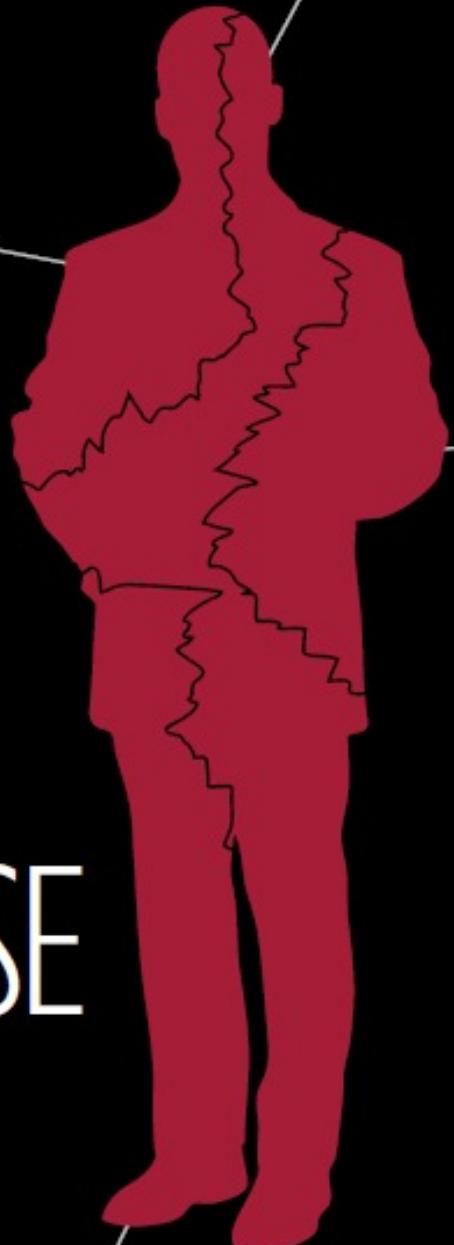


STEPHEN D. SENTURIA

ONE  
MAN'S  
PURPOSE  
A NOVEL



# One Man's Purpose

A Novel

Stephen D. Senturia



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## Author's Preface

Readers familiar with Cambridge, Massachusetts, may recognize the Cambridge Technology Institute as a thinly disguised version of the Massachusetts Institute of Technology. Indeed, the CTI of *One Man's Purpose* shares a location and a number of physical features (as well as a few organizational ones) with the real MIT, the place where 'you are what you do,' and where I parked my hat for thirty-six happy years as a member of the faculty. I owe an enormous debt to the hundreds of faculty colleagues, the thousands of students, and the many members of the staff and administration with and among whom I was honored to ply my craft as a teacher. But that's where it ends. CTI and the people who work therein are fictional. I can be a bit rough on CTI and on some of its minions, but that doesn't mean I bear corresponding animus toward MIT. And while faculty members everywhere share the stresses of work *versus* family in the midst of professional overload, the agony of tenure and promotion, and the often acrimonious debates over educational policy and practice, the story-teller must make these stresses concrete; hence, CTI.

Similarly, Bottlesworth College in the town of Brimfield Junction, Maine, is a fiction, bearing only the most superficial resemblance to Bowdoin College, and even the Harvard in these pages has had some minor surgery, but without a change of name because Harvard just is.

Some of the names, events, book titles, and dates are historical or, like DARPA's contracting procedures, have been plausibly modified in service to the story. Most, however, are made up. For example, the Metropolitan Opera in New York might not actually have presented *Siegfried* on one particular Friday night to be followed the next day by

a matinee production of *Cosi fan tutte*. On the other hand, the theft of nominally secure information followed by posting on the internet is now an everyday occurrence, so it is only a matter of time before the confidential letters collected as part of a university tenure decision become compromised. Perhaps by the time you have read this book, it will already have happened somewhere.

Stephen D. Senturia

# One Man's Purpose

Part I: Spring Term, 2013

## \* 1 \*

The thermometer said her body was ready. The doctor said her body was ready. But was Martin ready? Really ready? He had been so nervous last time. Overly solicitous, almost patronizing, acting the role of doting husband instead of being one. And she could smell his relief after the miscarriage. Was he really ready to try again?

She could understand his nervousness. She, after all, had been plenty nervous before JJ was born. But George had taken such obvious delight in her changing shape, in JJ's first kick, so gentle and loving, coming home early from work, massaging her feet. She blushed as she remembered the making of JJ. It wasn't planned, like this, with an early-morning basal temperature test. No, it was spontaneous and joyful, and thoroughly orgasmic for both of them.

Jenny looked over at her husband, still asleep, just as the sun crawled up to start its final January traverse, spilling a cloud-filtered dawn onto the putty-colored house Martin had bought during his fourth year on the faculty and which, now that he had made Full Professor, they could afford to move out of. But Martin liked living near Harvard. He would even do without off-street parking and only one car in order to live near Harvard.

The two-story house had an attic gable facing the street, a pair of bay windows, and two snow shovels on the tiny front porch. Within, the furnishings told a story of displacement — the displacement of Martin's taste for simple clean lines and off-white walls by Jenny's preference for the elegance of eighteenth- and nineteenth-century furniture, or, in deference to budgetary realities, well-done replicas, all tempered with softer wall colorings and textured papers. It was still a

work in progress, this displacement. The kitchen, for example, remodeled by Martin using his tenure raise, still had its black-front appliances, Shaker-style cabinets and faintly pink granite countertops. But when Jenny wanted to replace Martin's Danish-modern teak dining set with a beautifully rebuilt and restored Queen Anne oak table and matching replica chairs, the teak dining set got Craigslisted away. They compromised on the living room: the furniture could be styled to Jenny's taste, but it had to be light enough to be moved out of the way when Martin had one of his chamber-music sessions.

Upstairs were three bedrooms. In the largest, the one with the two faux-Chippendale bureaus, tousle-headed Jenny lay nestled up against Martin's thigh, wondering. She had tried to warn him off by saying she wanted another child, but instead of running the other way — what she had both expected and dreaded — he had grinned and said, "A child? Great! So how soon can we get married?" And when Dr. Rosen said it was now safe to try again, Martin had said, "By all means, let's." She took a deep breath, smiled at his angular face with that shock of brown hair flopping over his eyes, and started shaking his shoulder. "Martin, love. It's up two tenths. Wake up. Two tenths."

Martin opened one bleary eye. "Wha? What time is it?"

"Six-thirty. C'mon. Wake up. It's up two tenths. I need your pearly essence. C'mon, love. Up, up, up."

Martin groaned. "Christ a'mighty!" He stifled a huge yawn. "Okay. I'm awake."

Jenny rolled over, put her head on his shoulder and reached under the covers to massage the appendage that held their future, if not in its hands, then perhaps in the little jewel sack it always carried around. She cooed, "C'mon, Jean-Pierre. Wake up. Wake up so Martin can be a daddy. JJ needs a little sister."

"Sister? You've chosen a sister?"

Jenny laughed. "Or brother. I'll take either one."

Martin closed his eyes and imagined Jenny as Salome, dressed in seven gauzy veils, then six, then five... Jenny, not being particularly

gauzy, but nevertheless having thus aroused Jean-Pierre many times in her quest for motherhood, felt his response. "C'mon Martin. You're doing fine. Keep it up."

He chuckled. "Jesus, Jenny! Get it up. Keep it up. There's just gotta be a better way."

She giggled. "This is the natural way, you goofus. And you're almost ready. Me on top?"

"Please."

She mounted him, guiding his tumescence where it needed to go, and with her well-schooled motions gradually brought Martin to deposit his little DNA-carriers deep inside her, hoping that maybe, this time, maybe...

After a short snuggle, Martin rolled out of bed, pulling on his ragged sweat pants, his swamp-smelling sneakers and the treasured *Pocari Sweat* T-shirt he bought during his 2010 trip to Japan. He descended to the basement to do his three miles of treadmill and ten minutes of weight lifting on the home gym.

