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New York City

In Suspension (4)

Foam, tissue paper, bristol paper, acrylic paint, wood

Hummingbirds, despite seeming delicate and gentle, are extremely aggressive and territorial. They frequently fight each other when their territories are threatened. These fights rarely lead to death or severe injury, but in one instance, two hummingbirds impaled each other midair. Scientists don't know exactly what led to their death. It's possible that it was during a territorial fight, or perhaps the paths of their courtship rituals perfectly intersected. Whatever really happened, they had to have impaled each other at exactly the same time- if just one of them had diverted their course, neither would have died.

The sculpture's feathers were created by painting onto tissue paper, similar to the collage technique of Eric Carle. I hope I've done justice to the wonderful bright colors in his work, as I've specifically created Anna's Hummingbirds. They're the species of hummingbirds we see on this campus, and their bright green and pink feathers are just beautiful.

I was drawn to this event because I've always thought of hummingbirds as only being very delicate and beautiful. These hummingbirds and the story of their death should challenge that idea, but I don't find that they do. They died in an undeniably horrible way, but I find myself continuing to marvel at just how pretty they are- I don't feel that the horror of their death has either diminished or amplified their beauty, it simply exists alongside it. I hope that in a similar way, my sculpture is not just morbid, or just beautiful, but both.

Hummingbird Life



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The Oxbow School

OS48

Writer's note: On February 13, 2023, two hummingbirds flew through the painting studio's open door. They could not find their way back out. They hovered around the ceiling, at least 30 feet up, out of reach from the students trying to lure them out. They were not attracted to the flowers, light, or sugar water we set out for them. The next morning, there was a dead hummingbird on the table. There was another in the rafters. The hummingbird on the table is buried. The hummingbird in the rafters remains there.

I. FEEDING

To live, hummingbirds need near constant food in the form of flower's nectar and small insects, often consuming more than one and a half times their own body weight per day. The insects in their diet provide the essential nutrients, while the high amounts of sugar found in nectar provides the energy required for their rapid wingbeats, allowing them to hover midair and continue feeding at these flowers. This specific need for nectar's sugar to provide their energy has resulted in flowers shaping every single aspect of the hummingbird's life- habitats, mating, biology, it's all designed for this feeding.¹

They're constantly on the move, using immense amounts of energy to move from flower to flower, feeding to regain that energy, then expending it to feed again. It's a cycle that takes up most of their lives. It reminds me of you- cooking and eating, cooking and eating, cooking and eating.

But you were never doing it for yourself, the way a hummingbird does everything to stay alive. You did everything for me. Really, I was the one trapped in that cycle, living to move from meal to meal.

Hummingbirds need high amounts of sucrose in their diet to sustain movement. When they're captured for research, scientists provide them with pure sugar water to make up for lost feeding days.²

That day, you placed the water in front of me and begged me to drink it. You said I was dying.

II. TERRITORIALISM

Hummingbirds are territorial birds, claiming certain patches of flowers as their own. They will defend their territories from other hummingbirds in order to ensure they have enough nectar for themselves. The sizes of their territories depend on the abundance of flowers in their habitat- a territory in a densely populated area will be much smaller, while a territory in an area where flowers are sparse will be larger and more difficult to defend. When these territories are challenged, the two birds will fight.

¹ Sheri L. Williamson, *Hummingbirds of North America* (Norwalk, Connecticut: Eastern Press, 2001), 19.

² Williamson, *Hummingbirds of North America*, 31.

Hummingbirds fight with their beaks and claws, but the standoffs rarely end in injury or death. They simply swoop and dive at each other, pushing each other from flowers, out of territories, threatening to attack without ever attacking. Still, in one instance, two hummingbirds fatally impaled each other in midair with their beaks.³

Two birds, two people. Two birds impaling each other, two birds trapped in the studio, two people trapped at home.

If one of those birds had made its way out of the studio, could the other have followed? Could they have saved each other? Scientists suspect the birds impaled each other when the trajectories of their courtship rituals intersected. If just one had diverted its course, neither would have died. You gave me the option to leave and I never did.

