She let it go, opening her eyes.

"We should get a cab," David said. He almost had to shout to be heard over the clatter of rain on the awning above.

"We'd have to call for one," Alex said, looking up and down at the empty streets.

Mara nodded. "Come on, it's only a couple blocks."

David sighed. "But it's cold."

She was already heading down the block, pulling the collar of her coat closer around her neck.

Around the next corner and halfway down the block on the far side of the street was a hotel. It was a nice place, with an awning that reached to the curb and a liveried doorman in navy blue and brass. Now it seemed mostly silent, the flags on the facade dampened and clinging to their poles and the doorman out of sight. Two figures were standing at the end of the awning, a cab waiting patiently a few feet away. Mara glanced across at them idly, stopping short as she recognized the taller one. She took a step back into the shadows.

"You're sure you're okay with this?" the smaller figure was asking, a woman with professionally coiffed platinum blond hair and the sort of black cocktail dress that women of a certain age with expensive personal trainers tend to favor. Her face was lined by time; Mara wouldn't have guessed her age at any less than forty, but

it wasn't an unattractive look on her; she had strong features that made her handsome. Mara was willing to bet she had an equally strong personality. Her voice held a trace of the East Coast, perhaps somewhere in the Northeast, but it had been softened and dulled by time.

"Lisa, it's fine. I'm happy for you," the man said. "I'm just tired, and I want to get home." It was Kendall, his voice rough around the edges. To Mara, who had spent enough late nights with him in the lab, he sounded exhausted, and she wondered if the rain was bothering his leg.

The woman seemed unconvinced. "You're sure? You know how I worry about you, Eric."

His shoulders moved like he had sighed, though Mara couldn't hear it. "Don't take this the wrong way, but we've been over for a long time now."

Catching up with her at last, Alex touched her shoulder, and Mara forced herself to keep walking. Whatever kind of moment they were having, it wasn't her moment.

"You okay?" Alex murmured as they reached the end of the block. Mara turned back to see Kendall getting into the cab.

"I'm fine." She turned back, gesturing over her shoulder with her thumb. "That was my advisor."

"Huh." Alex glanced back at the car's tail lights as if hoping to catch a glimpse. "Who was the woman?"

"His ex, I think." Mara shivered, trying to draw her coat closer, and Alex draped a companionable arm around her shoulders.

David glared back at them. "Hurry up, guys; I don't want to be out in this all night."

Mara giggled, brushing the sodden hair out of her face. The rain had proved too much for Alex's glasses and he had tucked them into his shirt pocket, leaving him with a nearsighted, mole-like look. "He whines a lot, doesn't he," she murmured, loudly enough that David would hear.

"Hey," David said, wounded, and tried to punch her shoulder, but Mara danced backward out of his reach and took off down the street.

Then Mara was climbing the stairs, David and Alex lagging behind.

The apartment was cool, dark, and, happily, dry. Mara stood for a moment in the blue glow of the fish tank, watching the little silver fish dart back and forth, the purple beta drifting lazily in the current from the filter.

Behind her, David turned on the overhead light and prodded her in the small of the back, pushing her farther into the room.

“Time for bed, Mara,” Alex said from behind her.

“Yes, Mum.” She took off her coat and hung it on the back of a kitchen chair, then retrieved her bag from him. “Thanks,” she said, and ducked into the bathroom to grab a towel. When she emerged, Alex and David were making awkward conversation in the kitchen, so she went on into her room.

“Do you want to watch a movie or something?”

“Sure, that sounds cool.”

She shut the door, dropping her bag on the floor with a thump, hoping there was nothing too fragile in it. She couldn't recall. Cold water from her hair was dripping unpleasantly down the back of her neck. She stripped quickly, dropping her wet things in the corner, and put on the thick blue robe she had left thrown across the bed that morning, wrapping the towel around her head. She turned off the light.

The alcohol and fatigue made her limbs feel heavy, and her bed crooned invitingly, but Mara went to the window and lay down on the sofa. A cool breeze was coming through the screen, and she could hear the soft rattle of the rain on the pavement below. She looked up, toward the clouds dimly lit by light pollution and lightning still flickering in the distance. Above them somewhere was the edge of the atmosphere, the planets and stars and the whole sweep of the Milky Way, and distant little galaxies like a shoal of fish in a vast ocean, all of it glowing brightly, too far to be seen.

“What if I forget?” she said aloud, mostly to herself, and she wasn't surprised when there was no answer. She bit her lip. “What if I remember?”

There was only silence in her head, and Mara leaned back and looked at the ceiling. She was probably going to have a headache in the morning, and there was work to be done on Monday, assignments to grade, and someone had to do inventory at the shop no matter how much Alex teased about it. And the defense, she had to prepare for it. And—

Mara let go and the anxiety floated away, until she felt far removed from it, like watching a balloon vanish into the sky.

Outside it was still raining. Inside, finally, Mara slept.

Acknowledgments

This novella began life as my senior thesis as an English (emphasis in creative writing) major at the University of Wisconsin–Madison. Five years, two graduate degrees, and many revisions later, this may be the closest I ever come to publishing any of my academic work.

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