Jenny lay still for a while longer so that Martin's little gene bundles would not be expelled by gravity. She imagined this swarm of micro-guppies following some mysterious emanation that would guide them to her cervical opening, swimming up the path of life in a race for the egg her thermometer told her was on its fallopian journey toward a gametic rendezvous. In a country where the son of a Kenyan goatherd had been elected president, now for a second term, Jenny felt that whichever one of Martin's sperm won the race would create an embryo of great potential. Maybe this time it would take proper hold in her uterus and turn into a baby.

Enjoying that thought, she edged herself out of bed, took a shower and began dressing. She picked out a brown and tan tweed skirt, a tailored white blouse with a round collar, a pale green cardigan that was loose enough to keep her shapely bosom hidden from her blue-stockinged clients, cream-colored panty hose, brown flat-heeled shoes, and an amber bead necklace and matching earrings.

By the time Jenny put Martin's plate of scrambled eggs and toast on the kitchen table and poured juice and coffee, he was on the way into the kitchen, sweaty and hungry.

"I'm sorry I had to wake you like that. I know you hate it. Good workout?"

"Good enough, considering. My headphones are just about shot. They make Pavarotti sound old and creaky, and that's sacrilege." Martin took a big bite of toast, and started talking through the mouthful. "And I don't actually hate those pre-dawn awakenings. But, y'know what I miss?" swallowing the toast, and taking a swig of juice. "Slow cuddly fucks. Nibble-your-boobs fucks. Kiss-your-sweet-pussy fucks."

Jenny blushed and replied, "Shush. JJ will hear you. And, yeah, I know, it's not all that exciting. But you come to bed so late. We used to really enjoy..."

Martin cut her off. "Speaking of timing, I have to edit a thesis this afternoon and might be a little late getting home. How 'bout I call you this afternoon with an ETA for dinner?"

Jenny frowned. "What's a little late mean? Oh, never mind. Just don't forget to call. I'll manage." She plunked her dishes in the sink and went upstairs to wake JJ and get him ready for the Montessori pre-school near the Belmont line. Martin, oblivious to Jenny's dish plunk, skimmed the *Globe* sports section, noting that the Celtics' point guard had turned up with a strained hamstring, but the Celts had won anyway. He finished eating and went upstairs to shower just as Jenny was starting downstairs with JJ, a tow-headed energy quantum, blue-eyed like Jenny with bright-red chubby cheeks.

Martin was a careful dresser. He had an image to maintain, positioning himself between the scruffiness of his grad students and the overly suited and necktied Department Heads, Deans, and other wastrels, all the while still being presentable enough not to embarrass the surprise visitor from Japan or Taiwan who might appear at his office door on any given day, requesting fifteen minutes of his precious time. It was almost a uniform: slacks, a shirt of an appropriate pattern and color vis

*a vis* the slacks, sometimes a tie but mostly not, a blue blazer or tweed sport coat, and loafers, except when the weather required boots. By the time he got downstairs, Jenny and JJ had gone.

With a serious chill in the air and the threat of what the TV weatherman loved to call a ‘wintry mix,’ Martin opted for boots, his navy blue L.L. Bean down coat, the small green knapsack he used as a briefcase and a black and yellow wool cap that Jenny had knitted. The cap made him look like a Bruins fan, not a bad thing when one lives just a block from Somerville. Suitably swathed, he went out the front door and was surprised to see a robin foraging in his patch of yard. “Don’t you know it’s still winter?” asked Martin. The robin looked up, tilted its head, and resumed its hop-and-peck search for food.

Martin took the longer path to his office, cutting across the Divinity School, past Mem Hall and through the Harvard Yard to Massachusetts Avenue, where he turned left toward the Cambridge Technology Institute. His path would vary from day to day, but he usually managed to traverse at least a corner of the Harvard campus. It connected his present to his past, a soupçon of coherence and calm before the stresses of his typical day. The ebb and flow of classes, exams, and undergraduate advising was one thing — what one might expect in a professor’s life — but what made him work his hardest was the endless cycle of supervising his graduate students’ research, reporting the results at conferences, and writing new grant proposals to fund the next set of students. Martin had long ago given up figuring out which was the chicken, the pullet, or the egg in this cycle, but in spite of its many irritations, he was an expert at managing it.

Jenny would ask him, now that he was tenured and a Full Professor, why he continued to labor so mightily in this arena, especially since he repeatedly told her that he was getting tired of having to produce new and revolutionary ideas to justify the next round of grants. He had no crisp answer. How do you find the words to justify your addiction to the perks that flow from a high position in the professional pecking order, the invitations to give plenary talks at conferences, appointments to

journal editorial boards, requests for consulting services, even (once) testimony before a congressional committee? His twelve-person group was generally considered among the two or three best in the world at modifying the surfaces of semiconductors to give them special and highly desirable electrical or optical properties. But Martin knew, deep down, that his group's actual rank was number one. Like making first-string center forward with the whole world as cheerleaders.

Ego-stroking by colleagues notwithstanding, Martin's deepest passion was for teaching. He thought of himself, first and foremost, as a teacher and a teacher of teachers. If he could only set aside enough time to write, he knew that his planned book on the essential role of live conversation in education, now just a glimmer within his busy brain, would be a wake-up call to all those zanies who think that massive online education is the wave of the future.

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Massachusetts Avenue is the backbone of the skeleton of Cambridge, but only the tourists ever use its full name. Over the years, development along Mass Ave has resulted in fewer Irish bars, more coffee bars, some box-like apartment and office buildings, gradual encroachment by retail chains, and a jumble of low-cost ethnic restaurants in Central Square, a major intersection a bit more than half way to CTI: a frenetic mix of rich and poor, Irish and Italian and African and Caribbean, sober and not. As Martin walked this well-trod path, his thoughts floated back to his morning with Jenny and how predictable and forced their sex life had become.

He recalled their first time, after a lovely dinner in Jenny's condo, with JJ put to bed and asleep. Jenny had taken the lead. She insisted on undressing him with the lights on so she could see and feel and smell that he wasn't George, and then she held her arms out and said it was his turn to undress her, which, with shaking hands, he did. The effect was volcanic. Not only was Jenny bold like that, she was totally comfortable with her body and could say exactly what she wanted — touch

me here, kiss me there — something that Martin had always struggled with. Was the sex in other marriages like his? He had never talked about such things — not with Sumner, not with Horatio, nor with anyone else. With a four-year-old child in the house, sex was necessarily different. But consciously trying to conceive another child? On demand stud service? That's really different.

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Martin reached the edge of the campus and turned toward the chunky concrete box that was the Semiconductor Technology Lab. He took the stairs to the fifth floor, greeted Felice, his assistant, already at work in the outer office, and entered his private sanctum.

Firing up his email, he noticed cc's of several messages between Miles Callaghan, the Editor-in-Chief of *The Journal of Semiconductor Materials Technology*, and Wolfgang Schultz, an author, whose paper Martin, as one of the four Associate Editors of *JSMT*, had rejected four days earlier. The gist of it was that, according to Schultz, Martin had completely misunderstood not only the paper but also the referee comments and therefore had wrongly rejected the paper. Callaghan's view was that Martin was in charge and he would get involved only after Martin sent the paper out for a new set of reviews, which, via cc, he was asking Martin to do. Martin silently cursed the pair of them, acknowledged to both via email that he would pursue a new set of reviews and opened the pdf of the paper to think about what to do.

He thought about Phelps at Purdue, someone he disliked but whose reviews were usually prompt and more or less thoughtful. To find another, he examined the reference list in the paper, picking out S. J. Chang, co-author on the key reference. This would be something of a gamble since Martin knew nothing about him. He called, "Can you come in for a minute?"

