

Wildcard

Cory Doctorow

doctorow@craphound.com

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The first day at a new school is always hard, but for Tish, it was literally impossible. Because Tish walked into Benn High and slipped right through a crack and disappeared.

Oh, she was *there*. There she was, wearing her new school clothes, clutching her book bag. She'd painstakingly worked it with electro thread so that it blinked out the logo for her favorite Canto-funk band, Handshake Building. She could switch on the light show and make the whole corridor throb like a street-disco. If she spoke to people -- the hall monitors, the teachers, the office ladies with their greasy, taped-together spex -- they spoke back. But as far as the school was concerned, she was invisible.

Here's a glimpse into the day of an invisible pupil: Your locker won't open. Your phone won't register on the school network, and blinks its stupid yucky-face sign that means you're not allowed to use your device here. The office door is locked and you have to be buzzed in by one of the office ladies, who then scolds you for wasting her time because pupils should be able to use the automated system, and then turns brusquely back to her work. The classroom doors won't open either, and the teachers won't let you into the room, because they can see plain as day and sure and silicon that you are not enrolled in your class, no matter what the flimsy bit of paper you're clutching in your sweaty hand says.

She was a malformed packet in the school's network, and the only people with the power to help her rejected her instead, dumping her on the floor like a router throwing spurious data into the bit-bucket. She couldn't even call her parents because the school's countermeasures blocked all external networks, as Mr Yucky Face on her phone was quick to remind her.

Here's a glimpse into the day of an invisible pupil: Everyone else seems to know each other. They hug and touch phones and whisper to each other, cutting their eyes over to the new kid with the wrong shoes wrong hair wrong socks wrong bangles. They all seem to smirk. They all seem to know a dialect of English that's full of subtext you can never hope to understand. They shoulder past you on the way to very important errands that you can't possibly be a part of because you're invisible.

Tish found a recess in the wall behind a structural support column and she pressed her back into it, trying to disappear, wishing she was *really* invisible. That's where the school security guard found her. She was a tough-looking, middle-aged woman with ruddy skin and a slight limp. She peered at Tish through her spex. "Who are you, then?" she said. She sounded like a cop: hard-edged, no nonsense. Her nametag said HRUSKA.

"It's my first day," Tish said. "I'm *supposed* to be here. I'm *enrolled*. But nothing *works*!" She shook her piece of paper, the letter that had confirmed her enrollment, which had been physically delivered to her house, like a bag of groceries or a prescription. Her parents right away went into one of those "In my day, all letters were on paper" things, as though she'd never downloaded an old TV show. She knew about letters. She'd put it in her book bag and brought it with to school. She was glad she had.

HRUSKA examined the letter closely. "OK," she said. "What's the problem?"

"Nothing *works*!" Tish said again, and gave HRUSKA a run-down of all the fails she'd been through that morning, from the classrooms to the lockers to the office ladies.

"How the hell did you even get in the building?" HRUSKA said. "You're not registered on the safenet. Door shouldn't have even opened for you."

"I went in with a bunch of kids."

HRUSKA blew out a disgusted breath. "Tailgating. System's not supposed to allow that." She touched her ear and cocked her head, then looked up at one of the CCTVs ostentatiously mounted behind a smoked-glass dome on the ceiling next to the sprinkler. She gave it a thumbs-up. "Boss is worried about you," she said. "Wanted to know if we needed to get the cops up in here. I told him no. I figure this is just an honest misunderstanding." She stared at the letter some more. "I reckon this is it," she said, and tapped the paper, holding it under Tish's nose.

"What?"

HRUSKA tapped the paper again. Tish felt like she was in one of her bad pop-quiz dreams, the ones where she had to answer questions written in another language, where every time she stuck her hand up to explain herself, she got shushed by the proctor.

"It's your name, girl!"

"What's wrong with my name?"

"Look here," HRUSKA said. She pointed to Trish's name at the top of the sheet: PATRICIA BROWN LOEB. Then she pointed to the bottom of the sheet: PATRICIA SAMANTHA BROWN-LOEB.

