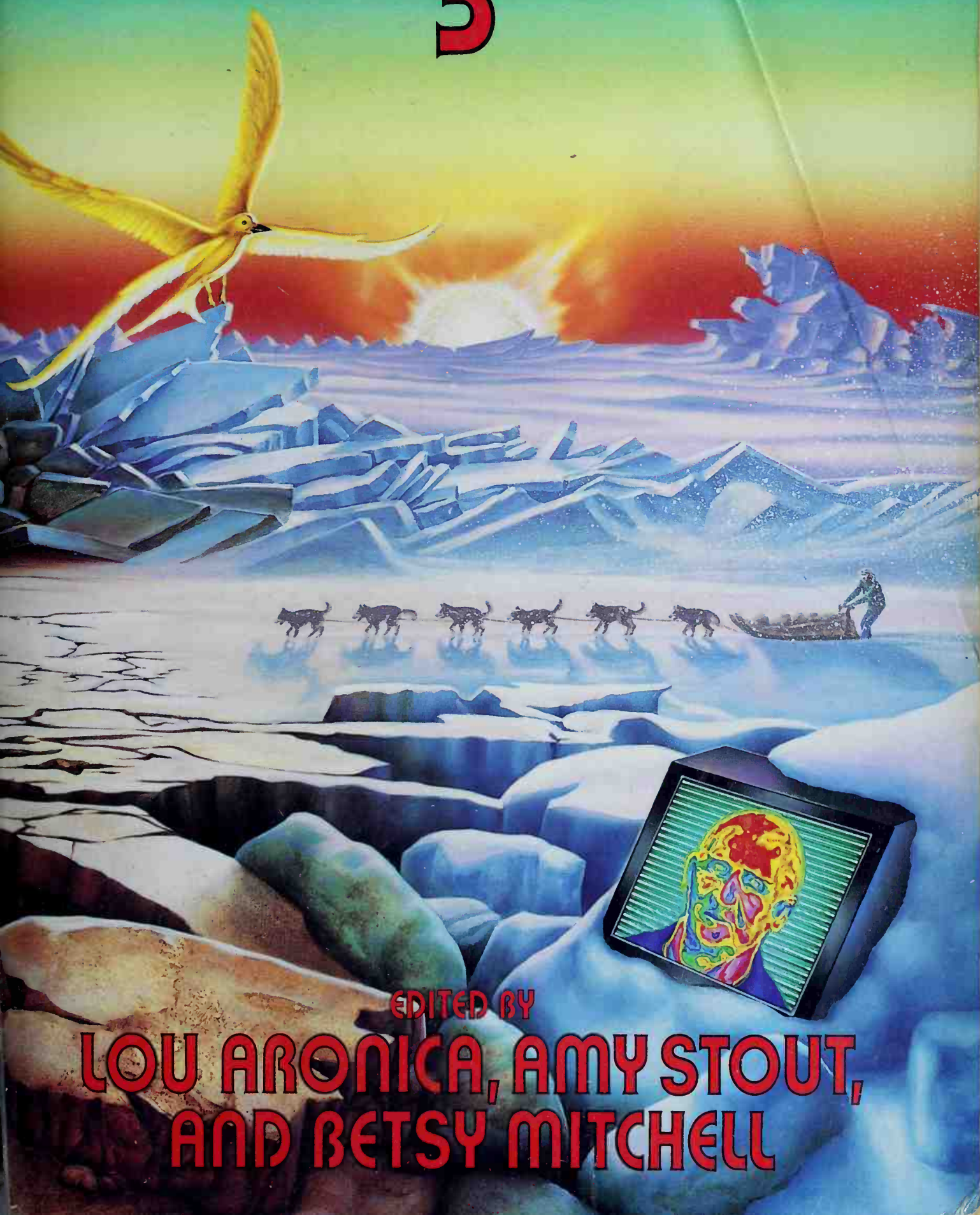


"FULL SPECTRUM 3 MAY BE THE BEST ORIGINAL ANTHOLOGY EVER PRODUCED."—LOCUS

FULL SPECTRUM 3



EDITED BY

LOU ARONICA, AMY STOUT,
AND BETSY MITCHELL

"If the heart of science fiction and fantasy is the short story, then a collection such as *Full Spectrum 2* surely must be its soul."

—*The Ottawa Citizen*

The imagination is alive and well, and its spirit is recorded here on the pages of *Full Spectrum 3*. With eight Hugo and Nebula award nominations to its credit, *Full Spectrum* presents the third exciting installment of award-caliber speculative fiction.