Felice Albright, thirty-something, coal black and seriously overweight, with corn-rowed hair surrounding a broad and usually-smiling face, came in and took a seat on the little pumpkin-colored sofa, pad

in hand. A native of Sierra Leone and a graduate of UMass-Boston in communications, she had worked at CTI for three years and as Martin's assistant for the past two. Her work was accurate and her manner friendly. Martin knew almost nothing about her life outside CTI, other than that she lived with her mother and a seven-year old daughter near Central Square.

"We've got to send the Schultz manuscript out for new reviews. A clean re-review. No copies of the two we already have. I've selected Arthur Phelps at Purdue and a new guy, S. J. Chang. He is co-author on reference seven, and you might have to do some web-searching to track him down. Before you send it out though, let me check his web page to see if he's appropriate. Okay?"

Felice smiled as she wrote notes. "You don't know his organization?" she asked, with an imprint of her West-African heritage in her speech.

"Not sure, but I think he's the Chang in Materials Science at Texas A&M. Try there first."

"I'll try to have this before you get back from lunch," she said as she rose to leave. "Oh yes, one more thing. Your calendar was clear, so Peter moved today's squash game to eleven."

- - -

Peter Dempsey, ten years Martin's senior and an expert in transistor physics, had been playing squash since his prep school days at Groton. Thirty pounds overweight, paunchy and turning gray, Peter was court savvy. In spite of his paunch, he could move with catlike speed in the short bursts needed within the confines of the court, and because of his paunch, he was impossible to dislodge from the T, the strategic central position. Peter had introduced Martin to the game. It took about six months for Martin's athletic skills to catch hold, but he was now able to provide good competition for his more experienced partner.

Today's match followed the typical pattern. Martin would clobber the ball and Peter would find a way to return it. Martin managed to win the first game in a tie-breaker, but Peter won each of the last two by

a handful of points. As they headed to the locker room, panting and sweaty, Martin asked, “What are you teaching this term?”

“The grad device physics,” wheezed Peter. “And you? Doing the usual Broadway show?”

“If you mean C&E, then yes.” Martin reached his locker and began stripping.

“We need natural actors like you on the faculty,” said Peter as he and Martin went for their showers. “Most of us are boring. If I was teaching C&E, the lecture hall would be empty after two weeks. But you seem to keep ‘em coming. How do you do it?”

“It’s not acting, you asshole. It’s teaching. I engage their brains.”

“Sure, sure, teaching. But you can tell me the truth — you get off when those freshman girls fall in love with you, don’t you?”

“Jesus, Peter! Is sex all you ever think about?”

“No,” Peter chuckled. “Sometimes I work.”

“Very funny. Speaking of work, did you send me your DARPA stuff?”

“The dreck is in the mail,” said Peter, as they finished their showers. They dried off and dressed in silence, and Peter went off to the campus bookstore.

Martin decided to grab lunch in the student center. The rigors of the squash match entitled him to pizza, two slices with pepperoni and onions. He went to a table in the corner of the noisy dining room, wiping off some spilled soda with a handful of napkins before he sat down. Two bites into the first slice he found himself pondering the sting of Peter’s teasing. Freshman girls? Bullshit. It was much deeper than that. When Eddie Cranshaw had his heart attack, he had volunteered to take over the huge Circuits and Electronics class even though he didn’t yet have tenure. Once he took it over, enrollment steadily increased and was now up by thirty percent, all from out-of-department students choosing to study with him. And they weren’t just freshman girls, goddam it.

“Can I share the table?” Martin looked up to see a familiar face, but he blanked on the name.

"Sure. Have a seat," said Martin, eyeing his slight, owlish, wispy-haired companion.

"Is that Martin? Martin Quint? Hi, I'm Julian Kesselbaum." He extended a hand.

"Oh, yes. Hi," shaking hands, but still confused. "Sorry, but I didn't expect to see you on campus. Out of context, I guess."

"But I'm here quite a lot these days. IT security department. I help them out when they have problems."

"So you're still in Cambridge?"

"Oh, yes. I run a blog and do some consulting, and, of course, lots of teaching. Different places around town. I'm giving a seminar here, today, for administrative staff, on safe use of the internet."

"Well," said Martin, "I'm sorry about the tenure. I thought you did a great job for us."

"The truth is," said Julian, chuckling. "I'm not a research type. At least not the kind of research you can publish. Internet security, bugs and viruses and all that, is a tough field for academics. I mean, the weakest link in any network is the people who use it. Try publishing that in a journal. Most people will fall for a well-designed Trojan horse. Anyway, I heard that Ken Fitzgerald is headed to Washington. Doesn't this affect you?"

"Yeah, I just heard, but I'm not a candidate for lab director, so I don't think it will change my life all that much."

"You never know," said Julian, a remark that puzzled Martin. Did Julian know something?

Martin finished his lunch, said a brief goodbye, and walked toward his office, wondering why that odd duck would have chosen to sit with him, or with anybody, for that matter.

## \* 2 \*

Before Martin could get to his thesis reading, he had to run his kickoff C&E staff meeting: four faculty colleagues who each taught two sections, eight Teaching Assistants and four undergraduate homework graders. With practiced efficiency, he got everyone introduced to everyone else, assigned each to their sections, primed them for his first lecture, Tuesday at eleven, described the subjects to be covered by the faculty in the first set of Wednesday sections, and announced the time for the weekly staff meeting, noon on Thursdays, following lecture. Meeting adjourned.

On returning to his office, he learned from Felice that S. J. Chang was an Assistant Professor of Materials Science at the University of Minnesota with a short but highly relevant publication list. Decision made. Send him the Schultz manuscript for review. Finally, he turned to the business at hand: what Martin referred to as the Wojtowicz Catastrophe, or the WC.

It was a gnarly source of irritation that Martin's American-educated students often wrote less well than his foreign students. Khalil, for example, his Algerian post-doc, wrote flawless English. Kevin Wojtowicz, on the other hand, born and bred in the good old U. S. of A., sputtered and flubbered through even the most elementary exposition. With Wojtowicz now on draft number four of his PhD, Martin was reasonably convinced that the science part was finally okay, but awkward sentence structures and grammatical hiccups persisted. He wished there was the equivalent of a spell checker for general writing, sort of a Hemingway button: simple declarative sentences with no extra words would survive; everything else would be erased. He also

wished his students knew how much of their professional lives would be spent writing English. Perhaps, then, they would work harder at it. But in this age of computer literacy and language illiteracy, it felt like a losing battle. The thesis defense was already scheduled for the end of March, and here he was still correcting English. Phooey.

By four o'clock, with forty pages to go, he was Wojtowicz-saturated. A wet sloppy snow had started. Not delighted at the prospect of either walking through ankle-deep slush or giving in and taking the Number One Bus up Mass Ave, he extracted the waterproof knapsack cover, custom-made for him by the lady who did repairs at Eastern Mountain Sports, zipped it over the backpack and stuffed his iPad and the WC inside. Then he picked up the phone to call Jenny.

- - -

The walking wasn't too bad. As he picked his way north, Martin's thoughts drifted once again to Peter's teasing, which, he admitted, had struck a nerve. His sister used to taunt him the same way when she was feeling pissy.

"You're nothing but a big phony," Helen would scream, with the self-righteousness only a fourteen-year-old girl can muster. "You just want to play first string so the girls'll fall all over you. If you really loved soccer, you wouldn't care what position, you would just play. You'd play for the sake of the team. But no. You gotta be first. Alla time first. Dad's wrong. It's not that you're a jock, it's that you're a stuck-up phony."

Martin, driven to fury by the taunting and nearly eight inches taller and fifty pounds heavier than his sister, could have done real physical damage had he wanted to. Instead, he would suddenly grab her in his arms, and hug and tickle her until her taunts became laughter. But it was true. He did want to be first — at everything. When Sumner got him to try out for crew in college, Martin couldn't take the rah-rah, the all-for-one and one-for-all crap. He quit the freshman crew and rowed singles to satisfy his Phys Ed requirement. Peter's taunt, too, was on target. He did enjoy the fact that the freshmen girls fell in love with

him. Was that so unusual? Was it preventable? Was it wrong? And it wasn't just freshmen. He had more female graduate students than most of his colleagues, and some of them clearly had crushes on him. What's wrong with that? Women students need good mentors. It's not like he fucked them or anything.

