

# **Bugs and War and Thou**

(Another look into the cutthroat world of  
Earth system modeling)

By Randal Koster  
Author of *The Swenson Code*



I watched the bearded man with interest as he adjusted his glasses and leafed through his notes one last time. He was getting ready to make a statement. I already knew what to expect from him. Lies. This guy could be trusted as much as a variance computed from two data points.

“To summarize, then,” Eugene Lefkowitz said, setting down his papers. “Simmons has written a strong proposal here. I’m a bit surprised that he didn’t reference my recent paper in *Computational Fluid Dynamics*. Some of my approximations would help him considerably, especially in his Task 3. I’ll write that up in the report. Anyway, aside from that, there are a lot of good ideas here. Two of the mail reviewers, Hawkins and especially Perritt, agree with me. The other reviewer, Yang, does not, but when you read his review it’s clear that he doesn’t appreciate the nuances of the science. I don’t think he was an appropriate reviewer.”

The rest of the NOAA review panel, sitting around a large table in a small, windowless room, listened wearily from behind their own stacks of proposals. Scattered papers and half-filled cups of coffee, now cold, lay in the center of the table. A web of power cords connected the laptops on the table to the outlets in the walls, making travel around the room difficult, encouraging the scientists to remain in their seats, hard at work. The day had been long and tiring. The panel was starting to feel punchy.

As for me, I sat in front of my own laptop, in a corner of the room. My purported role here, my “cover”, was Second Assistant to the Chief of NOAA Research Operations. The panel thought I was there to take notes on the discussion. I typed away, playing my part well.

“So,” Lefkowitz concluded, “given the strength of the proposal on its own merits, and given the importance of turbulent morphicity, a field still in its infancy, I have to recommend a high score – I’d say a full 5.”

The scientist across from him had been leaning back in his chair. Now he sat up straight and let out a loud snort, half in amusement and half in derision. “What’s with you, Eugene?” he said. “That’s the first positive thing you’ve said about any proposal all day!”

“When it comes to turbulent morphicity, any proposal would sound good to him!” jeered someone at the end of the table.

“It *is* a good proposal,” Lefkowitz sniffed, “and I just told you why! I hope you were listening. I know what I’m talking about, and I’m telling you – Simmons has some good ideas here.”

“Yeah, yeah,” said the fellow across from the table.

“Do you have something else you want to say?” Lefkowitz demanded.

The fellow across from him waved his hand dismissively. “It’s just that, so far, you haven’t given any proposal a score higher than 3. Now you’re suggesting a 5 for this one. It doesn’t add up.”

Lefkowitz eyed him coldly. He had been challenged, and apparently that was something he wasn’t used to. When he spoke again, his voice was even. “Are you suggesting,” he said, “that I haven’t been fair in my ratings today?”

“What I’m saying,” said the fellow across the table, “is that there’s more to short-range weather forecasting research than turbulent morphicity, and you don’t seem to realize that!”

A powerful silence filled the room. Lefkowitz was dumbstruck – he obviously couldn’t believe what he was hearing. You might have just told him that the Navier-Stokes equations were missing an important term involving turtles. Finally, he got to his feet. He glared down at his adversary. “Who the hell do you think you are?” he said quietly, ominously.

“Eugene...” interjected the program manager.

Lefkowitz turned to face him. “I don’t need this! I worked hard reviewing these proposals! I spent...”

The program manager held up his hands. “Eugene, it’s okay! No one’s questioning your motivations. We’re all just a little tired. Now sit down! Please!” Lefkowitz turned back for another long glare across the table. Then he slowly sat down. The program manager breathed audibly before continuing. “Thank you. Okay. Let’s hear from the secondary reviewers on the panel.” He looked at his schedule. “Hmmm... One of them is Gina, who, as you know, just got called out on a personal emergency. We’re near the end, so we’ll have to do without her. The other secondary is Tom. Any comments on the Simmons proposal, Tom?”

Tom, a short, skinny guy sitting not far from me, shook his head. “No, not really. I’ve never understood this morphicity stuff, and to be honest, I can’t believe people get into it. No offense, Eugene. I did read the proposal, and it seems okay, to the extent that I understand it. Eugene’s the expert, though. I trust him.”

“You trust him,” the program manager repeated. He turned to the man who had challenged Lefkowitz earlier. “How about you? Do you trust him too, or do you want to spend some time right now going through Simmons’s proposal yourself?”

The fellow across from Lefkowitz paused before shrugging and shaking his head. “I trust him, I guess.”

“Okay, then,” the program manager said. “Let’s put it to a vote…”

Finally – at long last, after a long, tiring day of sitting there, doing nothing – it was time for me to act. “Wait!” I cried. A roomful of surprised eyes turned to face me. It was the first time I had spoken since the meeting began.

I stood up. For dramatic effect, I said nothing for five full seconds. Then I asked earnestly, “How many of you know Professor Simmons, from conferences or whatever?”

They looked at me in confusion. Five of the twelve panel members slowly raised their hands. “What’s this about?” someone asked.

“So a few of you have met him,” I said, ignoring the question. “One of you, though, is more than just an acquaintance. One of you knows him very, very well. Vadose!”

The word “vadose” was a pre-arranged signal to Connie Swenson, the blonde woman sitting next to Lefkowitz. In one quick movement, she reached over with her right hand, grabbed his beard, and yanked down on it hard. From me, he would have seen it coming; he would have done something to protect himself, to keep me away. Connie, though, could catch him unawares. With a gentle tearing sound, the beard came off in her hand.

“Folks,” I said. “Meet Bernard Simmons.”

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“On one level,” I said to the panel ten minutes later, “it was a magnificent achievement. For five full years, this man was able to maintain, in parallel, three separate professional identities.” I was sitting in the seat Lefkowitz/Simmons had vacated. He was gone now – long gone. When the beard came off, he looked more furious than ever but said nothing. There was nothing he could say, nothing he could do, and he knew it. He shot a killer glare at me and then at everyone else, and then he stormed out of the room, a small mat of artificial hair still dangling from his cheek.

“Three identities,” I continued. “Eugene Lefkowitz, Bernard Simmons, and Nigel Perritt. The last fellow, you’ll remember, was one of the mail reviewers on the proposal.” I shook my head. “Did you hear that? I just said ‘the last fellow’. Even I get confused. They are all the same person.

“The three identities are the three leading world experts on turbulent morphicity. That’s right – the three *leading* world experts. Are you beginning to see the brilliance of the scheme? Perhaps some of you have tried reading papers on turbulent morphicity. If you have, you know that it is a very difficult field to grasp or enjoy. The equations are outrageously complex. Turns out, though, that the complexity isn’t real. It’s phony – it’s there to hide the fact that there’s not much to the science. Turbulent morphicity, as a field of study, appears powerful on the surface but is really a bit of a sham. I suspected

as much when I started working on this case. Connie Swenson, your fellow panelist, took the trouble last month to go through the math and prove it unequivocally.”

I nodded at Connie and momentarily lost my train of thought. She often had that effect on me. She was the smartest person I knew by far, probably the most brilliant person now working in the Earth sciences. She also had a figure as compelling as the theory of special relativity, a figure exquisite enough to keep me permanently in her reference frame. An adventure two winters before had brought us together, and our natural chemistry – if I can use another science metaphor – had kept us together ever since. I had no complaints. I worked hard to make sure that she didn’t, either.

Connie smiled at the panel, a little embarrassed. Her face was drop-dead gorgeous, too. I struggled to marshal my thoughts. “Back to Lefkowitz,” I finally said. “Again, the scheme was brilliant. Aside from his three identities, very few scientists have ever studied turbulent morphicity extensively —not really, anyway. As a result, the papers and proposals of one identity were always being reviewed by his other two identities. That enabled each identity to build up a substantial publication record and substantial funding – all built on a lie. Undoubtedly he also counted on occasional false positive reviews from outside reviewers who were snowed over by the complexity of the mathematics. He used other ruses, too. This Gina – the other secondary reviewer for the Simmons proposal – will probably find her emergency to be a false alarm.

“At each of his home institutions, he’s considered an eccentric, standoffish scientist who spends most of his time traveling. I learned in my researches that he might also be Magda Svetalyana, a female scientist from St. Petersburg who’s just establishing a name for herself in the field. I haven’t had the time – or the stomach – to verify that yet.”

I sent my eyes around the room. Everyone was listening closely, riveted to the story. After all, this fellow – this monster – was one of their own. I continued. “Now that he’s been exposed, it’s all over for him. That’s going to please my client. It should also please each of you. After all, each of you struggles for funding and reputation the old-fashioned way – through honest, hard work.”

My spiel finished, I invited questions. The panel was full of them, and I did my best to provide all the answers – except, of course, when they asked for the identity of my client. After a while, I chided them to get back to work. “I think you have some more proposals to rate,” I said. “I hope you don’t mind if I stop taking notes. My fingers ache like nuts!”

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A couple of hours later, Connie and I left the Metro station at Farragut West and walked along 18<sup>th</sup> Street to our hotel. The late afternoon summer sun and the steambath humidity were oppressive, but we were both in good spirits. I had successfully wrapped up a case, and Connie had finished her work on the review panel. I thought back to the days when I was a working scientist and how good I always felt when a review panel job was behind me.

“Don’t forget,” she told me, after we stopped to read a menu outside a restaurant. “We’re having dinner with my brother on Friday night.”

Suddenly, my good spirits started to ebb. Suddenly, I felt the power of the Washington humidity all around my neck, suffocating me, pushing me down... “Oh yeah. That’s right,” I said. “I guess I must have pushed it out of my mind.”

“And you’re going to behave!” she added, eyeing me sideways with half a grin.

“I always behave!” I replied.

“Like the last time?”

“He was coming after me with those electrodes again,” I protested. “What was I supposed to do? I didn’t think he’d actually fall down when I knocked them away. And I did help him stand up again.”

Connie shook her head. “You keep saying ‘electrodes’. They’re not electrodes, their synapse stimulators. And you were supposed to let him work on you. It doesn’t hurt that much. He says that your brain is more adaptable to his DSDA experiments than any brain he has ever tested. He’s on the verge of a breakthrough, and we need to encourage him. He needs your help. He needs you to work with him.”

“Work with him!” I scoffed. “Ha! That’s a laugh! He doesn’t let me do any work! I just sit there and let him zap my brain. I’m nothing more than a glorified lab rat – a guinea pig!”

“I wish you wouldn’t think of it that way!” she said, kindly.

“How can I help it?” I said. “I wish I never let him run those tests on me in the first place.” My mind was aching with memories of her nerdish, overexcited brother strapping his electrodes – okay, his synapse stimulators – to my forehead and then pressing the buttons on his control panel. Not only was the zapping uniquely unpleasant, in a way I can’t begin to describe, but his breath was always horrific. The computers at his lab had been going down a lot, and though he claimed it was due to a faulty cooling system, I knew it was because he breathed on them. Anyway, I no longer wanted any part of his experiments or his breath.

And here was the worst thing – the research was a complete waste of my time, since his theories were utter nonsense. “Connie,” I said, “this DSDA research of his is nothing but a pile of crap. You must be able to see that! Why do we encourage him?”

Connie’s face showed admirable patience. We had had this argument before. “Mike,” she said. “It’s not crap. It’s powerful stuff.”

“Connie, the only thing powerful about your brother is ...”

She held up her hand, stopping me. She was silent for a few seconds. Finally, she looked up at me again, a gentle pleading in her eyes. She put her hand on my chest. “Mike,” she said. “I know he’s a bit unusual, and I know he gets on your nerves. I really do appreciate your patience with him. Please, though, don’t keep putting him down. My brother is the smartest person I know!”

“Well,” I said, “you’re the smartest person *I* know, and I know your brother too. By logical inference, then, I conclude that you don’t know yourself!”

“What?” she said. Then she laughed. “You’re an idiot!”

“Ah! Something we can both agree on!” I said, making a face – an exaggerated face, the kind of face, I guess, an idiot might make. She laughed again. She was especially gorgeous when she laughed. Ah, to hell with her annoying brother, I thought to myself. Maybe I could buy him a toothbrush. She was worth it! I caught her up in my arms and we kissed, our bodies suddenly generating our own summer heat, our summer sweat commingling on our cheeks.

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Air-conditioned coolness crashed over us like a tsunami when we stepped into the lobby of the hotel. Connie shivered, and I put my arm around her shoulder.

That’s when I spotted him. What can I say? I’m a detective. He was sitting on one of the couches by the indoor waterfall, in full suit and vest, carefully but unobtrusively studying the people that walked by. He looked like a government agent – serious, forthright, and capable. The no-nonsense type. We were in Washington, so there were probably thousands of his type milling about on the streets. I wondered, though, why this particular one was in our hotel and who he was looking for.

And then, to my surprise, he spotted us and stood up. “Just a second,” I whispered to Connie. “Something’s happening.” We stood still, looking back at him. He approached us.

“Are you Michael Wells?” he asked, following a quick study of my face.

“I’m Mike Wells,” I said. “You’re looking for me?”

In response, he pulled out his wallet and showed us his ID. My eyebrows went up – way up, as far as they could go.

“I’d like you to come with me,” he said.

I looked again at the ID. “To the State Department?” I asked. “Why?”



His face was devoid of expression. He was a true government professional. “Very simple, sir,” he said. “Your country needs you.”

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Before I go any further, I need to apologize. In the following I'll be referring to two countries, Otan and Horvania, that don't exist. There's a reason for this – the State Department won't allow me to give the true names of the countries at the center of this story. It's a ridiculous rule, and I can't say I understand it, but there's nothing I can do. Suffice it to say that these two countries are adjacent to each other and lie somewhere in South Asia or the Middle East, or maybe in Northern Africa. That's all I can tell you.

I can, though, describe the seminar room at the State Department, which is nothing like the seminar rooms in academic institutions. When the main lights are on, the large room looks impressive enough; the hundred-odd seats arranged in semicircles on terraced levels, all facing the podium and screen in front, seem uniquely poised to welcome the great political minds of the country, to keep them comfortable but alert for high level briefings and debate. The room, however, when darkened, takes on an extra, powerful, undefinable energy. The energy seems to emanate from the neon blue lighting along the baseboards, aisles, and ceiling and the soft green lighting around the doors. The energy permeates the room and everyone inside. You almost feel like you're on a spaceship, preparing for an attack. It would be hard to imagine a weary scientist falling asleep in a room like this, even during a seminar on neural networks, held just after lunch.

I was seated beside some high level State Department official. He was surprisingly personable, for a fed. "Glad you could come on such short notice," he drawled.

"Not a problem, sir" I said. "I get the feeling that there's some urgency here."

"You get the feeling right!" he said.

"What I don't understand yet, though," I continued, "is why I'm here."

He smiled enigmatically. "All in good time, my boy!" he said. "All in good time. I think they're about to begin." At that point some aide tapped him on his shoulder, and the two began a whispered conference. I was left alone to ponder my situation. *Why was I there?* I did know, based on a conversation with a friendly staffer on the floor below, that the upcoming presentation was mostly directed at me, to bring me up to speed on a question of international importance. Apparently, I had something unique to offer to its solution. As to what that would be, I had no clue.

Connie had understood, as usual. "I'll get room service," she said earlier, when I left the hotel with the G-man. "I'll lie on the bed and watch some trash TV. That's something I haven't done in a long, long time!" I hoped she was enjoying herself. At least she could eat. I was excited about being here, but I was also hungry. "A steak would be good right now," I thought to myself, "medium-well, with peppers and..."

That's when the main lights went out, and that's when I felt the true power of the room for the first time. I quickly forgot about my stomach and settled back in my chair to see

what would happen. A number of conversations around me hushed down to nothing. The screen up front was suddenly lit up with a map of Otan and Horvonia.

A disembodied voice, deep and sonorous, addressed us. “Otan and Horvonia,” it said, “and perhaps the world, are on the brink of war!”

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Otan has a large, shallow, inland lake. Otan plans to divert the water in its major rivers to its population centers, and this diversion will eventually dry out the lake. Horvonia believes that the lake is an important evaporative source for its precipitation. In other words, Horvonia believes that if the Otanians dry out their lake and the surrounding wetlands, Horvonia’s annual rainfall would go down. Since Horvonia is already pretty arid, the Horvonians are mad. Hopping mad.

That’s a brief summary of the first full hour of the presentation – that and the additional, terrifying fact that Horvania is something of a powderkeg, a potential hotbed of terrorism. If the Otan/Horvania situation was not treated with finesse, the global terrorism problem would almost certainly escalate. The world might soon face a terrible wave of deadly attacks.

“Mr. Wells,” thundered the disembodied voice. “Is all this clear?”

The question came as a surprise. Apparently the presentation really *was* directed at me. “Yes,” I said, loudly, not sure where to direct my voice.

“You understand the urgency of the situation?”

“Certainly.”

“And the dire consequences to our nation’s security if we do not take pro-active measures to prevent this war?”

“Yes.”

“Are you willing, then, to help your country stop this war, even at some risk to your own life?”

What a question! Fortunately, I didn’t have to think about it too hard. There was only one possible answer. “Of course,” I said.

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An hour later my cell phone linked up with Connie’s cell phone. “I’m going to Colorado tonight,” I told her. “On a chartered jet.”

Silence – not because she was mad, or distressed, but because she had been asleep when I called and was still trying to wake up. “What? Tonight?” she finally asked, groggily.

“Yeah. I’m off to NCAR. I need to be there first thing in the morning.” NCAR, the National Center for Atmospheric Research, is a research organization nestled in the mountains above Boulder. Connie, of course, already knew that.

“What’s going on?” she asked, starting to sound a little more awake. I put my feet up on the desk in the empty office I was using and told her about the Otan and Horvonia situation. Then I told her about Fayed Subein, a former Horvonian who now worked at NCAR on an atmospheric general circulation model, or AGCM. (Not the main NCAR model, but his own separately supported research model.) Subein, a naturalized U.S. citizen, was still so well regarded in Horvonia that the government there was relying on his AGCM experiments to determine its response to the Otan hydrological threat.

“Fayed Subein,” she said. “I’ve read some of his work. He does water tracer studies, doesn’t he?”

“That’s right,” I said, “when he’s not working on the model’s dynamical core or its moist process physics.”

“So let me guess,” Connie continued, seeing the light. “He’s designing an AGCM tracer experiment to see if Horvonia really does get its rainwater from the Otan Lake. His model is able to ‘tag’ the water that evaporates from one region and follow it through the atmosphere until it rains out again somewhere else. He plans to determine where the water evaporating in Otan eventually does fall back down to the ground.”

“Bulls-eye,” I said. “But there are problems.”

“Problems?”

“Sabotage,” I said.

“Sabotage!” she responded, surprised.

“Sabotage,” I repeated. “Someone has surreptitiously modified the model codes at NCAR, and they’ve corrupted the backup copies.” That’s when I told Connie about my assignment. I was to go undercover at NCAR as a climate process modeler, one who would work directly with Subein. I would keep my eyes open and find out what was going wrong – and who was doing what to the codes. I would keep especially close tabs on Subein himself. It seems the U.S. government suspected Subein of the sabotage – that he was the one who was corrupting the codes, foiling the success of his own experiments. They couldn’t guess at his motivations, but certain evidence did point his way.

The government also – somehow – knew all about me. They knew that during my tenure as a full-time private detective, I’d done a lot of undercover work in the Earth sciences,

much more than anyone else around. And they knew that a decade or so earlier, when I was a working scientist, I'd worked with AGCMs and even dabbled with water tracer studies. With such a background, I was considered perfect for this assignment.

"But tonight?" Connie asked. "Are things that urgent?"

"We're talking about imminent war," I reminded her. "A war with global ramifications, a war that threatens our own security. Horvonia is already deploying troops along its border with Otan. Otan, in response, is deploying some of its troops. Tensions are at an all-time high. The Horvonians won't wait forever for Subein to run his experiments. They'll act soon – they'll attack Otan – in a week or so, unless they get evidence that the Otanian river diversion project won't affect them."

"But... But what if Subein's experiments confirm their worries?" she asked reasonably. "What would happen then?"

I leaned back farther in my chair. "Then we may be able to convince the Otan government to shelve the project, at least for a while, and that would at least delay the war. It's a shame that neither government will trust any other modeling group to do these experiments, but that's the way it is. Though he was born and raised in Horvonia, Subein has some distant relatives in Otan's ruling class, and he is well regarded in Otan for his science and his integrity, almost as much as he is in Horvonia. So, unfortunately, we have to fix *his* model and run *his* experiments. There's no other choice. And the experiments have to be run within a week, two weeks at the outside, or it'll be too late."

"Oh," she said. "Well, I understand of course." She was silent for a moment. Then she said, "Think of me as you're flying around in your chartered jet. I'm lying here all alone, and I've been missing you, if you know what I mean."

The mental picture was too much. I suddenly felt very grumpy. Damn, I thought. The sacrifices I make for world peace.

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While the State Department briefed me further on my mission, some feds went over to the hotel and got my bags. There was no time to go over there myself, which I suppose was just as well, since I would have found it overwhelmingly difficult to leave once I got there. At about 10:00PM, bags in hand, I left my temporary office to go down to the street, where a car was waiting to take me to the airport.

