

When Time Stops

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Casey Shearer Memorial Award for Excellence in Creative Nonfiction

We all woke up at once when our rear tires skidded sideways across right shoulder of the highway. The driver fell asleep despite downing three Red Bulls before our departure, and he jolted awake when the car vibrated violently on the rumble strips. In trying to correct his swerve, we spun backwards, flipped over twice, and landed in the ditch next to the highway. The skids slowed us down enough that when we actually flipped we were only going about 35 miles per hour, the police told us later. We had been going 80.

We were in the middle of the desert in central California, closer to Nevada than the ocean. The Sequoia National Forest loomed to our left, and the three-and-a-half-million-acre Death Valley National Park stretched right. We — me, plus three strangers, all boys, all college students, all skiers — left Los Angeles three hours earlier, and were due to arrive in Mammoth Lakes in two hours' time. My only connection to these people was that we were all members of our college ski club, and we all signed up for the earliest slot on the carpool list, electing to leave before dawn to start the five-hour trip to Mammoth Mountain. We'd planned to arrive in time for first chair; it was going to be a powder day.

Fresh tracks didn't seem to be in our future. My mind wasn't on snow — I didn't know where I was, or what wilderness I was looking at. I was new to California and its vast, austere landscapes. Accustomed to the gentle hills of my home state of Vermont, this place looked severe and empty. All I knew was that I had fallen asleep in the back of a blue Subaru just outside downtown Los Angeles, and woken up when it was screeching sideways across the highway.

A few days later, my friend Morelle's eyes light up when I tell her about the accident. We are sprawled on the central lawn of campus, and Morelle is detailing her upcoming midterms. Her typically tightly ponytailed brown hair is loose in a wild, curly mane, and she totes a stack of books with names like "Fundamentals of Engineering Thermodynamics." She adopts an almost-maniacal look of thrill when I mention the crash.

"Did time slow down?" she asks.

It seems like a strange response to my announcement that I flipped over in a moving vehicle at a high rate of speed. I ask what exactly she means.

She explains: "Basically, your brain has an incredible capacity for information absorption. It's taking in tons of stuff, all the time, and filtering out what it doesn't need — all the random sounds, useless details, whatever. But when you get an adrenaline rush, your amygdala goes into overdrive."

"Amygdala...?"

"It's part of your brain. That's not the point. The point is your brain absorbs way more than the normal amount of information. The same amount you'd usually experience in thirty seconds gets condensed into ten or something. So your time perception gets all screwy. It's called time dilation."

I consider this, and mentally replay the events of the accident. In retrospect, the memory really is in slow motion.

When the car stopped moving, it was belly-up in a ditch. I was semi-suspended, held in place by my seatbelt, and bracing myself with my arms against the ceiling. I unbuckled and crawled through the window, which had shattered when we flipped. I faintly heard someone say that overturned vehicles can burst into flames, and I sped up. I scrambled away from the wreck and up onto the berm of the highway, my three companions following my lead.

And then it was quiet. We stared at the exposed underbelly of the station wagon, its pipes and wires sticking out at odd angles. A massive black lake stretched between the car and the desert in the distance, and as we stood in silence, the sun began to come up. The desert was cold and dry, and I stood rigidly with my hands in my pockets, coat zipped up around my face. I pulled my phone from my pocket, and it told me it was just after 5 a.m. I texted my friend Laura, *Just got into a car accident. Flipped over. Everything is fine.* I don't know why I texted Laura, who I knew was asleep, instead of calling the police, or my parents, or just sitting down and crying, but that's what I did.

The events of the actual crash are still vivid when I recount them to Morelle. I add that I can't remember very much right after the event, between the police's arrival and when I got back to Los Angeles that afternoon. Most of what I know about the post-crash was pieced together later. Morelle is visibly thrilled.

"Yeah! That's exactly right! After you experience time dilation, you get exhausted. Even if you don't undergo any physical trauma, your body just shuts down. And sometimes you can even black out after! You're so lucky!"

I don't feel lucky, exactly, but Morelle is right: we had been tremendously fortunate. The driver had a few small cuts on his hand from the broken windshield, another's wrist was a little sore, and we all stank like the smashed bottle of Jaegermeister that one boy had stashed in the trunk. But other than that, we were fine. Despite the dry, bitter cold of the desert morning, I was warm. I could feel my heart pounding and a bead of sweat forming at my temples.

