The Way We Move

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From afar, movement looks cohesive; it looks purposeful, even graceful at times. Up close, though, we may see that the minute movements that comprise the final product are at times a bit odd, a little ridiculous. However, it's these seemingly insignificant, awkward movements that result in that final motion, the one we see as beautiful.

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I sat behind him in Calculus class. Every day I'd vacillate between the decision to listen to lecture or discuss something absurd with this stranger in front of me. More often than not, I chose the latter. Conversations with him usually meandered through a myriad of topics, resting on each one for only a moment. Rarely did he talk about himself, which was a shame because he was very interesting. He was strange and I liked that. His hair fell a bit past his shoulders, brown going more toward ginger, and his usual attire consisted of a weird t-shirt, cargo pants and sandals. Even during the winter he wore sandals.

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A sarcomere is the basic functional unit of contraction in a muscle cell. It's basically a rectangle spanned by thin tightropes of molecules called actin. The ones walking the tightrope are myosin proteins. They're comprised of two globular heads that attach to the actin and a tail that links to an anchoring molecule. If the actin is uncovered, the myosin will automatically begin walking, its stride pulling other fibers, causing the muscle to contract. However, the actin is surrounded by regulatory proteins called troponin and tropomyosin that block the binding sites on the actin. Only when the threshold of stimulation is reached will the regulatory proteins move and allow myosin to begin its travels.

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We didn't dance much during prom. We wandered around the hotel, exploring an empty arcade, vandalizing strange back hallways with sharpies and pilfering fruit from platters at the front desk. I wondered why he didn't ask one of his closer female friends to accompany him to prom, but I was strangely happy with his decision to ask me. Something had changed in my mind.

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When a muscle cell receives enough stimulation, a structure called the sarcoplasmic reticulum releases a flood of calcium ions. These ions bind with those regulatory proteins, troponin and tropomyosin. The proteins change in shape, opening the actin site to myosin. Myosin begins walking; its movement brings the muscle cell deeper into contraction. This is not a runway-model walk, though, or even a normal walk.

Myosin has an awkward, ridiculous way of traversing the span of an actin filament. It's an unwieldy staggering in which one leg swings out to the side, circling in front of the first leg to bind to the next actin site. It pauses to regain composure. Then the other leg goes about the same motion. And so it goes, drunkenly stumbling toward a destination, slowly contracting the fiber.

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We spent a lot of time together that summer. It began with his attempts to teach me how to play *Portal* and evolved into walks that criss-crossed his neighborhood as we searched for good climbing trees. He persuaded me to join him in the consumption of a ghost pepper, and we suffered together as the capsaicin wreaked havoc on our insides. Many days, we sipped on oolong tea picked by monkeys and talked about everything. Everything.

He told me about his attempted suicide, explaining that his two-month absence from school in the winter had been caused not by an intense flu, but hospitalization as his liver recovered from an overdose of sleeping pills. Since sophomore year, he'd been seeing a psychiatrist. A dozen or so different medications had gone through his system. None of it had lessened his wish to self-destruct. I was glad he was alive, amazed that I'd never known and so sad about the possibility of his not existing. I wanted him to want to exist.

The next year, I was a senior. He had graduated and took classes at a nearby college. His friends cut his hair, reducing the shoulder-length locks to almost nothing. I looked forward to Fridays, not because of the weekend's arrival, but because he would come to school to eat lunch with me in our usual place. He still wore sandals in all weather.

Mid-way through the year, he decided to attend an art school in New York. Before he left, I realized I liked him. It was a very inopportune realization that I decided to keep to myself. He'd find someone interesting in New York, someone artsy and strange and perfect.

During his five-month hiatus, Facebook was our tireless mailman. Our messages experienced an exponential growth pattern. Two-line messages morphed into two-page long responses that had to be typed up in a Word document before being pasted into a message. Even in writing, his idiosyncratic speech was apparent, but I missed hearing his actual voice. I missed him.

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Myosin continues its stumbling forward toward somewhere. I'm jealous of its ability to move forward without fearing where it's headed. Each step it takes is eleven nanometers. A millimeter is about the width of a fingernail tip. A nanometer is one-millionth of that. Myosin seems not to move very far with each strange step, but at least it moves.

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He ate lunch with me the first day he returned. We made a meal of passion fruit and mangosteen that he'd brought back from New York. I pestered him with questions. "Where did you go? What did you do? Was it awesome? Did you find any pretty ladies?" The last question just slipped in without my planning it, but I anxiously awaited the answer. "No," he replied with a smile, "they were all old."

I graduated. The beginning of my summer I spent with extended family as they heaped congratulations on me. After that, I spent my time with him, climbing trees and finding strange foods.

One day, he told me to come over to his house for a surprise. I walked into his room to find a huge box wrapped in black duct tape. Cutting it open I found another box, which I cut open to find a Dali-style melted clock. I thanked him. I hugged him. I kissed him.

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One myosin molecule moving along one actin filament isn't enough to cause a muscle to fully contract. It's when a bundle of fibers is traversed by billions of myosin molecules, all walking toward the same place, all stumbling in the same direction, that things happen. Their motion seems unwieldy and strange, but when an arm bends, when fingers wriggle, when muscles finally move, we see that the arc of movement is amazing. There might be some purpose in it after all.