I had one more surprise waiting for me, though. Just as I was stepping out into the hallway, I saw a familiar face beside the elevator, a face I recognized instantly, though I had never seen it before in person. Its owner was waiting for me.

"Mr. Wells," she said, when I reached her. "I wanted to wish you, in person, a very successful mission."

“Thank you, Madame Secretary,” I said.

“I’ve looked over our background files on you,” she continued, “and I’m convinced that you’re the best man for this job – perhaps the only one who can help us resolve this most unfortunate situation.” She was dressed to the nines, and though it was getting late, she looked fresh and energetic – like she had just gotten out of the shower. I got a vague whiff of a sensuous perfume, a scent as subtle-but-probably-real as an anthropogenic climate change signal buried in a multi-decade time series riddled with natural interannual variability.

“I’ll do my best,” I assured her.

“But be careful,” she warned. “There’s a lot at stake here, and if cornered, there’s no telling what our saboteur might do.”

She was stating the obvious, of course, but I appreciated her concern. “Madame Secretary,” I said, “you don’t have to worry. This sort of thing isn’t new to me. I’ve had plenty of experience taking care of myself in situations like this.”

She nodded. My collar must have lain crooked, for she reached up and adjusted it. That brought her closer, and the sensuous scent became a firm reality, one that could easily parallelize my internal libido code, if I let it. “Well,” she said, “I appreciate your sacrifice and your special talents. You should know that Earth science is more than just a hotbed of crime. My predecessors here at the State Department told me, when I first got here, that it permeates almost all geopolitical questions, the issues we deal with day in and day out. I didn’t believe it at first, but now I see the truth in it.”

“Yes, ma’am,” I said.

Her hand was now on my arm. “Mike – can I call you Mike? – we do take Earth science seriously here. If I had my way, funding for basic Earth Science research in this country would be multiplied tenfold – even a hundredfold.”

I didn’t know if she was serious, or if she was just saying what she thought I wanted to hear, for reasons only she knew. “Perhaps you can put a word in with your boss,” I suggested.

“Perhaps I can!” she purred. “He listens to me!” The elevator opened, and she seemed disappointed that I had to go. “Good luck!” she said, as I stepped inside.

I knew Fayed Subein was hiding something from the first moment I met him.

I had arrived in Denver at 1:30AM. The airport was deserted, but I wouldn't be using the terminal anyway – a portable stairway took me from the smallish jet to the runway, where an unmarked car was waiting for me. “Get some sleep,” the driver suggested, once I arranged myself in the back. “We've got more than half an hour of driving ahead of us.” I thanked him and took his advice. I barely remember rousing myself when we got to the hotel. I stumbled off to my room and fell asleep again in seconds. Four hours later, I woke and tried to shake off the fog by splashing a gallon or so of Rocky Mountain spring water – I assume that's what came out of the tap – on my face before shaving.

When I stepped out into the parking lot, I should have been prepared for the dry, crisp feel of the air, but I wasn't. I took a deep breath, soaking my lungs with coolness, and looked up. The sky was blue beyond belief. It seemed huge somehow – much bigger than the sky back home. Impossible, I knew, but that's how it felt. Colorado always had that effect on me.

The license plate number on the set of keys I got at the front desk matched that of a dark blue Lamborghini parked near the lobby door. Nice! This year, I thought, when I paid my taxes, I'd stifle any complaints. I drove south through the city and soon reached the narrow road that twisted its way up along the mountainside to the NCAR parking lot. I remember thinking about how this was a hell of an amazing place to plop down a research laboratory, practically halfway up a mountain. I wondered whose idea it was, and how they got away with it. My hat would be off to them, if I wore a hat.

After signing in at NCAR's front desk, I made my way down the hallway, past the tornado machine on display there, and into the office of Ed Crump, a high-level NCAR administrator. He was expecting me – the State Department had already briefed him on my mission. “Welcome to NCAR!” he said, extending his hand. He told me that he had already set me up with a computer account and had done everything else needed to integrate me into the system, so that I could get to work right away. “One thing, though,” he said, suddenly looking a little tired. “I haven't told Fayed yet that we've signed you on to help him. To be honest, I've been putting it off. He's not going to like it one bit!”

“I understand,” I said. “Do you know if he's in his office yet?”

“He is. I saw him earlier.”

“Whaddya say I meet him right now?”

Crump nodded, and we both stood up. I followed him up a flight of stairs and through a wide hall to the other end of the building. As we knocked on the open door of Fayed's office, I noticed the thin, rumped, balding modeler quickly and nervously shove a paper under the calendar blotter on his desk.

Like I said, I knew instantly that he was hiding something.

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The coffee gambit doesn't always work. I had to do something, though, to find out what was under that blotter. So, just after Crump introduced us and told Fayed that I was there to help him fix the code, and just before he – Crump – returned to his office, leaving Fayed and me alone to talk, I hastily scribbled a note and slipped it to him. “Bring two large cups of high quality coffee every half hour,” the note said. Crump glanced at the note and nodded.

Fayed hadn't argued the point when Crump tossed me in his lap, but he didn't exactly welcome me, either. In fact, he said nothing at all, and he continued to say nothing once we were alone. He just stared at me, waiting for me to make the first move. I did.

“So, I've heard something about the Otan and Horvonia situation,” I said. “Sounds like you've got quite a problem on your hands.” Fayed's silence continued. With each passing second he looked more annoyed. “I hear that a bug has somehow crept into your code and that you don't know where to look,” I went on.

It was my turn to be silent. I stared right back at him. If it weren't for the deep hum of his desktop computer, the silence would be deafening. Finally, he caved. “I don't have time for this,” he said.

“For what?”

For you!” he said. He didn't shout it, but he was clearly piqued. And he spoke with almost no accent. I'd learned during my briefing that he'd been in the States for a long time. It showed.

“From what I understand,” I countered, “you don't have much time for anything. In fact, you're just about completely out of time. Whether you like it or not, you need help. That's what I'm here for.”

Another glare. It would have been a killer one, but at that moment, a woman stepped in with two large coffee mugs on a tray. “You're Mike, right?” she said, looking at me with a smile. “I'm Margie, from the front office. I hear you've just joined us. Welcome!” She set the tray down on a desk. “I brought you some coffee. I brought some for you too, Fayed.”

“Thanks!” I said.

“Yeah, thanks, Margie,” Fayed said. He didn't sound sullen with her. Maybe it was just me that brought it out in him. Fayed reached for a cup, took a sip, looked at the cup in



surprise, and then took another sip – a longer one. I drank some from my own cup. Yes, the coffee was excellent.

Margie left us alone again. “So, tell me about your code problem,” I said to Fayed, pretending that our first conversation hadn’t gone sour.

“It blows up,” he said shortly. Then, exasperated, he added, “Who are you, anyway? Mike Walker? I’ve never heard of you.”

“I’ve been at GFDL working on tracer water problems,” I lied. “Before that, I was at GISS.”

“So, why haven’t I heard of you?”

“I don’t get out much. Listen. We’re wasting time. When did you first notice the bug?”

He stared at me for another full minute. Then, suddenly, he rolled his eyes and threw down his pencil. “What the hell!” he said in disgust. He looked at me, then at the clock, then at the computer on his desk, and then back at me. “This is a waste of time, and I could be working on fixing the damn thing right now, but what the hell. I can’t get to work until you go away, and it looks like you won’t go away until I tell you about it.”

I flashed him a winning smile.

He sighed – a deep, heavy, weary sigh. “What the hell,” he repeated. “Okay. Listen. Just shut up and listen. Two weeks ago I learned that I wasn’t conserving tracer mass. I tracked the problem down to the convection scheme. I was losing mass below the cloud every time it rained.”

“An improper sink term in the re-evaporation parameterization,” I suggested.

He shot me a glance. “That’s right,” he said.

“Re-evaporation with tracers can be tricky,” I said. “Does your scheme allow the equilibration of tracer vapor with the tracer in the droplets? I mean, can you get a net tracer flux between the air and the droplets, even without a net flux of water?”

“Partial equilibration,” he said. He was sounding less sullen now. I was getting through to him; I was speaking his language. “It depends on the drop size distribution,” he added, “which I’ve parameterized in terms of rainfall intensity. Actually, that’s where the bug was.”

“We’ve got partial equilibration in our code too,” I said, “but mostly because we do isotopes. I don’t know if it’s worth putting in for tracer water studies.”

“We’ll be doing isotopes ourselves soon,” he said.

“That would explain it.”

“Uh-huh.”

“I’d like to see your equations sometime,” I said. “But time is short, and we’ve got work to do. What did you do with the parameterization?”

“I found the bug easily enough, and I fixed it.” He sighed again. This sigh seemed to empty every last cubic centimeter of air from his lungs. Fortunately, though, he no longer seemed angry with me; now, he just seemed angry with the entire world. “I suddenly realized that I had a much bigger problem on my hands,” he said. “I wrote that part of the scheme myself, and I know that that bug wasn’t in there originally. I know that for certain. I did not make that mistake. Someone must have planted the bug, on purpose.”

I nodded. “So you suspect sabotage. I heard about that.”

“It gets worse – much, much worse,” he said. He looked miserable. Either he was being honest, or he had planted the bug himself and was one hell of an actor. At that point, I still hadn’t decided.

“How bad?” I asked.

“Worse than you can imagine,” he said. “Two things. First of all, all of our backup files have been tampered with. I found the identical bug in every backup we have.”

I whistled. “Someone was thorough,” I said.

“Hell yeah. And second, there’s at least one more bug in there somewhere, and I have no idea where it is. The model never used to blow up. Now it blows up regularly, sometimes within a hundred time steps – and I don’t even know where the problem starts. It could be anywhere. It’s a full AGCM code, dammit!”

If he was being honest, I felt bad for him. An AGCM is a tremendously complicated numerical program with complex and often very subtle connections between its parts. A problem that shows up in one subroutine could easily stem from the modest perversion of an obscure variable in a seemingly disparate subroutine. Even in the best of times, tracking down such a bug could be horrific work. With the weight of a potential war on your shoulders, the job would be ten times worse.

I was about to ask him about his debugger options when a financial analyst from down the hall stepped inside the office. The analyst was carrying two large cups of coffee. She was early. It had only been ten minutes.

...

I won't bore you with more of our technical discussions. I'll just say that, through my own experience with these models back when I was a scientist and through various tricks I'd learned over the years doing undercover work, I was able to convince Fayed that I was a worthy colleague, someone who really did know enough to help him with his problem. And I'll mention what he said when I asked about running experiments with some other, unbroken model, simple experiments in which you artificially 'remove' the Otan Lake. Experiments like that would allow you to see the effect of the lake removal on Horvonia precipitation without ever looking at a tracer. "They insist on seeing tracer studies, and they insist that I use my own parameterizations, in my own version of the GCM," he answered, shrugging his shoulders self-consciously. "That's what I'm supposed to be famous for." I nodded in understanding. The poor guy – if he was legit – was ironically a victim of his own brilliance.

I learned one more thing of interest – Fayed Subein could hold his coffee. By 11:30, we had both had seven large cups. I'd trained myself over the years to hold it in, as the coffee gambit has more than once paid off big, making all the difference in a case. I'd never, though, competed with someone like Fayed. The man was a camel. Cup after cup had no effect on him. He just kept sitting there, looking far more comfortable than humanly possible.

When 11:45 rolled around, I was hurting – bad. I could barely sit still. I strongly considered giving up on the idea of seeing that hidden note, but then I remembered what was at stake – millions of lives, the survival of two countries, the overall safety of the world – and I stayed put. "Focus, man!" I said to myself silently, as I listened and responded to Fayed's discussion of his code. It didn't help that we were talking about water transport.

Just when I thought I could last no longer, Fayed stood up. "I'll be back in a minute," he said. "Thank God!" I thought, as I watched him leave the room. I wasted no time. Once I was sure he was well down the hall, I stood up – carefully – and stepped to his desk. I lifted the desk blotter and read the note underneath.

I admit I was shocked. Over the course of the morning, I had gathered the distinct impression that Fayed was okay – that he was not sabotaging his own work. I was actually starting to like the guy. The note, though, gave me pause:

FAYED, PRINCE JUST SAW CABINET. EVERYONE PLEASED. THE TERMS DISCUSSED EARLIER ARE APPROVED. HERON'S GRILL NOON THURSDAY FOR FIRST PAYMENT. – T.

"This looks bad," I said quietly to myself. Sometimes I can't help stating the obvious.

-4-

I hate to do this to you again, but here goes. Porok is yet another country in the South Asia / Middle East / North Africa / Sahel region. Of course, that's not its real name. I can't tell you its real name. I can only tell you two things about it: it's close to Otan and Horvonia, and it would benefit greatly, both politically and economically, from a war between its neighbors. As Otan and Horvonia slowly destroyed each other, Porok's influence in the region, now small, would grow dominant. It would finally be a player, a powerhouse. At least, that's what the Porokis were thought to think.

Fayed's hidden note was signed "T". Could "T" stand for Tashin Kassad, a Poroki now living in the U.S., a man on the U.S. government's special "short list" of potential troublemakers? Two weeks earlier, the State Department intercepted an e-mail to Tashin from the Poroki government. The e-mail mentioned Fayed Subein by name. It did not implicate him in any way – the reference was vague – but the mention was enough to make the State Department nervous about him – that is, Fayed. That's why I said earlier that they had reason to suspect him. That's why they told me to keep a close eye on him.

In the context of the Poroki scenario, Fayed's note seemed to imply that he was guilty. Dead guilty.

Still, I wasn't convinced. After all, I'd spent over ten years dealing with both good scientists and scientist scum, and that experience counted for something. Nowadays I could almost always spot a bad one after a few minutes of conversation or following the discussion of a few hypotheses. I had already talked to Fayed for over three hours, and he showed none of the signs. My intuition – and it's damn good intuition – told me that the surly, moody, and stressed out scientist was, in spite of all that, an honest scientist. I couldn't ignore my intuition.

I thought about all this, over and over again, but only after I made it to the bathroom. As I washed my hands, I resolved to find this Heron's Grill and be there on Thursday, out of sight. I had to get more information.

...

I lunched in the NCAR cafeteria. An idea struck me as I tore into my lasagna. It was a long shot, but it couldn't wait. I took two more quick bites and pushed my plate away. A minute later I found Fayed in his office, still sitting at his terminal. "Hey," I said, "can you show me the first bug – the one you found?"

He looked at me strangely. "Yes. But I fixed it!"

"I know that. I want to see it anyway."

He shrugged. “Whatever,” he said. “I saved a copy of it.” A minute later, after a bit of typing and clicking, some code appeared on the screen. “It’s right here,” he said, pointing to the following lines:

```

DO N=1,NBIN
  FEQUIL(N)=AMAX1(FEQUIL(N),0.1)
  TL=TL+RMASS(I,J,L)*FDROP(I,J,L,N)*FEQUIL(N)
  DO K=1,NTRACE
    TLT(K)=TLT(K)+RMASST(I,J,L,K)*FDROP(I,J,L,N)*FEQUIL(N)
    TLT(K)=TLT(K)*.99
  ENDDO
ENDDO

```

“Fortran-77,” I said.

“Call me a dinosaur,” he said.

I held up a hand. “Don’t get defensive,” I said. I studied the code fragment and pointed to the line ‘TLT(K)=TLT(K)\*.99’. “And that must be the problem sink.”

Fayed nodded. “Yeah. That whole line was inserted by the saboteur. A pretty easy bug to find.”

“I see. And the rest of the code is yours?”

“Uh-huh.”

I gazed at the lines again. I hadn’t really expected to see anything, but there it was. Plain as day. “Remarkable,” I said, shaking my head.

“What?” Fayed asked.

“Our saboteur. I think he’s left us a fingerprint.”

I had the distinct impression that, up to this point, Fayed was bored and impatient, convinced that I was wasting my time – and his. Now, though, he looked alert, intrigued. “What do you mean?” he asked.

I ignored the question, instead scrolling down through page after page of the code. In no time my suspicions were confirmed. I grunted in satisfaction. My long shot had paid off – big time.

“What?” he asked again.

I looked up at him. “Computer code is supposed to be written precisely,” I said. “Otherwise it won’t work. The individual coder, though, does have some latitude in

formatting. And the coder will often lapse into his own formatting style without thinking.”

I scrolled back up to the problem line. “Look at the way he wrote ‘.99’ rather than ‘0.99’,” I said. “You don’t write numbers that way. Up here, you wrote ‘0.1’. All of your numbers, throughout your code, include the zero before the decimal point, if you can put one there.”

“Holy crap!” Fayed said, stunned. He was staring at the screen. “I never noticed that before!”

“If the other bug, or bugs, involve decimal numbers less than one...”

“... Then I can find them,” he finished, excitedly. “I can find them easily!”

He almost pushed me off the seat, so eager was he to get to his computer, to try an idea that had never occurred to him, one that could save his research and perhaps prevent global Armageddon. “Don’t get your hopes up too much,” I warned. “The chance that the other bug will have the same fingerprint is very slim. Here’s your best bet. Think of all the unique ways you format your code. Consider capitalization, your continuation characters, the lack of spaces between terms in your equations, the use of blank lines – everything.”

“And search for deviations!” Fayed said, already typing in earnest.

“That’s right,” I said. “With any luck, we’re dealing with a sly and slippery but sloppy saboteur.”

...

The first attempt on my life came some hours later, just after 10PM. Before that, in the afternoon, while Fayed carefully searched his code for format irregularities, I spent my time talking to his NCAR colleagues, examining a huge number of records kept by the computing center, and going through hundreds upon hundreds of center-wide e-mails covering the last several months. I hadn’t planned to spend so much time on the e-mails. Something about them troubled me, though, as soon as I started looking at them. There was some pattern there that I couldn’t place – not yet. I’d have to let all those messages slosh around in the back of my mind until their pattern became clear.

And there was something else I noticed that afternoon – or rather, something else that I viscerally felt. Somehow, I got the sense that the scientists at NCAR were working under a heavy and unnecessary weight. Some unspoken, unspecified evil seemed to hold them all in its grip. I knew that if I could just figure out what that evil was, if it really did exist, I could make some real progress on my mission. As with the e-mails, though, I couldn’t put my finger on anything specific. I’d just have to wait for the clues to start pouring in.

Anyway, as I was saying, I came face to face with potential death later that night. I was walking down the hall to the office I was using, ruminating on all I had learned that day, which wasn't much, when I noticed that the door to the office at the far end of the hall was open and that the light inside was on. That surprised me. From what I was told, that office was supposed to be deserted. I stepped to the door and peered inside. No one was there. A laptop computer, though, sat open on the desk, and it was running. The screen saver hadn't come on yet.

What I did see on the screen stopped me cold in my tracks.

I looked back up the hall and, seeing no one around, I stepped inside to face the laptop. I had to. On the screen was a photograph, from the nose up, of Richard Allsworthy, my graduate school advisor from some 20 years before. It was an old photograph, from early in his career. What was it doing on this laptop, in a supposedly empty office? Though he's well-respected and famous, I'd never encountered his picture by chance before, not like this. Either its presence here was some sort of bizarre coincidence, or somebody here knew my true identity. For the sake of the mission, I was rooting for the coincidence.

On one level, my next course of action was obvious. I could scroll down the screen to see if any text appeared below the photo, text that might explain everything. Half of me was eager to do just that, and right away I found myself extending my right index finger toward the 'page down' key. Fortunately, the other half of me – the smarter half – stopped me in mid-reach.

With a chill, I quickly revised my plans. A look around the office showed me something that should work: a small metal and plastic staple remover. Slowly, cautiously, I stepped backwards through the office door, grabbing the staple remover on my way out. I positioned myself behind the doorjamb. With a steady eye and a smooth underhand motion, I lobbed the staple remover across the room and, while it was still in the air, I hotfooted it down the deserted hallway.

I must have aimed well; the staple remover must have landed right on the keyboard. The next thing I knew, the air just outside the office door was filled with fire, smoke, and debris, just as the building rocked with the sound of the explosion.

...

Somebody here *did* know who I was. He – or she – had tried to kill me with a 'silicondemner', an ugly device manufactured by a little-known, underground tech firm in Russia. I'd never actually seen one before, but I'd seen a picture of one, and evidently that picture, lodged somewhere in my subconscious, helped me recognize the device for what it was. Silicondemners are basically laptops rigged with internal explosives. Some explode only when a certain icon on the desktop is clicked or only when a certain word or phrase is typed into, say, Microsoft Word. Others, like this one, explode when any key at

all is touched, once the trap is set. Someday, I vowed to myself, as I gazed at the destruction before me, I'd see to the extinction of all such devices.

Right now, though, I had a more immediate problem. I had to track down a would-be assassin before he got too far away.

I ran back down the hall to the stairwell. I had to get outside. The guard yelled at me and tried to grab me as I passed him on the stairs, but I ignored him, and I was well out of reach before he could do anything. I would talk to him later. Right now there wasn't time.

I stepped out onto the terrace. It's a large terrace, lying just outside the front entrance, and from its edge you can scan a good deal of the parking lot. I scanned it carefully, helped by the overhead lights and by the rising full moon, which tonight was bright enough to form shadows. I knew that whoever planted the bomb would stick around until he knew I had stepped into the office with the silicondemner. He would then disappear before the cops showed up. So, given this timeframe, he was probably somewhere outside, on his way to his car. My search was methodical, quick, and successful. I soon saw a tall, wiry shadow moving hurriedly and furtively among the shadows of the far edge of the lot.