- - -

By the time Martin reached home, it was dark and the slushy snow was turning to snowy snow. He opened the front door, dropped his dripping backpack inside, called out a "Halloo" to Jenny and ducked back outside, where he grabbed one of the shovels from the front porch.

Shoveling snow gave Martin a lot of satisfaction. There was the pragmatic fact that if he got it out of the way before it froze, life would be better for him, for his neighbors and for the mailman, but it was mostly that he liked the feeling in the muscles of his back, arms, and legs when he was shoveling, hoisting, and tossing. No matter how much he worked out on his home gym, something real like snow shoveling was energizing, both physically and mentally.

With the walks temporarily cleared and the street side of his car shoveled out (unless, of course, the Cambridge Snow Plow, a rarely seen object, showed up to plow it back in), Martin was satisfied and nicely sweaty. As he entered the house, JJ pounced. "Daddy, Daddy," grabbing Martin's legs. "You got home early. Read me a story tonight? For bedtime?"

Martin chuckled. "Sure, bud. Give me a minute to get my wet stuff off. Of course I'll read you a story. Which one?"

"*Wild Things. Wild Things.* Rumpus, rumpus." And he ran off shouting, "Mommy, Mommy. Daddy's home. Daddy's home!"

Martin took a quick shower before joining Jenny and JJ at the kitchen table. Getting home in time to share a midweek meal with his now-adopted son had become a rarity. JJ had already started fistling ketchup-slathered hotdog slices into his mouth.

Martin was hungry, and he dug into the food while Jenny reported

on her day. "I landed a new client today. Very exciting. Big job. Total re-do — furnishings, wall-coverings, the works."

"Very cool," mumbled Martin with a full mouth, as he wiped ketchup smears from JJ's face. "Do you like these folks?"

"They're really nice. Husband is an investment banker downtown. Says he knows Sumner, by the way. And she is, as she put it, a philanthropist. Serves on boards. Writes checks. That kind of thing. But not snoozy at all. The house is on Berkeley Place, that little cul-de-sac off Berkeley Street. Late 1880s, I think."

"Do they know what they want?"

"We'll just have to see," said Jenny, putting some melon on JJ's plate. "The schedule for the planning phase is pretty tight. And she mentioned a trip to New York to look for antiques. With me, I mean. Budget is apparently not an issue."

"Whoa," said Martin. "Budget not an issue? Must have made you drool."

"Oh stop it, silly. I'm sure there's a budget. So, anyway..."

"But you haven't seen it?"

"Not yet. She told me not to worry about that now. Anyway, are you ready to start the new term?"

"Yeah. Staff meeting went well. All set." Martin, a fast eater, got up to clear his plate and noticed that JJ had already gobbled his melon. "Hey, little guy. How about a bath and a story?"

- - -

JJ was in one of his cooperative moods and went smoothly and quietly to bed. Closing the door to JJ's room, he went downstairs to do his thirty minutes on the piano, tonight practicing a trio by Menotti that he, Sumner and Vladimir were learning. He then extracted the WC from the now dry backpack and took it to the third bedroom, their shared study, crammed with two small side-by-side desks, an easy chair and a small sleep-sofa, all arranged with a precision and functionality that only an engineer married to an interior designer could devise.

Jenny was at her computer, working on CAD drawings. “Is this for the new project?” asked Martin.

“Yeah,” she said, not looking up. “I need rough layouts in time for a meeting next Tuesday.”

Martin went to his desk and found a yellow card on the seat of his desk chair. “What’s this?” he asked, turning to face Jenny.

Jenny pushed her keyboard back on the desk and swiveled in Martin’s direction. “I want to try something. A signal.”

“A signal?”

“Think of it as a yellow traffic light, a caution. I don’t want to fight. I just want you to pay attention. One of the things I love about you is that we can usually talk through things. But we’ve both so busy lately that we miss the chance, and then things get bottled up or we end up snapping at each other. I want a signal so you will talk with me without feeling attacked. Does that make sense?”

“I actually like the idea. I never want to fight with you. But what did I do to earn a yellow card?”

“This morning. You complained about our sex life. Okay, I understand that. I really am a noodge about getting pregnant, and it does interfere. I miss those nice sexy times too, those whatcha-call-it fucks. But when I started to talk about it, you changed the subject, and not to something nice. You just dumped ‘might be a little late’ on me. Now I already do all of the chauffeuring, most of the shopping, and most of the cooking. The least you could do is be considerate about my schedule for a change, and not just assume that your schedule trumps everything. I’ve got my own work to do, not just as maid and nanny.”

“Yeah, I guess I was a bit abrupt. You’re right. I’m sorry.” He held up the WC. “This goddam thesis, well, the kid just can’t write, and it’s bogging me down just when I need to be working on the new DARPA grant.”

“Okay, but you’re not the only one. I need to make a completely new set of drawings by Tuesday, all between cooking and chauffeuring and spending some decent time with our son. It’s not a question

of who has the most work to do or the most important work, it's about awareness of each other's feelings. You've gotten sloppy, my love, and it's best if you hear it direct from me when it happens. I hate fights. But I hate being dumped on, too."

Martin stared at the floor. "Okay. You're right. This is much better than fighting." He took a deep breath followed by a poofy exhale, then looked up at Jenny. "Yes, you're right. I earned a yellow card today, and I deserved it." And with a puckish smile, he added, "But it takes two yellows to be disqualified, and I'm going to be a pussycat from now on."

"You are such a goofus!" giggled Jenny. "I was thinking of traffic signals, but okay, if you understand yellow cards from soccer, so be it. It's sort of cute. And now I've got to work on these drawings."

Jenny turned back to her computer. Martin moved over to the easy chair, adjusted the reading lamp, and opened the WC.

After almost an hour, Jenny got up from her desk. "That's it for tonight. I'm heading for bed." She cocked her head to one side. "I'm not sure if you're, shall we say, up for it, but I would be happy to accept your donation tonight and then I wouldn't wake you so early in the morning."

Martin, expressionless, looked toward his wife, wondering. "I'll join you soon." Jenny smiled and left the room.

Martin pressed ahead to finish the final Wojtowicz pages, got up from his desk, turned out the study lights, and went into the hall. He could hear that Jenny was in the shower, a very different and familiar kind of signal. In spite of having already showered, he stripped quickly and joined her just as she had finished rinsing. As soon as he got wet, she grabbed the soap and started washing him, from his shoulders, down his back, then carefully, gently, in the crack between his butt cheeks. Turning him around, she soaped his arms and armpits, chest, and stomach and, finally, his now rampant erection. "My boobs want a nibble," she said, as she got out of the shower.

Martin shot back, "And your sweet pussy?"

"That too. Finish up and come to bed."

## \* 3 \*

Tuesday. With Jenny's ovulation window now passed, Martin was not called to stud service at six-thirty. He was, nevertheless, roused by Jenny shortly before seven because it had snowed six inches overnight and, thanks to what the locals call the Montreal Express, the temperature was heading down into the teens by mid-morning. Jenny needed the car liberated before the salty street slush turned to ice.

The Cambridge Snow Plow had made an appearance during the night, and it took a full thirty minutes for Martin to deal with the impacted car, all the while wondering how that poor robin was doing. Knowing he wouldn't be walking to CTI today, Martin indulged himself with an extra twenty minutes of the *Globe* and the *Times*, after which he selected a white shirt, regimental-striped tie, and blue blazer to honor his first class. Bundled up and with eyes on guard for icy sidewalks, he minced his way over to Mass Ave to pick up the Number One Bus. The snowy conditions reduced traffic to a crawl, so he arrived at CTI with only an hour to spare before his lecture.