The police drove us to Lone Pine, eight miles north, where they dropped us off at a McDonald's and drove away. I bought a coffee and it made me feel even worse. I smelled like licorice, alcohol, and sweat, and my stomach ached. I sent Laura another text, *I'm at a McDonald's. This place is gross. Back at school this afternoon hopefully.*

The boys were intent on getting to the snow, despite the totaled car and rattled nerves. The idea of continuing to travel with this band of strangers after what had happened made me even sicker to my stomach, so I asked around for a bus. The next one heading south would leave in two hours from the other side of town, taking me as far as Mojave. I bid the boys farewell, as they were planning their route to Mammoth Lakes. I don't know how they got there in the end. I haven't spoken to any of them since. I heard the snow was great that weekend, though.

On the bus two hours later, I fell asleep. At one point, we meandered onto the rumble strips and I jolted awake, gasping and clutching my seatbelt. It took a minute to calm myself down again, and then I looked at my phone. A text from Laura: *I'm coming to get you.*

She pulled up to the Carl's Jr. in Lancaster in her little white sedan, wearing Ray Bans and a Salvador Dalí t-shirt. I was sitting on the stoop, exhausted and hungry, and elated to see my friend. Apparently, I was babbling — recounting the tale in a steady stream of hardly intelligible words. This later served as the basis for most of my memories of the morning's events, as retold by Laura. I don't remember that, but I do remember she hugged me, handed me a coconut granola bar, put on a Wilco album, and let me sleep for the two hours back to the city.

By one o'clock, I was back in my dorm room, showered and feeling completely separate from the girl who was upside down in a blue Subaru eight hours earlier. I put my puffy blue coat and my green backpack in the washing machine to get rid of the stench, and shoved my ski boots into the back of my closet.

But my conversation with Morelle a few days later brings the crash back into my mind. I wonder why I can remember the crash so vividly, and hardly anything afterward. What, I wonder, happened to my brain in that moment of terrible fear, and why does it make my memory so vivid? I look into tachypsychia, the technical name for time dilation. I learn it is a controversial issue that divides the neuroscience community.

Some aspects are certain. The adrenal medulla produces adrenaline when the body is under stress, which skyrockets your heart rate, increases oxygen absorption, dilates your pupils to let in more light, and releases glucose into the bloodstream. In these moments of stress, fear, or anger, the amygdala, an essential component in memory formation, goes into high gear. Together, these components slow down your perception of time.

The question that's so hotly debated is: does our experience of time in slow motion happen during the event itself, or only in hindsight? David Eagleman, a neuroscientist who specializes in synesthesia and time perception, sought to answer this question. To study the affect of adrenaline on time perception, he had to get his subjects' adrenaline levels to skyrocket. Exercise wouldn't cut it; neither would a roller coaster or a zipline. So he dropped his volunteers from a 150-foot tower.

Morelle's explanation of time dilation piques my curiosity about other ways to achieve it, ways that don't involve risking my life. The promise of protracted time and memory precision intrigues me, and I've always been a sucker for thrills. I find, not surprisingly, that time dilation isn't limited to near-death experiences; it can actually be a pleasurable pursuit. Marc Wittmann, a German neuropsychological researcher, says that the main ways people experience time dilation are during psychotic breaks, in intense meditation, or through drug use. I've never had a psychotic break, and don't really care to induce one. I have a difficult time sitting still, and an even more difficult time trying to empty my brain of all thoughts. And drugs, in this case, feel like cheating — I'm looking for a natural high. So I do as Eagleman would, and jump off a cliff.

A few months after the desert car crash, I visit my high school for my one-year reunion. It's a tradition to return the first spring after graduation, and almost my entire class is there. We do devious things that make us feel old, like drink wine on campus out of thermoses. On Saturday, I go with two friends to the quarries. The quarries are about a two-mile bike ride from the idyllic, 2,000-acre wooded campus, followed by a short walk through the forest past a shooting range. Old quarries are hidden throughout the New England countryside, often somewhat menacing and remote semi-industrial sites, where the lush forest is harshly interrupted by soaring, grey rock

walls. Abandoned now, the ones near my old school have filled with rain and spring water. The deep dark pools at the base of the cliffs are both beckoning and forbidding. Buried deep beneath the surface is rebar, cabling and old mining equipment. The whole area is strictly banned to students.

The best quarry for swimming is in a small clearing, a deep pond in the middle of a circle of cliffs that rise up out of the water. The rock walls are covered in profanities and graffiti. There is one rock we call the penis rock, a gigantic knob of stone painted with a huge phallus, and from its tip is a fifteen-foot jump into the water below. That's the smallest jump, with the highest about forty-five feet. I visited this quarry a few times in high school, but always cowered at the 45-footer. I would work my way up the cliffs, doing the fifteen first, then the twenty-five, then the thirty, and inevitably lose my nerve at the final leap. I had watched a few friends do it, limbs flailing wildly as they descended into the black water, but I never worked up the courage.