Trish stared and stared, then said, "Is it..." She trailed off. It was too stupid. Could it really be? "Is it the hyphen?"

"Pesky things. Don't hold with them myself."

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The thing was, Trish's parents didn't hold with them either. That's why she was Brown Loeb, not Brown-Loeb. They wanted both of their last names in there, but as individual words. Once Trish learned to write her own name, she'd waged war on that goddamned hyphen, the world's dumbest piece of punctuation. It meant *minus*, for chrissakes, what more proof did you need that it was pointless? It subtracted value from any word to which it was added. And yet, time and again, the official email, the online logins, the attendance sheets, the hospital bracelets, every stupid one of them, had her name as Brown-Loeb. Simple as it was, no one could figure it out.

Mom and Dad thought getting locked out of school because of a hyphen was hilarious. At first.

"They don't do anything important on the first day," Mom said.

"Showing up on the second day is way better," Dad said. "All the dust has settled. What's better, to try and figure out everything at the same time as a million other kids in a world of total chaos, or to be the only one with a special request in a world of relative

calm?"

Trish bit the inside of her cheek. She was already new at Benn, didn't have any friends, didn't dress right, didn't even speak the freaking language. The last thing she wanted was to be a freak in a new way.

If only she knew.

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Thirty three days later, Trish figured it out.

She hadn't been able to go to school. Her mom took her to school on day two, and the school was much more polite to them. They spent a couple of hours trying to get the computers to agree that Trish was well and truly a student at Benn. Once, they even declared victory over the forces of Evil Hyphen, but they were premature. They called tech support. They spent a lot of time on hold. Finally, the principal -- a rail-thin woman as tall as Trish's father, who dressed all in drapey black clothes that looked like something a banshee would wear to the opera -- came out and demanded to know what was up. When they told her, she pressed her skinny lips together so hard they practically disappeared. She went back into her office and they all heard her shouting at someone in tech support. She came back out and smoothed off the draped, layered black fabric and said that she was very sorry, but it would all be fixed tomorrow.

She was wrong.

After four days of this, they told Trish to just stay home. Mom and Dad said they'd sue. They even hired a lawyer to send a very threatening email. The school offered to pay for a tutor "while these unfortunate IT shakedown issues work themselves out."

Trish sat down with her parents that night and made the case for not sticking her with a tutor. "Look, they're going to fix this soon, right? So I'll have this tutor, and he'll, what, teach me all my subjects? Why don't I just download the curriculum modules and work through them on my own? You can mark 'em, or I can hand 'em in once this is all fixed."

Her parents came around after a couple hours of this. They didn't like the idea of having some total stranger hanging around the house all day with Trish. She painted them a picture of her life as a kind of monk in the library, even mentioning that she'd bring a *laptop* instead of spex. Her parents didn't trust learning unless it involved keyboards. They thought that QWERTY came down off the mountain on a couple stone tablets, and that RSI was a holy scourge for the virtuous.

But it was the library that clinched it. Mom and Dad owned fewer than ten physical books between them. Years of moving around chasing Mom's job had divested the family of anything bulky, heavy, or prone to being damaged by movers. Books ticked all three checkboxes. All those books had been replaced with ebooks in the house cloud. But Trish knew how guilty they felt about it. Like bringing up a kid in a house that wasn't insulated with bookcases was a kind of child abuse. For years, they'd lugged around three boxes of kiddy books she'd never had the heart to tell them she never, ever wanted to look at again. She'd resolved this two moves back by cutting the traces on the tracking labels so that the boxes couldn't be automatically read and routed. They'd never arrived. She'd pretended to be sad about losing her old paper pals. For her parents, the idea of Trish spending time in the company of the books sealed the deal.

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Really, it only took one week for Trish to figure it out, but it took 26 more days for her to prove it.

After all, everyone knew what the problem was. Multiple, competing systems were trying to parse out her name in different ways. Some of them thought her last name was "Brown Loeb." Some thought it was "Brown-Loeb." Some thought it was "Loeb." There might even be one that thought it was "Patricia." She wouldn't have put it past the school's IT systems.

