Nonfiction Passage

"The Orchid's Secret"

Deep in the jungles of Colombia there is a kind of flower that attracts bees with its unique perfume. The male bees store as much scent as possible from this particular flower on their hind legs. The male bees that collect the most scent attract the female bees to mate with them. In Venezuela there is a flower people collect for its large white or yellow petals. Few people ever find it, though, since it only blooms for a few days. There is a small pink and yellow flower that only grows in a very specific part of the state of Florida. It also only grows on trees, and wind or birds may spread its seeds. These flowers are some of the most rare and delicate species in all of nature. They are all types of orchids.

For hundreds of years orchids have been prized discoveries of collectors and adventurers hoping to find new and exotic breeds of the flower. In her book *The Orchid Thief*, author Susan Orlean tells how in the 1800s orchids became popular in Europe, which made them very valuable. Many "orchid hunters" set out to find and bring back new types of orchids to sell. However, many of the men who went looking for the mysterious orchids met with tragedy instead. Orlean relates that "dozens of hunters were killed by fever or accidents or malaria or foul play. Others became trophies for headhunters or prey for horrible creatures . . . ." Sometimes orchid hunters even were injured or killed by other people.

On one trip to find orchids in 1901, eight hunters ventured to the Philippines, which is a group of islands in the Pacific Ocean. A tiger ate one hunter, another was badly burned, and five more completely disappeared. The trip's only survivor brought back 7,000 orchids. Even modern-day orchid hunters, like Tom Hart Dyke, still face incredible dangers to collect the flowers. He and his partner, Paul Winder, were held as prisoners for over nine months after they were captured on an orchid hunt in Central America.

While the plants have long been valued for their beauty, they may be even more important to science and our understanding of co-evolution. Unlike plants that can self-pollinate, orchids need very specific insects or birds to spread their pollen. The process by which insects, the wind, or birds spread the pollen of different flowers is called pollination. Pollen is a powder produced by plants that contains their genetic material. In order for the plants to reproduce, the pollen must be physically moved to the flower's stigma, which contains an egg. Now the fertilized egg can become a seed. Birds and insects can pollinate plants by touching many different flowers and spreading the pollen around.

Orchids evolved to attract insects and birds. Because there are many different species of orchid, there are also many different ways the orchids attract their pollinators. Orlean explains that "many species look so much like their favorite insects that the insect mistakes them for kin [other insects], and when it lands on the flower to visit, pollen sticks to its body…. Another orchid imitates the shape of something that a pollinating insect likes to kill.... Other species look like the mate of their pollinator, so the bug tries to mate with one orchid and then another… and spreads pollen from flower to flower each hopeless time."

Other orchids don't use their shape at all, but rather produce specialized scents to attract specific insects, such as bees, beetles or flies. Some orchids smell like cake, some like chocolate, and some like rotting meat. All these smells may seem weird or gross, but they exist to lure creatures to their pollen and help the orchids survive. The strategies to attract insects and spread their flowers' pollen go on and on. Each family of orchids has a unique kind of insect or bird that visits their flowers, as well as its own way of attracting them. It has worked, too. According to NOVA, a science television series on PBS, "orchid species number more than 25,000 worldwide." That is more kinds of species than any other flower on the planet, and new ones are still being found.

Orchids and the insects that pollinate them are one of the most amazing examples of evolution. Though their degree of co-dependence varies, as it is apparent that at least some orchids are more reliant on their pollinators than the pollinators are on the orchids, the degree of evolutionary specialization is still very impressive. Research by Harvard scientists suggests that certain species of orchid evolved specifically to attract orchid bees, which collect a wide variety of scents from various plants in preparation for mating. In another case, an orchid mimics a female's smell and appearance—and the male pollinator gets nothing out of the bargain whatsoever. By tricking the insects that collect its pollen, the orchid has survived since the time of the dinosaurs. Shh! It's a secret.

Fiction Passage

"The Great Green Gulch"

"You've got to be kidding me!" A puddle of drool surrounded Jules's new Nikes. They were his birthday gift, custom-colored and everything.

His twin sister, Ilana, had gotten a puppy for her birthday. Ever since Ilana had become obsessed with puppies, Jules had wanted nothing to do with them, especially Barnaby. Everything Barnaby did was a miracle to Ilana, and a disturbance to Jules.

"He's not trained, Ilana. He's just lazy," Jules squawked when Ilana started showing off Barnaby's ability to sit on command. As far as Jules was concerned, Barnaby did not know any tricks, and he most certainly did not know how to respect people's personal property. Barnaby lifted his head and stared at Jules, who, in spite of himself, felt a pang when he looked into the dog's sad, inquisitive eyes.

