

The Day of the RFIDs

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The way into the **Homeland Security Bureau** seldom runs through mom & pop grocery stores and the **Internet Movie Data Base**. Even less often does that route continue onto the **Ten Most Wanted Fugitives list**.

Chalk me up as one to take the road (lane, alley, trail, deer path) less traveled.

I'm not blogging this for your sympathy--but I hope, at the least, to establish credibility and get your attention. I'm posting this, in fact, for your own good. And, while I am being direct, one more thing...

I'm not the only one being watched.

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At one level, I would like to blog my story under that grand old pseudonym "Publius." As patriotic, though, as I believe my goals to be, my role model is someone far removed from Madison or Hamilton or Jay. There is, in any event, nothing to be gained from a pen name: The feds know exactly who I am. The challenge lies not in anonymity, but in elusiveness ... at least long enough to spread the word. Maybe personal details will make this all a bit more credible.

So who am I? The family name has always been a point of obscure pride to my parents: Boyer. "Like the suave actor, my boy," Dad would say, as though I had any idea whom he meant. "You could be like him." Despite my cool attempts at disinterest, I eventually absorbed that said long-gone thespian was **Charles Boyer**, with whom I identified about as much as with Bela Lugosi or Fred Flintstone.

Oddly omitted from this bit of cinematic trivia was how the black-and-white era actor pronounced his name: boy-YEA. Grandpa had Americanized the name, so that it came out boy-ER--from which it was a short step to boy-ARE. As in: Boy, are you a geek. The family business being a small grocery, it was only a small step further to the leitmotif of my youth: Geek Boy are dee.

The grocery wasn't all bad. It supported the family, and I had a built-in after-school job--which didn't help the Boyardee jokes. Dad, fortunately, wanted me out of the store as much as did I. Owning a grocery store means hard work and long hours. "If you follow in my foot steps, Zach," he would volunteer more or less weekly, "I will personally break your ankles." Not that there was ever any chance I would make such a career choice: The geek taunts were reasonably well-founded. I'm good with computers and better with microelectronics. I went to college to become an EE and meant never to look back.

Easier said than done.

It's not that I ever thought the store did *well*, but pitching in every day after high school I had believed the place did okay. Going away to college gave me a whole new perspective. Seeing the store only every few months, on holidays and at breaks, the place looked different to me: dated, fewer shoppers each time, an ever-older clientele, brands that--now that my friends regularly shopped at Wal-Mart and Costco and Big Bob's--seemed oh so dated.

Throughout high school I had argued with Dad about upgrading to checkout stations with barcode scanners. (I'm sure you know the advantages: fast, efficient checkout and machine-readable data on what was selling.) It wasn't like I was pushing new technology. I had lost the argument, of course. Tech was never Dad's thing, so you can imagine how he felt about putting serious money into it.

By the time I had finished college, I had seen at the big-box stores the technology that was fast replacing barcodes--and there were Mom and Dad still punching prices into old cash registers, still walking the aisles to decide what to reorder when. They were doomed ... without my help, anyway.

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Through These Portals
Pass the Best-Fed Mortals.

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Growing up, the carefully hand-lettered sign on the store's entrance seemed clever. It might even have been true once. But time marched on and "portal" came to mean Yahoo! and AOL. As the sign faded, the clientele, looking progressively *too* well-fed, gained paunches and lost hair. And outside of the undertaking business, an ever-aging clientele is bad news.

That's how, new-and-fascinating EE day job notwithstanding, I came to spend hours each week in big-box emporia. On weekends, their cavernous aisles echoed with a chittering, droning, buzzing sound that would make seventeen-year cicadas proud. But it was for a good cause.

The barcode technology Mom and Dad had yet to accept was fast being replaced by radio frequency ID tags: RFIDs. That's "are-fids," if you prefer to speak your acronyms (and like truffids, if you favor the classics). While a barcode can be read only when in line of sight--you've seen the red laser beams at checkouts--the coded microwave pulses to which an **RFID** tag responds are omni-directional. One invisible, inaudible, electromagnetic *ping!* and the whole jumbled contents of a cartful of books or CDs--or groceries--declares itself.