There was no time to spare. I ran down some steps to the ground level and sprinted to the north side of the building. There I found the road that connected the parking lot to the rest of Boulder. This was the road the assassin would take. I squatted behind a bush and waited some tense seconds. Soon the car tore past me, tires screeching. I got its number, and – just as important – I memorized the pattern of its taillights. I ran as fast as I could to my own car. The chase was on.

I caught up to him easily, while we were still on the mountain road. I was, after all, driving a Lamborghini. I stayed back, though. I didn't want to draw attention to myself – not yet. First, I thought I'd better find out where he was going.

Broadway Avenue – that's where. And he was driving much too fast. I had to match his speed to keep up with him, and that worried me, because I was the one driving the flashy car, and that meant I'd be the one who got pulled over, if anyone was going to get pulled over. Luck held with me, though. There wasn't a cop in sight. At one point, my quarry went through a yellow light. To keep up, I went through the start of a red one. Someone honked, and I heard a skid. I kept driving.

Finally, he slowed and turned into the parking lot of a hotel. *My* hotel. "Shit!" I thought to myself. "He thinks I'm dead, and he's going to ransack my room!" He parked and jumped out of his car. I followed suit. We entered the lobby some twenty paces apart. I couldn't see much of him, because he wore a hooded raincoat, but I could see that he was tall and hunched over a little. And I saw that he didn't notice I was following him. I wondered what he was after, what he thought I had.



I wasn't at all surprised to see him pass by the elevator and approach my room, which was on the ground floor, just past the swimming pool. He tried the knob. Bastard! Yes, the moment had come. It was time to introduce myself. I walked casually past him, as though I were some other hotel guest from down the hall. As soon as I passed him, I swung around, grabbed his right wrist, and twisted his arm high behind him, close to his back.

He let out a yelp. His shoulders went down, and he continued to grunt sharply and miserably. Soon he collapsed to his knees. I kept up the pressure, holding his arm high. He couldn't move without causing himself horrific pain. He was helpless.

"Looking for me?" I sneered.

"Mike?" he gasped. "Mike! It's me! Corky Swenson! Connie's brother!"

-5-

“You!” I didn’t say it; I spat it. Corcoran ‘Corky’ Swenson. What the hell was *he* doing here?

I released him, and he fell to the ground in a heap. Maybe you think that was foolish, that he might have been the one who tried to kill me. Well, I knew better. Corky Swenson needed me alive. He needed my brain – not for its smarts or its cleverness, such as they were, but for its internal synaptic patterns, which just happened to be perfect for his experiments. He once told me that everyone’s patterns are unique, kind of like fingerprints, and that my particular patterns don’t actually help me in any way – again, kind of like fingerprints. My brain’s patterns just happen to work exceptionally well with his synaptic transmitters and receivers. Call me one hell of a lucky guy.

He wanted to prod my brain with electrodes – *that’s* why he was here. He wouldn’t be here to kill me. Even so, I was furious with him. Because of him, I lost track of the real would-be killer, who could be anywhere by now. I looked down at him. He didn’t move right away; he just lay there, his head near the wall, his back toward me. It was all I could do – it took all my inner reserves of strength and patience – not to kick his rear end as hard as I could.

Finally he stirred. He lifted himself on one elbow and turned to face me. “Mike!” he gasped. “I did it!”

“Did what?” I snarled, not really caring.

He sat up now. He took a few deep breaths. I could see that, despite his lingering discomfort, he was pleased with himself. “I separated the last synaptic phase functions!” he said. “I can control them now – digitally!”

“Why are you here?”

“Huh?”

“Why are you here? And how did you know to find me here? Did Connie tell you?” I just couldn’t believe she would do such a thing. Not Connie.

“Well, no, she didn’t exactly tell me,” he said, hesitating. He looked down at the floor before facing me again. “I flew down to Washington to talk to her at her hotel, and I saw your name and this hotel’s name and number on a piece of paper by the phone.”

Ah, the lady is innocent, I thought to myself. Careless, but innocent. I stared at him some more, daydreaming about a restraining order. “And you flew out here today?”

“That’s right,” he said. “I first drove to the hotel and found you weren’t in. I figured you were at NCAR – why else would you be in Boulder? – so I went up there, but the guard

wouldn't let me in because it was too late at night. So, I drove back here to see if you'd come back." A gleam came into his eye. "Mike – listen! I did it! I finally overcame the last theoretical barrier! DSDA is mine! Let me wire you up right now, and I'll show you! My equipment's in the car. I can..."

"Stop!" I said, disgusted. This was too much. I'd had a long day, and so far, I hadn't gotten very far in my little job of averting a war. I had no time for any DSDA nonsense.

Perhaps I should tell you what DSDA is, so you can better understand my attitude. DSDA, which stands for 'dream state data assimilation', is supposed to be a process by which one's mental images while sleeping can be guided in a controlled way by external electrical impulses. In other words, if you are dreaming of an elephant playing chess, and Corky has his electrodes strapped to your head, and your brain has the right kind of patterns, Corky could punch something into his computer, and little electrical zaps would make you visualize the elephant making all the specific chess moves Corky suggested. Or something like that. The external suggestions would be assimilated, through electronics, into the 'dream' system defined by the dreamer, updating the dream states.

I was quite sure he hadn't made any breakthroughs. For one thing, this wasn't the first time he was convinced he had the final answer and had traveled great distances to subject me to his 'tests'. For another thing, you can't make breakthroughs in bullshit.

Corky, unfortunately, was as persistent as ever. "Really, Mike! I can..."

"No! I've got no time..."

"But Mike!..."

Arguing with him would get me nowhere. Long, weary experience told me that. So, I stepped over to where he was still sitting, reached down, and gruffly pulled him up by his collar. That brought me close enough to smell his breath. I ignored it. I held him at arm's length as I stared into his puffy face. "Shut up!" I said. "For just one minute, keep your mouth shut!" I pushed him back as I let go of him, and he sank back against the wall behind him.

A couple of seconds later, he said, "Geez, Mike! I'm just trying to..."

"Shut up!" I yelled. "Just shut up!" I was using my "sarge" voice, and it worked – he finally quieted down. He was staring at me now, crestfallen. Someone down the hall opened their door slightly, peeked through it, and closed it again. I took a breath. "Listen," I said, trying my best now to sound calm. "This is important. Very important. Just now, when you were at NCAR, did you see or hear anything unusual? Did you see anyone else in the parking lot?"

"At NCAR?"

“Yes.”

He nodded as he thought about it. “Yeah, Mike, I did!” he said. He thought some more. “I heard a loud bang from inside the building, just after I left. Almost like an explosion. A little while later, near my car, I thought I saw a man in the trees. When I looked again, he was gone. It was dark, so I can’t be sure.”

“A tall man? A short one? Anything that might distinguish him?”

He thought a little more. “Medium-sized, I guess. And I think he was wearing metal-framed glasses, from the way the moonlight was bouncing off them.”

I sighed. Fayed was medium-sized, and he wore metal-framed glasses. Of course, that could describe a lot of people. “Anything else?” I asked.

Corky shook his head. “I only saw him for an instant,” he said. “Now about my experiment. Really – it’ll work this time. I promise! If you’ll just...”

I walked past him and unlocked my door. He must have thought I was ready to help him, because he stood back quickly and smiled eagerly, waiting to be invited in. Apparently to his surprise, I turned and faced him with a scowl as soon as I entered my room. “Go away!” I said. “I’m going to bed!”

I slammed the door in his face. Call me shallow, but it felt great.

...

At least one good thing came out of his visit. I called Connie, and she offered to come out and run interference on her brother. She’s the only one who knows how to handle him. “I’m so sorry I let him know where you are,” she said.

“Well, I just woke you up, and it’s after 1AM back there,” I said. “Call us even.”

“If you say so,” she said, yawning.

Her yawn was catching. I was running out of steam fast, like a hurricane that suddenly encounters a patch of anomalously cold SSTs. “I suppose I should let you get back to sleep,” I added, when my own yawn was done. “Good night, and I’ll see you tomorrow!”

“Good night”, she said. “Oh, and before you hang up, let me tell you what else I’ll do when I come out there.”

I listened. Her voice and her words were like chapstick on the parched, cracked lips of my soul. All traces of my sour mood vanished completely.

...

The next morning I needed to borrow a wife and a child. I realized this while staking out Fayed's house in Longmont, a town outside of Boulder. I had already watched him leave the house that morning, a laptop briefcase in one hand and a stack of papers under the other arm. He looked terrible – like he had had no sleep. Maybe he hadn't. Afterward, as I sat there considering how to approach his wife for an interview, I saw the wife – short, slim, good-looking, with shoulder-length reddish hair – leave the house and head up the street with a small dark-haired boy and a baby in a stroller. The boy was holding a soccer ball, and from that I deduced that they were going to the park up the street. I deduce things like that all the time. I am, you know, a detective.

The park would be a good place to approach Fayed's wife, who I'll start referring to here as Cheryl, since that was her name. I figured that if I went there with a wife and kid of my own, I – or my borrowed wife – could approach Cheryl more easily and get her to talk, to tell me what I needed to know.

Fortunately, finding a rent-a-wife was much easier than it sounds. One advantage of being in the detective business for a long time is that you get to know a lot of people, all over the country. Some become friends, and some just owe you favors. Kathy Ellswick was in the first category. She worked at the University of Colorado, in the Physics Department. Four years earlier, she had helped me bring down her officemate, an opportunistic plasma physicist who, late at night, was running his own for-profit publishing house with the office copy machine. Kathy and her husband Dave were good people. I still received their annual Christmas card.

I found Kathy's number, called her up, and explained the situation. Twenty minutes later I was in the passenger seat of her car. Six-year-old Lizzie was in a car seat in the back. "So, you got the picture?" I asked Kathy.

"Piece of cake!" she said. "I love this kind of stuff!" We parked on the street that skirted the park, and I quickly spotted Cheryl on a bench near the playground. The boy – Fayed's son – was kicking the soccer ball around on the grass. Cheryl was watching him absently. I didn't feel good about deceiving her, but I had no choice. Fayed lay at the center of this problem. I had to know what was going on.

We stepped out of the car. Kathy and I walked, and Lizzie ran, to the playground. I put on a terribly troubled face.

"Mind if we use this side of the bench?" Kathy asked when we got there. Cheryl smiled and waved a hand, welcoming us to sit.

"Thanks!" Kathy said. Turning to me, she said, "Now, Tom – you just sit right here and close your eyes. Let your mind go blank."

I groaned softly as I closed my eyes. "My paper! Revisions due... Must get to work..."

“No,” Kathy said, gently but firmly. “Not now. Doctor’s orders. You are outside, and it’s a beautiful day. Focus on that. Nothing else.”

I suddenly stood up and howled, my eyes still closed. I started to shake. Kathy stood up and gently sat me back down. “Shhh…” she said. “That’s right. A beautiful day. Listen to the birds. Shhh…”

Cheryl, of course, couldn’t help but watch all this. Kathy pretended not to notice. “Our kids are playing nicely together,” Kathy said to her a moment later, when I seemed to have calmed down a little. With a flick of her head, she motioned at the two children, swinging on the swingset side by side.

“What’s the matter with your husband?” Cheryl whispered. She sent me a sidelong glance. For her benefit, I was staring into space, rolling my eyes around in little circles and moaning softly.

Kathy sighed. “The doctors call it Ramok’s syndrome, but all the people at the lab call it ‘sci-chosis,” she said. “He’s got it bad this time.”

“Sci-chosis?” Cheryl asked.

“Yes. From what I hear, it’s not all that uncommon amongst scientists these days. My husband works at the university, and the stress has gotten to him. It’s bad this time – I’ve never seen it quite this bad before.”

Cheryl was silent for a minute. When she did speak again, she sounded worried. “My husband is a scientist,” she said.

“Ah! Then you know. You must have been down this road yourself.”

My hands suddenly reached forward, and I started typing on an imaginary keyboard. I was breathing fast, muttering something about shell scripts. Kathy grabbed my wrists and firmly lowered my hands. “You’re in the park.”

“What?” I said. “The park?”

“Yes. Shhhh.”

The two women watched me for a full minute. I had relaxed again and was now quietly staring into space, apparently lost in my own world. When Cheryl spoke again, she spoke in whispers, but I could hear her words plainly. “What makes it come on like that?” she asked.

“Stress,” Kathy said. “Why? Are you worried about your husband?” Cheryl nodded uncertainly, and Kathy continued. “Maybe I can help. I know the warning signs. I should by now! Tell me about your husband. Has he been under stress for a long time?”

“Almost two years!” Cheryl said. “This last week has been especially bad, because apparently something terrible happened to his computer code, and it’s vitally important that he fixes it fast. So now it’s worse than ever. Even so, like I said, he’s been going downhill for about two years.”

“What’s stressing him out?” Kathy asked. “His research? Is it stalled?”

Cheryl shook her head. “No, that’s not it. His research is going fine. That’s what he loves; that’s what energizes him, makes him want to get up and out of bed in the morning. No, it’s all the other stuff – all the extra work piled on him by the institution. ‘Busy work’, he calls it. None of it related to science, all of it required from on high. It got so bad this last spring that he started ignoring half of it – but then he started feeling guilty on top of everything else.”

Kathy nodded. “How about his recent behavior?”

Cheryl thought for a moment. “Well, like I said, he’s been trying to solve a very difficult problem this week. He told me the stakes are huge, but he didn’t explain. He was up until four this morning, sitting at the dining room table going through computer code.”

“Send! Send! Send!” I shouted, clicking an imaginary mouse with an outstretched hand. “Why can’t I send this e-mail?” Kathy turned to me, lowering my arms again. “Ask her if he’s had any visitors at home recently,” I whispered to her silently, blocked from Cheryl’s view.

“It’s okay,” Kathy said aloud. “Everything’s okay. Just calm down.”

Kathy did manage to ask my question, and many more, over the next twenty minutes, all in the context of addressing Fayed’s potential sci-chosis. We learned nothing more of obvious value, though, other than that Cheryl was a loving and worried wife. Fayed, I figured now, was innocent – why else would he stay up all night scouring code? – but that only meant the real saboteur was still at large. I was still no closer to figuring out who it was.

“Your medication!” Kathy gasped, turning to me. “I’ve left it at home!” A minute later we left Cheryl and her son behind and headed toward Kathy’s car, my head swaying slightly as we walked. The interview was over. I had to get back to NCAR, and Kathy had to get to the university, to meet with some of her graduate students. Cheryl watched us leave. I hoped we hadn’t ruined her day.

“You wanna join us for dinner tonight?” Kathy asked me, when she dropped me off at my car. “We want to meet this Connie!”

“Dinner would be great,” I said, “but not tonight. We’ll have to wait until my job here is over.”

“Big case, huh?”

“The biggest.”

Kathy looked impressed. “Really?” she asked.

“Yes. I’m serious. In some ways, it’s the biggest case I’ve ever tackled.”

“Wow! Well, good luck!” she said.

I shook my head. “At this point, luck is precisely what I’m counting on most!”

...

My reunion with Connie that afternoon was tainted by the second attempt on my life. “I’m in the NCAR parking lot now,” she told me on the phone. “Where exactly are you?”

“I’m in the building. I’ll come out and get you!” I said. I needed a break; I needed to get outside. I had spent the last several hours on several different lines of inquiry, all leading nowhere. Fortunately, I hadn’t had to deal much with the police regarding the previous night’s explosion. Ed Crump, a good guy, had sheltered me from all that.

We met at the base of the stairs. Was she ever a sight for sore eyes! She was dressed for summer, in shorts, sandals, and a top that showed the world the exquisite curves and smoothness of her shoulders – a mere sample of the exquisiteness that permeated every part of her body. Her wavy hair brushed her shoulders in the warm summer wind. She smelled of sunscreen, and her mouth tasted like Tic-Tacs. Orange Tic-Tacs.

Our lips disengaged, and she looked carefully at my face. “You look tired,” she said.

“There’s more to do,” I said, shaking my head. “A lot more. I just wish I knew what it was!”

She nodded sympathetically. “I can help,” she said. And she was right; she could. Aside from her brilliance in the sciences, she had a lot of untapped potential for detective work. I knew that the first day I met her.

Yes, she was amazing, but there was one thing she didn’t have: my years of experience. She hadn’t yet developed the sixth sense for danger that is so critical to the survival of the detective. As we walked up the stairs to the terrace and then toward the entrance to the building, it was that sixth sense that made me suddenly look straight up.



That's when I saw it. Death. Accelerating at  $9.8 \text{ m/sec}^2$ , and heading straight for us.

-6-

My arm was already around Connie's back, my fingers resting on her belt loop. That was lucky, because it helped me carry her along with me as I lunged to the side, out of the way. There'd been no time for discussion or planning. I fell on the ground hard, and Connie fell on top of me. The boxes – heavy and bulky, fifteen in all – smashed themselves down against the walkway. We would have been nailed if we hadn't moved. We would have been flattened. Literally.

We scrambled to our feet, our eyes immediately drawn upward, in case more danger was on its way. For the moment, though, things looked safe – there wasn't a box in the sky. I looked quickly at the wreckage before us. Most of the boxes had broken apart on impact, their contents spilled about in all directions.

“Hey! Those... those are reprints!” Connie exclaimed.

“Yes,” I said. I wasn't surprised, not in the least. Something like this was bound to happen sooner or later. Authors of journal papers still receive boxes of reprints from the publisher, even though the need for hard copies has essentially disappeared – nowadays, if someone wants a copy of your paper, they won't ask for a reprint through snail mail; they'll ask for a pdf, which you can send electronically. Boxes of unread reprints have been building up in scientists' offices all over the country for years. Eventually, something would have to give. Either the scientist would get fed up and throw out all his boxes, or they would sit there until they were stolen, as these were, and misused. I thought about our near brush with death. It was close. Real close. Yes, boxes of reprints could definitely be misused.

The killer was on the roof – that much was clear. “Watch this door!” I said to Connie. “If someone runs out, follow him. You can call me with your cell. But stay safe!”

I ran inside. I lost no time getting to the stairwell that led to the roof. I ran up the stairs three at a time, meeting no one on the way, and swung the roof door open. I stepped – no, I tore – into the bright sunlight.

And then... Nothing. No one was in sight. Now, the NCAR Mesa Lab is not your typical building. It was designed by a famous architect (I. M. Pei), and it looks a little like a boxy, space-age castle. The roof, as a result, lies on more than one level, making a full search difficult. Difficult or not, though, a full search was necessary. I moved around quickly, my mind on red alert. I looked around every corner, behind every obstacle, on every level. Still nothing. Soon it was obvious that I was alone. Either the assassin had reentered the building right after dropping the boxes, or...

I looked around again, this time more closely, this time looking for anything at all unusual, not just a killer in hiding. That's when I saw it. Clamped to a solid-looking venting pipe was a metal cable that stretched out of sight over the ledge on the north side of the building. I hotfooted it over there. A quick look over the ledge confirmed my

guess – the other end of the cable was attached to the trunk of a large pine tree some 50 meters away. The cable was taut – perfect for a quick, commando-style rappel to safety. “Damn!” I said out loud. He had prepared well, and now he was gone, like the imprint of an atmospheric initialization on a climate simulation after a lengthy spin-up period. Most likely, he was already driving away to safety while I was still running up the stairs.

I called Ed Crump on my cell phone and had him send out a team of trusted scientists to search the building for strangers, just in case. It would be a waste of time, though. I was pretty sure of that. Shaking my head in disgust, I headed back to the east side of the roof, up on a tower that skirted the northern edge of the main walkway into the building. This is where the assassin must have been waiting for me earlier.

I wasn’t surprised to find a tall stool there next to the ledge. I studied its position. Yes, the assassin could sit there on the stool and watch everything below. I had no idea how long he’d been up there, how long he’d had to wait. It’s a safe bet that if I hadn’t come out eventually on my own, he would have found some ruse to get me outside. The boxes had been stacked on the ledge itself, ready to be pushed forward and down. That much I knew from the dust and dirt marks I found there. Fifteen boxes would make a nice pyramidal stack.

Something about the stool nagged at me, and I looked at it again, this time more carefully. A dusty smear covered much of the seat, and along the edge, in a worn crack between the metal and the round piece of corkboard that served as the seat’s center, I found a clump of dirt – almost dry, but not quite, and mixed with tiny pieces of dead foliage. I reached into my back pocket for a clear plastic bag, which I always keep handy, and used my car key to extract the dirt, which I deposited into the bag. At the time, I didn’t know why I did it. Later, though, I was glad I did.

Nothing else about the roof was helpful, other than some footprints I found near the ledge, which suggested that the assassin wore a size 10 shoe. I looked around one last time. The roof had told me all it could. I headed back to the stairwell door.

Eventually, I found my way back down to the lobby. Ed Crump spotted me there and walked over. He looked worried. “No one’s found anyone yet,” he said.

I nodded. “They won’t,” I said. “But we have to look anyway.”

“And Fayed is missing,” he added. I nodded, catching his meaning. We discussed the situation briefly, and then I went outside to find Connie.

