

AN ATTRACTIVE PORTAL TO UNCERTAINTY

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"Winds in the east, mist coming in. Like something is brewing, about to begin." – P.J. Travers, Mary Poppins

If you are going to study meteorology, you are going to leave home. If you are going to be a meteorologist, you are going to move away from home. If you are going to be a meteorologist, you better love change.

The head of the meteorology department at Valparaiso University has spoken. We have driven 750 miles from our home in New Jersey, and our son seems to like this Indiana college with a reputable meteorology department; still, I watch his face for a sign that he's heard enough, maybe that he's changed his mind.

He seems, instead, serious and clearheaded, and asks to see their weather room, what by now—the start of his senior year of high school—we have learned reveals the heart of a college meteorology department. It is where the weather nerds gather on Friday nights (or really on any night, or any day), and debate the effect of barometric pressure on a fulminating system hundreds of miles to the southwest.

On the 12-hour drive home to northern New Jersey, we stop at Perdue University's meteorology department, and later, in central Pennsylvania, we pass within 10 miles of the main campus of Pennsylvania State University, where the boy has twice attended Weather Camp for high school students. At Rutgers University, an hour from home, we are disappointed not to be dazzled by our state university's meteorology department.

Three years later, the boy who hated change, who needed to know everything would stay the same, each day predictable, now spends his days anticipating, calculating, predicting—welcoming—change. He does not quake the way he did as a toddler, or a child, or a preteen, and something, anything, happened that he could not foresee—if the Cheerios ran out, or Sesame Street was pre-empted, or his racecar towel was in the wash.

The experts we consulted, when he was a toddler, a boy, a tween, agreed: he may grow out of it, but more likely, he will adapt, he'll cope. In other words, he will change.

Now, when the winds turn, when fair weather threatens foul, when there is a clear indication of coming unpredictability, the boy calls from college to report about it. When the weather changes—outside his window, outside in the world—even if it does something wildly unexpected—if it snows in Delaware in April, hits the 90s in Wisconsin in December or the 30s in Utah in July—this is now a good thing, or at least the thing that does him the most good.

This boy—who sheltered in the principal's office for fire drills, away from the noise and emptying classrooms disrupting the predictable routine of the elementary school day; the kid who declined birthday parties at the Funplex because he could not predict what might happen next—he once had parents who ran interference, explaining that he wasn't like other little boys who craved the new, the odd, the fun in surprise. This young adult is now most at home studying the most frequently shifting patterns—hurricanes, tornadoes, blizzards, the polar vortex: things that make him feel, inexplicably, settled.

I cannot sufficiently explain to myself or others how it is that a person who in virtually all other areas of his life, still seeks to eliminate variation (dinner in the dining hall is pasta and salad every night), is happiest just at the earliest point of realizing change is coming. Ecstatic, in fact, at the beginning a new meteorological inquiry, the moment when he has noticed...something. Something in the wind, the jet stream, the cold fronts.

If he knew the reference, my manchild might, in his best Gordon Gekko voice, declare, "Change—is good."

Once a week I get a YouTube link to a five-minute weather forecast on a local access cable television station for the small town at our son's college. It's the boy, letting folks know what to expect over the next week, when the predictions will hew close to seasonal expectations, when they will stray. He is confident, relaxed, at ease in a way I have rarely seen him, making eye contact with the camera. He is moving his arms in all the right directions on the map behind him, and few viewers are likely aware that he is standing in front of a vast empty Kelly green screen, and side-eyeing the moving graphic maps off camera to his right and left, and tapping a Jeopardy-like remote clicker encased in the palm of one hand which will switch the back-drop between a temperature map, a Doppler radar graphic, and an aerial sweep of the state.

It might rain. Or maybe not. That overnight temperature dip could mean frost, so cover up those plants, folks, you never know. Bring the umbrella. But don't be surprised if it never unfurls. Plan that barbecue for Saturday, not Sunday. How thoroughly happy he appears, explaining to others what to expect, and why.