An RFID tag would never be as inexpensive as ink lines printed on a label. Still, a tag was simple electronics. The couple cents an RFID tag costs were insignificant compared to the faster, foolproof checkout it enabled.

"You're *so* good at spotting new products before they become hot," Dad began saying. I understood his surprise: Did you know just one in ten new food products survives even a year? After a few demonstrations (I called both Yebeg Wot, an Ethiopian lamb-in-red-pepper-sauce dish, and organic mushroom burgers before either was featured in *Grocers Weekly*), he began stocking pre-trendy--and high-margin--ready-to-go meals on just my "intuition."

I knew better than to try an explanation. The RFID scanner in my pocket, its sensitivity boosted by a few tricks I'd mastered in college, invisibly polled the carts of every shopper exiting whatever big-box retailer I chose to loiter by. Dump the data into a PC, sort, and *voilà*: market research. But catching fads was only postponing the inevitable, unless--fat chance--Mom and Dad could match big-box volume and buying power.

At this point I was actually starting to feel a bit like Charles Boyer, whom I had finally gotten around to scoping out on **imdb**. Boyer had done a ton of movies and TV I'd never heard of, and a few I had. In a world of 500-channel digital cable, "The Rogues" was always on some network. Damned if he wasn't suave, and who *doesn't* like to see scoundrels get their comeuppance?

So, in a way, Plan B was Dad's fault.

RFID applications are not limited to checkout. The newest thing in groceries is smart shelves. Picture a

smart store that with a few microwave pulses identifies every jar of pickles and can of cranberry sauce in stock, including those orphaned items abandoned aisles away from where they belong. It's now possible to signal a merchandise management system--even before the shopper meanders to the front of the store--that it is time to reorder something.

Plan B required a newer gadget, one that took me inside the stores instead of staking them out. Wouldn't it be interesting, I had decided, if merchandise management systems were to believe that phantom jars of sauerkraut were selling like hotcakes? That quarts of eggnog were being abandoned in freezer cases? It didn't take much to make my little gadget pulse random UPC, batch, and package numbers as I roamed the aisles. My inventory gremlins were ephemeral--but, I guessed, troubling enough to reintroduce into the ordering loop safely fallible and inefficient humans. Judging from the recent occurrences of stock boys and girls wandering the aisles with clipboards, my first several ventures had been successful.

On foray number eight, the feds nabbed me.

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After 9/11, everyone said everything had changed. After the 2/4 dirty-bomb attack on the Super Bowl, everything finally did. The new Homeland Security Bureau was the most visible proof. The newest domestic intelligence agency was not known for its candor: It appeared in media reports as Homeland BS far more often than innocent typos could explain.

I was driven by two taciturn feds to the headquarters of the country's newest intel agency. Growing up in outer metro DC, I had endured too many school field trips downtown to expect aesthetics from modern government buildings--but this recent construction was just stunningly ugly. My impression, as our nondescript sedan swept past armed guards and a security gate into the underground garage, was of a concrete castle rendered by MC Escher.

I didn't see how what I had been up to could be illegal ... but oblivious and impervious as I was then to current events, I also knew the government had taken to making rather expansive assertions under the **Patriot Act**. It did not help that my perceptions of the FBI, a big chunk of which had become a core component of the HSB, had been formed by "The X-Files."

By the time they laid it out to me in a spartan, windowless room, I was numb with shock. Big Bob's had no intention of sharing their sales data, so a case could be made for theft. The exceptional sensitivity of my Plan A RFID receiver notwithstanding, I had had to stand on Big Bob's property--the parking lot--to get useful signals. That added a possible case for trespass. And, they mused, how confident was I a jury wouldn't find hacking the most credible explanation for the indoor signals my Plan B transmitter had been emitting?

Trespass? I had bought something on every trip, which made me, in technical terms, a *customer*. Theft? Rival retailers had sent secret shoppers into competing stores since forever. More than once Dad, having spotted a furtive note taker, had offered another store's spy a cup of coffee and a chair. Polling RFIDs just made the data collection more efficient.