Gregory Benford, Ursula K. Le Guin, Poul Anderson, Nancy Willard, and Norman Spinrad are just a few of the voices representing the vanguard in these 23 powerful stories. Newcomers are here in force as well, contributing a vast range of provocative ideas.

From James Morrow, whose story in *Full Spectrum* won the Nebula Award, a slyly told fable called "Daughter Earth," in which a Pennsylvania farmer's wife gives birth to a baby biosphere named Zenobia.

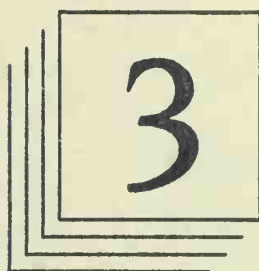
Michael Bishop's novella "Apartheid, Superstrings and Mordecai Thubana," already nominated for a World Fantasy Award, is the cautionary tale of a white man who spends one dark South African night aboard a bus called "Grim Boy's Toe," learning about the passionate pursuit of a radical equality and the Grand Unification Theory.

And from French writer Joëlle Wintrebert, "Transfusion," a wildly expressionistic description of a woman's descent into madness.

"[*Full Spectrum*] contains state-of-the-art fiction by state-of-the-art writers. Marvelous stuff."

—*Analog*

Full Spectrum



Other *Full Spectrum* Anthologies

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Full Spectrum



EDITED BY

*Lou Aronica,
Amy Stout,
and Betsy Mitchell*



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Tracking the Random Variable

MARCOS DONNELLY

TUESDAY EVENING, Ronald Barr sat wifeless on the sofa in his darkened living room, sipping a glass of scotch and warm water. While he waited, he sketched histograms on graph paper: x -axis, timeline; y -axis, number of minutes Jessica spent away from home on weekdays outside of working hours. Last Thursday, 425 minutes; last Tuesday, 260 minutes; Monday before last, 315 minutes . . .

He never asked where she went, couldn't bring himself to ask. She had stopped offering the excuses of evening faculty meetings at the elementary school and late conferences with parents from two-career homes.

Two-career homes. He and Jessica had been a two-career home just ten weeks ago. Now she had a career, he worked a job.

There had to be a pattern—control the variable, control the situation. He arranged the data as a pareto chart. Nothing. A scattergram correlating days of the week and the time she spent away. Nothing. A range graph, a deviation chart, a double bar- x control chart.

He sat tapping the pencil point against his wrist, then resorted to sketching a fishbone diagram for cause-effect analysis. He winced; low, very low for a statistician.

Ex-statistician.

- EFFECT: Wife spending excessive time away from home.
- DESIRED STATE: Wife's time away from home brought under control.
- MAJOR CONTRIBUTING FACTORS:
 - Communication with wife
 - Appreciation shown to wife
 - Financial support of wife
 - Sexual relations with wife

Financial support. Not really significant. His current salary at her Uncle Luke's garage was only a thousand less than his second-year salary had been at Resotech. He had balanced the difference by taking over her coupons and organizing them for cost efficiency.

Sex. Well, maybe. He'd only made love to her twice in the past four weeks. Just twice? He dug through his memory but couldn't recall more than two times. It was, in fact, a variable he hadn't yet taken into account.

Jessica arrived home at 10:17 P.M.

"Hello, Ronald." Her voice had the chill in it.

He hid his statistics under a stack of invoices from Luke's service station. Careful, he thought. Look casual.

"Hi, honey. You must be exhausted. About ready to hit the sack?"

She stared at him as she stepped out of her heels. She was quiet for a moment, and he was afraid she wouldn't speak to him. That would be bad—broken communication, too many variables to bring under control.

But she did speak. "I was out until half past ten. Don't you care where I was?"

Ronald breathed relief; there was still communication. She looked beautiful standing there in the foyer glaring at him, her straight red hair touching each shoulder of her white blouse, one strand tangled in the 33-inch gold chain he had given her on their 333-day wedding anniversary. He almost said so, that she looked beautiful, but a shiver of panic ran through him before he did. Too many variables.

"You were working, right?" he finally said. "You must want to go upstairs and kick back a little." Don't press her; that would cause tension. "Would you like a glass of wine?"

"Jesus, Ronald." She threw her purse on the sofa. He walked to her and kissed her neck gently, grimacing for a second from the sharp taste of fresh perfume.