In a drawer somewhere in our family room, spooled on an old VHS cassette, a three year-old child with velvet brown curls and a toothy grin, holds an upside down turkey baster and points to a crooked paper map he has taped to the door behind him. He is delivering an endearing, articulate and mature weather report. *There's a blizzard already howling outside. The snow is drifting as tall as an adult. His report ends, I'm your weatherman, S__ R__.*

When I see scratchy old videos of Eli Manning tossing footballs at age two, or a prepubescent Bobby Flay in the kitchen, I think of this video of my boy, and I wonder. Then I remind myself: the other moments inadvertently captured on video, of this boy refusing to step outside to the patio for even the briefest moment without a hat on, or the one in which he hurls a stuffed animal out of the playpen 14 times in a row because I'd carelessly cut off its fabric label. Those images, I realize, were not predictive either.

What, I have wondered often, might lure a child so intently terrified of change, so unrelentingly opposed to, and hysterical at variance, to a life composed of constantly parrying with change that is making its sure, relentless way, west to east, into his life? Arachnophobia sufferers, I reason, do not choose to spend four years studying spider biology. Acrophobes don't become high steel construction workers. Agoraphobes seek out jobs they can do without leaving the house. Or do they? Actors, I am told, are shy creatures who seek the stage to feel otherwise. I read about a pilot who needed tranquilizers before his first flight as a passenger.

I look up "fear of change" and see that it's called metathesiophobia, also known as the fear of having no control. I learn that the condition is partly encoded in our genes, that since the beginning of recorded time, humans have craved predictability. That reading predictable signs in the environment once helped ensure survival. I read that modern day treatment for severe metathesiophobia includes hypnotherapy, cognitive therapy, neurolinguistic programming. Nowhere in my casual research do I find the recommendation that studying some constantly changeable phenomenon will eradicate the phobia. But I consider that effective reprogramming via such approach-avoidance behavior makes a kind of sense. Peering into the eye of the storm, so to speak. But I don't believe my son is conscious of this connection.

I do ask him. I ask him why someone like him, who hates change, loves the unpredictability of weather. He surprises me by admitting that he has actually thought about this before. "Maybe," he says, stroking his beard, "it's because deep down, I have the weird idea that if I can predict the weather, then I can make other parts of my life predictable."

The boy also loves history, American founding fathers a favorite topic. Benjamin Franklin once declared, "When you are finished changing, you are finished."

At the University of Oklahoma, we must complete a half dozen forms, be pre-approved weeks in advance, and surrender our passports at the desk, to gain entry to the college's meteorology department, which shares space with the U.S. government's National Weather Center and Storm Prediction

Center. At 17, my son is hyper excited that we will be allowed onto the top floor of this six story building jutting straight up from an empty flat field outside Norman, Oklahoma, a building constructed to sustain an F5 tornado (thought it hasn't had to, yet).

One of the professors who normally speaks to high school seniors is away. *Stormchasing with a bunch of students*, we're told, and I have to glance at my son, who seems to light from within (and also, almost imperceptibly except perhaps to a mother, flinch).

There is not a single thing not to like at this University, except that it is in the center of the country, in the epicenter of the nation's tornado activity, 1562 miles from home, a two-stop airplane flight and a shuttle bus trip away. This challenges his idea of a college close enough to pop home for a weekend. Too much change, maybe. Still, that building, those resources.

We tour meteorology departments at Plymouth State University in New Hampshire (where his minor of choice is not offered); and pass Amish buggies on our way to Millersville University in Lancaster, Pennsylvania (too small, too quiet), a department populated by instructors trained at Penn State.

Ten months after his second stay at its summer Weather Camp, one month after a successful student-for-a-day overnight at the huge University Park campus, the boy decides on Penn State, though its Happy Valley reputation has been recently tarnished by scandal.

In the face of the huge upheaval college will mean, he wants, still, things to stay the same, to go to the college where he is already comfortable, where he already knows a few meteo professors. Or at least this is how his father and I interpret the choice, but we don't mind: the department's stats reveal that 80 percent of all working meteorologists in the U.S. are Penn State graduates.