He found an email from Rebecca in Department Headquarters asking him to drop by at 3 PM, no explanation offered. Professor Wong needed to see him. After confirming that he would see Wong at three, Martin used what was left of his free hour trying to assemble the first complete draft of a preliminary grant proposal, called a White Paper, for a huge seven-investigator program on advanced semiconductor materials. DARPA was going to create two such centers this year, and with five million dollars on the line, the competition would be fierce. In addition to his own group (CTI, Purdue and Berkeley), there were teams from Stanford-UCLA-Cal Tech, Michigan-Cornell-Georgia

Tech, Penn State-Columbia-Maryland-Illinois, and maybe one involving several of the University of Texas campuses. The White Paper was due at DARPA on Friday of the following week, and it still needed a lot of work. Three of his collaborators were late with their revised submissions, so Martin had to send nagging emails and work around the gaps. Then he went to class. At least this part of his day would be fun.

Martin entered the lecture amphitheater at eleven sharp, pleased that several of his TAs were already clearing the white boards. He scanned the room to find and nod to each of his four section instructors, put his one sheet of notes on the lectern — not notes really, just a few bullet points — and looked around at more than two hundred fifty eager faces. Well, maybe only ninety were all that eager. The rest were computer science students who had to take C&E as part of their core requirements. To Martin, computers were a bunch of high-speed electronic switching circuits. It was the moral duty of anyone who worked with computers to be curious about that, or at least to know something about it. After quieting the crowd and introducing himself, the section instructors and the eight TAs, and outlining what was expected in terms of homework sets, laboratory exercises and exams, Martin began his lecture.

“You are all about to embark on the study of engineering, so it’s reasonable to ask: what is engineering? My answer is both simple and complex. The words are simple: engineering is the purposeful use of scientific knowledge.” He paused to let that sink in, then wrote the word ‘PURPOSEFUL’ on the board in large caps and underlined it twice. “The problem, and it is a real problem for each and every one of you,” as he glanced almost menacingly around the room, “the problem is that one man’s purpose, or one woman’s purpose, can be another person’s anathema. Consider drilling for natural gas by the method known as fracking. To those worried about running out of fossil fuels, fracking has been more than a blessing, it has been a boon. To those worried about the environment, it is the devil incarnate, polluting the water table and risking earthquakes, all for the sake of some profit-hungry oil

company.” Martin paused to scan the room, now dead silent.

“Society needs to debate these issues. Each of you, as a member of our society, must come to your own decision about what is purposeful and what is not. It is your moral duty as a citizen and as a human being. But, even more, as engineers you will be equipped with a power that ordinary citizens won’t have. You will have the tools to imagine, design and build whatever society might need. This places on your shoulders a more intense moral responsibility to be aware of and attuned to the impact of your work.

“In this particular course, Circuits and Electronics, we’re not going to spend the rest of the semester in debates over what is purposeful and what is not. But I want each one of you to be aware that the tools you will learn here make it possible for you to do good in the world or to do evil. I want you to commit to benefitting society. Get as broad an education about the human condition as this fine institution offers. Take your humanities courses seriously. Read newspapers or blogs or opinion pieces. Or, failing that, at least watch the news on TV, although much of that is now just overblown propaganda for one point of view or another. Learn to recognize where technology offers choices to society, and what those choices mean when measured against your ideas of what is purposeful. In other words, grow into true citizenship, but as an engineer-citizen, superbly responsible for his or her actions.”

Martin paused long enough for a murmur of whispers, neighbor to neighbor, to begin to build across the lecture hall. He waited patiently for it to reach its peak and then subside back into silence before continuing. “Many of you were checking with your neighbor about what I just said. That’s good. I want you to talk to each other, but, of course, not while I’m talking.” Laughter. “I’m not a philosopher, but I do have a strong sense of what makes for good education. It’s communication between people. When you,” pointing to an auburn-haired woman in the third row, “can explain something to him,” pointing to pony-tailed man seven rows back, “and he can then tell you, in his own words, what it means to him, you have not only helped him learn, at the same time,

you have intensified your own understanding of the ideas you were talking about. Learning is, at its root, a social as well as an intellectual experience, a conversation. Face to face. Person to person.

"But," he went on, waving a finger, "this is not a license to copy someone else's work and turn it in as if it were your own. You are responsible for doing your own work. You can ask anyone for help. You can even look up the answer to a homework problem in a book, if you can find it. My only requirement is that you cite your sources." Martin wrote 'CITE YOUR SOURCES' on the white board, underlined. "If you get help from a friend, tell me which friend, and if you find the answer in a book, tell me which book."

Martin once again paused, waiting for the cadence of whispers to grow and then subside before continuing. "Okay, gang. Let's get to work. I'm sure you all expect to see a lot of facts about electric circuits, and you will. These circuits and their behavior create the infrastructure for our modern electronically-linked and computer-intensive society. But even more important, I want you to learn a methodology of problem solving. And since I expect you to cite your sources, I will now cite mine.

"George Polya, a mathematician at Princeton University, wrote a wonderful little book called *How to Solve It*." Martin wrote Polya's name and the title of the book on the white board. "According to Polya there are three ways to solve a problem. The first..." Martin paused, assuming a Benny-esque pose, with one hand on his cheek, supporting the elbow with his other hand. "By far the best way," pausing again to tilt his head and look askance at the class, "is to know the answer." After a brief burst of laughter, the room went silent, but Martin held his pose as the silence again rippled into laughter, then quieted.

Martin relaxed his posture and said, "Yes. There is nothing so satisfying as knowing the answer to a problem. Failing that, the second-best way to solve a problem is to transform it into one for which you do know the answer." Silence.

"Let me give you an example. In physics you all learned about the

vibration of a mass attached to a spring. You then analyzed the swinging of a pendulum, and you discovered that, at least for small-amplitude swings, the dynamical equations for the pendulum reduced to those of the spring-mass system that you had already solved. So it then became trivial to write down an expression for the period of the pendulum.

“We’re going to be doing the same kind of thing here, but at increasingly sophisticated levels of complexity. I call it the method of solved cases. We’re going to learn in exhaustive detail how to solve a few simple problems. After that, we will take more complex problems and cut them into pieces. Each piece corresponds to one or more of our solved cases, one for which we already know the answer. We then reconstitute the original problem, often writing down the final answer without having to do any actual solving. The methodology can be used everywhere, especially in programming, where you draw on subroutines and functions calls — the solved cases.”

Martin paused again. “Any questions before we move on?”

The auburn-haired woman in the third row raised her hand, and Martin nodded to her. “I thought you said there were, like, three ways to solve a problem,” she said. “What’s the third?”

Martin grinned. “Thank you for asking,” he said. “The answer is what Polya calls brute force.” Another pause, punctuated with nervous laughter. “Yes. Really. Brute force. Write all the relevant equations and solve by whatever grungy method you can find. We will continually run into new cases where we can’t do the partitioning into pieces, and this will lead us, perhaps by brute force, to a new class of solved cases we can then use for even more sophisticated problems. It’s a never-ending process of knowledge and skill building, and once you get the hang of it, it’s really fun.

“Now I have a question for you. How many of you know how to ride a bicycle?” After a puzzled silence, nearly every hand went up. “And when you learned to ride a bicycle, did you just read a book about it?” Bemused murmurs. “No, of course not. You had to get on a bicycle, feel what it’s like when you are properly balanced and then train your

muscle systems to find that balance without having to think about it. Riding a bicycle went from being an unsolved problem to a solved case. When you ride a bicycle, you might have to think about where you are going to turn, but not how to turn. The solved case of riding supports your higher-level action of deciding where to go.

“Along the same line, how many of you can play a musical instrument?” About a third of the hands went up. “And when you learned to play that instrument, did you just read a book about it? No, of course not. You had to suffer through the process of teaching your body to produce the sounds you wanted. Once you did that, though, you could play Bach, or acid rock if that’s your taste. Making the sounds on the instrument became a solved case, one you could apply at a higher level to make real music.