I filled her in as we walked to my office. She listened attentively, stopping me occasionally with a pointed question or two. She asked the toughest question of all when I finished my summary. “Okay,” she said, “so what’s the answer? What’s going on here?”

“I don’t have the answer,” I said. “I do know this – there’s something very wrong about this case.”

“Certainly there is! Somebody just tried to kill us!”

She grinned when she said it, and I loved her for it. I grinned back as I lifted my feet up to the top of the desk. “No, that’s not what I mean,” I said. “There’s something wrong in how I’m reading everything.”

“Meaning?” she asked.

My face got serious again. “Just this, Connie. Things are not as they seem. There’s much more to this case than meets the eye...”

...

I was all set to explain when the phone rang. I picked up the receiver and heard a familiar but unexpected voice. “Madame Secretary!” I said.

“Yes, Mike, it’s me. I guess you’re surprised.”

“Uh, yes! A little!” I set my feet back down on the floor and sat up straight.

“I know. I could have had one of my staff call, but I like to consider myself a... well, how should I put it?... a hands-on manager.” She purred when she said the words ‘hands-on manager’. I found the purr strangely disquieting. “So,” she continued. “Any progress?”

“Progress is slow,” I admitted. I told her about my investigations and about my interactions with Fayed. I didn’t tell her, though, about the note I found under his desk blotter. I was still convinced that he was innocent, and I didn’t want his coffin to be nailed shut yet, not before I’d learned more.

She gasped when I told her about the attempts on my life. “So your cover is blown?” she asked.

“I thought so at first, but maybe not. At the very least, someone is finding my presence here uncomfortable. That probably means I’m on the right track, whether they know who I am or not!”

“Oh. Well, just be careful,” she said. “I don’t want any part of you damaged.”

That was a strange way of putting it. The room was starting to feel warm. “I don’t either,” I said.

She continued. “I have some news, too. Otan has issued an ultimatum. Horvonia is to remove its troops from their shared border by this next Tuesday. If they don’t, the Otanians will go on the offensive with a pre-emptive assault!”

“A full, flat-out war is that imminent?” I asked.

“Yes. The Horvonians aren’t flinching. Other nations in the region are starting to choose sides, and our allies want to know what we’re doing about it. The situation has never been so critical. We have to get that model working!”

I did my best to reassure her, but that, of course, isn’t easy when you’re not so sure yourself.

“Don’t let me down, Mike!” she said, half commanding and half pleading.

“I won’t, Madame Secretary.”

“I know you won’t.” The subtle purr, gone for a few sentences, was suddenly back in full force. “I’ll be thinking about you.”

“Yes, Ma’am. I’ll do my best.”

“You know, it’s strange, but I’ve already been thinking about you at the oddest times.”

“Ma’am?”

She continued. “Just this morning, in the shower, for instance – and then later, after I had dried off and was reaching for the lotion...”

This was too much. She was speaking to my most primitive instincts, and she was an excellent speaker. Her appeal was irrepressible and undeniable. I suddenly felt a bead of sweat slide down my forehead. I wiped it off with the back of my hand. “I’ll do by best,” I repeated, hoping to change the subject, to break the spell.

“Oh, the time! I’ve got to go,” she suddenly said. “Good luck! And keep me informed!” She hung up the phone.

...

“I’ll tell you what bothers me most about this case,” I said to Connie a few minutes later, after I had filled her in on the phone call. In fact, I had told her everything about the call, and she had stepped over and kissed me confidently and passionately, to realign my priorities. A most effective measure. Anyway, I said to her, once she sat down again, “It’s as though our quarry has two distinct personalities, two completely different ways of doing things!”

“Two personalities?” she repeated.

“Yeah. Think about it,” I said. “The first personality is subtle. The coding changes that can’t be found, the quiet revisions to the backups, and the e-mails – I swear there’s something in those e-mails, but it’s so subtle, I can’t spot it. Not yet.”

“Okay,” Connie said. “I’m with you. What about the second personality?”

“The second one is anything but subtle,” I said. “An exploding laptop, the deadly assault just now, the commando-style escape... This second personality hits things square on the head with gusto.”

Connie considered. “Yes,” she said. “I see what you mean. It does seem odd.”

I shook my head. “No. It’s more than odd. It’s just not right. It’s almost as if... But no, that’s impossible. The odds...” I fell silent.

“Odds of what?”

I looked up at her. The answer had suddenly hit me like a ton of reprints. I turned and stared into empty space for a moment, and then I stood up and started slowly walking back and forth across the office, thinking it through. I was barely aware of my surroundings, barely aware of anything but a single thread that, if pulled out carefully, could unravel the knot. Connie too fell quiet and watched me walk.

I came back to Earth. “Connie!” I said. “I need your brother here, now! Can you reach him?”

“Yes, I guess so,” she said. “But why?”

“And I’m going to need your help running a distributed hydrological model – ASAP!”

“A distributed hydrological model? Mike, what are you talking...”

“Connie!” I said. “Listen! I think I know how to capture our killer!”

-7-

We brought in the cavalry – we squeezed five of NCAR’s top land modeling and land dataset experts into my office. They sat in chairs grabbed from other offices, while Connie sat in my chair, and I sat on the desk itself. Using the computer beside me, the keyboard on my lap, I walked them through the modeling problem we’d be tackling. It was far from comfortable. With all of us temporarily in one tiny room, and with the door closed so as not to garner too much attention, it had the distinct flavor of a subway car at rush hour.

The five NCAR scientists were willing to spend the rest of the afternoon and evening helping us, thanks largely to special “encouragement” from Ed Crump. He basically promised to let them skip the next several “all hands” NCAR staff meetings. I think they jumped at the chance. The seven of us worked late into the night, running simulation after simulation with a model that Connie downloaded from her research group's website. Connie led the effort from start to finish. I knew she’d be more capable than anyone – including myself – of dealing quickly and effectively with all the unexpected problems that would show up. As for the NCAR guys, they too deserve a lot of credit. They stuck to it to the end, even though they had no idea why we were doing what we were doing. They were incredibly helpful. World class, all the way.

Finally, at about 12:30AM, we finished. I pushed aside some empty pizza boxes, found the phone, and called the State Department.

...

I slept a full half-hour, between 1:30 and 2 AM, in the front passenger seat of the SUV. Sleep was then impossible, because at 2 AM, we left the pavement and began driving on an old ratty mountain road. Special agent Capp Jackson was at the wheel. As it moved forward, the SUV swayed back and forth in the ruts, first to the left and then to the right, oscillating with the insistence and quasi-periodicity of an El Nino signal.

“Awake, huh?” Capp snarled. His shrewd eyes were glued to the road, watching the ruts. His bald head – shaved that way – glowed orange in the light from the dashboard.

“Yeah,” I said groggily. I coughed to clear my throat.

“Well, we’re just about there. I sure as hell hope you know what you’re talking about.”

“So do I,” I said.

“Because this whole thing looks to me like a waste of time,” he continued, as if I hadn’t spoken. “And I can’t stand wasting time, especially after a day like I had today.”

“Uh-huh.”

“Yeah,” he went on, “if I had my choice, I would run things differently. But I don’t have my choice, and sometimes I have to do what I’m told, and that’s why I’m here with you, in the middle of nowhere, at two in the morning, dammit, in search of some phantom murderer who won’t even be there.”

The car lurched into a huge rut, and the bottom of the SUV scraped the ground. Before adjusting the wheel, Capp said two colorful words, one a verb and the other a noun. I thought about it for a second. No, I’d never heard those two words used together like that before. The action it suggested was decidedly improbable.

“You sound like you’d rather be somewhere else,” I said, stating the obvious.

“Shut up!”

“Look,” I persisted, “we’re about to capture an evil, murderous thug, someone who’s been keeping me from tackling a critical problem of national security. It’s about as important as anything you can imagine. I thought you guys lived to do this kind of stuff!”

“We’re here,” he said, stopping the car and turning off the lights. He stared forward. “Let’s get this over with.”

We got out of the car and started our hike. We avoided flashlights, relying instead on the ample light of the full moon. I avoided talking, and Capp avoided grousing, to make sure we didn’t tip off our quarry. The thin trail wound its way into the mountains, past trees, dry grass, and the occasional sheer cliff. We hiked for close to half an hour, constantly checking the dimly glowing coordinates on our portable GPS system.

“Starting right about here,” I finally said, pointing toward my left, “and then moving this way for about 200 meters. We should find him somewhere in this stretch.”

And we did, to Capp Jackson’s utter jaw-dropping amazement.

...

“I can’t figure it,” Capp said, speaking to me but staring at our prisoner, who was now handcuffed to a tree that stood near a small green tent, the prisoner’s temporary home. “You knew exactly where this guy was. According to my boss, all you knew about him was that he had mud on his butt, some of which he left behind on a stool.”

“We knew more than that,” I said. “But the mud was the key. You see, you’ve had a dry season out here – a very dry season. Mud is only going to be found where the water table can still intersect the surface, as defined by the topography.”

“The topography,” Capp repeated. “What – you mean the elevation?”



“What I really mean is the compound topographic index,” I explained, “which is determined from the upstream contributing area and the local slope. Regions with the same topographic index are hydrologically similar, meaning that hydrologically, they behave in much the same way. Are you with me?”

“Yeah, yeah. I’m not stupid. Go on.”

I continued. “Given the time history of all the meteorological forcing – the rainfall, the radiation, everything – all points with a certain topographic index or above will be characterized by a water table that intersects the surface. That’s where you get mud. Just tonight, to figure out where the mud is, we ran extensive simulations with a distributed hydrological model constrained by high resolution topographic data and driven with atmospheric forcing for the last two years.”

“Right,” Capp said. “A distributed hydrological model. Got it.”

From his tone, I knew he didn’t really get it, and that he didn’t even want to get it. I went on anyway. “Fortunately, the mud he left behind at NCAR also told us about the local soil type and even the vegetation type, from some leaf parts we found. So, we had several clues. We had to find a location that was serviceably close to NCAR, that lay in or near the surface saturated zone as defined by the topography, that featured a silty clay loam soil, and that hosted the species *Quercus Poridicus*. Through simulations and the cross-referencing of datasets, we found five such regions in this area. This one, believe it or not, was by far the most accessible from the main road.”

In the light of our lantern, I could see Capp shaking his head. There was that disbelief again. “Listen, Wells, this is nuts. He could have gotten muddy anywhere! At some park, where they were watering the grass...”

“No,” I said. “I haven’t told you one other thing. I know this guy. I’ve studied his habits for some time now. Whenever he goes to a new place, he camps in the wilderness to avoid meeting people. He always does that – it’s his MO. Once I figured out who he was, I knew he’d be out here, up in the mountains, somewhere. It was just a matter of narrowing down the possible locations.”

Capp fell silent for a minute, digesting all this. Maybe he was just starting to believe me, but I couldn’t tell. His next words didn’t help: “So, who is he?”

We both looked at the prisoner, who’d been glaring at us nonstop from below a thick mop of hair. I stepped over and grabbed the hair, pulling it off. “His name’s Eugene Lefkowitz,” I said. “He actually has several names, several parallel identities. I busted him just a few days ago, exposing him to a review panel for the fraud he is.

“This afternoon I figured out that he had followed me around in Washington, D.C., after I’d busted him. I also learned – straight from my girlfriend’s brother’s mouth – that he

approached the brother in D.C., after he saw him come out of her room. Bought him a Dr. Pepper, got him to talk. That's how Lefkowitz learned I was in Boulder."

Lefkowitz spat at me. I shrugged and stepped a couple of paces away. "Poor bastard. I suppose he thinks I ruined his life."

...

We rekindled Lefkowitz's campfire. Capp and I took turns sleeping, getting two hours each. One of us had to stay up and keep watch, in case a confederate was lurking about. Unlikely, but you never knew. As for Lefkowitz, he stayed awake by his tree, looking sullen and beaten, but saying nothing.

The sun was already up when we broke camp at 7:30. Leading – and sometimes pushing – our still-handcuffed prisoner ahead of us, we snaked our way down the trail toward the car, making much better time in the daylight than we had the previous night. The daylight also helped us spot his rental car, which was hiding behind some trees not far from our own car.

"The car is worth a look," I said.

"Sounds good," Capp said. I looked over at him. In the daylight, he seemed even more like the perfect G-man – a picture of strength and competence, bald and powerful. And today, he didn't consider me an idiot. I was definitely thankful for that.

Looking in the car turned out to be a very smart move. We found enough illegal, murderous gadgets in there to put Lefkowitz away for a long, long time. For example, in addition to two more silicondemner laptops, we found, wrapped in plastic inside a small cardboard box, a "skod", which is basically a plastic shift key for a standard computer keyboard that has been hollowed out and filled with a slow acting contact poison. Micropores in the plastic deliver the poison to whoever touches the key. Over time, enough poison builds up in the user's system to trigger a massive heart attack. A skod, short for "shift key of death", is particularly dangerous to scientists in the government, what with all the acronyms they're forced to use.

And then, on the floor of the back seat, I saw something I hadn't seen in years. "Ha!" I said. "A disc flinger!"

"A what?" Capp asked.

"Watch this," I said. I took the computer hard drive out of the back seat and set it on the ground, taking care not to point it at anyone. "The flinger doesn't need electricity," I added, picking up a stick. "It has its own internal impulsion system." Standing to one side, I raised the stick and gently tapped the eject button on what appeared to be a CD drive. The tap brought forth two distinct noises: one sharp and almost as loud as a

gunshot, and the other brief and whirring. At the same time, something shiny shot out of the computer at a dizzying speed. “This way!” I said to Capp.

We stepped over to an old pine tree. Embedded in the trunk, a full 3 cm deep, was a thin, flat disc. It was the same size as a standard CD but made of metal. Capp gingerly touched it. “Razor sharp!” he said.

I had already known what to expect. Even so, a chill ran down my spine. “Deadly,” I said.

“No shit!” Capp agreed.

...

We went back to the car, where we had temporarily handcuffed Lefkowitz. Soon we were winding our way along the rutty road, with the prisoner and I in back. “I still can’t believe you found this guy,” Capp said.

“Well, here he is,” I answered.

“Working for the Bureau,” he continued, “I’m supposed to stay abreast of new methods and techniques, new ways of catching the bad guy. Last year they started offering a hydrological criminology course. I didn’t think much of it then, but maybe it’s time I looked into it.”

I nodded and said, “You’d be amazed at what you can do with a basic understanding of the subject.”

“Right.”

We made it to the main road and started the half-hour drive back to Boulder. “I’ll take him in,” Capp said, his thumb pointing backwards at Lefkowitz. “We’ve got plenty to charge him with. And we’ll need you to come down for a statement, of course.”

“That’ll have to wait,” I said.

“What? Why?”

I looked out the window. My pleasure in capturing Lefkowitz, in putting that part of my problem behind me, was dissipating – fast.

“Well?” Capp persisted.

“I’ve got more work to do,” I said finally. “Like I said before, this guy was nothing more than a distraction – a nuisance that had to be disposed of before I could focus on my real work.” I looked over at Lefkowitz. He didn’t respond to my words. He just kept

looking forward at nothing in particular, continuing to sneer. It occurred to me that he hadn't said a word since we first captured him, rousing him from a deep sleep.

"More to do, eh?" Capp said. "Well, you probably won't run into anyone as nasty as this guy. It should be all downhill from here."

"No," I said. "It's uphill from here. Unfortunately, a much bigger problem lies ahead."

"You're after someone worse than him?"

"Uh-huh."

"You're after someone worse than a filthy, murderous creep, someone who would kill you in cold blood with no more remorse than if he flushed a tick down the toilet?"

"He's bad, yeah," I said, looking at Lefkowitz again. "Evil." I took in a deep breath and let it out slowly. "Unfortunately, NCAR right now is hosting yet another evil. A greater evil."

"You talk funny," Capp said. "So what are you going to do with this 'greater evil', as you call it?"

I shook my head. "Unfortunately," I said, "at the moment, I can't do a damn thing."

"No? Why not?"

"Because I still haven't given it a name and a face!"

-8-

Two hours later, I was back in my office at NCAR, with Connie sitting across from me. I must have looked like crap. I certainly felt like crap. For five minutes I sat there saying nothing as I cradled my hands around a cup of coffee, nursing it slowly, breathing its caffeine-laced vapors deep into my lungs. I tried my best to convince myself that I had had enough sleep. My arguments fell on deaf ears.

With an effort, I forced myself to get to work. "Check these out," I said to Connie. I placed paper copies of two e-mails before her. She read the first one out loud:

To: All Personnel  
Subject: Mandatory Career Development Training

*Next week, human resources will provide a required training course designed to bring awareness to NCAR employees, including supervisors, about the revised performance management system, the responsibility of each employee to take on their career development, and guidance on seeking and receiving effective developmental feedback and opportunities. All of this information is essential for managing one's career at NCAR. This course was developed by an NCAR team in response to the recommendations made by the independent consultant on shifting performance management systems, and is required for all NCAR employees, by that agreement.*

*The 4-hour course will be held at 8AM and 1PM on Monday, Wednesday, and Friday. All employees must pre-register by COB Thursday of this week: <http://www.ncar.org/personnel/training/registration>.*

"Pretty dry," she said.

"Read the next one."

She did:

To: All Personnel  
Subject: EMS Awareness Training

*NCAR has developed and implemented an Environmental Management System (EMS) to identify and address the Center's high priority environmental impacts. NCAR's EMS Guidance Protocol 6114.5 requires that each employee take basic EMS awareness training. The primary purpose of the training is to ensure that employees are aware of the environmental impacts of their jobs, their personal responsibility within the EMS, and the basic contents of NCAR's environmental policy. The web-based course can be accessed at <http://www.ncar.org/operations/EMS/training.html>.*

She read each e-mail again, silently this time. Her face was filled with doubt. "You think there's a hidden meaning in these?" she asked.

“That, or a hidden pattern,” I said. “But not just in those. In a whole mess of them. I can’t explain it, but there’s something about them that’s gnawing at me. I was hoping you could look at them with fresh eyes. Maybe it’ll jump out at you.”

“Okay,” she said. “I’ll study them.” I turned the computer terminal toward her and showed her a mailbox file containing 315 messages. Her eyes grew wide with alarm. “You want me to analyze all these?”

“Yup. Together they represent all of the center-wide e-mails sent to employees in the last two months.”

“315!” Connie said. “Geez, Mike!” She leaned back in her chair with an exaggerated flair and sat there for a few seconds, looking pained, as if beaten into submission. The pained look was for my benefit, but I barely noticed it. She was wearing shorts that morning, and when she leaned back, sitting a little sideways on her chair, she propped her feet up on an adjacent chair, giving me a side view of her legs. My breath quickened.

She noticed what I was looking at and gave me half a grin. I returned my full attention to her face. “All right,” she said. “I said I’d do it, and I will. But you’ll owe me.”

“I’ll owe you,” I agreed. “Tonight. Or at least some night very soon, when all this is over. You name it, you’ve got it. Anything – *anything* – you want!” Our eyes met. I liked the way her half-grin became whole. I knew she was thinking what I was thinking, and I wasn’t thinking about the case.

“And how about you?” she asked. “What will you be doing while I’m doing this?” She motioned her head sideways at the computer.

“It’s Thursday, and we’re closing in on noon,” I said. I yawned. “I’m going to catch 15 more minutes of sleep, with my head down on this desk here. Then, it’s time to go downtown and listen in on a meeting Fayed is having with some mysterious visitor, some guy – or woman – named “T”. It’s time to find out once and for all where Fayed stands.”

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I suppose I could have “pulled a Lefkowitz” and worn a disguise. With the right false beard and the right hat, I could have walked right up to Fayed at Heron’s Grill or anywhere else without being recognized. I decided, though, to take the easier route. With a substantial wad of cash, to be reimbursed to me later by the American taxpayer, I convinced the hostess at Heron’s to leave the booth behind me – the one closer to the door – open and to seat Fayed and his visitor there when they showed up. All booths were enclosed in the darkish restaurant, so I was perfectly safe. They wouldn’t even see the back of my head.

I glanced down at the note in my hand:

FAYED, PRINCE JUST SAW CABINET. EVERYONE PLEASED. THE TERMS DISCUSSED EARLIER ARE APPROVED. HERON'S GRILL NOON THURSDAY FOR FIRST PAYMENT. – T.

This note was in my own handwriting; I had hastily scribbled it down from memory after seeing the original under Fayed's desk blotter. I looked at my watch. 11:55. I was no longer tired. I was alert, ready for anything.

What I needed to be ready for most, though, was a long wait. Noon came and went, and they didn't show up. I ordered myself a monte cristo sandwich – partly because I was hungry, and partly just for something to do. The sandwich, when it came, was sprinkled with powdered sugar. I wondered if the Count of Monte Cristo ate food like this while wasting away in his dungeon. I doubted it.

Finally, at 12:25, the hand mirror I had positioned along the edge of the table before me showed the approach of two figures: Fayed, looking uncertain and a little nervous, and a tall, thin, dark man with a hard glint in his eye and a long whitish scar that ran just above his right cheekbone. No, it was his left cheekbone. I was looking through a mirror.

They sat down in their booth. They spoke in hushed tones, but I was leaning back, my ear near the wall of my own booth, and I had no trouble hearing their conversation.

