

of scorned women and
causal loops
ROBERT GROSSBACH

Here's a sly and intelligent look at the proposition that maybe, just maybe, you should sometimes just shut up and listen, no matter how smart you think you are . . .

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t Cornavin Station the rental agency had given him one of the new Electricques with the re-designed fuel cells, and he'd accepted it reluctantly, knowing it would not have the pickup of the old gas-driven models. Yes, yes, of course it was a thousand times better for the environment, ten thousand times, but still he liked the feel of the gas pedal, preferred it over the *accelerator*. One more thing to make him cranky, as if the TGV ride from Paris, his sore left buttock, and France's first round World Cup elimination weren't irritants enough.

He drove now on the Route de Meyrin, westbound from Geneva, passing a new outdoor shopping mall, the giant Thompson CSF and IBM buildings, an auto-mated radar speed monitor, and a Citroen dealership, regarding all with a faintly disapproving and dyspeptic eye, which was how he viewed everything, for reasons he'd never cared to plumb. After eight

kilometers, he arrived at a hangar-sized building of corrugated metal, situated amidst a scattered complex of structures, all surrounded by a paved parking lot and double chainlink fence. The sign over the guard booth read ORGANIZATION EUROPEENE POUR LA RECHERCHE NUCLEAIRE, or, as the English and Americans called it, CERN (ignoring in their usual obtuse manner that the first word had been changed from CONSEIL nearly seven decades earlier).

He flashed his credential at the guard, passed with an indifferent wave through a flimsy-looking gate, and parked next to a blue Mercedes. He locked the doors of the Electrique out of habit, and trudged toward the building, upper left ham-string throbbing at each step. On a low hill just beyond the complex, he thought he could see sheep grazing and paused for an instant to squint before moving through the entrance.

He signed in at a long, polished wooden desk, filling in the “Name,” “Entry Time,” and “Person to Be Seen” columns, but leaving blank the “Purpose of Visit” space. When the young receptionist had finished on the phone, she presented him with a plastic yellow rectangle that identified him as a visitor, “*lei est votre—*”

“English will be fine,” he said.

She nodded. “Here is your badge, Inspector. Someone will be out momentarily to escort you.”

He grunted a thank-you, then went to stand awkwardly near one of the vinyl waiting area couches, pausing to knead his eyebrows and temples in a futile at-tempt to ward off the headache he already knew was inevitable. When he looked up a moment later, a fortyish woman stood before him, wearing a loose blouse and pleated gray skirt.

“Inspector Lagrange?”

Short black hair framed a slightly roundish Kewpie-doll face: button nose, cherub mouth, dark red lipstick, touch of rouge. Lagrange thought her just short of pretty. “I’m here to see Dr. Elizabeth Parkes,” he said.

“I am she.”

Apparently, his expression did not sufficiently conceal his reactions.

“I do not fit your conception of a nuclear physicist?”

He smiled back. “No, no, it’s just. . . the receptionist said they were sending somebody. I assumed — “ He waved his hand. “It’s of no importance.”

She stared at him bemusedly. “Well then, shall we?” She motioned toward a doorway. “I assume you’d like a look at the experiment first?”

“That would be fine, yes.”

She held the door, and he stepped through.

The hangar area was vast; they padded along a blue steel catwalk past a dozen rows of huge, thrumming machines. “Generators,” said Elizabeth, over the din. “They feed the superconducting magnets for the accelerator.”

“They give me a headache,” shouted Lagrange. He now had pain in his head and his ass; he supposed somewhere along the way he’d stub a toe. They emerged finally into the rear half of the building, seemingly empty except for a giant overhead crane suspended from a heavy steel girder. But as they approached the far end, Lagrange suddenly saw that a huge section of floor simply vanished into a cavernous rectangular pit. He fought off vertigo as they stared over the edge.

“Six stories deep,” said Elizabeth.

At the bottom, amidst scattered pieces of equipment, tools, and ladders, was a structure that looked like two piggy-backed railroad cars. Thirty-centimeter-diameter ropes of cable, numbering in the hundreds, ran from the cars up the sides of the pit and disappeared into boxes of electronics that lined the walls.