But today, I stand on top of the cliff, looking down at my friends standing on the penis rock. They cheer me on, but I barely hear them. Legs shaking, ears ringing, I close my eyes. Perhaps it's an effect of adrenaline, or maybe my nerves are preparing for the wave of sensation they believe is coming, but my skin is tingling. I take a deep breath, step forward, and leap off the edge. Suspended in midair, I feel a rise in my chest and hear myself, as if from afar, shriek with terror. After what feels like ten seconds, but is probably three, my feet meet resistance and I am enveloped in icy water. I come up gasping for air, and doggie paddle back to the penis rock in a daze.

My forty-five foot cliff is less than a third of the height of the tower in Eagleman's test. But it seems I have experienced another round of time dilation.

Eagleman concluded that the adrenaline rush experienced in moments of extreme stress doesn't actually increase our speed of cognition; that is to say, we don't absorb an abnormal amount of information. Instead, our brain allows us to remember more details in retrospect. Since our lives are experienced almost exclusively in hindsight, we perceive our recollections to be true. Our raw, first-hand experience is so miniscule, so split-second, that its significance pales in comparison to the infinite time we spend replaying it.

This implies that our perceptions are only constructed in retrospect — we don't really know how we feel in an experience until we reflect on it later. Standing on the side of a cold desert highway, damp with perspiration and Jaegermeister, I barely felt anything at all. I was numb, too, standing atop the granite quarries, preparing for my leap. But when I consider these events in retrospect, I can recall every tingle on my skin, every color on the graffiti-covered granite walls, and, although I can't remember the names of any of the people in the car, I can see every splash of sunlight across the obsidian lake next to Highway 395.

Life goes by fast. We're all looking for ways to experience existence more fully, to absorb as much as we can in the short time we're here. In these moments of extreme adrenaline, we get to experience life at a different speed, even if it's only for a few seconds. For an instant, the world is crisper, more profound, and more vibrant. Maybe that's why people jump from airplanes, surf massive waves, and ride roller coasters. We're looking for a rush, but perhaps we're also looking for a brief stillness, a clarity that only comes from the slowing down of time.

If you Google time dilation, you'll be presented with a series of graphs, Greek letters, equations, and references to Einstein's theory of relativity. But the great thing about Einstein is he could speak human, too: he said, "When a man sits with a pretty girl for an hour, it seems like a minute. But let him sit on a hot stove for a minute, and it's longer than any hour. That's relativity."

His point, revolutionary at the time, now seems trite: time is relative. Since leaving Los Angeles, many of my memories there have gone fuzzy. My stint in California feels like a tiny blip on the map of my life. A few things remain clear, important things like my friendship with Laura, and crazy things like how it feels to flip over in a car, but my brain is now mostly consumed with new memories and adrenaline-pumped moments. But I do still think about Morelle every once in a while, in those instants when my stomach is in my throat and time seems to be in slow motion.

In February of 2013, the highly anticipated Winter Storm Nemo hits New England. We're warned to stay off the roads, remain indoors, and hunker down for a few days. Instead, after one look at a radar map of the northeast, I drive north to ski the powder at home. I make my way slowly through the storm, and arrive home in Vermont about three hours after the snow begins to fall. There is already a heavy layer of fresh snow on the ground, and I know the next day will be a powder day of epic proportions — at least by Vermont's standards.

My brother Angie and I wake up the next morning at the crack of dawn and drive to the ski area. We spend the day bouncing between trees and floating in three feet of fresh powder, riding chairlifts with old friends and joking about the chumps who stayed home in fear of dangerous roads. It's easy enough to poke fun when you make it through unscathed.

Angie takes me down his favorite trail in the woods, The Bruce, which starts the top of Mt. Mansfield and spits you out onto the main road about half way into town. It's a tricky ski full of tight turns through trees, and it has a long flat section at the end that requires some patience. But it's stunning, and silent, and the longest ski descent off our mountain. A few minutes into the run, Angie stops.

"There's a little drop up here, think you can handle it?" I look at him, wide-eyed.

Can I? I'm three years Angie's senior, but his skills on skis surpassed mine years ago. Never one to admit an inadequacy to my little brother, I nod. I follow Angie for a few turns between some big pines, and then find myself in midair. I see Angie up ahead in his black puffy parka, skis gliding effortlessly through the powder. Sunlight peeks through the branches and speckles the shady trail with white light, and the deep snow makes the woods seem silent and mysterious. Suspended above the powder-covered trail, my breath catches. And just for a moment — time stops.