Like all publicly purchased software, the school's IT systems' source code was on public deposit. Anyone could check it out and --

Well, that was the thing, wasn't it? Trish had had all the normal programming courses, Squawk and Pipsqueak and even some real Squeak, a bit of graphic Python and that sort of thing. It had all been drag-and-drop, though, colored boxes. Trish knew from some hard experience trying to get her apps to run that colored boxes could hide as much as they showed, and when you really wanted to delve into the Inner Workings, you had to squint at impenetrable lines of text.

But colored boxes (or colored "boxen" as her old comp sci teacher always called them) were good for starters. She spent her days in the library wireframing all the school logic, turning every process into a flowchart and showing how they meshed. She fed her name into the system at various points, watched how it emerged at the next junction, like flushing numbered pieces of floating plastic down the toilet to map out the sewer system. It was an apt analogy, as this code stank worse than a sewer.

In this way, she whittled away parts of the system, isolating the borked modules, opening them up, trying to make sense of their inner workings. The hairiest parts were written in real Python -- not the graphic stuff she'd learned on -- and some of it was even in Perl, which was something her comp sci teacher had always made nervous jokes about but never taught them.

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In the end, Trish had to teach herself regular expressions. She'd heard the term before, of course, but she always thought it had something to do with machine translation, like writing programs to *express* *regular* French verbs in English or something. She quickly realized her error. Regexps were ways of matching bits and pieces of text in larger chunks. For example, if you wanted to count all the "words" in a block of text, you could use a regexp to count all the times a little piece of text that wasn't punctuation was preceded by a character like space, comma, quote, or a new line. She already knew about wildcards, the little stars you could use in place of any text, so that *tric* would match "patricia" "Patricia" "trick" "tricky" and "trickle". But regexps were deep magic, each special character a kind of vicious genie that would grant you one wish and then give you *exactly* what you'd wished for, even if that ended up screwing you up. Or keeping you out of school.

What's more, not all regexps were the same. Like the slang they used at Benn High, every programming language had its own dialect of regexp, subtle differences that could make a complex regexp work beautifully in one place and fail miserably in another.

The school's IT systems had been built by four different vendors, and included packages and libraries from hundreds of free software projects. The security subsystem had

generated a unique ID for her based on her hyphenated name, by using a cryptographic hash function. This unique ID meant that she could be kept separate from any other Patricia Loeb or Patricia Browns or Patricia Brown-Loeb. The enrollment system had done the same thing, but using the unhyphenated version.

Of course, Trish wasn't the first student whose name appeared more than one way in officialdom's databases. That's why some programmer had written a "compatibility and sanity checker" module that took non-matching names and looked for near-matches using --yup -- regexps.

And therein lay the problem. Trish could *see* it happening. She fed her name through the security module to the sanity checker, and through the enrollment module and through the sanity checker and yup, it was clear that before the sanity checker was invoked, both systems agreed that she was probably her. But afterward, the sanity checker drove them both insane, and her name was no longer a match for her name.

Back she went to the colored boxen. She found an app that would turn any regexp into a set of cute colored boxes that diagrammed the way that it would filter texts. And according to those, everything was perfect. Thanks, colored boxen.

Down and down she dived, to the bottom of a murky ocean of ancient, arcane artifacts from the lost civilization that gave the world regular expressions. And thirty three days after she was supposed to be having her first day at Benn High, she surfaced clutching a perl. Or specifically, an out-of-date perl module with a funny bug in the way it handled "escaped strings," including, yup, Evil Lord Hyphen, Prince of Darkness and Author of All Trish's Misery.

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Trish quickly realized that she was the only one who felt like throwing her a hero's parade for her discovery. The school grudgingly readmitted her. Her parents focused largely on that one important fact (and on chasing her grades for the rest of the semester). The new kids didn't know or care about why the weirdo from out-of-state showed up more than a month into the term. Her old friends? They were busy with their own stuff: new friends, new hookups, new fights.