Lagrange pointed to a circle on the roof of the top car. “That’s where Monsieur Parino entered?”

Elizabeth nodded. “A hatch. Hard to tell from up here.”

“And you’re absolutely certain there’s no other way into or out of the experiment?”

She shrugged. “You should know, Inspector. Your people have been over that structure about a thousand times.”

“Not my people.”

“You’re Swiss? I’m sorry, I just assumed you were French. I know there was some sort of a jurisdictional dispute because the tunnel straddles the border and —”

“I’m with Europol.”

Her eyes rose in feigned admiration. “Ah, Europol. Yes, someone said they were sending an expert.”

“Hardly an expert,” said Lagrange. “Far far from it. But I suppose, relative to my local colleagues, I am perhaps ever so slightly more educated in the area.”

“Would you like to go down to make an examination?” she asked. “I’m sorry, but there are no elevators, we’ll have to use the ladders.”

Immediately, Lagrange felt his buttock spasm in anticipation. “That won’t be necessary, I’ve studied the reports.” He indicated an aperture in the side of the pit, five stories below. “That’s where the beams emerge?”

“That’s the opening into the collider tunnel, yes, but ‘emerge’ is perhaps not the right word. In operation, of course, the tunnel is continuous through the experiment. An extremely high vacuum must be maintained.” Somehow, she seemed to sense his discomfort. “Would you be more at ease in another area?”

“That would be fine, yes,” said Lagrange.

They exited the building by a rear door, emerged into bright sunlight. Almost immediately, he tripped over a raised section of concrete walkway, winced as he regained his balance.

“Are you okay?” She reached out to steady his arm and momentarily, quite against his will, he became aroused.

How pathetic, he thought, that the mere incidental touch of a woman could do that to him. “I’m fine,” he said. “I strained a hamstring while I was jogging the other day. A warning from nature, I suppose, to stop trying to interfere with her course.”

“Now you sound like Giorgio.”

“Really? In what way?”

“He was always talking about death. Well, alluding to it, anyway. That is, when he wasn’t talking about physics. He seemed to feel he was racing against a time-table. He wanted to get the Nobel while he could appreciate it.”

They entered a narrow two-story building that connected at an odd angle to two other identical structures.

“He was disappointed he didn’t get it for the Higgs. . .”

“You know about the Higgs?”

They walked down an asbestos-tiled corridor. “Not much. I know it’s the name given to fields of some sort and also to the particles that presumably transmit them. Higgs bosons, I believe they’re called. Goldman found the first one right here and got the prize —when was it? —about fifteen years ago.”

“Two thousand three,” she said. “Giorgio felt it should’ve been his.”

They entered a small cantina. Candy and Coke machines on one wall. Ten tables and chairs. Microwave oven. Coffee stand.

“This okay?” she asked.

“Anything,” he said. “As long as I don’t have to hear those generators.” They sat at one of the tables, and she brought over some cafe au lait. He sipped at the Styrofoam cup. “So Giorgio was bitter.”

“Oh, of course,” she said quickly. “Isn’t that *de rigueur* for world-class physicists who feel they’re being overlooked? Bitter, driven, obsessed, callous” —her voice deepened, her gaze drifted off — “manipulative, cold, self-absorbed — “

“But you were in love with him.” Her focus abruptly returned. “As I said, I’ve seen the reports,” he added, almost apologetically. “It was in the interviews.”

She shrugged. “I was at one time, yes. I suppose it was common knowledge. Physicists gossip like anyone else.”

“And was the love reciprocated?” He could see the hurt ripple across her features, and he leaned forward. “Mademoiselle Parkes, I am truly

sorry for what I realize must seem like an outrageous intrusion into your personal life, but I beg you to try to understand my position. Giorgio Parino was perhaps the world's greatest experimental physicist. His disappearance under the conditions of the experiment—”

“Some of us would not call it a disappearance.”