“I think you get the point. When learning a new skill, you need to practice. Here in C&E, we are going to be teaching you a new skill: partition, solve, and reconstruct. To become proficient at this process, you will have to practice, practice, and practice. The homework sets will feel long, occasionally tedious, and eventually somewhat repetitive. But that’s the point. Once you recognize that a problem is repetitive, you can jump for joy, because that problem has now become one of your personally owned solved cases. As we embark on this adventure, be aware that tedium might be a sign of success. When you can look at a new problem and just write down the answer, you will have arrived. We will start with the simplest solved cases on Thursday.”

Martin thanked the class, the roomful of students applauded, and Martin smiled.

## \* 4 \*

Martin's research group met every Tuesday at 1 PM. His seven graduate students, two post-docs and three undergrads, representing a mix of genders, racial features, raggedness of hair and number of piercings, drifted in to the conference room and took seats around the long rectangular table. It was a little United Nations. Khalil was Algerian; Ahmed, Egyptian; Yu-Chong and Ming-Wu, Chinese; Byung, Korean; Latisha, African-American; Arnold, Kevin, Michael, Evan and Christina, Caucasian-American; and Natasha, a native Caucasian from the Ukraine. Christina wore her usual uniform: a short skirt with black panty-hose and a much-too-revealing tank top set off with bangle earrings. Everyone else was dressed in shapeless clothes — standard CTI grunge. It always puzzled Martin that the women students would choose to dress as sloppily as the men. Only Christina dressed with any flair, and she overdid it.

Martin stood at the head of the table with the white board behind him, bearing a list in deep-blue marker entitled 'SMSC PAPERS.' The list had three names: Khalil, Yu-Chong, and Christina. He rapped the table briefly and started the meeting.

"Okay, gang. This will be a short meeting. First of all," handing Kevin his thesis manuscript, "I've finished what I hope is your penultimate draft. The things marked in red still need some attention. Let me know if you can't understand my scrawl."

Kevin took the document and Martin continued. "The deadline for the Semiconductor Materials Specialists Conference is a week from Friday, the fifteenth. Since it's in Boston this year, we have to make a good showing. I've gone over your draft abstracts, and I've decided

these three have the best shot at acceptance." He pointed to the list. "Khalil's is about done. Yu-Chong's is technically fine and just needs editing to clean up a bit of creative English." Yu-Chong smiled and looked down at his hands. Martin turned toward Christina and added, "Christina, we still need one more confirmation of the surface reconstruction correlated with the reflectivity." Christina nodded.

Martin continued, "The critic teams are Byung and Ahmed for Khalil's, and..."

Byung, a new Master's student, barged in. "But sir, you really think I can help? I barely know what the paper is about."

This was Byung's first time through the paper-submission process. Martin said, "It isn't a question of whether you can help, Byung. We always do this in teams. This is how you learn. You and Ahmed go over Khalil's paper with a microscope and help fix any problems — references, commas, whatever."

Martin paused for effect. "Natisha and La ..." A chuckle and a pause. "Sorry," continuing syllable by syllable, "Na-Tash-A and La-Tish-A. That's a mouthful, isn't?" Pointing, he said, "You two." Everybody laughed, including Martin. "You two work with Yu-Chong on his English. I'll help Christina. Any questions?" He waited the obligatory fifteen seconds. "Okay. We need to get this done right now, so let's cut this short. We'll pick up with the normal cycle of project reports next week."

As the room emptied, Martin beckoned Christina to stay. He asked, "Have you got a sample ready to go?"

"Yes, Professor," she said, a glow in her cheeks. "I've got three good samples, and I already did the scan on the first one. It looks really good."

"Great. Let's go see."

They went to Martin's laboratory, to the bench holding the atomic force microscope, a tool that can actually 'see' the arrangements of individual atoms on a surface. "See that sir?" asked Christina as she pointed to the video monitor. "The hexagonal arrays repeating across the probed field? Just like it should be?"

Martin studied the display. “This looks good. So do the optical measurements and the analysis. Bring the results to my office when you’re done.”

Martin returned to his office and once again worked on the White Paper. He was assembling the revised Purdue section when Christina knocked on the door and, mouse-like, opened the door, poking her head in.

“I got the data, Professor. Can we go over it now?”

Martin, without looking up from his computer, said, “Yes, grab a seat. Give me half a sec to finish this.” He continued to work as Christina sat on the sofa. A few minutes later, he turned back to her. “Okay. Done. How did it turn out?”

Christina was wistful. “I’m not sure. There’s a systematic difference between the model and the data, and I can’t figure out why.”

Martin got up from his desk, and wedged himself into the little sofa so that he and Christina sat hip to hip. “Let me look.”

Christina put her papers and charts on the coffee table and leaned forward to point at the columns of figures, displaying more bosom than Martin thought appropriate. He wished he could find a way to tell her to dress more modestly, but failing that, he did what most other males might do. He snuck a peek. “This column is the measured reflectivity,” said Christina, “and this one is the simulation. The shape is mostly right but there’s a factor of 1.4 between the two results, and the baseline seems too slanted. Here. I’ve got the graphs.”

After studying the results, Martin asked, “Did you run the standards before and after the reflectivity measurement?”

Christina raised her hand to her mouth, and blushed. “Oh, shit!” After an embarrassed pause, she continued. “Excuse me. Sorry, Professor. No, darn it. I guess I was rushing and I forgot. I used the standard from this morning’s measurement. How stupid!”

Martin loved these gotcha moments right after a student’s mistake. In his most professorial tone, he said, “When facing a deadline, we need to be swift but careful. Always careful. Do it over with the standards.

Then you'll have to repeat the simulations with the new values."

Christina, nearly teary, answered, "Yes, I know. I'll get on it."

Martin gave her a big smile. "Now don't worry. There's still plenty of time. I'll check in with you tomorrow." As Christina exited, Martin smiled to himself, happy with the thought that for the rest of her career, she would never forget to run the appropriate standards.

Martin glanced at his watch, turned to scan his e-mail and, finding no emergencies, went out to the east-side stairs and down two flights into the third floor of the connecting building, which housed, among many things, the newly-renovated Department Headquarters. Just inside, he greeted Rebecca, a thirty-something zaftig brunette with long and luxurious hair, the kind Martin would see in shampoo ads on television. She looked up from her desk with a grin and said, "Hi, Martin. Grab a coffee and rest your butt. He's got someone in there."

Martin grinned. He and Rebecca often joked about being in the same class, each joining CTI eleven years earlier. He was a frightened but outwardly cocky Assistant Professor, having been recruited by CTI after a three-year faculty stint at Carnegie Mellon. She was the junior assistant to Professor Fitzgerald, Associate Director of the Semiconductor Technology Laboratory. They enjoyed an occasional chat together, and when the occasion permitted, ribbed each other with feigned venom, except for that brief time some years ago, when, because of Martin's misbehavior, the venom directed his way wasn't feigned. Fitzgerald was now the STL Director, and Rebecca had worked her way up through the administrative assistant ranks to become the assistant to the Department Head and had added a wedding band to her jewelry.

He went into the kitchenette, selected a Sumatra K-cup for his coffee, brewed it, and took a chair in the waiting area near Rebecca's desk.

"Know what this is about?" he asked.

Rebecca smiled and shrugged. So Martin waited.

## \* 5 \*

Morris Wong was the epitome of the second-generation American Dream. Born in Westchester County to immigrant parents who ran a successful fabric import business, he was educated at Fieldston and Yale, finishing with a PhD from Berkeley. At 3:20, he emerged from his inner office escorting a tall but very young man in a tee shirt, jeans and sneakers, set off with an ill-fitting blue blazer. They shook hands and the visitor exited the office area. Morris, in a subtly pinstriped gray suit with a white shirt and paisley tie, ran his fingers through his brilliant white hair shaped into what his colleagues (but only behind his back) called the Seiji Ozawa cut. He turned to Martin. “Sorry we ran over. Can you believe that the kid is worth 450 million? A dot-com plutocrat.”