"We are very satisfied," said a voice I didn't recognize, obviously that of the tall thin man. His accent was thick and could have been Poroki. Fortunately, he was speaking English. "It is well what you have done," he added.

"I don't know," Fayed said. "I'm not sure I'm right for this kind of work."

Fayed, for his part, sounded like a man being torn apart by some inner conflict – or was I just imagining it? The tall thin man spoke again. "Ha! You are a natural. With a secret, clever change of a few lines there and here, you have made a situation. You have given my people a chance to tower above the others. And no one at NCAR suspects, this is right?"

"No one," Fayed said.

"Well, anyway they would not understand," the tall thin man said. "They would not understand that there is more to life than the pitiful little scientific studies of theirs." Fayed must have been shaking his head, for the other added, "No, no, my friend. The world is much bigger than they realize, now or ever."

"I suppose," Fayed said regretfully.

“You worry too much, my friend,” the tall thin man said. “You worry about how we do the business. I can see that. You must know by now that we are a proud people. What must be done, it must be done.”

Fayed said nothing to this. The booth behind me fell silent for a few seconds. Eventually the tall man spoke again. “I brought the money.”

I heard the crinkle of paper. An envelope, I wondered? I heard the rustling of bills. Fayed said, “This is more than we discussed.”

“You have earned it,” the other replied. “As they say in America, the stakes in this game are high.”

“Some game,” Fayed said. I heard him close up the envelope and stick it in his pocket.

It shouldn't surprise you that at this point, I was feeling sick to my stomach. Fayed, it seemed, was guilty after all! While two countries stood at the brink of war, while countless lives hung in the balance, he was counting out cash in the back booth of some restaurant! I thought about his wife, his children, his future, his ability to go on living with himself. What was he thinking? Where was he going with all this?

And then, suddenly, their conversation took a turn for the better. “So he saw the cabinet?” Fayed asked.

“Yes, he did.”

“I worked hard on it,” Fayed said, some pride creeping into his voice. “Weekends, late at night, whenever I could find time.

“Excellent workmanship,” the tall thin man said. “You, my friend, know how to build the furniture!”

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Only two things were possible, as far as I could see. First, they really had been talking about furniture all this time, in which case the best thing I could do was confront them, since Fayed had other things to think about right then – things like fixing code. Second, they might suddenly have realized that I was listening in on them, and they started talking about furniture to mislead me. In that case I might as well confront them, since continuing to hide would serve no useful purpose. Sometimes the whims of logic provide you with very few choices. I rose and stepped over to their booth.

“Mike!” Fayed said, genuinely startled.

“Fayed,” I said. “What's up?”



He looked cornered, guilty. “Not much. Um, how long have you been here? Did you, uh, hear any of my conversation with Tabeer here?” he asked nervously, motioning to the tall thin man. “Oh, and Tabeer, this is Mike Walker, who just started working with us at NCAR.”

“Actually, it’s Mike Wells,” I said, shaking Tabeer’s hand. Fayed looked puzzled, so I added, “I’ll explain later. Anyway, I did hear you guys talk a bit.” I looked at Fayed expectantly.

Fayed looked down. He looked at his glass, his fork, his thumb, and the tip of his nose before finally looking back up at me. He now seemed troubled and very, very sad.

Tabeer watched his motions curiously, as did I. I watched and waited. “Yes, maybe I should explain,” Fayed said at length. “I really ought to talk to somebody.”

“We are done with our talk for now, my friend?” Tabeer asked.

“Yes,” Fayed said.

“And you will give us soon your answer?”

“Yes, very soon.”

“Good,” Tabeer said. “Then I will leave.” Tabeer nodded at Fayed and then at me as he stood up. I followed him with my eyes out of the store. Through the window, I saw him step around to the driver’s side of a weather-beaten truck labeled ‘Amadh and Sons Furniture / Boulder, Colorado’.

“Furniture!” I thought to myself, shaking my head internally in disbelief. “Furniture?” I asked aloud to Fayed, who now faced me across his table.

He hesitated before speaking. “I built them a nice piece, for one of their clients,” he said. “The client was Tony Prince, of all people – you know, the sportscaster? Anyway, it turned out pretty good.” He went on to answer a number of my questions. The ‘lines’ Fayed had changed, for example, were lines in the original cabinet design plans. Fayed’s changes led to an improved design that Tabeer was sure would help his family – his ‘people’ – tower above the other furniture shops in Boulder, once they started building more of them. “Tabeer takes his furniture – and all this secrecy – seriously,” Fayed concluded.

“Obviously!” I agreed. “But there’s one thing I still don’t get – why the need for secrecy on your part? What are you hiding from the people at NCAR?”

Fayed fell silent, and he stayed silent for a long minute. I waited. When he finally opened his mouth to speak, he stopped himself short, his words apparently failing some internal QC check. He looked at me pleadingly, as if I could offer some useful, workable

words for him to use. I couldn't, of course. I waited some more. I was doing a lot of waiting that day.

At long last some words came out. "I'm thinking about giving it all up," he said miserably, staring into his glass of water.

"Giving what up?" I asked. I had to keep him talking. If he stopped, there was no telling how long it would take to get him started again.

"Science!" he said.

"Science?"

"I could build furniture instead," he continued. "There's good money in it. Taber's family wants to hire me. There's nothing wrong with building furniture!" he added, suddenly and defensively.

"Of course not!" I agreed. "But why the change? Is something wrong at NCAR?"

He looked down again. I mentally kicked myself. Maybe I said the wrong thing; maybe he'd clam up on me again. But he didn't. "I can't take it anymore," he said quietly.

"Can't take what, Fayed?"

"Things have gotten worse and worse there," he said. "How can I explain it?" He thought about it for a few seconds and then said, "Maybe with a question. What do you think they pay me to do at NCAR?"

I shrugged. "Basic and applied research into the mechanisms controlling the climate system," I said. I knew this answer would be wrong, since it was the obvious one, but I also knew he expected me to say it.

Basic and applied research," Fayed said. "You would think so, wouldn't you! But it's not. No, instead I'm being paid to document the research I should be doing!"

I nodded as if I understood. "Documentation," I said.

"Documentation, training, and all kinds of other miscellaneous bullshit," he said. He reached into his pocket and pulled out a piece of paper. "I wrote this up a couple of weeks ago, before all the Otan and Horvania stuff started. I keep it with me to help me focus, to remind me of why I've got to leave." He handed it to me.

The paper held a list of about 30 items. I scanned it quickly and looked back up at him. "It's a list," he continued, "of all the things I had to do that particular week. Look at items 1 – 5. I was supposed to inform five different groups about my research progress, using a different format for each."

“Departmental leadership,” I read aloud. “Computer services. Financial administration. Funding agency contact. Public Affairs.”

“The department wants a 2-page written summary with figures for a report they’re writing,” Fayed explained. “The financial department wants me to cross-reference my progress with my expenditures on an Excel spreadsheet. Public Affairs requires a dumbed-down version for the public, which in some ways is the hardest thing of all to write. The funding agency wants a PowerPoint presentation with slides they can use themselves, and Computer Services wants a quad chart. Do you know what a quad chart is?”

“No,” I admitted.

Fayed put up his hand. “Don’t get me started about quad charts! And then there’s the training. Look at items 6 – 9.”

“Sexual harassment prevention training,” I read. “Diversity training. Internet security training. Safety training.”

“Half-days or full days of training about utterly obvious stuff that any moron should already know,” Fayed complained. “And it’s all mandatory. It’s as if they hired a full-time staff for training in general, and to give these trainers something to do – to justify their continued presence at NCAR – they invented mandatory training courses for the rest of us to take. It’s insane! Next week, for example, we have “reorganization training”. Our departments were reorganized two months ago, and we had to learn about that, and now they’re being reorganized back to how they were before, and for that we need even more training.”

“Sounds bleak,” I agreed. I looked back down at the list. “What’s the rest of this stuff?”

Fayed took back the list and glanced at it. He sighed and shook his head. “Busywork,” he said. “Mandatory surveys, reviews of scientific steering plans, committee work on streamlining the computer procurement process, committee work on evaluating contractor service, manpower assignment planning exercises, dry runs of presentations for visiting NSF personnel, refinement of terms of reference for planning committees, liaison meetings with UCAR, long-term ‘vision’ exercises, computational units award review, supplies inventory analysis, all-hands managerial briefing, proofreading of a project’s scientific implementation plan, interdepartmental science coordination team meeting, competency management system update, and lots more. And all this stuff was just for one week. Do you know what that means?”

“Yes, I think I do,” I said. “But tell me anyway.”

“It means,” he continued, “that if I did everything I was supposed to do on this list, and if I spent an extra two hours every day at work, and if I worked as efficiently as possible,

I'd have about 15 minutes left over in the week to do research. Maybe. And here's the killer – every single week is like this!”

It sounded bad – real bad. “So what do you do?” I asked.

“The only thing I *can* do,” Fayed said. “I ignore about half of it. But then I start getting pressure from the higher-ups. Everyone thinks their own busywork is the most important. I tell ya, I'm damned if I do and damned if I don't. It's getting to me. I mean, it's already gotten to me. I've got to get out!”

His eyes flashed as he spoke, but when he finished, he looked more embarrassed than angry. Sighing again, his face fell forward into his hands. He fell silent.

Suddenly, I was hit over the head with a revelation. From the hour we first met, Fayed's behavior – his surliness, his despair, his overall demeanor – reminded me of someone I knew, but I couldn't figure out who. Now, with the source of his problems made clear, it was obvious. Fayed reminded me of myself, some ten years before. He reminded of myself just before I got out of the sciences and entered the detective business. Of course, my main problem back then was more with the structure of the funding process, with the way national and internal politics determined which science was worthy of support, regardless of its true merit. Fayed's problems were somewhat different. Still, the net effect on his well-being seemed to be precisely the same. The poor guy must have been going through hell.

“So, what should I do?” he finally asked.

I quickly juggled some responses around in my head. I could tell him my own story, but that might not be wise. I doubted the world of science missed me much when I left, but it would probably miss Fayed a lot. Or, I could tell him not to give up, to do whatever he could to struggle through. Would that make me a hypocrite, though? While I juggled these thoughts, my cell phone rang. I answered it. It was Connie.

A smile crept across my face as I listened to her news. The thoughts I was juggling fell to the ground and rolled away. “Fayed,” I said after hanging up, “let's go back to NCAR.”

“NCAR,” he sighed. “Right. I'll fix the code if it kills me, and then that'll be it. I'll say good-bye to that place forever.”

“I wouldn't be so sure of that,” I said, thinking about Connie's news. “Something tells me you'll be working there for many, many years to come!”

“Ninety percent of the e-mails!” I said, still marveling at the idea.

“That’s right,” Connie said.

“All written by the same person,” I added, “even though they were sent out, and supposedly signed, by a whole bunch of different people!”

“Uh-huh!”

Connie, Fayed, and I were sitting behind NCAR on a large rock (sorry, but it was a Boulder boulder) near a path that leads to the Mesa Trail, a trail that runs along the mountains. The afternoon was on the cool side, and some scattered clouds floated by to block the sun and taunt the climate modelers below with their subtle complexities. The dry wind swept Connie’s hair behind her. My hair was short and stayed where it was.

Fayed, quiet until now, spoke up for the first time. “What e-mails?” he asked.

“I haven’t told him anything yet,” I said to Connie. “I still wanted to get all the details from you anyway, and I thought he could listen in from the beginning.”

Connie nodded. She opened the laptop computer at her side and brought up a copy of the e-mail folder. “You and your colleagues received over 300 e-mails from management in the last two months,” she said to Fayed. “Mike asked me to study them, because he felt there was something fishy about them. Turns out he was right.”

“I wasn’t just right, I was *damn* right!” I said, strangely proud of myself, even though it was Connie who solved the puzzle.

Fayed thought about this for a minute. He looked skeptical. “How did you figure that out, though?” he asked. “I mean, how can you be so sure they were written by one person?” I suddenly realized that I should be wondering the same thing. I looked at Connie.

“Stylometry. Have you heard of it?” she asked. Fayed shook his head. “It’s fascinating,” she continued. “A bit more subjective than what I’m used to, but the statistics do seem to work out.”

“Stylometry...” I said, trying to remember. “Oh yeah – I’ve read about that.” I thought a little more. “I think it works like this. Suppose Joe Bobblehead says that he found a lost work of Shakespeare in an old sneaker. You examine the statistics of word usage in the work and compare it with that in, say, Hamlet or McBeth. The statistics – like how many times ‘prithee’ and ‘fie’ are used together in a sentence – would tell you whether or not the discovered work was the real thing.”

“Prithee and fie?” Connie asked, amused.

“Yeah,” I shrugged. “Prithee and fie.”

“That’s some copy of Hamlet you’ve got!” she said. “Anyway, you’re basically right, though it’s a bit more complicated than that. The methods have evolved considerably over the years. What you’ve just described sounds a little like the technique of “rare pairs”. People also use neural networks and genetic algorithms to get at the statistics they need to establish authorship.”

“So you did a stylometric analysis of the e-mails?” I asked.

She shook her head. “All I know are a few basics. I do have a friend in Georgetown, though, who does stylometric analysis for a living. On a hunch, I sent him the whole e-mail folder and asked him to do an analysis. The hunch paid off. The probability that one person wrote 90% of those e-mails turns out to be 99.3%.”

Fayed furrowed his brows into a family of complex curves. He still didn’t look satisfied. “Okay,” he said. “Obviously you’ve found something very odd. But what does it have to do with our problem? We’re not worried about e-mails here. We’re worried about my code. I still haven’t routed out the bug!”

Connie looked a little embarrassed. “I have to admit,” she said, “that I don’t see the connection yet myself.”

“Oh, there’s a connection,” I said. I paused, marveling again at what was going on there at NCAR. Something ugly, something cruel, something utterly unacceptable. As if to underline my thoughts, a cloud suddenly lolled past the sun, enveloping us in shadow and giving the cool wind an extra bite.

“Go on,” said Connie.

“Fayed,” I said, returning to Earth. “You’ll agree that whoever planted those bugs in your code is both extremely clever and extremely evil.”

Fayed nodded. “Well, yeah. That’s clear enough. The bugs are very subtle, and the backups were destroyed, which is really difficult. You already know the implications of not finding the bugs in time. Yeah. Clever and evil. In the extreme.”

“And I saw your list of tasks back at the restaurant,” I continued. “All that documentation and training, and all those pointless meetings. Every task on your list came down to you through one of those management e-mails.”

“I guess so,” Fayed said.

“E-mails written by a single person,” I continued. “A single person clever enough to control what other people send out and evil enough to stifle the progress of every scientist here with pointless busywork.”

Light dawned in Connie’s eyes; they flashed a brilliant blue. “You think they’re the same person!” she said. “The person who planted the bugs also wrote the e-mails!”

I nodded. “Either that, or NCAR is home to two independent evil geniuses. And I do know something about evil geniuses. The odds against two of them operating in one place at the same time are staggering.”

As I spoke, the sun peeked out again from behind the cloud. High above, a lone hawk glided in the wind, blissfully ignorant of the problem we were facing below.

Connie looked thoughtful. “I see what you’re saying,” she said.

“And you see what we need to do?” I asked.

“Yes. It’s simple. We just need to find out who wrote the e-mails, and we’re practically done.”

Fayed, for his part, suddenly seemed energized; I had splashed the brisk water of new hope on the sad, weary face of his soul. He slapped the top of the boulder. “Let’s get that bastard!” he said.

...

Walter Weblik was a large bald man with tufts of wiry black hair around his ears and probably the strongest pair of glasses I’d ever seen, with lenses so thick they made his eyes look like large eggs and his irises look like poker chips. I surveyed his eyes – and the rest of him – from across his desk in his office. He was a strange one, that much was clear.

I soon learned that when he got nervous, he stuttered. “Mr. Weblik,” I said. “You sent this memo out about five weeks ago.” I lay a slip of paper on his desk and slid it across to him. It was a printout of an e-mail stamped with his return address:

*From: Human Resources Department (wweblik@ncar.org)*  
*To: All Personnel*  
*Subject: Team-Building Training*

*Team-Building Training is a three-and-a-half-hour course designed to provide NCAR personnel with the tools and skills they need to create effective, efficient teams for meeting center and project goals. Attendance in the course is mandatory for all personnel. The courses will be held mornings starting at 8:30*

*during the first two weeks of June. Employees must pre-register by COB March 25: <http://www.ncar.org/personnel/training/registration/teambuild.html>.*

He glanced down casually at the memo. “That’s right,” he said, nodding. “I remember this.”

“Did you write it yourself?”

To him, my question must have come out of nowhere. “Wh-what?” he asked.

“The memo. Did you compose it yourself, or was it someone else’s memo that you just passed along?”

“I wr-wrote it myself, of c-course!” he said. He suddenly wouldn’t look at me. Instead, his eyes slowly and deliberately read and re-read the few lines of text on the page. I could see that his mind was racing.

Walter Weblik was no evil genius. That much was patently obvious. And something else was obvious too – all of a sudden, he was terribly and pathetically afraid. But of what? Of whoever did write the e-mail? It was a reasonable guess. I also guessed that his fear, strong as it was, would now shut him down cold, like simulated transpiration in a coupled land-atmosphere system when subjected to vapor pressure deficit stress and the associated runaway positive feedback.

“We have reason to believe that someone else wrote this e-mail and two others purportedly written by you in the last two months,” I said. “We need your help tracking the writer down. I can’t go into specifics, but it’s a matter of great international importance!”

He said nothing. His eyes darted around the room, but never in my direction. “Countless lives hang in the balance here,” I added. “Innocent lives!”

“I’ve g-got work to d-do!” he finally spluttered. He looked frantically about his desk, and, finding little there but an NCAR phone directory, he picked it up and shook it importantly. “I’ve g-got p-people to call! S-see?”

He could be broken down. I knew that. I could get tough and instill my own kind of fear into him, enough to counter that which currently held him in its grip. Fortunately for him, I wouldn’t do that – not just yet. I knew from experience that such an approach could backfire – badly. I had to play things carefully. Besides, he wasn’t my only hope; there were still many others to interview.

“Mr. Weblik,” I said. “If you change your mind and want to talk, you can reach me at this number.” I scribbled my cell phone number down on a scrap of paper and left it on his desk. He was looking down at the floor when I left his office.



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The fear I saw in Weblík's face was far more widespread than I ever would have guessed. I interviewed seven more people that afternoon. Connie interviewed five down at the Foothills Lab, a part of NCAR that didn't sit on the mountain. At 5PM, we met in my office to compare notes.

"Everyone's afraid!" Connie said. "As soon as I mentioned the possibility that someone else wrote their e-mails, everyone clammed up!"

"Same here," I said. "We're facing something formidable – a complex web of fear."

"But what's behind it?" Connie asked. "Do you know?"

I leaned back in my chair and put my feet on the desk, one over the other. Connie, who knew me well and was used to that move, watched me patiently, waiting for me to expound on my ideas at my own leisurely pace. "No, I don't *know* what's going on," I finally said. "But I do have an idea. One that might explain everything."

"What is it?" Connie asked.

"It's just conjecture," I said. "Pure guesswork. I have no proof."

"For Pete's sake, spill it already!"

I grinned. "Well, it's like this," I said. I didn't get to speak, though, for at that moment, Fayed rushed into my office.

"The bug!" he cried. "I found it!"

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The three of us rushed down the hall. "You were right!" Fayed said to me. "I found it by studying the formatting of the code. The saboteur did leave a mark!"

I was glad that I had convinced him to work on the code rather than do interviews like Connie and me. His work had paid off. We entered his office.

"Before I got you, I submitted a run on the highest priority queue," he said, falling into his seat. "I'll check on its progress right now. In the meantime, take a look at this. Can you spot the format difference?" He handed me a printout with some Fortran, pointing to a line halfway down the page.

$$\text{DHLDT}(I,J,1)=(\text{DTLDR}(I,J,1)*\text{DELR}(I,J,1)*\text{CPAIR}/\text{DELT})+\text{DHLDT0}(I,J,1)$$

I studied the line and those around it. “I sure can,” I said. “He’s using parentheses when he doesn’t have to. You wouldn’t have put those in there!”

“Exactly!” he said. “And that line, which is a slight modification of my original line, could cause some severe problems. So, I fixed it and resubmitted. I’m sure it’ll do the trick!” Fayed was typing as he spoke, his eyes glued to the screen in eager anticipation. Connie, from her expression, seemed to share his optimism. As for me, I wasn’t so sure. An unhappy thought was nagging at me; it wouldn’t leave me alone.

Suddenly, Fayed’s expression switched from excitement to incredulity, and then to alarm. He typed some more, his fingers now doing a panic dance across the keyboard. A job output file filled the screen. He looked worriedly through it. He said nothing.

“What’s the matter?” I asked, already guessing the answer.

“Just a second,” Fayed choked out. He clicked again through page after page of the file, scanning the traceback, his head shaking in disbelief. He pulled up a copy of his code and scrolled down to where the most recent bug was, to check his fix. Finally, with a groan, he collapsed backwards into his chair.

“Well?” Connie asked gently, stepping over to him and resting her hand on his shoulder.