He tried to fashion a boyish grin. "What do you say we go upstairs together?"

Their lovemaking was brief, and she was silent. When it was over, she rolled away with her back to him. Ronald was certain she would start getting home on time.

He should not have lost the position with Resotech Corp.

He *could* not have lost it.

Ronald Barr had been prepared the day the "Please report to Personnel" note came. The odds were in his favor. Of the 300 employees whom Resotech was laying off that afternoon for the statewide Reduction in Force, the top 205 had been from middle management. He was in the bottom third, the white-collar office workers who did real work for the company. Out of that group, he was part of the 44 percent who had completed a four-year college education. When he took into account that only 25 percent of Resotech employees with college degrees actually worked in the area of their undergraduate studies, and added to that certain emotional factors which couldn't be readily calculated—he and Jessica had just closed on their first home, were planning to start a family, those sorts of things that would add a sympathetic nuance to his otherwise purely logical argument—it left him as one of about ten and a half employees who had a good shot at talking Personnel into reconsidering their termination.

Good odds, even if he took the liberty to round the half-employee up to the nearest whole number.

He was valuable; he was the one who could see the hidden variables. He had shown statistically that removing car stereos from the sales reps' company cars would reduce speeding; tickets dropped 68 percent. He had demonstrated that the addition of hot cocoa and chicken soup to coffee vending machines would correlate significantly with employee honesty measures; petty theft of office supplies dropped 32 percent statewide.

He saw the variables; he could control any system. He should not have lost the position with Resotech Corp.

He *could* not have lost it.

. . . .

It was the Sunday morning after the Tuesday night that sex with Jessica hadn't worked. Thursday and Friday evenings, she had stayed out until 9:28 P.M. and 10:12 P.M., respectively.

She sat down across the kitchen table from Ronald, cupping her hands around the sides of her coffee mug. She was quiet for a while, and then asked, "Don't you care?"

Ronald kept sorting the Sunday-morning coupons. He set a 35-cent Charmin off to the left, and dug out the 35-cent Maxwell House from the unsorted pile. As he set it on top of the Charmin coupon, an article in the local section of the paper caught his eye: the Pittsfield district had just elected a third woman to its school board. The last time three women had been elected to the Pittsfield school board, he remembered, was January of 1982. The very next day, the Guinness world record for crawling had been broken in Newton Abbot, England. He would need to check tomorrow's paper.

"Honey," Jessica said. She reached across the table and set her hand on top of his. The tenderness in the touch felt like guilt. Good. Of course he cared. If she had any idea, if she was going to throw everything away—dammit, what right did she have to make him feel guilty for her actions?

Wrong approach. Control the situation, don't become a variable.

He could control *anything*.

"I'll get out of your uncle's garage," he said, establishing the communication. He fought the desire to pull his hand away. "I'll get a white-collar job. It's just a tight market now. I'll keep trying, if only you'd be a little patient."

She sat back in her chair and brushed a strand of loose red hair from her face. "I'm talking about *us*, Ronald. I didn't say anything about the color of your collar. Do you really think I'm upset with you about your career status?"

He added a Cheerios coupon to the 35-cent pile. The way she kept the coupons in such disarray irritated him: 60-cent toilet tissue mixed together with 15-cent drain cleaner and 50-cent cleansers. In the last week he had managed to arrange most of them by descending value of discount. Sometimes she seemed as haphazard as the third graders she taught. But she was trying to be kind, at least, pretending that his career setback didn't matter to her.

"Jessica, it's a tight market."

"You already said that."

"Well, it is! The odds against me finding work—"

"Odds!" She shoved herself away from the table and walked to the sink. Ronald knew what she would do: (A) dump the coffee; (B) thrust the cup in the dishwater; (C) put her right hand on the refrigerator, standing with her back to him; (D) remain silent for ten to fifteen seconds; (E) produce an exaggerated sigh; and (F) turn to face him.

Which she did. Steps A through F, in that order, in that way. If he could figure her out down to her damned *sighing* . . .

"When I *do* get you to say something, all you talk about anymore are the odds, the numbers, the variables." Her voice had become subdued and even. The chill was coming, and he knew it could last for days if he didn't respond at her level. "Please, Ronald, can't you just talk with me the way you used to?"

There was no way, no way he should be losing her.

He stood and took hold of her bathrobe sleeve. Without a word, he walked her through their living room and out the front door.

"The lawn," he announced.

"Which you said you were going to weed yesterday." Sarcasm; it was part of the chill.