Let the change games begin.

As my son makes his way along, I learn (how could I not), that weather is not as unpredictable as most think.

Even the most unexpectedly odd turn of meteorological events, is rarely startling, at least to some. In fact, the opposite is fundamentally true:

that given enough empirical data (science), and in the mind of a trained and intuitive forecaster (art), determining what the weather will do from one day, one week, to the next, isn't random at all. In other words, meteorology may be the perfect occupation for someone who must learn to recognize and interpret the signs of impending change before it makes its cold calculating way to where he's standing.

But I also learn that there are, of course, as in any mutable scientific phenomenon, curveballs that catch the most accurate forecasters off-guard. A nearly unanimous January 2015 forecast called for a blizzard to bring several feet of snow to the New York City metropolitan area; in fact, only about six inches accumulated due to a slight and debatably unforeseen storm track shift about 50 miles to the east. Boston was surprised. My son was not.

I learn that most of the country's meteorologists are employed not as broadcast reporters, but in government and industry, in the field known as operational forecasting, the track within the major my son has chosen. He claims to understand the meteorological job market, that he likely won't be on national (or any) TV, which is okay because while it would be a kick to work on camera (and he does on the student broadcast), those five or three minutes represent hours of data study, a half dozen forecast attempts, screens of data scanned, layers of thought, hypotheses, questions (*What happened in this area last year, last month, last week? What is happening over there, those winds, that storm, this pattern, that anomaly? This should happen, but that valley, this oversized factory, that erupted volcano thousands of miles away, could disrupt expectations, and how can we factor that in?*) and that it is those hours, those questions, which intrigue him.

I learn that climate (large scale, global weather and temperature patterns over decades, centuries, millennia) is very different from weather (daily, local or regional micro variations in temperature, humidity, wind, precipitation). That perhaps this is why the term "climate change" terrifies many, because it suggests not something with an unacceptable variance we've learned to deal with (bring an umbrella!), but the possibility of a massive shift (Manhattan under water!) we don't want to comprehend, and cannot, on our present course as a planet, meet and respond to. An umbrella

will not ward off sea level rise, broken ozone, constant drought. This is the kind of change, I imagine, that even meteorologists do not welcome.

I learn that people will joke about how it must be nice to be preparing for a career in a field where it's acceptable to be "wrong 50 percent of the time," and that "TV weatherman" is all most people know of what meteorologists do. I learn that companies like FedEx, Anheuser-Busch, Lowe's, and All State Insurance employ forecast meteorologists, and so do the Buffalo Bills, Denver Broncos, Colorado Rockies.

I learn more practical things, too. That sleet, hail, and freezing rain are terms almost universally misused and misunderstood. That the polar vortex has always existed and does not in fact, spin. That it can snow when the temperature is above freezing.

I am not particularly fascinated to learn these things, only mildly interested in the way one is when something we thought we understood turns out to be far more complicated, and because someone we love finds it fascinating.

"We may never get back to California again. I'm not going to spend an entire day inside watching The Weather Channel," I tell my son in August, a few weeks before he begins his senior year of high school. The television in our Omni hotel room in Los Angeles reports that a rare hurricane may slam into our home state.

"Mom! A hurricane's about to hit New Jersey, and I'm stuck out here. You don't understand," he complains.

We're stuck because our return flight to Newark was cancelled, and we can't get rebooked for two days, and so my husband and I worry about our house flooding, about old trees falling, about patio furniture hurling itself at our first floor windows. To take our minds off worry, we take the kids to Malibu, the Grammy museum, an ill-advised drive along canyon roads where we cannot understand why oversized hillside houses don't slide off their stilts. My son glances up occasionally but remains focused on weather apps pointed to the East Coast, mind and texts filled with data, the differences between a superstorm and hurricane.

In California, the ocean breezes billow our beach umbrellas, the sun

blinks from the rare cloud. We learn the meteorologist's joke that the worst job in the world is to be a forecaster in San Diego, where "74 and sunny" is what you would have to say 345 days a year.