“It bombed again!” he said miserably. “I fixed a bug, one that I know was planted by that goddam piece-of-shit asshole, and it still bombs!”

My suspicions were confirmed. I didn’t want to be right, but it looked like I was. “Three bugs,” I said. “There are three bugs. You’ve only found two.”

“Three? Ha!” Fayed spat. “Why not four? Why not ten? Or a hundred?”

“No, just three,” I said. “No less, no more. I can’t be sure, of course, but it all fits in with the profile I’ve developed of our saboteur. I’m guessing – and it’s a good guess – that you only need to find one more.”

Fayed still looked utterly miserable, but he was listening. Connie was too. “This profile – is it the same one you were about to describe to me, before we came in here?” she said.

“Uh-huh.”

“Well, let’s hear it!”

“Absolutely!” I said, not waiting to get comfortable this time. “What we have here…”

I was interrupted again – this time by my cell phone. I shrugged resignedly at the others as I reached into my pocket, pulled out the phone, and opened it. The voice on the other end was raspy and unusual. I listened intently. I don’t remember for sure, but I probably

raised my eyebrows – the message was powerful enough. “Stay right there!” I said into the phone. “I’ll be right down!” I closed the phone and stuck it back in my pocket.

“Gotta go!” I said hurriedly to Connie and Fayed. “That was Bruno Macalotti. He’s ready to talk!”

...

Bruno Macalotti, an assistant deputy program coordination specialist, was the one guy I talked to earlier that afternoon who, I thought, might be willing to call me back with some useful information. Sure, he was scared during our interview – visibly scared stiff, as all of them were – but he seemed to have an underlying self-dignity that, I hoped, would eventually win out. The cell phone call was ostensibly from him. I say ostensibly because it didn’t really sound like him. In fact, it didn’t sound like anyone at all; it sounded electronically filtered. Maybe it was just the phone system, I speculated as I headed down the stairs. Or maybe it was a trap. I’d have to be careful.

Bruno’s office was at the end of a long dark hallway. It was 5:30 now, and practically all of the administrative staff had gone home. As for Bruno, his office door was closed, but some telltale light streamed out into the hallway from below the door. I knocked. No answer. I tried the knob. It was unlocked.

Cautiously, not knowing what to expect, I opened the door and peered in. I immediately saw something both shiny and infinitely disturbing – the top of Bruno’s balding head. The head lay forward on the desk, balanced on nose and cheekbone; the mouth was open, the lips pressed against the desk in a grotesque kiss. The body attached to it was motionless. The arms dangled limply at either side.

I glanced quickly around the office. No one else was there. I rushed inside and vaguely heard the door close itself behind me. I felt for a pulse. None. Recalling something I once read in a Nero Wolfe book, I reached down for Bruno’s hand, squeezed the tip of his forefinger, and let go. The fingernail remained white; the blood squeezed out from behind it did not return. Bruno Macalotti’s body, though still somewhat warm, was dead. Very, very dead.

-10-

Though I'd been in the Earth science detective business for over ten years, this was only the ninth corpse I'd stumbled upon by myself. Some bizarre mental images and messages poured through my brain right then – a mix of the practical (“The cops need to know about this – now!”), the visceral (“There’s a killer nearby!”), the analytical (“Someone planted a bug in his body’s code and caused it to crash!”), and the just plain unhelpful (“Holy freakin’ crap!” or words to that effect). Somehow, through all this mind noise, the voice of Jake Kelly worked its way to the forefront. Jake is a police lieutenant back home. He’s also a friend, though he’d never say so out loud. My mind was replaying what he had told me two years before. I had called him about a mainframe operator I’d found freshly strangled with some magnetic computer tape off one of those ancient reels, the kind that was common in the 80s. “You’re smart, Mike,” he said, “but you’re mortal. First things first! Watch your back!”

The warning was as good now as it was then. I quickly sent my eyes around the room once more, and then I opened the door and scanned the hallway. Suddenly it struck me that I should check my cell phone’s log. It told me that the last call received, the one that had brought me down here, was made from Bruno’s phone, right there on the desk. “So,” I thought. “The killer *is* nearby. Useful information.”

And then, suddenly, I dropped my cell phone with a start, for it had exploded into song, blasting into bits the deathly silence that was filling the room. For just a second, I stared at the thing as it sat there on the floor, belting out its electronic version of ‘Poor, Poor Pitiful Me’. Connie had installed that ringtone as a joke, and I hadn’t changed it back yet. I picked it up.

“Hello?” I said.

“Mr. Walker? We need to talk.” I recognized instantly the filtered, almost robotic voice. It was calling me by my alias, the name I had been using all afternoon on my interviews.

“There’s a dead body here,” I said, trying my best to sound casual. “But I think you already knew that.”

“Heart attack,” the voice said. “That’s what the coroner will conclude.”

Something about the voice – something about its inflection – resonated in me. I couldn’t be sure, but I began to suspect I was speaking to a woman. “The coroner may be interested in what I have to say,” I said.

“I know where your girlfriend is,” the voice said. “I can get to her before you can. I suggest you sit down. We need to talk.”

Although Connie was not the damsel-in-distress type – she could take care of herself – why should I expose her to danger? Bruno was already dead and didn’t demand urgency

on my part. I could afford to wait, to see what this voice had to say. I sat down on a visitor's chair, my mind focused. I took care not to touch anything else. "Well?" I said.

"Mr. Walker, you have been making a nuisance of yourself. I need to know who you are and what you're after – and how much you already know."

Ah! We had obviously struck a nerve with our interviews. Of course, the dead body could have told me that. I looked down again at Bruno. I had almost gotten through to him. He must have been the weak link in a long, tortuous chain of evil. Now he was a dead link – and the weakness was gone.

"I do know a few things," I said into my phone. I chose my words carefully; what I said next might make all the difference. "Let me – uh – let me tell you a little story." I closed my eyes and quickly tried to decide what that story would be.

...

On impulse, I used a Kleenex to lift the handset off of Bruno's phone. I quietly punched in Connie's cell phone number and set the handset down on the desk near my chair. When Connie answered, I muted her voice, and I flicked my finger hard against the mouthpiece three times. That was my signal for her to say nothing and listen – at least, to listen to my side of the upcoming conversation. We had used that signal before, most recently in a case involving an unfortunate lab tech we found under some cement blocks at the bottom of an experimental wave tank. (Yes, that was another of my 9 corpses.)

Anyway, the phone thing kept me silent longer than I expected. "A story?" the filtered voice said impatiently.

"Yes," I said. "Sorry about that – just getting my words in order. My story is about a fellow – we'll call him Joe – who works in administrative support at a large scientific organization. Are you listening?"

"Yes."

"Fine." I started to put my feet up on the desk, but then I remembered again about fingerprints, and I stopped myself. I grimaced, something I don't often do. I really wanted to put my feet up. "Joe's organization," I continued, focusing again, "purports to be world-class, but all poor Joe sees is disorder – ugly, messy, unproductive disorder. He tries to ignore it, but it eats away at him. He decides to do something about it. 'I'll start small,' he says. Part of his work is in the travel accounting office, so he institutes mandatory detailed documentation of all travel expenses exceeding \$25.00. 'This will hold people accountable,' he says proudly to himself. 'And while they fill out their documentation, at least I know they'll be doing something useful, rather than just wasting time!' Joe is happy for a while, for he has made a difference. A small difference, true, but a difference."

I paused. “Go on,” the voice said.

“With time, though,” I continued, “Joe begins to feel uneasy again. The expense documentation just isn’t enough. He implements a couple of other documentation requirements, and that helps for a time, but eventually he begins to realize that his power over the vast disorder is limited. He’s just one person, and he can only do so much to control the activities of the scientists in his organization, to keep them from squandering away their time on who-knows-what. His inability to enact true change continues to eat away at his soul. You could say that Joe’s well-being is on a one-way trip to hell. And that... that is when he meets Barney.”

I paused again. I didn’t do this for dramatic effect; I paused because I was trying to keep my mind one step ahead of my story. At least the pauses told me that the murderer was interested. “Barney?” it asked. “Who’s Barney?”

“Barney,” I said, “is in financial planning. Over lunch, Barney admits to Joe that he went to a meeting in another state but never documented his expenses over \$25.00. Joe laughs it off. After all, Barney isn’t a scientist; Barney is in administrative support, like him. He’s one of the good guys!

“Later that afternoon, though, Joe has a brainstorm, one that would change his life forever. He walks over to Barney’s office. ‘You know, Barney,’ he says. ‘You could get into a lot of trouble over that missing documentation.’

“ ‘But Joe!’ Barney gasps.

“ ‘But nothing!’ Joe replies. Joe turns the screws on Barney, who has very little spine. In exchange for Joe not causing any trouble, Joe gets to use Barney’s position to institute some more changes around the center. Scientists now receive paperwork demands from both Joe’s office and, ostensibly, from Barney’s office. Barney, for his part, feels like he got off easy. After all, forwarding Joe’s e-mails in his own name seems like a small price to pay to keep his record clean.

“And then... Then Martha comes into the picture.” I stopped. “Are you still listening?” I asked.

“Yes. I find this all very interesting,” said the filtered voice.

“Good! Well, Martha, who is a procurement specialist, has more spine than Barney, but Martha is now barraged by mandatory paperwork from two locations. Joe happily monitors the lapses in Martha’s responses. He confronts her. Martha, it turns out, is afraid of a reprimand from her boss, since she’s already in trouble for something else, something unrelated. She caves. She agrees to let Joe send e-mails out from her address, too. Now Joe has an army of three.

“In the same way, Joe adds Sid to his army, and then Constance. With each addition, his power grows. Each new person in his army issues a new decree of mandatory paperwork, which helps him tighten his grip over the earlier soldiers. He is soon the center – the brains – of a powerful web of 17 administrative bureaucrats, a web that continually strengthens itself and that has far-reaching control over the entire organization – and particularly, over the scientists who work there.

“Yes, Joe has achieved his goal. No longer does he see the ugliness of disorder. Everyone’s time is now accounted for. Everyone has something to do – some documentation, some training, some committee meeting – to keep him or her suitably occupied and out of trouble. Joe is a brilliant success. The organization owes him a great deal.”

I paused. This time it was for dramatic effect. “So,” I said, “what do you think?”

The filtered voice was slow to answer. “You...” it said, “are... a very smart man, Mr. Walker.”

“So you know who Joe is?” I asked.

“We both know,” came the reply. The voice, now strained, sounded even more robotic than before. “We both know very well who he is. Joe... is me. I was never in the travel office, and I don’t know any Barney, but the details are unimportant. Yes, I am Joe.”

“No,” I said. “You’re wrong. *I* am Joe!”

That was my bombshell, the one I had been building up to. As I expected, it was met with stunned silence. I waited. “Are you there?” I finally asked.

“Yes. What do you mean, you are Joe?”

“I feel I can talk to you,” I said comfortably. “I think we understand each other. We’re what they call... simpatico.”

“Who are you?” said the voice, now confused and impatient.

“My name is Mike Walker,” I lied, “and I work at NASA Goddard. I’m an administrative specialist there. You could say that I keep everyone there very, very busy!”

I was laying it on thick now. I was telling quite a tale. Maybe you’re wondering why I was doing this – why I didn’t just tell the voice about the Otan-Horvonia war – and why I didn’t just ask about the bugs in Fayed’s code, so that the war could be averted. The answer is quite simple. Arguments about preventing a war would only work on a sane person. The owner of the filtered, robotic voice was insane. Clinically insane. I had no doubt about that at all. No sane person would instigate that much pointless busywork.

The best way to deal with an insane person is to play the game according to their rules – to work within their own twisted reality, to make that reality your own.

“Why are you here, Mike Walker?” the voice asked warily.

I shifted in my chair. “Just a second,” I said. I pulled a couple of Kleenexes out of the box on Bruno’s desk and used them to turn over the empty trash can at my feet. I then put my feet up on the bottom of the can. “Ah, that’s better,” I thought to myself. Into the phone, I said, “I’m here to test you, to see if you’re worthy!”

“Worthy of what?”

I worked some excitement into my voice. “ISO-10000!” I said.

“What?” said the robotic voice. “You mean ISO-9000.”

“No,” I said. “ISO-10000! It’s brand new, and it makes ISO-9000 look like a walk in the park! ISO-10000 is a whole new level of micromanagement through documentation. Even your detailed documentation efforts have to be documented in detail! The company is looking for suitable people – the right kind of people, if you know what I mean – to try it out at their institutions. They chose me, and I have to tell you, it’s wonderful. You wouldn’t believe the intricate guidelines, the mind-numbing complexity!”

“ISO-10000...” the voice said thoughtfully.

“That’s right! And now they’ve sent me here to check you out, to see if it would be a good idea to test the system at NCAR.”

A pause. Somehow, through the quiet, I could tell that my conversation partner was interested, even excited. “I could do that!” the voice said.

“I think you could too!” I said. “Because I’ve learned a lot about you. Good things. I’ve learned that you’ve set up an operation here very much like my own. You have your own network, your own army. Yes, you and I are very much alike. But you’ve gone beyond me, and that impresses me. It impresses me a lot!”

I accidentally looked over at Bruno again. I had to stop doing that. Corpses are disconcerting things. You don’t want one sitting across from you while you’re trying to concentrate.

“I’ve gone beyond you? How?” asked the voice.

“Well,” I said, “I’ve been pretending to help Fayed Subein with his computer coding problems. It appears that someone has infested his code with some subtle yet fatal bugs. I recognize your handiwork. I trust he was being punished?”



The voice didn't respond. I continued. "I'm guessing that he was shirking his documentation duties. In fact, most of the scientists here were. You were sending down paperwork for them to complete, and the completion rate was maddeningly less than 100% – far less. Unacceptable. You had to do something. You had to make an example of someone. You chose Fayed.

"Before anyone had any reason to be on their guard, you accessed his computer account and found the code he was famous for. He's somewhat of a lone wolf here at NCAR, running his own code rather than the publicly shared CCM, so isolating all the copies of his code was relatively simple. You then began your masterpiece of sabotage. Obviously you knew something about scientific programming – probably you were a programmer or a scientist in an earlier life. But what should the masterpiece be? Not just one bug. Not just two bugs. No, the great masterpieces of film and literature are trilogies. Look at *The Lord of the Rings*. Or *Star Wars*. Or *Indiana Jones*. Yes, there was something majestic – something artistically complete – about inserting exactly three bugs."

I paused once again. "So, how am I doing?"

"Does anyone else know all this?" the voice asked. "Your girlfriend, for instance?"

The voice would never believe a denial, so I didn't try. "Of course! She helps me at Goddard. Why should I deny it? And why should any of us be ashamed?"

Silence. Then the voice said, "And do they appreciate all the order you've created there at Goddard?"

"Well, no...", I said, throwing some embarrassment into my voice.

"I didn't think so. They don't understand us. They don't realize the good we've done."

"No, they don't," I agreed. "But they will. Give them time. They will."

"I wonder."

We were silent again for a few seconds. "Fayed Subein is sorry now," I said. "He's found the three bugs – one was in the raindrop equilibration scheme, one was in longwave radiation, and the third was in... um geez – I don't even remember now."

"The moist convection scheme, according to the subroutine name," said the voice. "So, you say he was sorry?"

I gave myself a mental high five, but I didn't let it show in my voice. "Well, he's suffered enough. He worked for a long time – late into the night, day after day after day, to find those bugs. Yes, he has suffered greatly for his sins."

“Good!” the voice said. “And the next time... Just a second.” Through the phone, I heard the sound of footsteps and of a door being swung open fast. “What?! Hey – you get back here!” the voice said angrily. I heard the crack of a gun – first loudly through the phone, and then faintly through Bruno’s door, from some remote location in the building.

‘NO!’ I thought. ‘CONNIE!’

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“Run, Connie!” I yelled it into the handset of Bruno’s phone. I knew the warning was probably pointless – I knew she probably wouldn’t hear me, either because she was already running for her life, or because she was on the floor, dead or wounded. Holy crap!

Connie, of course, had heard everything I had said to the voice. She knew exactly what was going on. I could guess what had happened. Holding the phone to her ear, she must have walked silently through the halls of NCAR, listening at each door, trying to locate the other end of the conversation, in case the speaker was in the building. It’s what I would have done. She would have done it, too.

And she had found the voice. Unfortunately, the voice had also found her.

Panic never helped anyone. Cold hard logic was the key. I counted out the possibilities in my head:

- 1) If Connie was dead, I had to remain calm and find the killer.
- 2) If she was wounded and needed attention, I’d still have to remain calm, but I’d forget the killer for the moment and help Connie.
- 3) If the bullet missed her, she was probably being chased. Then I’d have to find them both. Calmly.

My next move, then, was obvious. Before anything else, I had to find Connie, so that I knew which possibility I was dealing with. Yes, cold hard logic. I let it grip me. I let it grip me hard.

With a focused mind, I tore out of Bruno’s room and ran to the main lobby. I stopped at the tornado display and listened intently. A door slammed in the distance. Footsteps. Another slam. I breathed just a little easier. I couldn’t be sure, but those sounds seemed to point to possibility #3. They seemed to suggest that Connie was still alive – alive, but on the run.

The ceiling in the lobby of NCAR is two floors high in places, and you can see some of the walkways on the second floor while standing on the first floor. I could tell that the slamming sounds came from upstairs, from somewhere in the south tower. I took off for the south stairwell, the enclosed one. Connie would use that one rather than the open stairwell to keep from being an easy target.

But what could I do when I got there? What could I do, unarmed, against an insane killer with a gun and a powerful desire to see Connie – and me – dead? I hate guns; I always have. Even so, I cursed myself for not having one with me right then. It would have come in handy.

Fortunately, I always carry around my wits, such as they are, and right then my wits told me to grab the fire extinguisher I was passing as I ran down the hall. I threw open the small glass door of the wall compartment and yanked the extinguisher off its stand. The

thing was heavy, and it was awkward. I managed to run with it anyway to the stairwell door. Before I got there, I heard them coming down fast.

I flattened myself against the wall to the side of the door. It swung open, and Connie flew out. Her arm was bleeding, and her eyes were wild – *she* was in a panic; she was at the end of her rope; I think she was anticipating the hot searing sting of a final, fatal bullet in her back. Other than that, she seemed okay.

(To this day, I've never told her that cold hard logic would have helped her right then with her feelings of panic. I'm not an idiot.)

Connie passed by me in a flash. Now was the time for action. I jumped inside the stairwell and aimed the extinguisher up the stairs at the outstretched hand of her assailant, the hand waving the gun. My eyes and those of the killer locked onto each other as we both fired away.

I'm still unnerved when I think back on that instant in time. It could have been the end for me. I'm writing about it now, so you already know I survived. Somehow, and I don't quite know how, I was just a little bit faster than the killer, and my aim was right on target. The foam hit the gun, the deadly bullet flew safely past my shoulder, and the gun clattered to the floor, out of reach.

The killer then went into a coughing fit. This shouldn't be a surprise, I suppose, since the stuff in those extinguishers is pretty nasty. Someday I'd have to read the warning label. I wondered if the label said that it's okay to shoot the foam at someone if that someone is an assassin who's trying to kill you. Probably not. Those warning labels are never complete, and that's why I never read the things.

Still hacking, the killer turned her heels and ran back up the stairs. Yes, I said 'her'. My earlier hunch was correct. The killer, the insane bureaucrat, the instigator of all of Fayed's problems, was a woman – short and compact, with shoulder-length black hair, thin black eyebrows, and a thin nose between close-set eyes. Good looking, in a quirky sort of way. Except for the eyes. Something about the eyes spoke of dementia, of evil. If one's eyes are the window to one's soul, then hers had just been squeegeed clean.

In any case, I didn't recognize her. I had seen a lot of people since arriving at NCAR, but not her. I had no idea who she was.

Suddenly Connie was at my side. She was still breathing fast. "You're bleeding!" I gasped. I had time now to be alarmed, and yes, I was alarmed.

"Just a scratch!" she said, looking up the stairwell quickly and nervously. "Really – she shot at me, but the bullet just grazed the skin!"

I kissed her hard but very fast. “Get Fayed!” I said. “Have him bring a printout of his moist convection code. We’ve got work to do!” I tore up the stairs in pursuit of the killer.

...

The roof – again the roof. The sound of the door up there was unmistakable. What was it about the roof at NCAR, I wondered, that was such a draw to the criminal mind?

I made it to the roof door in no time, despite the fact that I was still lugging the fire extinguisher. I threw open the door and pointed the nozzle forward, ready for anything. No one was there. At least, no one was right outside the door. Ah, but she had to be up there somewhere. She hadn’t come back down the stairs – I would have heard that – and from my earlier experience up there, I knew there was no other way down. Cap Jackson’s people had already removed Lefkowitz’s getaway cable.

“There’s no escape!” I called out. “And we need to talk. Come out when you’re ready. I’ll wait.” I leaned back against the closed door to the stairwell, my arms folded, my eyes alert. I was ready for anything.

Five minutes slowly ticked by. I heard some more coughing from not far away, confirming her presence up there, but I couldn’t see her, for she was hiding behind some brickwork. By now my heart rate had returned to normal. The immediate danger seemed to have passed. Without her gun, any offensive she might muster probably wouldn’t amount to much. She would be as ineffective as a standard bucket land surface model is in capturing the fast timescale dynamics of canopy interception loss.