But Trish treasured the feeling she'd gotten when she'd picked apart the relentless, faulty logic of the program, submitted a patch, and watched the system unbreak itself. She wrote a little note to her old comp sci teacher, who sent her a nervous joke about perl.

But she enrolled in AP comp sci, and of course her honors independent study project was a major update to the colored boxes that had totally failed to identify the problem with "her" regexp. It turned out that the same out-of-date, buggy library was in use all over the place, and she wrote a crawler that identified any public source-code that used it, auto-patched it, and submitted the patch. There were over 400,000 pieces of public software in all. Seeing her name at the top of that year's bug-squasher leaderboards amused her no end.

Trish's love affair with regexps would have probably ended there, but for Mr Henry J Grimsby, Sr's parole.

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It was senior year, and Trish was a busy bee. Trish had pretended not to overhear Mom and

Dad's whispered conversations, but she wasn't stupid. She knew that Mom had passed up some very juicy gigs -- **very** juicy -- so that Trish could stay put at Benn High and finish out her diploma. Her education had cost the family something important, something that it might never get back. So yeah, Trish was a busy bee.

Of course, she had friends, and there were a few boys, and she'd screwed up pretty bad in AP history and had to take it over again. But Trish was neck and neck with three other kids for top of her class. One of those people was Hank Grimbsy, whose full name was Henry J Grimbsy, Jr.

"Trish?"

She'd never really warmed to Hank. The other two "smart kids" in her year were twin sisters who'd transferred from Finland in senior year, and they were so utterly martian that they weren't really competition. But Hank was a townie, born and raised, one of the few students whose parents weren't high-flying researchers with one of the big tech-park business. Like Trish's parents, say. Hank's parents weren't researchers. They weren't even rent-a-cops or janitors in a research park. You don't get that kind of job without a criminal records check, and neither of Hank's parents could pass one of those.

"Hey, Hank," she said. She never knew where to look when Hank talked to her. He was just so... She didn't know what. Different. Not like the Saari twins. More like someone who had a lot of bad, secret history. Someone who might casually start talking about murders. Not that he ever had, but...

"Got a minute?"

She looked at her phone, tilting it so that he couldn't see. It would have been easy to fake an appointment with a college advisor or an after-school commitment. But the fact was that she had nothing going on that evening, for once. Trish didn't like lying anyway.

"Sure."

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Henry Sr had been in and out of jail for most of Hank's life. He said this as plainly as Trish might have said that her Dad played keyboards in a noise-rock band with a bunch of other nerds from work.

"Started with something stupid. He and some buddies got someone to buy 'em some beer and they took it to a graveyard. One of them got rambunctious, kicked in a mausoleum. That's when the cops showed. Dad wasn't much of a runner. The rest were. You know that joke about outrunning a bear? 'I don't need to run faster than the bear, I just need to run faster than **you**.' Applies to cops, too.

"Breaking into a mausoleum, that's a felony. Never mind trespassing and drinking underage. So then he was a felon. Which meant that when he got popped for getting into a stupid fight over a softball game, he was on his second strike. Judge thought he needed to be an example, so he went back inside. He was still in when I was born."

Hank had a way of talking about this stuff. Made it sound like a story he'd told before. Trish figured he'd gotten it down to the minimum viable text, the least words he needed to explain what was going on with his dad.

"He went back inside when I was eight. Nine years ago. It was a stupid thing. He mouthed off to a cop who'd pulled him over because his car's firmware was out of date. Cop brought him in on obstruction. That's a felony, too. Plus, third strike."

Trish swallowed. "You're kidding. Nine years for mouthing off to a cop?"

"Nine years for mouthing off while on your second strike. He could stay there forever, except for parole."

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The public defender couldn't figure it out. She was an earnest lady, but busy. She was old, too -- seventy or older, and walked with a pair of elderly and rickety exos on her legs. Trish tried not to stare at them.

"Hank tells me you're very good with computers, Ms Loeb. Or is it Brown Loeb?"

"Trish is fine," Trish said. The lawyer had met them at a Lady Gaga's, which Trish thought was cute and kind of retro.

