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Everything Falls Apart

Children and homeowners are some of the greatest mathematicians I have ever known. Who else could do geometry better? Many average people are extraordinary geometricians too; humans just seem to have a propensity for it. From when I was young to a time when I was probably too old for it, I liked to eat Skittles—oblate spheroids of rainbowy deliciousness. What I liked more than eating Skittles was *playing* with the Skittles. Every child seems to have this innate desire to play with his or her food, whether it's parent-sanctioned or not. You have not seen possibilities until you've watched a child with Skittles. Stop at Walgreen's, grab a bag, and pay the 79¢, then approach a child and give them the bag. Assuming you're not arrested for doing this, you'll witness a magnificent artist at work. Organizing them into colors first, the child will begin playtime. In no time you'll see the net work of their creative genius: from spheroids to polygons, polygons to an ornate architectural overview, and then finally, once the play is exhausted, you'll see the child decide on five complex molecular structures (one for each color) sorted left to right, most atoms to fewest, and watch as the molecules swiftly succumb to a short half-life, measured at the rate of the child's consumption.

The child that eats Skittles at random cannot possibly be human. Which and how many the child decides to eat is important. Consumption can take on several forms—round-robin, preferential priority, methodical combinations of flavor whose sampling order is itself a permutation, and, in particularly dire circumstances, the “all at once” method—that was my favorite. On a good day, there'd be just enough of the rainbow to finish the chosen formula. This only happened once, if at all. When I finished the skittles before my algorithm, I was left mostly

satisfied, but I always got a subtle feeling, difficult to shake. This would slowly dissipate until I forgot about the skittles, distracted by some other disguised mathematical calling. Funny, how easy it is to assume we lose this geometric predilection as we age.

In Computer Science we have a simple but powerful concept called object orientation. The concept assumes each thing is made up of other things, and uses language and a hierarchy to maintain order. Our boilerplate example works well enough to explain the concept. Take a pig (please return it when you're done). What is it? It's a pig, yes. But it's also a mammal, a quadruped, hooved, an omnivore, an animal—these are the different ways we might categorize it. A pig is not a squirrel by virtue of its differing categorizations; they may share some qualities, but not all. Therefore a pig and a squirrel may both be *instances of* the groups “mammal”, “quadruped”, and “animal”, but the pig can't call itself clawed the same as a squirrel can't be hooved. If you have trouble picturing it, think of the child categorizing her skittles. She's doing the same thing. This system was revolutionary when invented, and it has since become a centerpiece in modern computing.

It so happens that children age. A few become accountants, some mechanics, but others become computer scientists (like myself) who spend much of their time deciding exactly where different objects fit in a hierarchy like this, except our hierarchies deal with more abstract matters. Watch a computer scientist do this for a couple of hours. Every now and then you'll see them shrug, shake their head, type something quickly, and continue what they were doing. This happens whenever the programmer finds an unresolvable ambiguity, where an object's position in the hierarchy is unclear. If you find him doing this, ask him about it. It won't end well. He'll dismiss

you: there's never any ambiguity in a program, if you ask a programmer. After all, even if you have very little experience with computers you know they do—sometimes to a fault—exactly as you tell them. No more, no less.

Let's consider the hierarchy again, and add two categories—“living thing” and “non-living thing”—to the hypothetical one with squirrels and pigs we constructed. Then make a final category called “virus” and place it in one of these. Suddenly, we've broken the hierarchy. As it turns out, this happens more than anyone thinks. All programmers go through this in their lives, regularly, until they grow old of it and retire. The cause of much unnecessary stress in their jobs is usually a by-product of coping with the exceptions and discovering how to make them work despite the limitations of the organizational medium. Now you have learned why the programmer shrugged; it was a shrug of defeat. I find inconsistencies like this wherever I program, whether it be in class or for my internship. I have no reason to believe that this feeling will vanish.

I have spent all of my life living in various suburbs around Chicago whose radial distance from the city was always an hour, no matter how far away apart the subdivisions were. This was, perhaps, the first geometric limit imposed on me. My first home—a small apartment in Oak Forest, Illinois—was just that: an apartment. When I was in the midst of grammar school my parents were reaching middle age, and decided they wanted to change this. For the first time in their lives, my parents were buying their own house, built from scratch. True, it wasn't exactly a house; it was one of those suburban oddities called a “duplex”, which always brought to mind store-brand, cream-filled cookies that as a child I always imagined were the product of a

precision-aimed collision between Oreo and Nilla Wafer trucks. But to my parents (and myself), it was a house, and a divine one at that. I remember the first night there—our things still *en route*—where we passed the time in carefree minimalism: sleeping bags, a toaster, a pan, a fourteen inch television. The day of the move ended with hellacious hailstorm, the blissfully fitting opening salvo in a war between my parents, my neighbors, and their respective little suburban cutouts of nature. Time pushed on and stormy skies cleared.