IV. YOUNG

Male hummingbirds take no part in the care of their young, leaving the female to build a nest, incubate the eggs, and raise the hatchlings independently. She lays two eggs shortly after mating, incubating them for 12-22 days and leaving the nest only to feed, bathe, or defend the nesting territory. When she leaves, the nest is at its most vulnerable, leaving it open to predators. Attacks from these predators are the largest cause of nesting failure. Fewer than half of all hummingbird nests produce hatchlings.⁴

If the nesting is successful, the mother begins to spend more time away from the nest, catching insects to feed her hatchlings. She digests the insects partially, then regurgitates the mixture back into the hatchling's mouths, appearing to pin them to the nest.⁵

That day, you forced the cup to my lips.

9 to 12 days after hatching, the hatchlings grow true feathers that replace the soft down they started with. The mother visits the nest less often, no longer needing to brood the hatchlings. After 15 days, the hatchlings begin to stretch their wings in preparation for flight. The nest becomes crowded as the hatchlings grow.⁵

That day, you forced the cup to my lips, and it spilled all over my favorite shirt. I couldn't even be angry. You put the shirt in the washer and gave me a clean one.

18 to 28 days after hatching, the hatchlings take their first flight and leave the nest.⁵

³ Williamson, Hummingbirds of North America, 23.

⁴ Williamson, Hummingbirds of North America, 27.

That day, you forced the cup to my lips, and it spilled all over my favorite shirt. I couldn't even be angry. You put the shirt in the washer and gave me a clean one. I wasn't angry, but I knew that I had to leave.

Even after they've taken flight, the fledglings are still dependent on their mother for one to four weeks. She shows them how to hunt, where to find nectar, how to stay alive.⁵

It took me another month to get out.

V. MIGRATION

Come winter, hummingbirds rely on the shortening daylight hours to signal that they must start moving south, seeking new food sources as northern plants and insects die.

Hummingbirds make their migrations alone. Young birds have no guidance from adults, relying instead on their instinctive internal compass. These compasses are occasionally inaccurate, leading the young birds to uninhabitable environments. These birds cannot be saved. Even if they are rescued by humans and transported to the correct destination, their compasses will just lead them astray the next year. Hummingbirds who do make the two week trip successfully are met with abundant food sources that could not be found during northern winter.⁵

Migration is all about the long trip, the way hummingbirds store up to twice their body weight to sustain themselves during the long flight- but I don't actually remember that drive. I don't remember what we talked about. I don't remember the music that played. I can only imagine we spent the hours in silence, neither of us willing to say where I was going.

I'm sorry I forced you to make that trip. I'm sorry I flew out of the studio. I'm sorry I diverted my path. I know you never wanted me to leave, I know it hurt you more than anything else.

But you know I had to. You know we both would've died there in that apartment.

The hummingbird must migrate. If it stays in place, it will freeze or starve.

VI. TORPOR

When a hummingbird must conserve energy and body heat, it enters torpor, a state in which all its bodily functions slow down. Its heart rate will drop from in the thousands to as low as 50 beats per minute, while its body temperature drops by 50 degrees Fahrenheit. Hummingbirds enter torpor at

⁵ Williamson, Hummingbirds of North America, 28.

night as the temperature drops and they can no longer feed. It tends to end about an hour before sunrise as their environment starts to warm.⁶

That day, they woke me up and told me my heart rate was dangerously low. If I fell back asleep, I would fall into a coma.

Torpor is completely involuntary. It's triggered only by the temperature of the environment around the hummingbird.

Is it scary, I wonder? Do the birds know what's happening to them? Or do they simply begin to drift off and come to with a slow heart and cold body? Every night for a month, I wondered if I would wake up at all.

But of course, every morning, I did. The hummingbird must leave torpor in the morning. That day, I stepped outside for the first time in a month and saw you standing there.