"The guidelines are very clear. Henry Sr should have been recommended for parole this year. I've got third-strike felons with far worse offenses on their sheets who were back out and with their families in five years. Some in four. Eight. Well, it's unconscionable. Waste of a good man's life, waste of a family's heartbreak. Waste of tax-dollars, too."

"So how can I help?"

"We know what it is," she said. "Look." She tapped the table three times and made an arthritic pinch-zoom gesture and some documents migrated to Trish's side, arranging themselves around the little shotglass of neutraceuticals she'd ordered. Even without the red circles around the text, she would have found it almost instantly.

"He's Henry Comma Senior here and Henry No Comma S-R here," she said.

"Did you know that state correctional service contractors are not obliged to patch their IT systems? They get an annual allocation to evaluate any updates for potential security problems, and once that is exhausted, they are no longer obliged to consider *any* patches. Right now, they are lagging eight years behind the patch-cycle for their major systems." The lawyer looked her right in the eye, skewering her in place, lasering the significance of her words into Trish's skull.

"That is so fail," Trish said. "I mean --" Words wouldn't come. Eight years!

"If you've got the money, you bring in an expert and have them testify to the court about the failings of technology that have led to you being unduly incarcerated. The judge then orders the state to free up the budget to pay its contractors evaluate the patch and a month or two later, you're out of the system."

Hank Jr's hands clenched and unclenched. "Expert witnesses don't come cheap," he said.

"What does it take to be an expert?" Trish said. She could put 10 and 10 together and get 100.

"Well, you have to have been recognized in your field," the lawyer said.

"Like topping the code.gov bug-fix leaderboard?"

"Exactly like that."

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She'd thought that Mom and Dad would lose it. Extracurricular activities were one thing. All but dropping out of school right before finals to analyze a hairy mess of eight-year-old code in order to prepare a legal brief and then testify? That was something else.

"Are you kidding?" Dad said. "Mad? Trish, we couldn't be prouder."

"But my grades --"

Mom put a hand over hers. "Trish, grades measure the stuff we know how to measure, which is approximately the stuff that matters *least*. If your grades take a beating, you can repeat a couple courses online. Come on, Trish, you know that this is the kind of thing we're a hundred percent behind."

She hadn't, actually. But Trish figured that that was probably her fault. Mom and Dad were busy, and she'd just assumed that because they'd made happy noises when she brought home her As that they'd flip out if she brought home Cs. Turned out they didn't give one sweet damn.

Besides, Hank, Jr came over and helped with her exam prep every night. Her parents made giggly embarrassing boyfriend-type noises, but Trish wasn't interested and besides, she was about 98 percent certain that Hank, Jr was into other boys.

And in the end, the Saari twins beat both of their final grades by seven points. But they all graduated.

Plus, Trish testified.

Plus, Henry, Senior got his parole.

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Hank, Jr sent her a huge bouquet of flowers -- really nice ones! -- and a gift basket and a hand-written card with a note that was so sweet even her dad cried when he read it. But Hank Jr didn't call or text or email or message her after that. Didn't come over anymore. It was summer, and she was scrambling to figure out college or maybe take a gap year, so she didn't notice at first. Then she assumed that he was catching up with Henry Sr. Then she got a little bit offended.

> Have you fallen into a well? Do I need to send out a search party?

He replied to her message nearly instantly, and came over the next night.

"I just thought, you know. The project was over. I didn't want to impose further."

She chucked him hard on the shoulder. "Impose? Idiot, it's not an imposition. We're *friends*, you know."

He looked up at her with big, sad eyes. "We are?"

"Derp. Yes. Course we are. Come on, J.R. --" that was her nickname for him "-- why wouldn't we be friends?"

"I just thought, you know. Job done. You've got your life to lead."

"What life?" She gestured at the living room, which was its usual tornado of clutter from three adults who were all indifferent to personal organization and busy with a million things.

"Trish, we're just, you know. Different. I'm a townie."

"Big deal. Shut up. We're friends, OK?"

"OK," he said. His smile could have powered the streetlights for their whole block.