He nodded stiffly. He was not quite ready for semantic scientific nitpicking. “Nevertheless, the pressure from the authorities and the public and the press for a complete explanation — “

“Fuck the authorities!” said Elizabeth. “And the public. And the press. And—”

“And the police. Of course,” filled in Lagrange, grinning.

She softened, grinned back. “Of course.”

He drained his cup. “Tell me about the Higgs.”

She pursed her lips. “As you said, a type of field. Still far from being understood. The Large Hadron Collider we have here was meant to investigate it. Current ideas have been expanded from theories first developed in the 1980s and '90s to explain how the electroweak force, which is transmitted by four zero-mass particles, could be transformed into two separate forces, one of which has massive particles as its carrier. The thinking was — is — that there's some kind of a field, the Higgs, that permeates all of space and that gave particles their masses when the early universe congealed.”

“And the collider is able to re-melt that field.”

“You smash together two beams of protons at seventeen teravolts, you get a hell of a lot of interesting effects.”

“Including travel through time?”

Again, she smiled. Then stood up. “Let's walk. You feel like walking?”

He didn't. “Fine.”

“I'll show you the Megatek room.”

“Okay.”

They emerged from the cantina, turned down the corridor. “You know, Lagrange is a famous name in physics,” she said.

“Unfortunately, yes,” he responded. “So my mother used to inform me practically every day. Even at one time claimed he was my ancestor, although I doubt it. If he was, I’m afraid I’d have been a terrible disappointment to him.”

“You were not a good student?”

“I barely managed to eke out a master’s at Columbia.”

“Ah, so that explains your excellent English: You went to school in the States.”

“As I said, my family had hopes. Fortunately, the experience demonstrated quite clearly that I’d never be any more than a third-rate physicist, if that.”

They turned a corner. “You must not let others’ opinions of you become your own,” she said with unusual intensity. “I had to constantly fight with Giorgio.”

“He considered you third-rate?”

No answer.

“Was it because you’re a woman?”

“He said . . .” She swallowed. Muscles worked high in her jaw. “He said I was very good on the details, but that I didn’t have the vision to be truly insightful. He said he realized it sounded sexist, but that all the women scientists he’d known seemed to have the same restricted perspective. ‘Tunnel vision,’ he called it, and then he’d laugh, because of—I don’t know—some private double enten-dre. He said I was wonderful at poring over data and attending to minute individual tasks and that I shouldn’t beat myself to death trying to be something I was not.”

“And you didn’t, I presume.”

“No.”

“Did you beat *him* to death?”

They came to a room marked “Megatek,” and she paused at the door. “Am I being charged with a crime, Inspector? Is this an official Europol interrogation or a casual conversation?”

Lagrange shrugged. “The answers are respectively, mademoiselle, ‘Not yet,’ and ‘Official interrogation.’ I apologize if my manner has been too informal.”

She frowned, but Lagrange could see that the gesture was theatrical. “Perhaps I should have an attorney present.”

He nodded slightly. “With all due respect, Dr. Parkes, this is not America. There is no Miranda law here, nor any direct equivalent of habeas corpus.”

She unlocked the door. “Whatever Giorgio did, he did to himself.”

Inside the room were a half dozen scattered computer terminals, a shelf-lined wall filled with black notebooks, a bulletin board sprinkled with particle-collision photos, and finally, in the center, two large machines that looked like 3-D video games. It was in these, the Megateks, that computer-enhanced, three-dimensional re-creations of the experiments in the collider pit could be displayed.

“Some people say you could have stopped him.”

“I tried. He wouldn’t listen.”

“But it was you who threw the switch.”

“At his order. At his insistence. Does that make me a criminal?”

“Perhaps. There are several dependencies.”

“Such as...”

“Such as what exactly has happened to him. Such as whether you knew the consequences of his order.”

“He was Director General of CERN, my immediate supervisor.”

“Nevertheless, if your direct superior commands you to fire a loaded gun at his head and you do it” —he held out his hands —“the law says you

are guilty of murder. And no matter that he is an arrogant, patronizing, womanizing bastard.” He paused. “Now, did you know the consequences of throwing that switch?”