VII. EVOLUTION

Hummingbirds first became their own group separate from their nearest relatives, the swifts, about 42 million years ago when they diverted evolutionary paths. Then, 22 million years ago, they began to diversify into hundreds of different species within the hummingbird family, each species adapting to their surroundings. But even today, so many millions of years later, hummingbirds are not done evolving. Scientists theorize that hummingbirds will continue to evolve until they've filled every ecological niche, splitting into even more new species, each perfectly adapted to their environments.⁷

What's really interesting about hummingbirds' evolutionary history is how little we know about it. Hummingbirds are currently native only to the Americas, but their fossils have been found in Europe, and scientists can only speculate about how, when, and why they relocated. We have fossils from the very beginnings of their existence and much more recent ones, but there's a gap spanning millions of years where we know absolutely nothing about their lives.⁸

My sisters, your first beautiful twins, told me you didn't remember any of those months. Any of what you said, what you did. Any time they brought it up, you'd seem confused and dazed and you'd go quiet.

⁶ Lasiewski, Robert C. "Body Temperatures, Heart and Breathing Rate, and Evaporative Water Loss in Hummingbirds." *Physiological Zoology* 37, no. 2 (1964): 212–23.

⁷ Jimmy A. McGuire et al., "Molecular Phylogenetics and the Diversification of Hummingbirds," *Current Biology* 24, no. 8 (2014): pp. 910-916, <https://doi.org/10.1016/j.cub.2014.03.016>.

That scares me. It was only ever us two in that apartment. We were our only witnesses. If you don't remember, if the only proof is my own memory- well, maybe it never happened. Maybe I've made all of it up. Maybe it was all just an elaborate nightmare, and we never have to look at any of it again.

The only way I know it was real is the stain on that shirt. It never quite came out in the wash.

I think maybe it's for the best, though. That you don't remember. It means we can move on. We can keep living.

It has been 42 million years, and hummingbirds are still evolving.

Works Cited

Baker, Herbert G. "Sugar Concentrations in Nectars from Hummingbird Flowers." *Biotropica*, vol. 7, no. 1, 1975, p. 37., <https://doi.org/10.2307/2989798>. Accessed 18 Apr. 2023.

This article provides an in-depth documentation of the properties found in the nectar of flowers pollinated by hummingbirds, specifically their sugar concentrations. It also provides details on hummingbirds' reactions to these properties and how these properties affect their feeding habits. It does also cover non-hummingbird pollinators' reactions to these sugar concentrations.

Del Rio, Carlos Martinez. "Sugar Preferences in Hummingbirds: The Influence of Subtle Chemical Differences on Food Choice." *The Condor*, vol. 92, no. 4, 1990, p. 1022., <https://doi.org/10.2307/1368738>. Accessed 18 Apr. 2023.

This article talks about hummingbirds' feeding preferences and the nuances of their diets, specifically their sugar preferences (sucrose vs. glucose vs. fructose) and the possible reasons behind these preferences. The article also discusses these preferences' influence on pollination and the evolution of hummingbird-pollinated flowers.

Lasiewski, Robert C. "Body Temperatures, Heart and Breathing Rate, and Evaporative Water Loss in Hummingbirds." *Physiological Zoology*, vol. 37, no. 2, 1964, pp. 212–23. JSTOR, <http://www.jstor.org/stable/30152332>. Accessed 19 Apr. 2023.

This article studies the metabolism of hummingbirds while in torpor and while awake, although at the time, it was not possible to record the heart rate of a flying hummingbird. The study also examines the circumstances in which hummingbirds enter torpor.

Powers, Donald R., and Todd McKee. "The Effect of Food Availability on Time and Energy Expenditures of Territorial and Non-Territorial Hummingbirds." *The Condor*, vol. 96, no. 4, 1994, pp. 1064–1075., <https://doi.org/10.2307/1369115>. Accessed 18 Apr. 2023.

This article talks about hummingbirds' feeding preferences and the nuances of their diets, specifically their sugar preferences (sucrose vs. glucose vs. fructose). It also covers the possible reasons behind these preferences, analyzing the efficiency at which hummingbirds can digest each of these compounds.

Williamson, Sheri. *A Field Guide to Hummingbirds of North America*. Houghton Mifflin, 2002.

This book is composed mainly of colored plates documenting the hummingbird species of north america as well information on how to identify said species and their locations. The book opens with general information on hummingbirds' mating, feeding, and other behavior.