"I was doing coupons." He reached under the forsythia bush to the right of the front steps and pulled a stone from below its drooping branches.

"A stone."

She crossed her arms.

"I'm going to throw *this* stone on *that* lawn. I want you to choose the one blade of grass that you think it will hit."

She turned her back to him, so he walked a semicircle around her to see her face.

"Come on," he said, "I'm trying to explain what I'm feeling. What blade of grass will it hit?"

She glanced sideways toward the lawn. "It'll probably hit a weed."

"Not probably! There is no such word as probably." He smiled and nodded; just maybe she was understanding. He tossed the rock in a high arc and chased it onto the lawn, almost slipping once on the cold dew. "This one!" he shouted to her. He pulled a blade of grass from under the stone and ran back to the porch. "This was the one, Jessica! And there was no probability about it. The bend in my wrist, the angle of the trajectory, gravity, the wind, everything working together made it so this was the blade the stone hit. *There was no chance involved!*"

She set one hand lightly on his shoulder; the other was balled in a tight fist in front of her mouth, a gesture he didn't recognize. He couldn't tell

if she had grasped everything he said, or whether she was still thinking it through.

"Jessica, nothing is pure chance. There are variables we haven't discovered yet. But they exist, and if I find them I can control *any* situation."

She wrapped her arms around him now, slowly, and set her head on his shoulder. He again found himself annoyed by her touch, by her breath against his neck; he again felt guilty for feeling annoyed. He couldn't decide exactly what to do with his own arms. He continued to think about it. He had nothing else to say, he realized.

She pushed herself from him and ran into the house. She slammed the door. Ronald stood outside for two more hours, throwing the stone, seeing where it landed, throwing it again.

Jessica's Uncle Luke stepped into the back office at the garage during Ronald's lunch break. Fumes from the cigar he clenched in his teeth filled the small room; Ronald looked up from the morning newspaper. He had been reading the article about the pair of teenagers in upstate New York who had just broken the world crawling record.

Luke hiked up his trousers across his belly. He pulled a folded sheet of paper from his pocket and squinted at the writing. "I think we might be getting low on spark plugs and brake pads. Could you order us some?"

"Sparks are due in at two o'clock today, Luke. Pads will be good for another twelve days. I've also ordered halogens for Chevys. We'll run out of those next Thursday."

Luke took off his John Deere cap and scratched his scalp, mussing the little hair he still had. He chuckled deeply. "Ronnie, it's too bad you hate this place."

Ronald sat up. "No, Luke, I don't—"

"Don't try to kid me, son. I understand. This just isn't your sort of job." He leaned on Ronald's desk and flicked a cigar ash into an empty coffee cup. "Hell, if I were in your shoes, I'd feel stupid too."

Ronald sat up a little straighter. "Stupid? Well, I—"

"Tell you what, though," Luke went on, looking philosophical. "Don't know how the hell you manage to run inventory so tight. You've cut down stock so much that I've got room to set up a fifth grease pit. Before I lose you to some corporation, you gotta show me how you figure it all out."

Ronald leaned forward and pulled a manila file from the careful stacks on the desk. "Well, I used invoices from the past three years to plot control charts. It has to be done for each of our high-volume parts. Then I pick out the variations in each system, and I calculate upper and lower

control limits. I can plot . . .” He glanced at Luke, whose intent expression resembled pain more than concentration.

“Well, anyway,” Ronald said, “I use math to guess what we’ll need.”

Luke nodded and set a hand on Ronald’s shoulder. “You’d be a millionaire at the racetrack,” he said.

Ronald set the open file on his desk. Of course it wasn’t just the math; that was the simpler part of it. The difficulty was developing a feel for the way things were linked in the universe, the hidden causes that were almost absurd. A butterfly flaps its wings in Beijing, gale-force winds result in Albany; a NASA technician throws his sandwich wrapper away in his partner’s wastebasket, a junk sinks off the coast of Taiwan. Finding the links, tracing the patterns . . . *that* was the formidable task.

Bernie rushed into the office, a five-dollar bill in his hand and Stan in tow. The smell of gasoline and body odor overpowered the cigar fumes, and Ronald felt the office closing in on him. Resotech had been a lot more spacious.

“Ronnie, how many air filters have I put in during the last six weeks?” Bernie asked, grinning. He turned to Stan and said, “Now listen close, wise ass.”

Ronald shook his head. Stan was the third sucker Bernie had taken on this bet. “Twenty-seven,” Ronald said without checking the back sales invoices.