One of the things many people have to confront when they first move into a house of their own is lawnwork. It's one of those things people seem to take for granted while living in a house that isn't theirs, but once they get their own pride that takes over, and that pride says: "I *must* have the best looking property". People obsess over this. The good natured arms race between neighbors with botanical ammunition began. Our next door neighbors (the ones whose house was umbilically tied to ours) were my parents' primary opponent. Neighbourly friendship began with a handshake and the exchange of pruning shears. The battle of principal importance was the lawn. I know of no other place in the world where lawncare is so important as in the Midwestern United States. Fertilizer bags interlocked in an over-packed sedan, lawnmower (our first ever) hastily bought from Sears, the gas can that was apparently in a perpetual state of half-fullness, the broadcast seed spreader sending out its regular Doppler pings of grass germ—these were the implements of war. With the showers of late-Spring came shoots of green. How difficult it was to watch my parents watch the lawn, waiting, and regularly asking each other whether it was long enough yet to push our new one-stroke across it, even if they both knew the answer was no. This was only the beginning. The gradient of germinating grass (grass never grows evenly) began to fill out, and soon thereafter came a mutual decision: yes. My father's long

dormant skills with a Craftsman were given a chance to once again prove themselves. The first cut was a simple one, perfect parallel lines across gentle undulations of the farmland topography. After the grass became fuller (we had to wait a Winter), so too grew the creativity.

The lawn became so beautiful in its preternatural uniformity neither my father nor our neighbors could not improve its growth. My dad, a fan of both baseball and golf—the sports of athletes and gardeners both—finally had the proper artistic medium to test his skill: he began to cut in patterns. Innovations like this often occur in arms races after periods of stagnancy. His cuts were advanced in geometry, even though he himself was not. Parallel lines evolved to diamonds, diamonds to square sectors with alternating horizontal and vertical cuts. There was a certain insanity in his dedication. He would begin each off day outside in the early morning, watering and cutting, sometimes making three or four full passes across the lawn's surface area before he was fully satisfied.

As a child I was often enlisted to sweep the sidewalks, a chore sometimes rewarded by candy—occasionally even a package of Skittles. I despised the chore, for I could never make the sidewalks perfectly clear of the grass. My dad, too, ran into similar problems concerning imperfections in his patterns. Despite his pride, he always finished with the resolve to do better next time—you could see it in his eyes; even the gentle undulations of rich Illinois soil could throw off Craftsman's arrow-straight path. Now, I'm older, and I have realized this is unavoidable. Lawn, like so many planar things, changes appearance by virtue of perspective, viewing angle. Thus, it turns out, the undulations perpetuated a state of imperfection. I knew not whether my father knew this at the time, but after I began to assume the responsibilities of lawn-care myself I'm sure he did. The asymptote never quite reaches its goal and my father could never reach a state

of symmetric mastery. For five years we lived there, and then we up and moved again to our first true house. It, too, was an hour's drive into Chicago. Strangely enough, hail also fell after the move; this salvo, though, was not met with any retaliation. A second war never began.

My grandparents have their own home, located in Oak Forest and also one hour away from our great city, and they have always been independent. My grandpa progressed from child to factory-worker-slash-student to computer programmer and finally to retiree, and has always been insistent on paving his own way. He, like all good grandparents, tells me stories of the past—how he started programming, surprising stories from his mischievous inter-city youth, how they came to live in their house, *et cetera*—and I, like all good grandchildren, listened. As years began to pass, pain set in. He isn't the man he used to be. The elderly all have their own methods for dealing with this, all seeming to fall somewhere on a continuum from increasing their love and charity to isolating themselves from the virile world. My grandparents started at the left of the continuum and began to progress into isolation. It was painful to watch. Pain. The crux of it all. The physical kind, of course, was there—we all secretly fear growing old and living in perpetual discomfort, bones screaming in protest and the spine boycotting the concept of alignment. Grandpa's body, like everyone's does eventually, slipped from healthy to hurting.

Once physically able to perform everything to near-perfection, age began to introduce error into his movement. At first he could cope with this. Also a child of the Midwest, Grandpa's pride rested in grass and bushes, carefully pruned. When I was young and we would visit, I could expect to see the driveway's bushes carefully trimmed to 90° angles. The bushes remained this way for a while, only gradually he began to take longer in the chore of cutting. But they remained thus

for so long. Gradually he discovered he had to accept the protests of his body—realized that he could no longer maintain the order once could—and the bushes were no longer trimmed. His care for the lawn survived, hung on longer. He, like my father, had learned to cut in fractal-like patterns. I suspect if you took a snapshot of the lawn after each cut and made a stop-motion of them, you'd see the once complex cuts devolve into parallel lines, and parallel lines into intersecting ones. The lawn was cut twice weekly, and now every-other. Grandpa's physical inability not only affected the physical appearance of the lawn, it caused his now self-imposed seclusion. It's funny: we really are mathematical creatures at heart, perhaps too much. How are we to achieve perfection, if our bodies and minds forbid it?