She inhaled deeply. “I. . .” She shook her head. “Giorgio had so undermined my confidence I couldn’t be sure of anything. I doubted my own mind.”

“So you weren’t certain?”

“No.”

“But you are more confident now.”

“I am more confident now, yes.”

He sat down at one of the Megateks, fiddled with the joystick. “How did Giorgio first get the idea about time travel?”

She leaned over one of the computers, began punching a few keys. “Here, better to show than tell.”

A moment later, at the center of his machine’s holographic projection volume, a schematic display of a detector appeared: cylinder for the central portion, larger cylinder for the electromagnetic calorimeters, rectangle for the hadronic calorimeters. She punched another button and, instantly, thirty or forty multi-colored spaghetti tracks shot through the display.

“A reproduction of event 1431,” she said. “The detector assembly surrounds the location where the protons collide.” She hit another key, and all but a half dozen of the tracks disappeared. She moved a joystick to enlarge the display. Three-inch-long traces fanned outward from a single point.

“A jet,” said Elizabeth. “Not that uncommon. The energy was 11.3 teravolts. Now” —again her tapered fingers flew over the keys —“let me show it to you as time passes.”

The traces slowly extended in length.

“Each inch on the display scale takes about .2 picoseconds.”

Suddenly, at about four inches, each trace seemed to double, joined by an adjacent twin, which streaked alongside it for about an inch and a half

before disappearing.

Lagrange turned, brow knit, palms up. “I’m sorry, I don’t understand.”

“No one did,” said Elizabeth. “Particles identical in every Fermi number—I know it’s impossible —had appeared from nowhere alongside the originals. Giorgio finally made the mental leap.”

Lagrange’s mouth opened in a silent Ah. “There were no new particles. The originals simply moved back in time to join themselves at an earlier instant.”

Elizabeth nodded. “The Higgs field had melted, mass had disappeared — and popped back about .3 picoseconds. The calculations confirmed there was a chunk of energy missing; Giorgio called it tau-sub-e, the temporal component.

“A totally unexpected effect.”

“Totally. And, of course, Giorgio immediately recognized the macroscopic ramifications.”

Lagrange shook his head.

“The effect had occurred over a linear extent of nearly a millimeter, but there was no reason why that could not be expanded arbitrarily. Apparently—Have you read his 2017 *Physical Review* paper?”

Lagrange said he had, but with very limited comprehension.

“Apparently,” she continued, “as the universe cooled, the Higgs field congealed into microscopic domains, separated by walls like, mmm ...” As she searched for an analogy, a tiny crevice appeared between her eyebrows; despite himself, Lagrange found it charming. “Like that plastic bubble paper they use to wrap gifts. The colliding beams popped the bubbles, releasing their energy.” She raised her eyebrows. “Anyway, Giorgio did the calculations for how to scan the beams so the bubbles would coalesce into a volume of arbitrary size.”

“And inside the volume,” ventured Lagrange, “whatever was there would move backward in time?”

She nodded. “Giorgio said they would have to give him two Nobel prizes, one wasn’t enough.” She grinned. “I suggested he should hold the

prize a few minutes, then move back in time and stand alongside himself.”
The grin vanished.

“He took you seriously.”

“Not immediately. His first priority was to go around the world, giving speeches. You understand, he was an incredible hero to physicists everywhere. He must’ve visited a hundred different countries.”

“While the rest of the staff.. .”

“Eighty of us. Studied the effect, repeated it, tried to understand it, tried to extend it. Eventually, we built a six-cubic-meter test chamber, used a magnetic field to suspend and levitate it in a vacuum —and sent it back approximately 3.3 picoseconds.”

“You must’ve been ecstatic.”

She gave a little snort. “I was disturbed. I felt there was something fundamental we were missing.”

“And that’s when you gave the speech.”