Suddenly I heard some tapping on the door behind me. “Yes?” I said through the door.

“It’s me – and I’ve got Fayed!” Connie said. I turned around and, remaining alert, I opened the door. Connie and Fayed stepped onto the roof.

I explained the situation. “She’s up here,” I said quietly, “and she’s weaponless – I think.” I looked at Fayed. “Did you bring the code?” He waved a stack of paper at me. “Good!” I said.

“That woman is a devil!” Connie said bitterly. She was holding some paper towels from the bathroom against her arm.

“She’ll have the devil to pay,” I said, “if she doesn’t help us now.”

...

“Let me tell you what’s going to happen,” I called out loudly. The late afternoon sun was well behind the mountain now, and the rooftop was filled with shadows. Connie and Fayed stood beside me at the door. Our adversary was still out of sight, saying nothing. I

continued. “The scientists in this organization will realize soon that there’s strength in unity. When that happens, they will rise up and defeat you. They can only be pushed around so much. They’ve been pushed too far already.”

No response. “Yes,” I said, “a large collection of scientists is like a sleeping giant. A powerful, almost invincible force, waiting to be organized, waiting to take control. Of course, most scientists don’t realize their potential. That’s why you’ve been able to control them so well. All they need, though, is a spark – a catalyst – to join them together as one. They will then refuse to respond en masse to your e-mail demands without any fear of reprisal. After all, NCAR can’t get rid of all of them at once, for the scientists are NCAR. Once they join together, you are doomed.”

I stopped and waited. The killer still said nothing. “That’s a nice little speech,” Connie whispered.

“Thanks,” I said. “I’ve got more!” Louder, I continued. “Perhaps you’ve been dreading their unification. Perhaps it keeps you up at night, worrying about when the catalyst will arrive. Well, your uncertainty is over. *I* am the catalyst. Tomorrow, first thing in the morning, I will organize the scientists myself. I will get them to work together to overthrow you. You can count on it!”

I stopped. We listened. Nothing. “Unless,” I said, “you help us. If you help us with a small problem, I will go away. Far, far away. I’ll be out of your hair forever. Your best move now is so obvious that I won’t even give you time to think about it. I’ll give you just ten seconds to get over here and help us, starting now!”

I didn’t count out loud. That would have sounded stupid. I did look at my watch, though. In eight seconds, we heard the woman’s voice. “You won’t destroy me,” she said. She sounded very different without the electronic filter. She sounded almost human. She also sounded strong, assured, and totally in control, in spite of all I said.

“That voice!” Fayed whispered. “My god! I know that voice!” He paused, deep in thought. “Marta... Gringold!” he finally said.

“Who’s Marta Gringold?” I whispered back.

“She used to work for me,” Fayed said quietly. “She was brilliant, in her own way. A whiz around computers and FORTRAN. But I always felt she had a screw loose somewhere. She quit about five years ago, and I never found out what happened to her.”

“Looks like she’s been right here all along,” I said.

“Working here at NCAR? Without me seeing her?”

I nodded. “She's that kind of person. Able to sneak in and out unobtrusively. It's part of how she maintains her power. And she picked on you because she knows you. She knows your vulnerabilities. Yes, it all makes sense now.”

“There she is!” Connie said suddenly. Fayed and I looked up. The woman had come into view – she had stepped out from behind the brickwork over to an open space along the edge of the roof. Though she was still some distance away, the malicious and defiant set of her face was unmistakable. She glared at us. We glared back as best we could.

“Marta!” Fayed called out. “It’s me – Fayed! Why are you doing this?”

“Careful!” I whispered. “She’s a little unpredictable right now.” I took the stack of code from his hands and carried it to a spot not far from the roof door, taking care to keep my distance from the woman. I set the papers on the ground and placed an old rusty bolt, conveniently found nearby, on top of it. I then walked back to Connie and Fayed. “I left a copy of Fayed’s moist convection code right over there,” I said loudly to the woman, indicating the spot. “The three of us will leave now. When we come back here, in about half an hour, we expect to find some marking in that stack of paper showing where you inserted the bug. If we find it, you’ll never hear from us again, and you can go right on doing what you’ve been doing. Your network here at NCAR will be safe from us. However – and this is a promise – if it’s not marked up, or if you plan some kind of ambush for our return trip, we will destroy you. We already know more than enough about you, and we will take precautions.”

I waited for a few seconds, and then I moved my head to motion Connie and Fayed toward the door. Before they could move, though, we heard the woman – I’ll start calling her Marta – speak. “I will not do what you ask!” Marta said with conviction.

We watched her carefully. She didn’t look like she was planning to cooperate. “What’ll we do now?” whispered Connie.

“I don’t know,” I whispered back. “There’s really not much we can do. I was hoping the ultimatum would work!” I frowned, and out loud, I called out, “You won’t? Tell us why not!”

“I am important! Too important for you!”

“Marta,” Fayed called out. “Do it please – fix my code – as a favor to me. We used to get along just fine, back in the day! Do it for old times sake!”

“Never!”

Fayed continued his appeal. Looking back, I realize now that I should have stopped him right there. He was trying to sound reasonable, and that doesn’t work very well when you’re dealing with a psychopath. At the time, though, I was all out of ideas myself, so I let him go on. “Marta,” he said. “Just today I learned that I need to write up an article

describing the parts of my work that were performed on NCAR computers. It seems that the computer center here wants to publish a glossy pamphlet showcasing research performed on their systems. Are you behind this request?"

"It is not a request," Marta said.

"No one in their right mind," Fayed said, "would ever sit down and read some pamphlet on research put out by a computer center, not even the people who fund the computer center. That means that writing the article would be a waste of my valuable time. Do you agree?"

"No."

Fayed was starting to get exasperated. "That woman really is insane!" he whispered.

"I know," I said.

"Actually, I'm not so sure," Connie whispered thoughtfully. "I think you may be reading her wrong. She doesn't have to be insane. Maybe she's just evil."

"No, she's insane," I whispered back with conviction.

"Marta," Fayed said loudly. "If we don't find the bug in the code, a war will break out, and millions of people will die! You've got to help us!"

"No!" the woman said.

"Insane!" Fayed whispered.

"Absolutely!" I agreed.

"Or just evil," Connie whispered back.

"What makes you think you'll ever get off this roof if you don't help us?" Fayed called out.

I put my hand up to warn Fayed to tone it down, but it was too late. The woman took a step forward. "Don't worry about me getting down," she said. "I have superpowers beyond what you can imagine!" And with that she ran to the roof wall sideways and quickly fumbled herself over it. The shriek of surprise she let out, probably upon learning that she couldn't really fly, seemed utterly genuine.

"Okay, so she's insane!" Connie muttered, as we broke off in a run toward the wall.



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Marta had managed to hit a tree on her way down, and her body was still sliding off the tree to the ground when the three of us reached the roof wall and peered over the side. Through the branches and leaves we could just make out the body lying motionless in a twisted clump. Connie pulled out her cell phone and called 911.

"She's dead!" Fayed gasped.

"Probably," I agreed. "Maybe not. Either way, I doubt she's in any shape to help us find the bug. Not that she would have, anyway."

"The paramedics are on their way!" Connie said. Looking down again, we saw some activity on the ground. A security guard had already rushed out, his own phone in hand.

I turned to Fayed and said, "The bug is in the moist convection code. And there *is* only one more bug. Sorry, but that's the best I could do!"

He nodded. "It's a lot better than nothing. Still, that's one of the longest and most complex subroutines in the GCM, and..."

"Just a second," I said, interrupting him. My cell phone was ringing, and I had a hunch it was important. My hunch proved correct. I opened the phone, said "Wells here", and listened.

"Mike!" said the caller.

I knew immediately who it was. "Madame Secretary!" I said. Out of curiosity, I glanced over at Connie. She looked a little disgusted – not at me, I think, but at the caller. I shrugged a 'helpless' shrug at her, because after all, what could I do?

"I have some bad news," the Secretary of State said, with just a hint of the old purr in her voice. "The Otanians have sped up their offensive. Troops have already crossed the border. We estimate that our new drop-dead time for stopping this thing is noontime tomorrow!"

"But how can they do that?" I protested. "They promised to wait until Tuesday!"

"All's fair in love and war, Mike," the secretary said.

"Just a second!" I said into the phone. Then, to Connie and Fayed, I said, "Noontime tomorrow! That's when they need the simulation results!"

"What??" Fayed said. He was visibly stunned. He looked almost on the verge of panic. If he had been an atmospheric boundary layer, I'd have worried right then about his stability.

“Fayed?” I said, “are you all right?”

His sigh sounded painful as he looked at me with intense eyes. “It’ll take hours to run the simulations and process the results,” he said. “With all that needs to be done, and assuming I work nonstop all night and into the morning on the results as they’re generated, I’d say we have maybe two hours now to find the bug – and that’s it!”

Two hours! I took in a deep breath before speaking again into the phone. “Madame Secretary, we’ll do our best, but I have to tell you right now – it doesn’t look good. It doesn’t look good at all.”

“I understand, Mike,” she said. “Yes, do your best, and keep me posted.”

“I will.”

“Oh, and Mike,” she added, “I do want you to know how much I appreciate all you’re doing.” The purr was now back in full force. “Here’s something that may give you some extra motivation. I was at the department store this morning, buying some underwear and things, and I found a present for you, something of a thank-you.”

“What?” I said. “A present?”

“Yes. I’ll show it to you when you get back to the East Coast. It’s something I have to... mmm... show you in person, when we’re alone.”

I would never cheat on Connie. There was a real bond between us, and besides, where could I find better? Even so, I involuntarily started to breathe faster, and my heart rate jumped way up. The Secretary of State probably had that effect on any male she chose to use her powers on.

Connie noticed. She grabbed the phone from my hand and spoke into it. “We’ll get to work, Madame Secretary!” she said, with businesslike precision. “Is there anything else? No? Okay. We’ll let you know what happens.” Connie hung up, and then she reached up, threw both her arms around my neck, and kissed me on the lips, deeply and sensuously. It worked again. The mists parted, and the spell was broken. “Are you back?” she asked. She was grinning, so I knew I wasn’t in trouble.

“Yes!” I said sheepishly. “Wow! The Secretary packs a punch!”

Fayed moaned. We looked at him. He was sitting down against the roof wall, his eyes looking at nothing. The sight brought us to our senses; it quickly reminded us of the overwhelming problem we now faced. “Two hours!” he said. “I’ll get started, but... it looks hopeless!”

"It may be next to impossible," Connie said, "but you've got to try! You've got to go through the code line by line and verify as many variables and operations as you can. It's our only hope!"

More pain crept into Fayed's face. "Do you have any idea," he said, looking up at her, "how many lines of code there are in the moist convection subroutine? And how convoluted the code is? I didn't even write most of it! Even with the debugger..."

Connie shrugged. "We have to hope you'll get lucky! And we'll look at the code too! Right, Mike?"

"Damn!" I said softly, as much to myself as to the others.

"What?" Fayed said.

I sighed. "A careful study of the code," I said. "It's *not* the only hope." I was suddenly feeling sick to my stomach. An idea had sprung into my mind, an idea that I wished would crawl back under its rock and stay there. It was an idea as unwelcome as nonstationarity in the underlying statistics when you're trying to derive a climatology from a few decades of observational data. "Fayed, you go start your analysis. If Connie will help, I'm going to try something in parallel. Oh gawd, I hate this!"

"What is it?" Connie asked.

"What is it?" I said disgustedly. "Nothing less than a waking nightmare!" I groaned inwardly. If my idea worked, I would soon be embarking on what was by far the most bizarre and horrible journey of my career. Hell, it could be the most bizarre and horrible journey ever taken by anyone in the history of mankind.

For all I knew, I wouldn't make it back with my mind in one piece. And yet, I had little choice. The stakes here were high. Countless innocent lives...

"Connie," I said. "Oh gawd!! I need you to call your brother. Get him over here, and have him bring his damned electrodes!"

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With scissors and razor, Connie carefully exposed twelve nickel-sized patches of bare scalp on the top and sides of my head. I knew that if I came out of Corky's experiment intact, I'd have to cover these patches with a hat for at least a few weeks. Or, I remember thinking, maybe I could show them off at various 'happening' venues around town and, with luck, start a crazy new fad. A lot of good could come out of that. For the impressionable young, shaved-out scalp patches would have the desired shock value of tattoos or piercings, but without the permanence. I promised myself I'd give it more thought after this was all over.

Connie kissed me. "That's for luck," she said. She kissed me again, longer. "That's because I'm a woman and you're one hell of a man. Please, Mike – please tell me you'll take care of yourself! I have to admit I'm a little worried."

I nodded. "I will," I said.

Our eyes then communicated in a way that can't be expressed in words, so I won't even try. "I've got to talk to Fayed now about the subroutine driver," she said after a few seconds. "He's extracted conditions for an atmospheric column at a midlatitude point during summer, at the start of a timestep that saw convection. For my brother's experiment, I'll use those conditions to initialize the column, and I'll use the debugger to run the driver and subroutine for one timestep."

"Gawd, she's sexy when she talks technical!" That's what I was thinking right then. I didn't say it out loud, though. Instead, I asked a very reasonable question. "And Fayed will be looking at the code on his own, in case this doesn't work?"

"Yes," she said. "He'll be tackling the problem the traditional way." Her hand touched my arm just above the elbow. The touch spoke volumes. Then she turned and left, and I lay back on the long table. I was all alone in the room. If Corky's experiment worked, I'd soon be all alone in my own private universe.

...

First, though, I had to deal with Corky Swenson himself. He tore through the door five minutes later, lugging a large canvas bag behind him. "Mike!" he called out. "I made it!" He came to the table and quickly examined my head. "Connie's prepped you," he said. "Good. Let's get started!"

He reached into the bag and pulled out the hated electrodes. He also pulled out a palm-sized digital recorder, and, to my surprise, he focused on that first. He picked it up and pressed the record button. "Today," he said grandly, "history pauses in its long march through time to rest its weary feet and consider a new and profound landmark, an UURRPP!"

The “UURRPP” was the sound he made when I stood up and lifted him off the ground by his collar. I was getting used to that move. “Listen, Corky-Boy!” I hissed. “We’ve got very little time here!” I set him down roughly, and I wrenched the recorder out of his hands and threw it hard against a nearby wall. I glared at him. A killer glare.

He wilted. “Okay, Mike!” he said. “Um, lie back down, okay?” He was flustered and said nothing more for a while, which was fine by me. He spent his time instead nervously but carefully attaching his electrodes to my scalp patches, continually checking the readings on the portable monitor that he had also pulled from the canvas bag. His bad breath hung over me like a cloud of smog trapped by an inversion layer. I gritted my teeth and took it. In an hour or so, I’d be done. Hopefully, I’d still be me.

“There!” he said. “Everything’s set, Mike! Oh, and by the way, I’ve fixed things so that the signals won’t sting anymore.”

“*That’s* good!” I said, though I wouldn’t believe it until I didn’t feel it.

Corky went on. “I’d better tell you now what you’ve got to do and what you can expect from the experiment.”

“Fine. But just the facts. No speeches!”

“Sure, Mike! Sure! Just relax! Now, I’ve told you before about DSDA, right?”

Both his voice and his eyes overflowed with excitement as he spoke. He loved talking about this stuff, and he especially must have loved the fact that his experiment was finally going forward. He had the right kind of enthusiasm for his work, I’ll say that much for him.

“Dream State Data Assimilation,” I said. “As you once explained it, I picture the unfolding of some story in my head, and at regular intervals you guide what I’m imagining – you make corrections in the direction of the story – through these electrodes.”

“Synapse stimulators,” Corky corrected.

“Whatever!” I snapped.

“Now calm down!” Corky said, holding up his hands and looking a little nervous again. He was regarding me through his thick, nerdish glasses as if I were an overly sensitive piece of lab equipment, one he had to tweak with care. “You’re oversimplifying things a bit, but you’re basically right,” he said. “I’m going to give you a drug that will put you into a very light, wakeful sleep – perfect for dreaming. You will then dream about a – what did Connie say it was – a moist convective process?”

“That’s right,” I said.

“What exactly happens in a moist convective process?” Corky asked. He sounded interested, but I wasn’t sure if he really wanted to know for himself or if he just wanted to make sure that I knew.

“Well,” I said, indulging him, “in Fayed’s code, you take a parcel of air near the Earth’s surface and test whether it has enough energy – whether it’s ‘warm enough’ relative to the air above it – to rise through the atmospheric column. The air parcel, if it rises, cools down and condenses out moisture – raindrops – and that moisture eventually falls toward the surface. Whatever doesn’t re-evaporate on the way down hits the surface as rain. The process then starts again from the next higher atmospheric layer, and so on. Besides the generation of rainfall, the moist convection redistributes moisture and energy up and down the column.”

Corky nodded. “Good, good. Now, as you fall asleep, you need to think about this moist convection process in detail. That way, your first dream will be about moist convection. The synapse stimulators will take over from there. They will keep the dream going, on track. My sister will run the moist convection subroutine from that computer.” He pointed to a nearby PC. “She’ll use the debugger tool, stepping through the code one line at a time, continually but slowly feeding you the various states of the process as generated by the model. The synapse stimulators will cause you to assimilate that information into your dream.”

“I understand. What all that means is...”

He didn’t let me finish. He was so excited he had to say it himself. “It means,” he said, “that you will visualize in detail what is happening inside the computer simulation! You will watch the air parcel rise – perhaps you’ll even imagine yourself inside it – and you’ll see the raindrops being generated! If there’s a bug in the code, as Connie says, you will see something along the way that doesn’t make sense – something that seems wrong!”

“Okay,” I said. “That all seems pretty clear.”

Connie came in just then with a memory stick, and for the next several minutes I watched as she and Corky began working on the PC. He was connecting the wires of his electrodes to a box that would itself connect to the PC via the USB port, and Connie, using another port, was loading the driver and the subroutine.

I looked back up at the ceiling. In my gut, I still regarded Corky’s theories as a pile of crap. On the other hand, though, Connie believed in him. Sure, he was her brother, but still – her opinion counted for a lot. I’d never have volunteered for this if she weren’t a believer.

They were almost done. It was time to ask the question that had been pestering me since I first agreed to the experiment. “Corky!” I called out. “How do I stop the dream and report what I’ve found?”

He looked up. “Stop the dream?” he asked.

“Yes, of course.”

He set down the cable he was holding and thought for a moment. “If you can make some sign to us, we can shut the whole system down,” he said.

“Fine,” I said, “but how do I do that?”

He thought some more. “Gee, Mike!” he said, “I don’t know. I never designed this thing for debugging. My first tests were supposed to be with a much, much simpler program that had no bugs. When the program was over, the subject – which I thought would be you – would just tell me what he saw.”

“So, if I run into a numerical inconsistency caused by the bug – in the worst case, something fatal like a floating point exception – what will happen to my brain?”

Corky’s face became deathly serious as he considered, probably for the first time, this all-important question. “Gosh! I don’t know!”

Connie looked up from her screen. “Mike,” she said, deeply concerned, “maybe this wasn’t a good idea.”

All three of us were silent for a while. Finally, Corky spoke up again. “If you can send us a sign before anything like that happens, there shouldn’t be a problem,” he said.

“But you don’t know how I can send a sign,” I said.

“No,” he admitted.

“Okay,” I said, thinking again about the imminent Otan-Horvonia war and picturing tens of thousands of innocent, starving, orphaned children. “I’ll just have to improvise. Let’s get started.”

...

You can’t explain the color orange to someone who’s been blind from birth. In the same way, I can’t describe to you exactly what I experienced once I fell asleep and started my dream. My description now is going to be limited. Very limited. I’ll do my best, and we’ll see how it goes.

Here’s an example of something in my dream state ‘model world’ that’s practically impossible to describe: the concept of fluid grayness. No words will ever give it justice. After being injected with Corky’s drug, I fell asleep almost immediately. In a flash, I found myself floating weightless in a sky of this grayness, which closed in all around me

like a dense fog and yet was fully transparent – I could see through it as if it were air. When I moved my hand, I could see swirls of movement in the grayness behind the hand, something like what you'd see on a lake surface behind a canoe paddle. The vortices were mere ghosts, though. The gray fluid they drifted through had no substance to speak of. Basically, the strange thing about the grayness was that it was both there and not there. I know – it doesn't make sense.

And here's another thing that was weird: I could also see smaller amounts of fluid blueness, greenness, redness, yellowness and brownness – flowing materials of some kind that were all jumbled together and yet were entirely distinct, each one of them. I had no trouble at all, for example, seeing how much more redness there was than greenness, even though both fluid colors were everywhere.

Of course, I wasn't really seeing anything – my mind was simply gathering information through the synapse stimulators and then interpreting this method of gathering information – and the information itself – in terms of something it could understand, like the seeing of colors. Yes, it was freakish, but at least I knew what the fluid colors represented. (It was my own mind, after all, that was generating them.) The grayness was air mass. The blueness was water vapor, and the other colors were tracer vapor. I remembered what Fayed had told me – in his simulation, he was following four separate water tracers. Four non-blue colors, one for each tracer – it made sense.