Bernie stepped out a peculiar victory dance he saved for this particular bet and stuffed the five dollars in the breast pocket of his greasy blue coveralls. The two of them, Stan and Bernie, were a mismatched pair, Stan as bulky and awkward as Bernie was handsome and smooth.

Stan looked incredulous. “Hey, you guys set me up.”

Luke stepped back and rested an elbow on the file cabinet as Ronald pushed his chair from the desk to sit facing the two. He folded his hands on his lap and feigned patience while Bernie went through part two of the wager.

“Fine,” Bernie said, putting his hands in his coverall pockets, a devil-may-care stance. “Double or nothing he can do it with any part you’ve used.”

“Okay, you twerp bastard.” Stan grinned with confidence as he pulled another five from his wallet. “Double or nothing.” Bernie reached for the bill, but Stan balled it in his fist and glared. “How many PCV valves have I used?” he asked Ronald.

“Since when?”

“Uh . . . six weeks.”

"What type of PCV valve?"

Luke laughed; Stan was frowning. "All right, pal, just 892-C's."

Ronald sat back. Stan, six weeks, ninety-one invoices, 2.8 liter V6 autos only; piece of cake. "Fifteen."

Stan looked blank. He unballled his fists and started counting on his fingers. Bernie snatched the second five, laughing. "You're a fucking computer, Ronnie," he said, slapping Ronald on the back. "Break down and join us at McCollough's Pub and the first beer's on me."

Ronald nodded. "Yeah. Maybe."

"All promises, but you never show," Bernie said, shrugging. He grabbed Stan by the shoulders and pushed him out the door.

"Those boys won't ever learn not to bet against Bernie," Luke said. "Never seen the guy lose, but they'll bet anyways. Never learn." He sat on Ronald's desk and put his cap back on. "So, tell me how my little Jessica's doing."

Ronald looked down at his inventory control charts and traced an index finger along an upper control limit. "Great. Great."

Luke rubbed a hand over the bristles on his chin. "Must be a happy little girl," he said, his voice edged with something like suspicion and understanding improbably combined. "Every time I ask you that, I get two 'greats' in a row."

Ronald felt the muscles tense in his lower back. "Well, she's still teaching. She likes it."

Variables. He'd exhausted the obvious. It wasn't a standard correlation. Employee theft and hot cocoa. School boards and crawling records. Time away from home. And . . .

"Yeah," Ronald said, retracing the inventory control lines. "She likes it."

He bolted upright in bed. "My God!" he said aloud, almost shouting.

Jessica stirred next to him but didn't wake. He could barely make out her form in the darkness; he could hear her breathing and smell the wine.

He crawled from bed as quietly as he could and made his way downstairs. The numbers had been rearranging themselves in his head, balancing, contrasting, screaming for his attention until he awoke.

Once he turned on the living room lights, he arranged the minutes table for Jessica's time away from home next to the inventory control charts for Luke's garage.

Scattergram: an x/y axis chart that would show the correlation inherent

in two recurring events, even if that correlation were improbable. Absurd. *Hidden.*

Fan belts showed no correlation.

Nor air filters.

Nor oil sales.

Spark plugs did, a correlation coefficient of .92, close to perfect. Then a T-test to be sure. As spark plug sales rose, Jessica's time away from home lengthened; as they fell, so did her time away.

Spark plugs. And.

Bernie leaned casually against the office doorway, flipping the last spark plug in the garage off his thumb, up in the air, and catching it. Replace the spark plug with a 50-cent piece, Ronald thought, and he'd look like an old-time con man.

Uncle Luke, on the other hand, was livid.

"What the hell do you mean you sent all the spark plugs back?"

Ronald shrugged and tried to ignore the feeling of a fist in his stomach. "I had to send them, Luke. The whole shipment was defective."

Luke began pacing tight circles on the concrete floor, scratching furiously at his left armpit. "Well, Christ, Ronnie, how the hell do you know they were all defective? You didn't test any of them. You wouldn't even know how to put one in!"

Casual. Control. "They had some kind of, uh, goop. It was all over them and they smelled like acid or burnt rust or something. Any idiot could see they were useless."

Luke had stopped pacing and was shifting helplessly from one foot to the other. "Aw, Christ, Ronnie. If we had extras in inventory there'd be no problem."

Bernie broke in. "Boss, if you want me to go down and buy a load from Mobil—"

Ronald gripped the arms of his chair.