But possibly I had started down a slippery slope by injecting gremlins into Big Bob's inventory statistics. How many, in a jury of my supposed peers, would be people whose VCRs endlessly flashed 12:00 (any jurors who still owned VCRs would be worrisome enough) and whose children dutifully reset their digital clocks twice a year? Could those peers be convinced my simulated RFID responses were *not* a hack attack? How much was I willing to bet on that?

As my peril began to sink in, the special agent in charge hinted obliquely at the real deal. What the bureau truly wanted was my evident smarts on RFID transceivers. Mine had better range than the gear they

were buying.

The best I could hope for in this situation was massive legal bills I would be years in paying off. Worst case would be legal bills plus who knew how much jail time?

What would you have done?

It was only much later that I realized the one thing the feds wanted above all else: to *avoid* a trial.

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Despite a life-long fascination with the space program, there was never any realistic chance I would become a rocket scientist. As kids, sparklers were the only Fourth of July fireworks my brothers and I were ever allowed--and the way Mom winced on those rare occasions Dad brought sparklers home sucked all the fun out of the experience. Then **Sojourner** rolled its first few yards onto the Martian surface. Problem solved.

NASA, it turned out, was not the only group that developed robots. By the time I graduated from college, DARPA--that's the **Defense Advanced Research Projects Agency**--was putting more funds into robots than was NASA. I'd never had any interest in defense contracting, but lots of DARPA-supported research was and is just way cool, cutting-edge stuff. That's how I wound up working for a Beltway Bandit on a DARPA contract. My bosses no doubt thought about one kind of "dual use" for the new technology while I was imagining another ... and while I nursed my dreams, if and when NASA ever again had money, of someday building robots at JPL.

It did not, amid the never-ending and ever-expanding war on terror, take much to outspend NASA on robots. My piece of the DARPA project was, not surprisingly, on the electronics side, and the budget scarcely covered salaries. To keep costs down, I did my proof-of-concept work using what the govbies call COTS. That's "commercial off the shelf," an acronym which, despite the plain semantics of its phrase, had been nounified. I needed a radio link between a lander and its rover--or, at customer briefings, between a war fighter's handheld controller and the tiny, semiautonomous scout vehicle it controlled. The cheapest, most accessible COTS used unlicensed radio spectrum. You know: the frequencies used by low-powered gadgets like **WiFi** wireless LANs and cordless (not cellular) phones.

It was the damndest thing. My rover would work just fine for days and then, for no apparent reason, it would glitch. Long story short, there was intermittent interference on the command link. My colleagues razzed me about my ill-advised choice of frequency (I didn't mention the dearth of cordless phones on Mars), and, rather than rebuild, we moved the project into a shielded lab. It didn't help.

Okay, NOW, long story short. Much time and expensive test equipment later, the problem was traced to several items of new clothing.

Would you care to guess what inexpensive labeling mechanism also uses low-power RF at unregulated frequencies?

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There's no reason to drag my erstwhile employers into this, not that much detective work would be necessary to identify them. For purposes of this history, "the corporation" will do just fine. Given the dual-use nature of my work, and who was funding it, I had been asked to apply for a Top Secret clearance. I had reluctantly gone along, comforted by the two-plus year backlog in clearance investigations. I was new enough to the real world to still be thinking in college-student time: Nothing matters if it can be postponed past the end of a semester.

My bosses at the corporation were beyond ecstatic when I mentioned a friend-of-a-friend introduction to

an HSB project manager interested in synergies between my current work and Bureau needs. The HSB got a fast-tracked research project, the corporation got a sole-sourced contract, and I got a bonus and an impressive-sounding title. HSB tracked down my long-dormant clearance application.

After my clearance came through, miraculously processed within a few weeks, I finally began to understand the Bureau's interest in me.

You can be excused if you believe an RFID can only be read from inches to a few feet away. The reason, when you approach the subway turnstile, you must hold your smart card right next to the sensor is *not* that the embedded RFID tag can't be sensed from much greater distances. Precisely because cards can easily be read from several feet away, the same pulse that wakes up and momentarily powers your smart card is activating the cards of everyone near you. Your card must be within inches of the sensor to make its reply sufficiently and unambiguously stronger than all others. The transit folks want to know whose account to decrement for the fare.