Martin got up and shook hands with Morris. “That’s a lot of lettuce. I assume you’re trying to eat some for him?”

“Of course,” he answered. “He’s thinking about funding a chair. Six mil, up front, is what I told him. The leeches in Development will work him over now, a named professorship and all that, with some good discretionary money as well. I think we’ll get it. Anyway, c’mon in. I’ve got a job for you.”

They entered Morris’s office. Martin took a seat in one of two black leather chairs while Morris sat on the black leather sofa, a small walnut coffee table between them.

“Let me get right to business. I assume you’ve heard that Ken Fitzgerald has been asked by Obama to serve as co-chair of a new Technology Assessment Task Force.”

Martin nodded. “Yeah, I’d heard.”

“Well, because of that, he’ll be in Washington a lot, so last week he

asked me if he could get off the Personnel Committee. He specifically recommended that you be his replacement. In fact he insisted on it, and I agree. Unless you jump up and down and scream in protest, you should consider yourself appointed, effective today. The only requirement, besides the honest employment of your good judgment and absolute discretion, is that you hold Wednesday 3-5 PM open every week starting in three weeks. I think that's the twenty-seventh."

Martin's eyebrows shot up. Of course he wanted it. It was the only truly important committee in the department. The PC consisted of fifteen of the most senior and trusted members of the department, the first string. Martin had assumed it would be years before he got asked to serve. Faintly aware that he might be risking another yellow card from Jenny, he said, "Of course I'll do it, Morris. It will be an honor."

"I was hoping you would say that. By the way, we don't post the membership on the department website. It's not exactly confidential, but we don't advertise. Okay?" Martin nodded, and Morris continued. "Now for the more important part of the job. Kat Rodriguez is coming up for mandatory tenure review in the fall. With the Gillespie disaster looming, it's essential we get her through."

"The Gillespie disaster?" asked Martin. "What's that?"

"This is confidential, okay?" Martin nodded. "Your first bit of confidential PC business. Looks like Sharon Gillespie in Mechanical will be denied by her department. There's sure to be a big stink once it goes public — demonstrations, lawsuits, the works."

"But isn't she one of the best teachers at CTI? I mean, her January robotics contest gets national TV coverage. How could she be turned down?"

"It's a department decision, and I don't know their reasons. But, whatever the reason, we don't want to end up like that with Kat. With Ken suddenly gone, I must ask you to be Kat's Case Manager." Martin sat in stunned silence.

"Yes, I know this is kind of sudden, but it's what we need you to do. Get her through. No turndown by the Dean, no demonstrations,

no lawsuits. Tenure. Please meet with her right away and get on it. Rebecca will give you a copy of her CV. We'll be starting those discussions on the twenty-seventh, but we'll hold off on discussing Kat until after spring break to give you a few extra weeks to get organized. Welcome aboard, and get busy."

Morris stood up, so Martin did as well. Still dazed, he accepted Morris's handshake and was ushered out of the office. Rebecca was waiting for him, holding forth a blue three-ring binder with his name prominently printed on the spine. "This is for you," she said. "It has the CVs for all the Assistant Professors plus I put in the old one I have for Professor Rodriguez. I don't have her update yet. Do you have a lockable file cabinet?"

Martin nodded. "So you knew about this?" he asked.

"Of course," she said, arching one eyebrow.

"Can I take it home? Looks like a lot of reading."

"Just don't lose it. Eventually, when we get letters on the cases, they will go in this notebook. Don't carry it around campus, and don't leave it lying on your desk. If it's not in your hands, it needs to be either in your house or in a locked drawer."

Martin floated out of Department Headquarters with the notebook securely tucked under his arm, feeling like he had just been asked to join the elite society of elders. Was this what Julian Kesselbaum had hinted at last week at lunch? If so, how did he know?

When he reached his office, he told Felice about his new appointment and the associated time constraint on Wednesday afternoons. He also asked her to set up a one-hour appointment with Professor Rodriguez, tomorrow if possible, in her office.

Then he forced himself back to that DARPA White Paper.

- - -

Just as he was loading his backpack to go home, the phone rang. Felice had already left, so he answered it himself. It was S. J. Chang. After the usual politenesses, Chang said, "I'm sorry, Professor Quint, but I

cannot do review of Dr. Schultz paper."

"Is it because of the subject area, Professor Chang," asked Martin, "or something else?"

"Something else. Dr. Schultz has things in manuscript from my work three years ago. Is no citation."

"But," said Martin, "I thought he did refer to your work. That's how I got your name as a reviewer."

"Different paper. Schultz equations three and seven, he says he derived. Not true. I presented them at SMSC in 2009, and Dr. Schultz was at my talk. Is from my PhD."

"Well," said Martin, "is it possible that it's a simple error and could be easily corrected?"

"If he cite me for equations three and seven, paper has no original content."

"Ah," said Martin. "This sounds difficult. Listen, Professor Chang, I would very much like you to do the review and say in writing what you just said to me on the telephone."

"But he will know I am reviewer. SMSC paper is not in journal. Only conference paper. He is senior person. I am only Assistant Professor."

Martin paused before answering. "I see. Perhaps I do need to find another reviewer. Can you think of a more senior person who was also at that SMSC session? Perhaps I can do the review that way."

"Andersen at UCLA was there. And Cal Tech guy. Name begins with K, I think."

"Koppin. Is that it?"

"Yes, Koppin. Him."

"Thanks so much for your help, Professor Chang. But one important thing: please email me a copy of the 2009 paper. I want to see everything myself. I will not do anything that will allow Dr. Schultz to learn your identity. Thank you very much for bringing this to my attention."

Martin was perplexed. Schultz was a senior scientist at ChipsOnDemand.com, a competitor to the company Martin consulted for. He had a big reputation as an expert in advanced atomic deposition

techniques for control of semiconductor structures. If what Chang said was true, and he had no reason to doubt it, then Martin would have to reject the paper. Chang was surely right about something else: when a junior person crosses a senior person, even in the nominally idealistic arena of science, the junior person might get squashed. Care was needed. He decided to send the manuscript to both Andersen and Koppin, but he would wait until he could look at Chang's paper.

- - -

Martin walked home as fast as the slush underfoot would permit — it was chamber music night. As he opened the door, he heard JJ in the kitchen asking, “What does Daddy really do all day?”

He heard Jenny laugh. “Well, he’s a teacher like Miss Cornelia at your school, but he has lots of other things to do also. He works with grown-ups to discover completely new things.”

“What kind of new things?”

“Why don’t you ask him? I think I heard him come in.”

Martin came into the kitchen and gave Jenny a quick kiss. JJ was stuffing mac and cheese into his mouth. After a big bite, he asked, “What new things do you discover?”

As he paused to collect his thoughts about how to explain semiconductor surface engineering to a four-year-old, it struck him that at places like CTI, you are what you do. Jenny was simultaneously a mom, an efficient homemaker, and a pretty successful interior designer. She managed to keep all three roles balanced and afloat, and was recognized in those various roles by her friends and colleagues. What was Martin? A teacher, a semiconductor expert, a husband and stepdad, a performing musician, a decent athlete, and an occasional helper at home, especially around JJ’s bath and bedtime. But the title ‘Professor’ cast a long shadow over everything else, and it skewed his priorities as well.

Martin took a seat at the kitchen table. “Good question, little guy. Let me see if I can explain. Have you heard of atoms?”

“They’re little, right?”

"Yes, little specks of stuff. Everything is made of lots and lots of atoms."

"Even me?"

"All of us. Everything. In the special stuff I work on, called semiconductors, most of the atoms are organized, like when you line up your toy soldiers in perfect rows. But the atoms at the ends of the rows, on the surfaces, they can get out of order and this ruins the semiconductor. My job is to tickle the atoms back into the best possible arrangement?"

"You tickle them? With your fingers?"

"Not our fingers. We use other atoms, and some heat. If you do it just right, the material works better for making computers and things like that."