"Jesus," Luke said. "Buy the goddamned things retail at triple markup? All right, all right, but just one case. Christ, Ronnie, I hope like hell you put a rush order on the new shipment."

Ronald resumed breathing—he'd just realized he'd stopped. A single case would get Jessica home at 3:43. "Of course I ordered more, Luke. Should be here in two days."

Luke winced, but seemed to be holding his temper. He turned around to Bernie. "Get Harris to rearrange the schedule. Move up everything he

can that he knows needs sparks. Aw, Christ, customers are gonna be pissed." He shuffled out of the office, muttering.

Bernie flashed an overly composed smile from the doorway. "Stan!" he called over his shoulder, and Ronald swiveled his chair to face the door.

Stan lumbered over from the garage floor. "Yeah? What ya need?"

"Look," Bernie said, putting a hand on Stan's shoulder, "how about a little sales bet? Ten bucks says that in the next three days combined we sell less fan belts than just yesterday." With his other hand he continued to flip the spark plug.

Stan looked astonished at first, but then frowned. "You're suckering me again. What, did Ronnie tell you something about fan belts? I'm not stupid, Bernie."

Bernie exuded nonchalance, kept flipping the plug. "Hey, if you don't want to play—"

Stan grabbed the spark plug at Bernie's next flip. "Okay, pal, I'll play your game. But *my* rules this time. Not fan belts. Spark plugs."

Bernie did a flawless imitation of someone turning pale. "But, Stan—"

"No buts! Take the bet or I tell everybody you're a swindler." Bernie nodded weakly, and Stan left laughing.

Bernie leaned in the office and gave Ronald a wink. "Break down and join us at McCollough's, Ronnie. First drink's on me."

Ronald smiled. "No promises at all, Bernie. Tonight's a definite home night for me."

The number of butterflies in Beijing increased 3.24 percent. In Albany, eighty-seven telephone poles toppled.

"How was school?" He met her at the door. It was quarter to four in the afternoon.

She looked at him as she set a stack of papers on the kitchen table. "It was fine," she said, her voice wary.

"Anything fun happen?" He felt the confidence and spoke easily.

Jessica leaned with one hand on the kitchen table, the other hand in the pocket of her blue cardigan. "A few things, yes."

He walked from the sink and stood beside her, drying the dishwater from his hands with a towel. "So tell me some of them. I haven't heard a funny school story out of you in two months."

She took off her sweater and sat down slowly, never taking her eyes off him. "All right," she said, "I'll tell you one."

"Great," he said. "Do you want a cup of coffee?"

She didn't go out that evening.

After dinner she excused herself to the bedroom, and he heard the phone being dialed and her whispers. He smiled. The living room stereo was tuned to an easy-listening station. He turned the lights low and waited for her to come downstairs.

The next day there was still only Bernie's case of spark plugs at Luke's garage. He made dinner for her that night, a London broil, one of three dishes he knew how to prepare. They laughed when the cooking meat set off the smoke alarm. She stayed home.

"You really don't mind I'm a blue-collar worker?" he asked.

She unbuttoned his shirt and removed it from his shoulders. The collar, of course, came off with it.

The evening after, they went out for ice cream after supper and walked through Settermen's Park until sunset.

On the third day, the next shipment of spark plugs arrived.

He dashed from behind the dumpster to the brick retaining wall and fell, face forward, from the weight of the case of spark plugs. For a second all he could see were elusive, peripheral stars and the capital C of the Champion logo.

Last one, he thought. His breath came in barely audible squeaks. Last one.

He made the run to his car, popped the trunk, and heaved the case in. Twelve boxes, total.

"If you need spark plugs," Luke's voice said from behind him, "I'll just *give* you a goddamn set."

The little breathing squeaks all pulled together into a strained squawk of surprise, and every bit of energy and tension drained from Ronald's limbs. He felt like a puddle.

Luke strolled out from the far side of the retaining wall. He was there, Ronald thought. He was right there watching.

"They were bad!" Ronald yelled, and he realized he sounded just as guilty as he was. "They were just like the last shipment. I was going to drive them back myself and get some good ones because I knew how upset you were the last time"—while he was saying this, Luke had opened one of the boxes and removed a ring case of six perfectly healthy spark plugs—"and even though some of them look good they're all defective and won't make any sparks, so what good are they as spark plugs?"

Luke stared at him.

Ronald realized what he needed more than anything else in the world at this moment was some of Bernie's fast talk and charm.