After uninvited RFIDs made my robots malf enough times, I concluded it was easier to teach 'bots to filter out unexpected return pulses than to strip-search everyone entering the lab. Filtering: It sounds deceptively simple. It's not. Think about coping in real time with arbitrary numbers of RFID tags. Each tag might emit any possible product code or serial number. Each signal as detected by the robot varies unpredictably in strength and direction as I or my coworkers pace. The same filtering technology, repurposed in my homemade scanner, is what made my parking-lot forays productive. The trick was to capture, not reject, the streams of RFID reports.

The HSB wanted my signal-processing logic--and they wanted me to keep enhancing it.

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Bureau folks never refer to their headquarters as headquarters, only (in hushed tones) as the John Ashcroft Building. That's generally abbreviated JAB, and the same wags who dubbed the organization Homeland BS speak as disparagingly of the Junior Achievers Building.

Hushed tones or irreverence? That choice nicely encapsulates my months of ambivalence. No matter how often I returned, the boxy, mostly windowless JAB never lost its hunkered-down, fortress-like aspect. But once I went through the curbside row of massive concrete obstacles unsuccessfully masquerading as planters, passed three tiers of badge readers and armed guards checking photo IDs, penetrated the maze-like corridors into the heart of the structure, an eerie surrealism always manifested itself.

Flyers that advertised carpools and retirement parties were taped beside doors secured by cipher locks and ominous warning signs. Armed agents in well-tailored suits were outnumbered by casually dressed electricians, programmers, janitors, and clerks. Stacks of still-boxed computers on pallets lined the halls, but it took weeks--and then, only if you knew whom to sweet-talk--before the Security and Infrastructure folks would hook one up. Parts of the interior were under construction at all times, providing isolated work space for some investigation or other, and altering pedestrian traffic flow from month to month. Yet somehow, despite all the security, random artisans were allowed into JAB to sell ugly handicrafts at tables in the cafeteria. And somehow, even in the very bowels of JAB, gear would regularly go missing from labs.

My new career had me conflicted from the start. It was hard *not* to feel good about helping stop the bad guys. I didn't know, nor did I think I needed to, who was caught how. It was sufficient to hear vaguely that terrorist plots were being disrupted. Evidently I also had no need to know exactly how my ever-longer-range receivers were being applied; in my mind's over-imaginative eye, I envisioned agents tracking unsuspecting bad guys at a discreet distance. At some level, I recall feeling Roguish--but more

like the crazy-coot uncle than a main character. Than like the dapper Marcel St. Clair played by Charles Boyer. And at yet another level, I have to admit, I was a kid set free in a toy store. Where homeland security is concerned, money was never an issue. It is hardly coincidental that the Beltway Bandit pronunciation of HS Bureau became Hasbro.

On the other hand ... this simply wasn't a line of work I had ever thought to get into, nor was I getting a single robot an inch closer to Mars or Titan. Nor was I helping Mom and Dad. My new, very humorless, customers had made it *abundantly* clear that my RFID trolling expeditions were over.

In short, I was confused.

Then **Mechanicsville** happened.

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CNN played softly 24/7 on a dozen TVs mounted high up on pillars throughout the JAB cafeteria. I was on an early lunch break, escaping the computer-room chill of my lab, when murmuring broke out. On-screen, flames engulfed a red barn, surrounded at a safe distance by flasher-equipped unmarked cars, ambulances, and two fire trucks. A trim HSB helicopter had landed to one side of the frame, its rotor still spinning lazily. The screen crawler gave the then-unfamiliar town name in Iowa.

All around me, "Waco" was getting mentioned a lot.

The **Branch Davidian** references were prescient. That is, although I don't think the HSB agents all around me knew it at first, children were dying in the conflagration: a high-school science club.

Many network exposés and blogs later, you know what none of us knew then: It was only a gung-ho young teacher trying during spring break to excite kids about physics through model rocketry. That--and some bitter irony here--regulatory overkill.

Respect for a parental phobia has kept my knowledge theoretical, but I understand model rockets. The fuel of choice is ammonium perchlorate composite propellant. If **APCP** happens to sound familiar, it's probably because APCP fuels the solid rocket boosters of the space shuttle. APCP is a rubbery mixture of salts, powdered metals, and resins that ignites at about 500 degrees Fahrenheit.