At the Charlotte, N.C. airport, on a redeye layover to New Jersey, in the crowded but quiet passenger lounge, we eat complimentary oatmeal, drink coffee and hot chocolate. Everyone, even those with cell phones in hand or computers on laps, stares at multiple television screens, all playing the same Hurricane Irene footage, a weather reporter wearing waders, fire rescuers behind him in boats, moving house to house in Woodland Park, NJ.

"Look, isn't that terrible?" a woman near us says to no one. "I feel bad for the people who live there."

"We live three miles from there," my son says, half to her, half to himself.

"Oh, I'm sorry," she says, to me this time. "It must be hard to watch."

A few years later, this boy will write an essay about what this moment felt like to him, a mix of disappointment, relief, thrall, and surreal disconnect, all combined into a perfect moment of clarity.

But for now, he jokes, "When Jim Cantore arrives in your town, it's time to *Get Out!*"

When our boy was around 11, our family took a tourist-y boat trip around the island of Manhattan, because although the city skyline is visible from hill near our home, we did not regularly take the boys into the city. It was a wilting humid day, and while I was stocking up on water bottles at the dockside store, and my husband was wrangling the kids into line, he turned to wave to me to signal their location. Just then, our son wandered into an adjacent line, which began moving, edging closer to the water though the boat had not yet docked. Suddenly, he realized his father and brother were not behind him, and his arms flailed, panic erupting.

"Mom! Dad! Mom! Dad!"

Within seconds, my husband reached him, he calmed, the storm threat receding. Later that afternoon, I recall passing under a bridge, our preteen son explaining why winds were chopier over water, how the barometric

pressure changes everything.

Among students studying meteorology in colleges and universities across the United States, forecasting rises to an athletic pursuit in a competition known as WxChallenge. Thousands of students compete individually in three categories: freshmen/sophomore; junior/senior; graduate students/teaching assistants; and sometimes on a 12-member college Wx team. Trophies, bragging rights, resume lines, and peer respect are at stake. Every two weeks, from September to April, competition administrators select a different U.S. city; competitors must enter their best non-guess, by the same time each evening, for that city's next day forecast. Frequently, cities are chosen for unusual characteristics—Wichita for its erratic thunderstorms; Grand Rapids for fickle lake effect snows; Newark, NJ for the tight confluence of urban heat, ocean and bay influences; Astoria, Oregon for variable timing of high and low temps and unstable Pacific coast storms; Butte because the Rocky Mountains mean random and unreliable temperatures. San Diego is never among them.

Five days a week, for about 32 weeks, including spring break, these weather geeks—almost all meteorology majors, though some are studying environmental science, engineering, even geology or geography—talk among themselves in small groups, argue, parry, and then separate. Each then individually dives into a kind of fugue state—spinning math, science, historical data, gut instincts, and sometimes, a hunch—to decide on their forecast, and enter it into a password secured site. Points accumulate for how closely predictions match actual conditions.

As a freshman, my son ended the year fourth in his category against more than 1000 freshmen and sophomores, missing third place by .001 when something distracted him as he was about to enter his final forecast the final week. He looked away from the computer, while the screen must have flashed *something went wrong, please re-enter*. His team still took the national championship trophy.

Sophomore year, struggling with required math courses, he says he "did poorly," finishing seventh against about 1200 others, but was again on the winning national team. Meanwhile, each semester many hundreds

of students at dozens of meteorology departments at universities across the country defect from the meteorology major, with its unrelenting load of calculus and statistics, and although he too has not passed several math courses, and must retake them, extending his time as an undergraduate, my son has not switched majors. Change, you know.

Junior year he was "doing okay" in Wx—holding steady in eighth place—then shot up to first place overall in all categories in February, but ended up third. Others in his program scored above him individually, and the team won again. Such accomplishments are a big deal for the meteorology department, for the College of Earth and Mineral Science, for alumni whose WxChallenge standings come up in job interviews. It is a very big deal in the northwest corner of the major research university; it is even a smallish big deal on a sprawling 40,000-student campus where, one mile away on the southeast edge, a football team and its affiliated scandal still captures national negative attention.