She nodded. There had been an assembly of the entire staff to discuss recent events in time travel. A conference room. Ninety-six yellow chairs in six even rows, blackboard in front, TV monitors lining one wall. Giorgio had taken a sub-orbital from Tokyo to attend.

Seven or eight of the physicists had gotten up to speak, discoursing on this or that arcane area, making recommendations, complaining, fending off Giorgio’s staccato questions and comments. Finally, it was Elizabeth’s turn. She took the low podium, hesitantly began to talk, showed several prepared slides. Unfortunately, she could not quite conceptualize what was bothering her, and when you could not quite conceptualize, Giorgio jumped down your throat.

“So the photographs were fuzzy,” he rasped. “So what. Clean your camera lenses.”

A chuckle rippled through the audience.

“They were clean, Giorgio. And the focus was checked.”

“So what is your point?”

“There . . . there is some spatial effect associated with time travel. Perhaps it is second-order, but—”

“With all due respect, Elizabeth, your data hardly justifies the conclusion. Frankly, I wouldn’t even call it data.”

“But the chamber . . . My measurements show it shifted nearly a millimeter—”

“Oh, so we’re measuring distances now? Very good. Did you use a wooden ruler or a metal one?”

More laughter, much of it strained.

“I used a laser calipers.”

“Ah, pardon me. I underestimated your technical ability.” Openly, savagely patronizing now. “Elizabeth, we are talking about a six-cubic-meter volume, subject to quite substantial forces here. Why are you surprised by a minuscule movement? Why do you think it’s important? Have you checked the magnetic field servos? Have you checked the uncertainties in the energy budgets?”

“I tried, but I couldn’t—”

“Have you done any supporting calculations? Any math at all? Any thinking at all before you came up here with these details? Details are fine, Dr. Parkes, but really, can’t we just get a little perspective on what is not a waste of time?”

White-faced, choking, Elizabeth had croaked “Sorry” and fled the stage.

Lagrange leaned back. “He humiliated you.”

She nodded. “In front of everybody,” she whispered.

“You left the conference?”

“Of course. I studied the minutes afterward.”

He pictured her, alone in some small room, a high school girl who’d missed the senior prom, reading about it instead in some dry secondhand

report. He wanted to hug her, tell her he was a kindred soul in personal disappointment.

But almost as if reading his thoughts —and rejecting them —she drew herself up. “I was angry. I felt” —her eyes blazed —“I may be an inferior scientist, but sometimes an inferior does good work. A hack writer comes up with a great novel. A poor soccer team beats a much better one.” She thrust out her chin. “An average detective has a magnificent insight that cracks an impossible case.”

Lagrange nodded. “So you felt you were onto something and were being ig-nored.”

“More accurately, I felt Giorgio was missing something. I guess, at bottom, what was really bothering me was the old grandfather paradox. You know, somebody goes back in time and kills their own grandfather, so that they were never born . . . which means they weren’t around to go back in time.”

Lagrange crossed his legs. “You didn’t buy the many-universe theories? As I understand it, the concept is that when someone goes back in time he is really travelling to another universe, which is identical with the first up to the instant of his arrival, but different thereafter because of his presence. That way—”

“In the universe he leaves, his grandfather is alive and he is born. In the one he enters, his grandfather dies, and he isn’t born.” She shook her head. “That was Giorgio’s explanation and most of the others’. The melting of the Higgs field produced closed timelike curves, CTCs, between universes.” She chuckled mirth-lessly. “To me, it sounded like magic. Invoke enough different universes and you can explain anything. It wasn’t true understanding. And I had my experiments. There’s something that working with actual hardware gives you — I know it sounds mystical —but there’s something that world travellers get out of touch with.”

The door opened then and two men entered, dressed casually in slacks and open-collar shirts. Lagrange stood up, withdrew his wallet, and flashed his badge. “Gentlemen, I’m sorry, but I must ask you to leave. We’ll only be another five minutes.”

The men seemed uncertain, but eventually departed.

“You know them?” asked Lagrange when they’d gone.

“Not well,” said Elizabeth. “The younger one’s been here a year, some kind of mathematician from College de France. The other fellow I believe is Russian, specializes in muon detectors.”