The thing is, APCP falls within the purview of the post-9/11 **Safe Explosives Act**, which means permits, fingerprinting, and background checks before anyone is allowed to buy the stuff. The funny thing is, APCP doesn't explode; it merely burns like the dickens. If you do buy it, the feds are allowed onto your property at any time and without notice to check for its proper storage.

The Cedar Rapids Rocketeers, like similar clubs, cooked up their APCP from unregulated precursor chemicals, just as farmers mix explosives to blow up tree stumps or "dig" irrigation ditches. It's all perfectly legal, under a **personal use exemption**. You might ask: How does one prove personal use? Is it not better, in our dangerous world, to err on the side of caution?

The final count was twenty-six dead: eighteen kids, the teacher, and seven parents.

Based on "a tip," HSB had begun what spokespeople called an "unscheduled inspection." Most people who see HSB's own video of swooping helicopter and onrushing cars think: raid. "Tragically," the final report concluded, "the unexpected arrivals appear to have caused the unintended indoor ignition of one or more model rockets. A rapidly spreading fire resulted. This only reinforces the tragedy of citizens working with such dangerous, generally illegal materials."

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Like most small businesspeople I know, Dad has little respect for economists. "If you took all the economists in the world and laid them end to end," he likes to say, "they wouldn't reach a conclusion." And, "Economists correctly predicted nine of the past five recessions." That last one, it turns out, is attributable to an economist.

My ambivalence about HSB ended with the cold shower that was Mechanicsville. There were real human consequences when domestic intelligence foiled nine of the past five terrorist plots.

Mechanicsville and the subsequent investigations raised plenty of questions. One of the most obvious--still officially unanswered--was, "Who tipped off HSB." That is: Who somehow confused a science club with terrorists? HSB did not reveal its sources, of course. I heard just enough hallway chatter to know that the question worried the hell out of people--and enough to disbelieve the media speculation that Homeland BS was covering for some naïve or competitive or vindictive classmate of the victims, lest others hesitate in the future to inform.

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Two kinds of people work in JAB: those who carry guns and those who don't. The latter (which includes contractors like me) tend not to get much respect. Too many of the former know squat about computers. In 2003, the **FBI was training agents how to use a mouse**.

And yet ... the modern approach to security is all about information.

Unless you've been on Titan, you must know passenger screening became serious business after 9/11. The last time I checked (**Airline Disclosures of Passenger Information**), six airlines and two big reservation systems admit to having shared at least samples of their passenger data with the Transportation Security Administration. No one asked the passengers if they cared to be part of the experiment.

After 9/11, everyone demanded to know why the FBI hadn't known ahead of time. No matter how many hostile operations were prevented in the intervening, fairly peaceful years, the question came back, big time, after 2/4. One result was establishment of the HSB. Not coincidentally, the biggest technology project the HSB now has going is its Consolidated Data Warehouse, the mother lode of information about *anything*. I had no need to know what was in it, nor did I, but it was clear that the approach being taken to better connecting dots in the future was: collect lots more dots.

Dots like: Several of the Cedar Rapids students had recently purchased "extremist Islamicist literature." That literature, as NBC News broke soon after this HSB explanation, was extra-credit reading in the curriculum of a World Civ class.

For a time I had a privileged user account on CDW. Designing gadgets did not require any access, let alone privileged access, but my testing collected scads of RFID transaction data, which I had kept, in my HSB lab, within a database management system. When a dayshift database administrator on CDW announced her vacation plans, I got volunteered to backfill.

My new, unwanted DBA task required occasional poking about the database, just to make certain everything was operating okay. The cardinal rule is: Never look up yourself. It's apparently bad form to check whether you're under investigation (evidently, double agent **Robert Hanssen** monitored his own records at the FBI for years for signs of suspicion). One thing I looked up instead, as a sample query, involved press reports of the Mechanicsville situation. A security admin spotted my query in an audit log, and my wrist got slapped. I wasn't on the approved list of people to be accessing such a sensitive matter.