JJ giggled. "I'm gonna tell Miss Cornelia about how atoms are ticklish. She won't believe me, but I'm gonna tell her anyway."

- - -

Twice a month, on the Tuesday evenings not otherwise taken up with Martin and Jenny going to hear the Boston Symphony, their living room became the music room. Tonight's group included his old Harvard roommate Horatio Billington, now a Professor of Linguistics at Boston University, his other roommate, Sumner Collingsworth III, who had become a successful investment counsellor, and Vladimir Tchernoff, a musicologist from CTI who played both violin and viola. Depending on the choice of music, other friends would be invited to join in, but tonight the agenda was the Brahms *Opus 114* trio for clarinet, cello and piano and the Menotti *Trio* for violin, clarinet and piano.

Horatio, who lived just three houses away, arrived first, with his cello case, a music stand, a portfolio of music, and two books, one brand new with a bright blue cover, the other, well-worn with a red and black cover. He handed them to Martin as he removed his slushy boots in the foyer. "Langacker finally came out with a more readable version of his *Cognitive Grammar*. Just published. You'll find it easier than the first one. I brought you my copy to look at, hot off the press."

"Oh, great," said Martin. "His stuff is so neat, but hard to read. What's this other one?"

Boots off, Horatio began setting up his stand in the living room. "When we were talking about your theory of education as conversation, it occurred to me that you needed to read this guy Clark, especially *Using Language*. He talks about what he calls signaling as an essential part of every conversation. It's like there are two things going on simultaneously — a set of signals between participants and then the actual content. It seems to overlap your idea of the social and intellectual components of teaching. Same basic concept with different words. I thought it might help you with your article."

"You're a hero, Roy. Thanks a lot. Can I keep them until our next session? And pick your brain once I've read some?"

"Sure, no problem," said Horatio, unpacking his cello. "We're doing one-fourteen tonight, isn't it?"

The doorbell rang. It was Vladimir and Sumner, who drove together from Brookline. Vladimir had a hand out into which Martin pressed the guest parking pass. Sumner entered, removed his shoes, and began assembling his clarinet as Vladimir returned from the car with his oversized violin-plus-viola case. Martin moved the floor lamps so that each player had good light. The musicians took their seats and warmed up, noodling through scales and arpeggios, and then asked Martin to sound an A on the piano for tuning.

Jenny came in, greeted everyone, and asked what they would be starting with. Hearing that it was the Brahms, one of her favorites, she stretched out on the sofa by the bay windows to listen. Vladimir, who didn't play in the Brahms, held the score and followed along, humming the themes *sotto voce*.

Playing music is not, as so many think, an escape *from* things. It's an act of exploration, an affirmation, a journey *into* a magical world, a world without DARPA deadlines or tenure committees or even freshman girls. It's a world in which the scrawls on a page, set down by Brahms more than a century ago, map a captive set of sounds that need

to be liberated by the players, realized anew at each playing, breathing one more life into Brahms' vision.

*Opus 114* was familiar and well-studied. Their first performance of it had been over twenty years ago in the Eliot House Junior Common Room after a Sunday noontime dinner. Tonight, they simply played it, end to end, to keep it fresh. Jenny thanked them for the lovely little concert and went up to her study. Attention shifted to their first run-through of the Menotti. The piece was challenging in spots, so it was hard work, following the usual steps that all chamber players must traverse: first, learn your own part, which each had done; second, learn how the other parts fit with yours; third, make it into music. Tonight, they were on step two. Vladimir swapped seats with Horatio, who, with score in hand, was an integral part of this process, catching errors, explaining, and coaching.

After making as much progress on the Menotti as a first playing would permit, Martin got out beer and snacks. The four friends sat around the Queen Anne, discussing the program for their next concert. It was scheduled for the end of April in the CTI Little Theater, so named not for its size but for a man, Peter Little, although it was little, seating only one hundred and twenty. The Menotti was too new to the group for an April concert, so Vladimir proposed that they do one of the Beethoven string trios, perhaps the *Archduke*, which they had already reasonably well in hand, with maybe one or two of the Bruch *Trios* to complement the Brahms. They agreed not to decide yet, and called it a night.

When they left, Martin took Horatio's two books to the study, paging quickly through Clark, tantalized. He thought about signals, reminded of how Jenny used all kinds of signals.

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Some men enjoy pornography. Not Julian Kesselbaum. He got his late-night jollies looking inside other people's hard drives. Just about the time that Horatio, Sumner, and Vladimir were saying their goodbyes, Julian

was hunched over one of the six computers in his North Cambridge condo, assembling the final details of what he expected would be a new untraceable route into CTI's computer network.

The son of a Stanford computer science professor, he had hacked into his father's machine at age eleven and was the only kid in middle school who knew exactly how much money his father made. By the time he reached high school, the Arpanet had become the internet, and he had invaded all of his schoolmates' home computers. Then, with aid of a well-constructed bogus web link, he breached the entire computer system of the Palo Alto Department of Education.

Julian was careful not to destroy anything. His obsession, which was what it had become by the time he entered Stanford as a sixteen-year-old freshman, was just to read other people's emails, diaries, finances and browsing histories. He gravitated to the on-campus hacker community, sharing some of his tricks and learning many more in the process. When he applied to the CTI PhD program in Computer Science, his application demonstrated such deep insights into computer security that he was offered a fellowship.

He did his PhD thesis on the problem of phishing — hooking people with phony emails and web pages, a technique at which he was already quite expert. His doctoral research was on why it works; why even computer-savvy users fall victim to phony emails and phony web pages. He did a study with volunteers and learned that neither gender, age, educational level nor number of years of computer experience had any bearing on the probability that a particular phishing attack would succeed. A well-disguised web page or email would hook even the experts.

CTI hired him onto the EECS faculty after his PhD with the hope that he would build on that thesis work in some important way. Now in charge of a classroom, he discovered that he could, for the first time in his life, engage with people instead of just computers, albeit from a superior position. He was the authority, the source, and people wanted to hear from him. His efforts on behalf of 'safe-sex' computer use were

legion. He not only taught the graduate internet security course, he offered seminars for undergraduates, for staff members, even for the coaches in the athletic department. He proselytized on how to protect logon IDs, passwords, virus prevention, warning signs when a computer is infected, and how to detect and remove spyware and malware. Even the CTI computer-system managers would consult him on security problems. He loved it, but it didn't earn him tenure. In January of 2011, he learned from Morris Wong that he would not be offered a permanent appointment.

Most people would be crushed and angry by a denial of tenure. Julian was angry, for sure, but not crushed. He started a consulting business in an office above The Crustacean, a cutesy restaurant in an office block up Mass Ave toward Central Square, and the CTI Information Technology people immediately put him on retainer at the level of a second-in-command. To bring in more business, he mounted a blog, [BiteTheBot.com](http://BiteTheBot.com), which gradually gathered readership, landing him three local banks as clients. From there, while he didn't exactly prosper, he certainly could afford to live and eat in modest comfort. To satisfy his compulsion to teach, he took Adjunct positions at UMass-Boston, UMass-Lowell and Bunker Hill Community College for twelve hours a week of in-class instruction on how the internet worked, web pages and their discontents, and how to avoid the most common intrusions.

Tonight's goal was to see if he could use his private botnet, a network of twenty-eight hundred already-infected machines located mostly in Romania and Bulgaria, to set up an untraceable bogus account at CTI. He sent the instructions to the botnet and after only a few thousand tries, ten minutes worth, wormed his way into the CTI Computer Accounts server, creating a new account with logon ID mark.felt, chuckling as he did so. With that success in hand, he created six more accounts, each with a clever alias, and like the acorn woodpecker of his native California, he stored them up.

The plan, at least for now, was to wait, testing whether anyone at CTI would discover the intrusion. If it was discovered, he was ready

with an instant solution, building his reputation as a security wizard. If not, he had a new set of platforms from which to work his way around the CTI network on the sly. It was, in his view of the world, win-win.