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The third rev of her resume made her want to go crosseyed and spit. There were only so many ways you could burnish up the career history of someone who's never held a job. Her bot was finding potential job at the rate of twenty a day and submitting to them, but not one had gotten back to her. There was nothing for it but to try and polish up the old turd of a CV and make another go at it.

"I don't know why you're bothering with that."

"J.R., just because we're not townies does not mean that we're rich. My parents expect me to start paying rent if I don't go to college in the fall, and I don't want to get nipple-deep in toxic debt before I've hit twenty. Rent it is."

"That's what I mean! Why are you pissing around with those loser jobs when you've got an easy way to make the rent?"

"J.R., if this involves a webcam, I'm going to skin you and make a rug."

"No, dumbbo. Weren't you listening when we went to Lady Gaga's? Expert witnesses don't come cheap. Rent? The work you did for my dad, you could have paid the mortgage on this place for six months."

She opened and shut her mouth a few times. She'd sorted her work for Henry, Sr into a bucket labeled "Good Deeds," and now she was going through the mental process necessary to move it over to the "Big Bucks," bucket.

"How the hell would I find clients?"

"Oh, I don't know," J.R. said. "Perhaps you could use a regular expression to sort through parole records?"

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She did one better. She crawled the entire antiquated codebase of every private prison contractor in the nation, then used the patch databases to identify candidate bugs. From there, it was a matter of scraping court records and locating the bugs that trapped the

most innocent people in jail. And from there, it was one more regex to find a few richie-rich types whose family would pay her to get Dad or Mom out of the joint, and in so doing, fix the bug for the largest number of people, including all those who could never afford her rates.

By the time she was 23, she was making more than both of her parents combined, and was not only employing J.R. as a general operations manager, but also the Saari twins and half their graduating class. She hardly ever wrote a brief anymore. Most of her work was teaching new staff the black art of manual regex parsing.

But that wasn't efficient. At J.R.'s urging, she recorded a series of videos and, duh, posted them online in public. Why not? Knowledge is power. Power works best when it's spread around. Not many people gave a damn, either, until she got called in to testify on behalf of the founder of an ancient social media startup who'd been locked up for securities fraud for 25 years. Getting him sprung made her name trend in every major city in America, and soon her tutorials racked up 50 million views. Then 100 million. Then she stopped checking the counter.

She was too busy.

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She could have written her own ticket then. Could have become a millionaire over and over again. But she'd made a lot of money fast and she knew that she could do it again if she needed it. Money wasn't that interesting. Solving problems, that was interesting.

Her Mom and Dad came to the launch party for her nonprofit: Wildcards*. They beamed at her from across the room as she was surrounded by well-wishers and press and politicians. Everyone came. HRUSKA. The lawyer. Henry, Senior. Dozens of her clients, and all her employees. The Saari twins played violin and piano in a corner.

There was bubbly and toasts and cheers. The party went all night. She stayed and helped the cleanup crew until dawn, then collapsed into bed.

But 12 hours later, she was up and wearing her spex, and on the job. She got the bullet train from Union Station and began her tour of the country, which J.R. had nicknamed "The Janey Regexpseed Inaugural Great American Road Trip and Medicine Show." The days melted into weeks, every day a new place, a new hackspace or school or prison support group, where she led tutorials on regex. The brightest students travelled with her for a day or a week, then fanned out in their own path, teaching more.

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One day, she stepped off a train and consulted her schedule realized that she was booked into an assembly at Benn High. She had come full circle.

HRUSKA met her at the door. "Have to have an escort," she said, gruffly, pretending that she hadn't enjoyed the warm hug Trish gave her. "School security system's not recognizing anyone around here these days. It's a disaster."

It took Trish three days to train the students, and took the students six days to debug the school's firmware. She threw herself into the work without a moment's hesitation, and when she was done, she realized that every single one of her kids had earned a hero's parade.

What the hell. She could afford it. She threw them one. They shut down Main Street for a whole hour. There were bands and clowns and free ice-cream. No one could figure out what they were celebrating, except for Trish's kids, and they grinned like loonies and marched in time to the music.

It was awesome.

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