Too late: I had already clicked through to long lists of annotated RFID transactions associated with the investigation. I had glanced at a few, and one I couldn't get out of my mind: the tires of a parent's SUV,

recorded by a Wave-N-Go pump at a Mechanicsville gas station. There was no record of a purchase, as though the stop had been for directions or a bio-break.

Clearly, the gas-station chain was providing company data to the feds. Was such surveillance illegal? Unethical? Creepy? Was this different than flight records, which, since 9/11, few expected to remain private?

I was still wrestling with those questions when I noticed: One of the chains providing RFID data to the HSB was Big Bob's.

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I was more facing my TV than watching it when the last puzzle piece fell into place. Had I been paying attention, I would have simply zapped the commercial. The ad did not even penetrate my consciousness until well into the next segment of sitcom. If my TiVo thought it strange that I backed up to re-screen a commercial, it did not comment.

The ad was for a high-end washing machine. Accompanying a close-up of a red sock atop a mound of pink underwear, the voiceover declared, "Make such tragic accidents a thing of the past." I froze the frame. It would indeed be great if my red socks and my tidy whities declared themselves to my washer. What was decidedly *not* great was the sudden epiphany that my socks and undies were likely announcing my presence to every RFID scanner I passed. As in: every big store I entered; every subway turnstile I passed, even if I'd bought my fare card with cash; every Wave-N-Go gas pump....

Feeling stupid--why had I compartmentalized the RFID-in-clothing problem as purely an in-the-lab issue?--I unearthed my homebrew scanner from its place of exile at the bottom of a desk drawer.

The newer half my wardrobe had RFID tags. My wallet was filled with them.

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If you have not yet joined a **currency exchange**, you should.

In much simpler times, people worried that newfangled credit cards were an invasion of privacy. There would be centralized records, somewhere, of what you bought when. People who worried about such records--some of them, obviously, Doing Bad Things--would use only cash.

Surely you've heard about the supposed nutcases who wear tinfoil-lined hats to hide their thoughts from the aliens. Well, my *wallet* is now foil-lined. New Euro notes carried embedded RFID tags as long ago as 2005; for several years now, new US currency shared that "honor"--to prevent counterfeiting. Here's what they don't tell you: You can be traced by the money in your pocket. Each bill in your wallet was associated with you when you received it at the bank lobby or ATM or in change at a store. It stays associated with you until a bank or store cash register logs its receipt. Tagged bills mean that even buying things with cash is no longer anonymous.

Are you still wondering about currency exchanges? That's a bunch of folks who meet for the sole purpose of swapping their cash. You can do it out in the countryside somewhere, far from any possible RFID poller, although there are obvious risks to carrying large sums of cash to an isolated rendezvous. A better solution is a shielded room (in technical terms, a "Faraday cage"). Copper window screening works nicely, as long as you remember to cover the floor, ceiling, and door, too. RFID interrogation signals can no more get in than microwaves can get out past the similar mesh embedded in the glass of microwave oven doors.

Click here for **plans to build your own currency exchange**.

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RFID chips are tiny. RFID tags generally are not, because the antennae must capture enough power to operate the silicon chip. The typical antenna occupies a couple square inches. That means you can find--and disable--the tags. After I calmed down from my red-sock epiphany, that's just what I did. If my story has made any impression on you, you will, too. I used a scanner to look for them; if you lack access to a scanner, pay close attention to big labels, overlapping fabric, and wide hems. If a garment crinkles, check there between cloth layers.

Shoes are harder. Taking them apart to find the tags that are almost certainly there will probably destroy your footwear. I zapped mine with a focused microwave beam until their chips fried. A bit of shoe polish covered the resulting scorch marks. (You *might* be able to microwave your shoes, but I don't recommend it--especially if they have steel shanks.)

You may be asking: Why? Why did I disable the RFID tags in my clothes?

No one had cause to be tracking me. Maybe *that* was my reason. That the tags helped retailers manage their inventory was no reason for me to be marked like a prospectively wayward cat. I was offended, damn it. Sitting in my newly RFID-free apartment, stewing in high principle, paranoia, and self-righteousness, my thoughts turned to the tires that had led HSB to Mechanicsville. Outside I went.