"Oh, lay off it," Ilana said. "He's the smartest." Jules could hear her words beginning to move into baby-speak. "And the most adorable! Aren't you, Mr. Barnaby?"

"Could you not?"

"Not what? Have the most awesome doggy in the whole wide world?"

"No. Could you not act like the most annoying thirteen-year-old in the whole wide world?"

"Very funny."

"Cut it out, you two!" their dad said, lowering the *Wall Street Journal* just enough to reveal two disapproving eyes, his glasses balanced on the tip of his nose.

It had been like this ever since the end of summer. Jules and Ilana used to do everything together. They sketched comics together. They ate lunch together (one peanut butter and jelly sandwich, one peanut butter and fluff sandwich, split in half so they'd each get both). They even wrote comedy acts together, which they'd perform for their parents once a week in what they called the "Sunday Theater."

They hadn't put on a show since the middle of August, right around the time Ilana and Ryan started hanging out. Ryan was Jules's friend—or at least he used to be. Now, when Ryan came to the house, it was to see Ilana, not Jules. Sometimes they'd all hang out, but the way Ilana laughed at Ryan's not-so-funny jokes drove Jules nuts. And the way Ryan looked at Ilana while she laughed made Jules want to throw up. It wasn't that he didn't expect his sister to have a boyfriend, but *Ryan*?

Ilana and Jules had just begun writing their first full-length comic book when she lost all interest in comics, leaving Jules with nothing more than a prologue. He had a tough time drawing

skyscrapers and shadows, and making the text look the way it did in real comic books. Those were Ilana's specialties.

Still, he wasn't about to beg for her help. Jules knew how to draw the figures. He was, after all, the one who'd created their protagonist, The Great Green Gulch, and his sidekick pet, Rocky Raccoon. Jules and Ilana still weren't sure if The Great Green Gulch was going to be their hero, their villain, or both. It was time to get back to work.

Jules ran up to his room, grabbed his sketchbook, and flopped down on his bed to read what they had so far. After he read, he closed his eyes, envisioning each scene. He heard footsteps through the open window and looked outside. It was Ryan. Jules would never be able to focus between his inane jokes and Ilana's giggles.

He shoved his sketchbook and pencil in his back pocket and went downstairs. He pulled on his old, worn sneakers and stomped toward the door. The *Wall Street Journal* lowered once more.

"And where exactly are you going?"

"Out. To get some work done for once," Jules said, glaring at Ilana.

"Well, that sounds like a fine idea," said their dad, already back behind his wall of stock market reports. "Dinner's at seven."

"What? How come you let him go out right before dinner but when I ask…" Ilana's voice faded behind the door. Jules brushed Ryan's shoulder as he strode down the driveway, straight toward the woods across the street.

There were plenty of trails that Jules and Ilana used to walk a mile or so down the road, but they'd never entered the woods over here. There were no clear paths, only thick trees, skinny saplings, thorny bushes, and endless fallen leaves.

Jules marched right in, trudging through the browning leaves. He walked with conviction but without direction, wandering to the left of a group of pines and then veering right around a giant elm. Seeing the white puff of his breath, Jules realized it was actually pretty cold out. *He* was actually pretty cold. He'd been so heated when he rushed out of the house that he hadn't thought to bring a jacket.

He moved faster, hoping he might warm himself up. He started to jog and then broke into a full-on sprint, kicking up leaves as he went. Jules's mind felt wonderfully empty as he ran, and his body really did start warming up.

The trees around him looked different than the ones near the edge of the forest. They were gnarly and knotted, nearly choked by twisting vines. Something hard hit the top of Jules's foot, and he lurched forward, his stomach flying from his body as he nose-dived toward the ground.

He landed softly in a pile of leaves, and the shock dissipated. He felt under the leaves where he'd caught his foot, and discovered a root. Or was it a vine? The more he looked, the more it seemed like they were all connected.

Jules laughed and let his body sink back down into the leaves. He closed his eyes, picturing the next scene of his story. *The Great Green Gulch tore through the forest in silence. He was its savior and also its greatest danger; he warded off those who tried to harm the trees, but with breath that turned toxic when his anger flared.*

Jules could picture the steam flowing from The Great Green Gulch's nostrils like smokestacks. He could practically feel its warmth on his skin. Or was it actually getting warmer outside? It couldn't just be his imagination. It was too real.

Jules opened his eyes, and there it was: The Great Green Gulch. Drool dripped from the side of its mouth and came toward Jules in slow motion.

Jules covered his face as it splashed him. The liquid hit his clothes and trickled down his neck, and Jules squinted, rubbing his eyes with the one little dry spot he could find on the inside of his shirt.

The Great Green Gulch looked different. He looked…hairier. He looked directly at Jules, with sad, inquisitive eyes.