“Tell me when Giorgio got his bright idea. Do you think it was always in the back of his mind?”

She shrugged. “I doubt it. I think it was one of those spur-of-the-moment things, one of those flamboyant I-am-the-boss megalomaniac power moves he loved so much.”

“Then it was for the benefit of the Japanese?”

“Partly, yes. They had sent in a large visiting delegation. They were talking about a huge funding increment—that’s what it’s all about in high-energy physics, as it’s always been —and Giorgio was anxious to make a grand impression.”

“And that’s when you picked to tell him you thought the experiments might not be safe.” He raised his eyebrows. “Awkward timing, no?”

She bristled. “It wasn’t ‘timing’ at all. I broached it to him as soon as I felt I had a solid basis for it. A couple of the Japanese just happened to be in the room. Should I have whispered?”

Lagrange didn’t answer. “And your concern was — “

“The small spatial dislocations I’d mentioned earlier. I was worried about what might happen if an object interpenetrated an earlier version of itself.”

“But Dr. Parino did not share your anxiety.”

“He was furious with me for bringing it up. As it turned out, he was right. There was a problem, but that wasn’t it.”

“Nevertheless, he decided to demonstrate the process safety by using himself as the subject of an experiment.” Lagrange began tapping his foot. “How did he justify that?”

“He didn’t, really. In his position, you didn’t have to. Oh, later on he offered up some mumbo jumbo about taking a bit of future information into the past, something that required a human mind, in order to test or dispel the so-called knowledge paradox. An example would be paintings brought

from the future to the original artist in the past, who copies them. The process eliminates the creative work. Anyway, no one considered that seriously. We all knew Giorgio was just being Giorgio.”

“Was it his idea to go a full five seconds backward? Wasn’t that trillions of times longer than you’d sent anything else?”

“It had already been shown that the regression in time depended exponentially on the rate at which you melted the Higgs domains, not the collision energy. It meant only that we had to increase our luminosity and scanning speed. Giorgio claimed five seconds was the minimum duration required for his future self to record and bring back a number that could be photographed with next to a sealed clock.”

“The Paris closing gold price.”

“Yes.”

“What did the other physicists think of his plan?”

“That he was entirely crazy, of course. But it was a genius move for publicity.”

“And were they worried, too, about safety?”

“Oh, most agreed it was rash, but no one could justify their feelings in terms of specifics.” She removed a small mirror and some lipstick from a tiny purse she carried. “Giorgio was not the kind of person who inspired feelings of protection.”

“Except in you.”

She stopped applying the lipstick. “I was up the entire night before the experiment. That was when I figured everything out.”

“You could see him from the control room?”

She nodded. Lagrange remembered the tape — control room activity was always recorded. Sixty television monitors. Two dozen physicists sitting at consoles, hunched over screens, harried, looking up to scan a readout, to shout something, to scream a command. On one of the consoles, Giorgio strides confidently toward the pit in the hangar floor. Underground area fifteen, or UA15, the time travel experiment. He says something to one of the Japanese visitors and the man smiles. Giorgio is

wearing an orange jumpsuit, a white lined pad under his arm.

WAITING FOR A COMMAND scrolls down one of the monitors.
WAITING FOR A COMMAND.

“Is the counter working?” shouts a physicist.

“Firing away,” says another. “I got it in the logbook.”

A mechanical voice announces, “Proton check,” and three of the screens fill up with numbers and graphs. A moment later, the voice declares, “SPS ready,” and more numbers tumble onto additional displays.

The camera catches Elizabeth, sitting at the main control panel. Her face is gaunt, her eyes wide. She uses a microphone to address people in the hangar. “Giorgio, I beg you not to do this. I beg you.”

Giorgio waves and smiles, pats the Japanese on the shoulder.

Lagrange shook his head. “Why did he make you the SLIMI?” SLIMI was Shift Leader In Matters of Information.

Elizabeth spoke in a near whisper. “It wasn’t that unusual. I had done it before.” She inhaled sharply. “I suppose it was further punishment.”