My car, it turned out, was filled with RFIDs, and not only in its tires and the E-Zpass transponder clipped to the sun visor. Even if I could take the car apart, some pieces were likely unzappable.

Which left what?

I could replace my car with a clunker too old to contain RFIDs. I could, in theory, keep a clunker running with old parts from junk yards. My suspicions were by then in full bloom. I found myself wondering why the NHTSA had suddenly decided a few years earlier that tires had an aging mechanism (**Tire Expiration Dates**) distinct from tread wear. Was age-related rubber deterioration real, or was it disinformation to get RFID-tagged tires onto every car in the country? Frying an RFID embedded in a tire would soften the surrounding rubber. That couldn't be good.

You're overreacting, I had lectured myself. Three-hundred million Americans and almost as many vehicles, evermore tags on each, every day passing within range of, well, I had no idea *how* many RFID-sensing toll booths and point-of-sale terminals. How could HSB possibly keep up with that data geyser? They would have to concentrate on small subsets already known for some reason, by some conventional investigative means, to merit scrutiny.

Wouldn't they?

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Perhaps you are enrolled in one or more **merchant loyalty programs**. Knowing what you buy, and when, and where, has value. That's why so many stores (but *not* mom & pop) discontinued coupons in their newspaper ads, but happily provide discounts once you disclose your customer ID. You regularly buy canned soup, so it seems harmless when they tempt you at the checkout with a deal on crackers. The results can be both humorous and off-putting when your favorite bookseller makes recommendations for you extrapolated not only from what *you* read, but from the gifts you've purchased for your quirkiest friends and relatives. It gets downright creepy when your pharmacist speculates from your prescriptions that, for example, you have a likelihood of erectile dysfunction, and mails you a Viagra coupon and the advice you discuss it with your doctor.

Those are trivial examples of **data mining**. Remember Dad and his disdain for economists? Economists predicted recessions by mining data long before that term came into vogue. Their models, of ever-growing sophistication and ever more voracious appetites for data, hunted for correlations, trends,

and clustering. But correlation is different than causation, which is how they predicted nine of the past five recessions. These flawed readings of the economic entrails and commercial tea leaves--they're almost funny until misinformed government policy ensues.

Data mining is a big deal now in homeland security, and rightly so. Way back in the Cold War, West German federal police broke the infamous Baader Meinhof gang by hunting for prime suspects: single men without cars registered to their names, who paid their apartment rent and utility bills in cash. Estimates vary, but the federal police may have surveilled, by emergent techniques not yet called data mining, up to five percent of the adult West German population.

Data mining can be powerful and productive. It's a good thing when phone-call patterns give warning of an imminent terrorist strike. But when HSB--and I speak now of former colleagues who are honest and honorable people, who in my mind, notwithstanding my current fugitive status, I consider my friends--detects nine of the *next* five terrorist attacks?

That's how you get a Mechanicsville.

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The red-sock incident happened on a Saturday. The following Monday I had a DBA shift, filling in for my still-vacationing colleague. Feeling a bit like Marcel St. Clair, I did a few "Is it still running?" checks of CDW.

Sturgeon's Law posits that ninety percent of everything is crap. Either Sturgeon was a cockeyed optimist, or he knew nothing about software. The data warehouse required constant babying, reconfiguring, tuning, restarting ... pick your euphemism for "fixing." Driving the process was a mix of recurrent and ad hoc queries, by which to gauge how well the temperamental software was behaving that day. In the ad hoc category, I queried with a few presumably innocent product RFIDs I'd recently captured with my scanner: tires on a friend's car, a second cousin's new penny loafers, a case of beer in the storeroom of the bistro where I had eaten dinner the previous night. I thought nothing of the gaggle of feds clustered across the lab at one of the security administration workstations. Secadmins are a breed onto themselves; it is their nature, like birds, to flock.

I was staring at the screen in frozen disbelief, at a column of time-tagged hits that tracked my buddy's car around town yesterday, when an HSB guy--the gun-toting, agent type--sauntered over and tapped my shoulder. "A word to the wise, Zach. Checking out your friends and neighbors is not allowed either."

I went outside for lunch that day, and never came back.