Here's the most freakish thing of all – I found that by moving my arms and legs, I could swim efficiently through the gray fluid! (Okay, so maybe it did have substance.) I immediately set off to see as much as I could. I swam downward first and, in about 20 meters, met up with a smooth, uniform, and impenetrable dark green surface – the land surface. I then swam upward and eventually found my way blocked by a wall of glass. Though I could see fluid colors above the glass, I couldn't get to them. "They must be in the second atmospheric layer," I thought. "I'm in the first, lowest layer, still in first few lines of code, and the convection hasn't started yet."

Now, while no one could have been more surprised than me that Corky's experiment was working, I had no time to be paralyzed by surprise. I had some problems to solve. "How can I communicate with Connie?" I wondered first. "How will I get her to stop the simulation if something bad starts to happen – say, if a temperature starts to oscillate?" A look around me didn't offer much encouragement. I couldn't affect the simulation itself – information flowed from the computer to me, not the other way around. I could swim through the atmosphere, but I couldn't change its properties, not in a way that Connie would notice with the debugger. And yet, there must be *something* I could do...

I stopped thinking about it because something was starting to happen. Far to my right, I saw motion. Upward motion. The moist convective plume! The rising air parcel was created from a small fraction of the grid box, a fraction that I wasn't currently in! If I didn't get over there, I'd miss all the action, so I swam like mad to the rising grayness. I reached the tail end of the plume just in time.



I wasn't prepared for what happened next. On reaching the plume, I suddenly felt my body being thrust wildly upward. I struggled to right myself, but the force was too strong. It carried me along with it like a powerful, swirling, rushing river carries a small, insignificant twig. I found myself tumbling upward head over heels, unable to focus on what was going on around me. This wouldn't do. I was there to observe, and if this kept up, I wouldn't be observing anything.

Finally, the parcel stopped rising, and I regained control. My stomach was still going in circles, but I ignored that, for I needed to look around right away. I saw the vague outline of a glass window below me, and I saw colors floating around below it. "So!" I thought. "I'm in the second layer now!" I also saw a great many colored spheroids floating around me, moving at different speeds and in all directions. I knew instantly what they were: liquid droplets, formed from the water vapor and tracer vapor in the rising, cooling plume. Whenever a droplet hit me, it exploded with a splash, like a spot-on water balloon during a summertime water fight. Before long I was drenched – soaked from head to toe.

I steeled my stomach. The plume would be rising again soon, to move ever higher in the atmospheric column, and I wanted to be ready. Sure enough, the air – I mean the grayness – grew restless. Restless and unstable. And then it started – the grayness about me began its manic ascent. I closed my eyes and let myself be carried along with it this time; I didn't fight for control. My reward was a much easier ride. I almost enjoyed it. Before long, I was in the third atmospheric layer.

The plume kept rising in this way – starting and stopping, starting and stopping – until it reached the eighteenth atmospheric layer. That's when it was no longer unstable. While I waited for the program to decide this, I saw something strange – something that flew against all logic. Suddenly, I knew what was wrong with the model. Yes, I had found a signature of the bug!

But how do I explain what I saw? I should tell you first that instead of spheroidal droplets, huge colored snowflakes had been forming around me as I ascended through the last several layers. The air was much colder now, and I remember trying to get my mind to fabricate a heavy parka for me. It couldn't. Believe it or not, not everything is possible in dream space.

Anyway, what I saw was that the relative density of the fluid greenness above the green snowflakes was somehow smaller than that of the redness above the red snowflakes or the yellowness above the yellow snowflakes. That was okay in itself. The green tracer, I deduced, must be one of Fayed's water isotopes, and fractionation was favoring the condensed phase. But here was the problem – whenever a blue snowflake came near a green snowflake, the fluid blueness was suddenly affected by the same fractionation, the same density reduction. This was wrong. You see, the green tracer was supposed to be passive, which meant that it was supposed to have no effect at all on the air and water fields of the model. Yet here it was, clearly having an effect on the water! This was bad

news. Yes, this could cause big problems, especially later when tracer-to-water ratios were being computed.

I had the answer. Now I just had to get out of the running program safely and let Fayed know what I'd learned.

...

I realized with a start just how important it was to get out soon – very soon. I wasn't worried so much now about numerical problems, since the problem with the blue snowflakes didn't seem to affect me. I did, though, have a new, unanticipated worry. So far, I had sensed my body reacting to everything that happened: I'd felt nausea as I tumbled in the plume, I'd felt wet when liquid condensate floated into me, and now I was shivering in the bitter cold of the upper troposphere. As far as my mind was concerned, these feelings – these experiences – were very real. And now I was about to experience the free-fall of precipitation.

I knew this would be bad, because I knew how this freefall was parameterized in Fayed's code. Many of the snowflakes floating about me would interact with the air below as they fell to the surface, and dryness in this air would cause parts of them to evaporate back into vapor. A separate fraction of the condensate, though, was assumed to fall through strictly saturated air – to fall, in effect, immediately to the surface. This was a major problem – not for the snowflakes, but for me. If I was unlucky enough to find myself with this fraction of the condensate, I too would fall fast to the surface, with two unhappy results: (1) the almost instantaneous change in the pressure would blast out my eardrums, and (2) I would slam hard into the land surface below, a victim of my own inertia. Of course, my body wouldn't really be damaged. There was no danger of that. Even so, as far as my mind was concerned, the damage would be real. And that meant I might go into shock. Probably severe shock. I couldn't afford that. I couldn't afford to lose consciousness and not be able to tell Fayed and Connie about the bug.

And if I managed to stay in the layer I was in, without falling straight to the surface? I was freezing up there in the eighteenth layer, and the air was very thin. I didn't think my mind could take much more of that, either. I was already starting to feel very weak.

I asked myself again – what could I do? Normally, in the real world, I have a handle on things; I can take a bull of a problem by the horns and wrestle it the ground. Up here, though, in Bizarre Model World, I was out of my league. Dammit, anyone would be.

I was despairing over all this when a giant red snowflake hit me on the knee. Its edge was sharp, and it hurt like hell. In frustration, I kicked the thing away, and it disintegrated into thousands of tiny red snowflakes. A giant green snowflake then came at me faster. I ducked just in time. These flying snowflakes, I realized, were yet another danger, one I couldn't ignore. I watched them warily, suddenly feeling like a spaceship in an old Asteroids arcade video game. It was while I was watching them, watching some pass slowly and some pass fast, that a memory gradually awakened in me, a

memory of a story I had heard long, long ago in an undergraduate physics class. An idea took root in the sandy clay loam of my mind. Maybe, just maybe...

I had remembered the story of Maxwell's demon. If you don't know about that, Maxwell's demon is a tiny, submicroscopic imp who lives in a glass of water. One day, in a mischievous mood, he herds all the fast-moving water molecules toward the left side of the glass and all the slow-moving water molecules toward the right side of the glass. The glass then had the same number of slow-moving and fast-moving molecules as before, but any human being looking down on the glass would be amazed to find boiling water on the left side and very cold water on the right side. A fun story. Physicists love it.

Maybe, I thought, I could play the part of Maxwell's demon! There was no time to weigh the pros and cons of this strategy. I had no other plan, so I went ahead with it. "Green and yellow," I thought to myself. "That should do it!"

For the next five minutes I shuttled back and forth, like some kind of psychotic fish, between the east (or at least what I thought was east) and west sides of the eighteenth atmospheric layer. Every time I swam east, I carried with me a green snowflake. Actually, I pushed it forward; it was too big to carry. I then swam back west with a yellow snowflake. I must have swum back and forth about 50 times, hoping that I would be in time, hoping that the moist convection scheme had something else to do before it was time to send the snowflakes down.

To my great relief, I finished the job – I had separated the yellow and green snowflakes. I already told you that I couldn't affect the computer simulation itself – I couldn't affect what was going on inside the computer. What I could affect, though, was the size of the correction the computer would have to make to my dream to get the dream back on track. By separating the green and yellow snowflakes into different areas, I was forcing my brain, as guided by the computer, to do a lot of work to mix the snowflakes back together again. Corky was monitoring my brain's activity throughout the experiment. With any luck, he would notice the unusual size of the correction (or 'increment', as the data assimilation guys like to call it), and he would recognize it as a signal from me to shut things down.

I finished, it turns out, with only seconds to spare. As I sat there exhausted, gasping in breaths of fluid grayness, the correction began. All of a sudden about half of the yellow snowflakes floating around with me shot off to the east like bullets. One missed me by a couple of centimeters. In the distance, to the west, I could see a bunch of green ones coming my way fast. I quickly swam behind a huge blue snowflake to keep from getting hit.

Yes, I'd been right. The computer was about to choose the fraction of condensate to send hurtling to the Earth's surface, and before that could happen in my dream, the snowflake distributions in my dream had to be made even again. My little trick with the yellow and green snowflakes had caused the activity level in my dream to skyrocket, at least

momentarily. "I hope you notice this!" I found myself saying aloud. "Dammit, Corky, pay attention!"

Sadly, though, I got no sign from him. The simulation moved ahead as if nothing had happened. I watched with dread as the snowflakes near me coalesced into even larger snowflakes and the glass wall below me dissolved into nothing. This wasn't happening in the other parts of the eighteenth layer, at least not that I could see. Of all the bad luck, I'd found myself with the condensate that would be sent straight to the surface! In a panic, I tried to swim away, but the bigger snowflakes were harder to negotiate, and there were so many of them, and they were merging together so quickly, that before long I found myself imprisoned within walls of sharp ice. Any second now, the condensate structure would be released! If I wasn't crushed on impact with the land surface, I'd be stabbed many times over by ice shards. I would die a horrible, if virtual, death, one that might shut down my mind for who knows how long.

And that's when I saw the first black smear rush across my line of sight. The deep, inky smear, which was filled with little dots of bright white light, obliterated my view of anything behind it. Soon another smear came, and then another. They kept coming, each one blocking out more of my field of view. Before long the snowflake prison was entirely blacked out; I could see nothing but blackness all around me, blackness speckled with bright white dots.

"Corky got my message!" I thought, relieved beyond belief. "They've turned off the simulation!" Still, I didn't know what was going on with all this blackness, and I wasn't completely sure that my new situation was an improvement. I watched with rapt interest as the dots began to multiply, growing in number until there were as many white dots as there were bits of black background. The white and black areas were pulsating now, pulsating rapidly. The effect was not unlike the 'snow' you see on a television set with no broadcast signal.

A ghost of an image started to form, and I strained to make it out. The straining, though, just about did me in. I was now overwhelmingly weak, on the verge of collapse. Parts of me pleaded to let myself go blank, to give in to the weakness.

I couldn't give in, though. The image was buried in there somewhere, and I had to find it. Some more dots came together. Yes... it was... an oval shape, lighter on top and on the sides. I strained some more. Something I recognized. No, someone I recognized. The aspect ratio was wonderfully familiar. Connie! Her face! I couldn't see her clearly. I couldn't even see her poorly, that's how bad the image was. I knew, though, that it was her.

I heard her voice. She was calling my name. I could barely hear her, though; she sounded like she was yelling to me from a couple of blocks away. What was going on here?! I searched for an answer but didn't come up with much. I could only think of one thing: when your dreams are being guided by Corky's electrodes, you apparently can't wake up in the normal way. No, the waking process becomes radically different.

Some waking process! I would hardly call it a success. I was fading fast. An unexpected consequence of the experiment was that now, almost every part of me wanted to jump into an abyss of nothingness, a place with no dreams, no senses, no thought, nothing.

The last tiny bit of me that was still holding on, though, knew that I was awake – sort of – and no longer within the moist convection dream. That last tiny bit used my last reserve of strength to gasp out a few choice words: “fractionation... isotope tracer... ice formation... not passive... affecting... model water...”

Yes, that was the last of my strength. When I used it, there was nothing left. I was gone.

-14-

Most of the light in the room came from buttons – glowing buttons of red, orange, and yellow. I realized with ecstatic relief that the colors were real, that they didn't represent some form of tracer mass. I was no longer in Bizarre Model World. I was back on Earth.

But how did I get in this room? I was lying flat on my back on a small bed, without a pillow. I moved my head, and, ignoring a sudden ache in my neck, I looked at the buttons more carefully. They were on instruments – medical instruments. So, this was a hospital room. And I was a patient.

I must have been unconscious when they brought me here. My brain must have been beyond sleep, 'switched off' in some complete way by Corky's experiment. As I considered this, a quiet snore sent my eyes to the right. Connie! Her clothes were rumpled, her hair was disheveled, and her body was curled up on the visitor chair in an astonishingly uncomfortable position. The poor woman...

My mind began to race. Suddenly, I remembered everything. The mission! Was it too late?

"Connie!" I whispered urgently. "Wake up!"

"Mmmrrmmph," she said. She opened her eyes. "What?... Mike! You're back!" She jumped out of her seat, as fast as anyone can jump when they've just been sleeping, and came to my side. She threw her arms around me and held me tight for several seconds, kissing my face quickly on the way down. Then she sat up. Her hand lay on my shoulder, and her eyes looked deeply into mine. "Thank God you're back!"

"What time is it?" I asked quickly.

She looked at her watch. "Four in the morning."

"Four in the morning," I repeated. "I've been out for about seven hours. What happened with the code? Did Fayed find the bug?"

She grinned. "Mike, you've been out for 31 hours! We couldn't wake you up."

"Thirty one hours!"

"You've been lying there comatose for what seems like forever! And yes, Fayed found the bug. You led us right to it. We got your message." She picked up some kind of medical monitoring device from the top of the bed. It had fallen off me somehow – maybe while I was still out. She shrugged and set it aside. "It was a subtle bug, one we never would have found in time without you. Fayed fixed the code right away and ran his simulations."

“And the war?”

“Postponed. The Otanians and Horvonians are looking at the results right now. The Otanian lake doesn’t appear to contribute that much to Horvonian precipitation, so apparently the Horvonians don’t have that much to worry about. There’s reason to believe the war can be averted entirely.”

I nodded. On the outside I was my usual calm, controlled self, but on the inside, the confetti was flying. Yes, this news was more than satisfactory.

...

A short while later I was in the passenger seat of Connie’s rental car, watching the wet, rainy streets sparkle like diamonds in the beams of our headlights and then glisten yellow, then red, then green below the stoplight at a corner outside the hospital. Needless to say, I was famished. We were driving to an all-night diner I knew about in town. I had it all planned out – I’d order two stacks of pancakes, a plateful of scrambled eggs, two sides of bacon, hash browns, coffee, and a tall glass of orange juice. I’d hold off on the blueberry muffin, though. I mean, I do have *some* control.

Yes, I was looking forward to breakfast. I was also looking forward to losing my hospital gown. Connie and I had just snuck out of my room, quietly stealing away to the stairwell while the overnight nurses were checking on other patients. Connie didn’t think the nurses would be too happy to see us leave, especially because my coma, if that’s what it was, had baffled the doctors at the hospital, enough to have them fly in some specialists for consultation. These specialists would be there first thing in the morning, which made it doubly imperative to get out right away.

I’ll admit I had trouble at first getting Connie to help me leave. She wanted me to stay and be examined, but I managed to convince her – finally – that no specialist would know anything at all about my Corky-induced condition, seeing that it had never existed before in the history of medicine. I’d be nothing more than a lab rat – again – and I’d had enough of that. I made that very clear. I didn’t even mind running out of the hospital half naked to get away.

So, carefully, surreptitiously, we made our way to her car. Being in a hurry, we didn’t stop to open the trunk and get out the spare change of clothes Connie had packed for me. I’d have to get them later, at the diner. “How would you feel,” I said, looking over at her as we drove, “if I took off this gown right now?”

Connie grinned. “Maybe I wouldn’t be able to take my eyes off you. Maybe we’d crash!”

“Not a good idea then?”

“Well... not now.”

“Okay.” The rain beat steadily down on the windows as we stopped at another light. I was thinking again about the whole Otan-Horvonnia situation. I still had some questions. “How did you find out about the war being postponed?” I asked. “Did you talk to the Secretary of State herself?”

Connie suddenly looked uncomfortable. She hesitated before speaking, pursing her lips a little and furrowing her brow, and when she did speak, she seemed to choose her words carefully. “Yes, I did. She... um... came over to the hospital last night.”

“She did?” I was, of course, stunned. Boulder was not exactly on the Secretary’s way home from work. “So she’ll probably want to talk to me today,” I said. “I don’t know, Connie, but that woman has some kind of...”

“You won’t need to talk to her, Mike. She’s already left town.”

“What? She has?”

Connie was now looking more embarrassed than I’d ever seen her look before. The light turned green, and we moved forward. She focused for a while on fine-tuning the wiper speed. I waited patiently. Finally she spoke. “The Secretary and I had a little... um... discussion, and she finally agreed that it would be in her best interest not to be around when you awoke.”

This sounded interesting – very interesting. “Discussion? What did you say to her?”

“Nothing of importance,” Connie said quickly. She changed the subject. “You actually had several visitors. My brother, of course. Several people from NCAR, including Fayed, who came twice. Capp Jackson stopped by. Alf from back home called you on your cell, and I answered it. He told me that he hoped you came back to life real soon and that I should hang in there and not worry too much. He’s a good guy.”

“I know.”

“He must have told Jake Kelly what happened, because Jake called me later. Jake tried to cheer me up too. He told me that if you were playing five card stud with the Grim Reaper, and the Reaper had 3 sevens showing, and you needed a seven on the last card to complete an inside straight, you’d bet it all and get the seven, and the Grim Reaper would go home broke, alone, and mad. Because that’s the kind of impossibly lucky bastard you are.”

I nodded and grinned. “Sounds like Jake!”

We drove a little more. “And how about you, Connie? Were you in the room pretty much the whole time?”



“Pretty much.”

“Sorry I woke you. You probably slept terribly in that chair.”

She shrugged. “I’m all right.”

“Actually,” I continued, “I’m surprised they let you stay overnight.”

“Yeah, well, I told them I was your wife.”

“My wife...” I thought about that. I was suddenly struck by something amazing, something totally unexpected. For the first time in my life, the concept of having a wife didn’t seem foreign to me, didn’t seem like something to be avoided at all costs. It even seemed like something to be pursued. I wondered what the hell was going on. “Is Connie that special?” I asked myself. “Or is this an after-effect of Corky’s experiment, an after-effect that will wear away with time?” I shrugged inwardly. Time would tell. “Oh, hell,” I said to myself a moment later. “Who are you kidding? You know the answer.”

“So, Connie,” I said aloud. “Time to spill it! What exactly happened between you and the Secretary of State?”

“Mike, do you want your pants back?”

“Huh?”

“Do you want your pants back, or do you want me to let you out right here, so that you can walk to your diner or your hotel in that gown, showing off your butt to all of Boulder?”

I pretended to think about it. “I guess I want my pants back,” I said.

“Then I suggest we talk about something else.”

I reluctantly dropped the subject.

...

The next day, on the way to the airport, we stopped at NCAR to say goodbye to Fayed. Connie and I sat across from him in his office. “Are you still planning on giving it all up here and going into carpentry?” I asked.

Fayed laughed, something I never thought I’d see him do. “No,” he said. “The evil is gone. Now I can do science!”

I shook my head. “No, Fayed,” I said. “The evil is not gone. It will never be gone. There will always be some bureaucrat somewhere who will have nothing better to do than waste your time with senseless busywork. It can’t be helped. But, in your case, the evil is now greatly reduced and totally uncoordinated. That’ll have to be enough.”

Fayed grinned. “It will be,” he said. “Take today. I get to spend six hours analyzing output – real work! Thanks for all you’ve done.”

I waved it away. “All part of the job,” I said.

We were silent for a moment. “Where are you guys going now?” Fayed asked.

Connie spoke up. “As a reward for a successful mission, the State Department is flying us in a private government jet anywhere in the world we want to go!”

“Excellent!” Fayed said. “And where will that be?”

“Well,” I said. “I thought we’d start from wherever Connie’s brother is. From there we’d travel 180 degrees along a great circle.”

“We’re going to Tahiti,” Connie said, giving me a patient look as she corrected me. “My brother will be out of commission for a while anyway. Mike’s coma came as a complete surprise to him, and he has no idea yet how to solve that problem. It could take him months, maybe years, to figure it out.”

“And when he does have an idea,” I added, “he won’t be testing it on me.”

“Fair enough,” Connie admitted.

“And what kind of Earth science crimes will you be solving in Tahiti?” Fayed asked.

It was a joke; his eyes told me that much. Even so, my mind reeled at the idea. I quickly thought about all I’d faced during the last week: the murderous Lefkowitz and his laptops and reprints of death, the just-as-murderous – and insane – Marta and her almost-successful bid to take over NCAR, and, of course, the giant, sharp, multi-colored snowflakes. This may not have been the most intense week I ever faced. The most intense week may have been when I infiltrated a group of terrorists who were building a string of desalinization plants along the coast of Greenland in an attempt to modify the Earth’s thermohaline circulation. (An exciting story, for another time.) Still, what happened this week was more than enough. I needed a break. A long break.

“No,” I said to Fayed. “No cases. When we get to Tahiti, I’m going to concentrate on six things, and six things only: sun, sand, surf, food, beer, and Connie.”

“In that order?” Connie asked.

“No,” I said. “Decidedly not in that order.”

– The End –