Each year, the winning Wx team does the same thing: takes a picture, posing in front of the 48-screen wall in the weather room, then heads out for pizza.

Two years after Hurricane Irene, Superstorm Sandy will slam into coastal New Jersey, barrel up the center of our peanut-shaped state, rattling windows on our colonial house, plunging our leafy suburban street into a powerless state for nine chilled days.

I will know for more than two weeks that it is coming because my son has told me so, and because he has instructed me to pay attention to weather reports sourced from something called the European Model, over the Global Forecasting System or the North American Model. In northern NJ, in very late October, media will make light of the prediction, tag it "Frankenstorm," point out how unlikely it is, this far north, this late in storm season.

Before Sandy pulverizes the Jersey Shore and tosses a massive boardwalk roller coaster into the ocean where it stands upright and eerie for weeks; before our younger son's high school three blocks from the Hudson River is flooded and closes for two weeks; before my job as a reporter

requires that I post hourly updates about the local availability of gas for generators—two months before any of this, we will drop our son at college for the first time.

When Sandy surges and wrecks beloved parts of our state, the inevitable phone call comes, and it is entirely predictable: *Another hurricane in New Jersey and I'm not there. I'm stuck in central Pennsylvania where all we got is some wind and rain.* He will joke that being in the wrong place (that is, safe and away from severe weather) when a dangerous weather event occurs, instead of in the epicenter of its unpredictable track, may not bode well for a future meteorologist.

When our boy entered kindergarten, he was watching The Weather Channel the way other six year-olds watched Nickelodeon or the Cartoon Network. Storm Stories was my favorite show, he remembers. Then Hurricane Floyd glanced New Jersey, and he recalls watching the rain bucket into our backyard, more interesting even than TWC. He always wanted, he tells me now, to figure out when something "cool and scary" like that might happen again.

In "Walking the Tornado Line," a lengthy article in *The Oxford American's* Spring 2015 issue, Justin Nobel interviews witnesses to the unrelenting April 2011 line of Alabama tornados, and while their descriptions are meteorologically captivating, it's Nobel's own revelation about why weather stories call to him that sticks with me. "As childhood ended and adulthood loomed before me, weather became an attractive portal of uncertainty, and I attempted several heady journeys into the elements."

Without flagging the quote, I give the article to my son to read, and he notices this line on his own, as well as Nobel's descriptions of darting outdoors in severe weather as a kid, wanting to experience storms for himself.

By now, I have seen university weather rooms, charged with a combination of alarm and anticipation, empty out as students and instructors alike rush outside to see for themselves the hail their computers assure them is currently falling. (Hail, by the way, which forms when strong winds blow thunderstorm rain to higher altitudes until the water freezes and the ice

becomes too heavy to sustain itself.) "We're all still like kids who think the weather's cool," a graying tenured professor tells me.

I'm his mother, brewing in some parental stew of hope and protective instincts, and so I want my son to both fulfill his dreams of being in the swirling center of freak weather (hurricane in Jersey in October!), or major predictable weather (tornadoes in Kansas in August)—and also stay safe behind a computer screen, parsing the meaning of different models. I'd rather he never go stormchasing. I also secretly hope he gets the chance. Go, I want to say, feel the hurricane slap your face, brace against the rumbling cornfield as the tornado roars its way across your path. No, I want to say, stay safe, stay inside, stay.

I think back to when he was born, into a unwelcoming season we called the "winter of 17 snowstorms," and how his colic cries were often soothed by getting up close to the bay window and watching the snowflakes descend, how on so many nights, the only way he could calm and sleep was by listening to the *Rainstorms* tape, or how he liked to move the radio station dial, not to change it to another station, but to listen to the static in between. The sounds of approaching change.

Change, I have come to understand is, ultimately, predictable. Change will come for him, one way or another.