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Which brings us to the end of my cautionary tale. If I am not simply deluding myself, if this blog has a readership beyond seething HSB agents, we may even be, to borrow a phrase from Winston Churchill, at the end of the beginning.

That is all very metaphorical, of course. I am going to be very vague about where, physically, I am. While I am being metaphorical, I will go so far as to admit a return to my roots. I am toiling once again at a mom & pop store. It's someplace that pays me in cash, and that--like *my* Mom's & Dad's place--still uses those quaint, low-tech devices which, although called "cash registers," register no information about the currency therein.

To anyone from HSB viewing this: Maybe it's a grocery. Of course, it could as easily be a dry cleaner, a hotdog stand, or a used-book store. Perhaps it's none of those.

In short, my hypothetical Dear Reader, I've gone underground. The Ten Most Wanted Fugitives list calls

me a cyber-terrorist.

HSB now claims I've hacked into the transactional databases of American companies. Not so. At worst, I've grazed the database of *one* company, Big Bob's. In my opinion, that hardly rises to most-wanted status.

HSB would also have you believe I brazenly engaged in a nefarious spying operation from within the bowels of JAB itself. Once again: not so. I'll admit--I have admitted--to a few peeks. I'll assert every DBA and sysadmin there does the same. Vigilance in the search for bugs in crappy, overpriced software is no vice.

Why, then, is HSB after me?

It all keeps coming around to Big Bob's. You've already read my after-the-fact reasoning (rationalizing, if you prefer) about the field trips to Big Bob's that brought me to HSB's attention. But the friend's tires that surfaced in the CDW, just before I went to lunch and never returned, were bought at Big Bob's. By inference, Big Bob's provided the data to HSB. Who else could tie those specific tires to that friend? Not that Big Bob's alone could possibly have had enough RFID readers, widely enough dispersed, to have captured the peripatetic course around town of those tires....

The quicker I am taken into custody, the sooner this narrative, in its many reincarnations and mirror sites on offshore servers, stops. HSB does not want to reveal its plans--devised, I will postulate, with only the best of intentions--to track everyone, everywhere, at any time. They want at all costs to keep secret the clandestine co-opting of Big Bob's, and countless other retailers, into Big Brother.

I keep remembering that agent's "friendly" advice. CDW had associated me with my second cousin from across town and the college buddy with whom, at the last minute, I had gone to dinner. My query had been enough to trigger a real-time alert at a secadmin workstation.

Many of you are thinking: HSB has no reason to watch *me*. *I've* done nothing wrong.

I'm relating this story to make you consider one central fact: *I* did nothing wrong, either.

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What you do now is your choice. My free advice: Join a currency exchange. Trade shopping lists with your friends. Pay with cash, and patronize stores with old registers. Carry your purchases in a foil-lined shopping bag. Remove those RFID tags that are safely removable.

But if you want to do more....

I have a new calling, and the spare time to indulge it: very specialized circuit design. I've concentrated on gadgets for all things RFID: **detecting**, **spoofing**, **jamming**, and **frying**. The frequencies used by RFIDs are unlicensed, making my hobby (except perhaps when zapping others' chips) entirely legal.

What these devices have in common is the long-term effect of their deployment. Widely used, they will degrade databases reliant on RFID-based tracking. If you believe that following your every move and viewing your every purchase should be more difficult than typing a simple query into a government database--if you place any value on your privacy--such degradation is a good thing.

Perhaps you have the skills and equipment to make these devices. Any savvy teen with access to a modern high-school electronics shop can build them. And they offer a productive new use for that old, wireless PDA that hasn't seen the light of day in months ;-)

Check back often for updated designs.

I've put on indefinite hold my dream that a robot of my design to roll onto Mars or Titan. My robotic aspirations have been repurposed toward a different world: the RFIDsphere. Imagine armies of tiny RFID spoofers and jammers set loose to roam, to mimic codes they encounter, and to inject RFID gremlins throughout their random travels.

How polluted must the data sources for repositories like CDW become before we're all freed from incessant surveillance?

Herewith two parting comments for my friends at the Homeland Security Bureau, and especially to those of you on the hunt for me. First, you have not heard the last of The Rogue. Second....

Tag. You're it.

The end