Lagrange recalled the final moments. Giorgio descending the ladder into the pit. Signal light going on indicating Time Travel Chamber secured. The mechanical voice saying, “Beam scanning sequence ready,” and Elizabeth making one futile last attempt.

“Giorgio, please . . . please . . .”

And the response: “Is the gold price in? As soon as it comes in, close the fucking switch and read me the fucking number when the counter goes down to two. I order it, Elizabeth.”

She hesitates several seconds, looks around at the other physicists, whose ex-pressions are maintained at careful neutrality. A man wearing headphones ap-proaches her and whispers something. She delays another moment and then, finally, chest heaving, she presses a key. The mechanical voice says, “Cycle one,” and begins a countdown from nine to zero.

At two, Elizabeth reads in the Paris close in New Dollars per ounce,

29.32. At zero, small dips appear on lines crossing three of the monitors.

Even in the hangar, there never was any sound. When the Time Chamber disappeared, it happened in vacuum; no air was present to rush in.

Lagrange stood up and stretched. “You knew immediately, of course.”

Elizabeth nodded. “All instrument readouts from the chamber went dead.”

He began to slowly pace, ignoring the hamstring twinges. “You knew where he’d be?”

“Not exactly. I knew how far, but not precisely the direction.”

“So it was more or less luck that Farside II happened to be pointed toward that sector.”

“I suppose. Chances were *some* telescope would catch it.”

“Your distance was correct?”

A faint grin. “Within experimental error.”

“Your so-called equivalence principle...”

She puffed her lips. “It seemed reasonable. Travel through space requires time; therefore, travel through time might very well require space.”

“It resolves the grandfather paradox.”

“It occurred to me the night before the experiment. You can’t kill your grand-father if you can’t reach him. If you travel through time, you can’t affect anything before you left—or have anything affect you —if you’re flung far enough away from your original position.”

“But how far is ‘far enough’?”

“In general, the speed of light multiplied by the time interval. Nothing could travel back fast enough to cause a problem. The universe could protect itself from inconsistencies and non-causal events, it didn’t need other universes to help.”

He pondered a moment. "But what if you're transported right near your grand-father, whom you immediately murder?"

She shook her head. "Either he'd have already sired your parent, so it wouldn't matter, or he couldn't have been your grandfather. In tech-speak, in the time interval you went back, no concatenation of world lines could traverse as much distance as you did."

Lagrange was content to grasp the essence. "So, therefore, when Monsieur Parino was popped back five seconds in time, in space he was thrust—"

Her eyebrows rose. "A million and a half kilometers."

Lagrange gave a low whistle. "Dr. Parkes, thank you. The interview is officially concluded. If you could see me back to UA15 . . ."

She stood. "Of course."

They exited the Megatek room. The two men who'd entered before were waiting outside and eyed them venomously as they receded down the hall. "So tell me, Inspector," she asked, "am I to be charged?"

Lagrange looked at her alongside him, pursed his lips. "Well, that is not for me to decide, mademoiselle. I only make a report." He could not keep a straight face. "But I think not." At a corner, he dared take her arm. "I think not."

He had heard talk that it was she now who might get the Nobel, sharing it with the departed Giorgio for "the Parkes-Parino principle."

"Have you seen the actual pictures from Farside II, Inspector?"

"Oh yes," said Lagrange. "Quite beautiful, in an eerie sort of way." He tried for a moment to imagine himself in Parino's shoes. There was a porthole in the chamber and he undoubtedly had looked out. Lagrange wondered if he'd been able to see the Earth from his position, how small it must've appeared from a million kilometers beyond the moon, how resplendent amidst the jeweled back-ground of scattered stars, how achingly, utterly unreachable... "The glare made the chamber look almost like a comet."

"Well," said Elizabeth, "there is a fair amount of energy associated

with tem-poral re-entry." An impish expression crossed her face. "And, of course, Giorgio always was brilliant."

Unprofessional as it was, Lagrange laughed.

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