

Nature in Words:

A Creative and Critical Study of the Natural World

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Introduction

As the Nature in Words fellow, my objective at the Pierce Cedar Creek Institute was to immerse myself in an environment of natural beauty and scientific knowledge in order to create a portfolio of creative and critical work. Unified by themes of natural observation, the intertwining of nature, and environmental activism, the pieces produced reflect a mindset of environmental awareness that aims to captivate the audience's attention and suggest new and more contemplative approaches to considering the beauty and fragility of nature.

Methods

While the creative process differed with each piece of writing produced, some methods remained constant throughout the project. Integral to my writing process was the careful observation of natural surroundings. When exploring the trails and forests of the Pierce Cedar Creek Institute, I would always have on hand a journal for recording the various sights, sounds, smells, and textures that greeted me there. These journal entries served as notes for when I would later begin writing a poem or essay and needed help recalling a particular detail I wished to feature in my writing. A digital camera also allowed me to capture the elements of visual beauty I chose to incorporate into my work. This process ensured that when I sat down to write, I had a complete catalogue of my experiences in nature.

By studying the writings of respected poets and essayists, I identified how to effectively communicate environmental concerns through written media. Each day I read the work of a wide range of authors, making note of the various strategies they used to address their audience in a manner both interesting and informative. I began by reading the classical environmental essays of Emerson and Thoreau and from them learned how to discuss nature in a formal manner.

However, as I branched into reading other works, I discovered the more informal tone of personal essays appealed more to my sense of style. I realized how limited the readership of formal environmental essays would be, and so I decided the way to best express my environmental concerns in a way that translated to the interests of other people was to capture those same issues addressed in formal scholarly writing but frame them instead as more conversational and creative pieces. In this way, reading Barbara Kingsolver's impactful personal essays was instrumental in finding my own creative voice. William Stafford's poetry of environmental activism similarly affected the direction of my writing.

The topics I chose to write about were directly influenced by my experiences at the Pierce Cedar Creek Institute. My participation in activities such as removing invasive species, surveying the Eastern Massasauga Rattlesnake population, identifying plants, and assisting other URGE researchers shaped what I addressed in my writing. Active participation in such events was very environmentally and ecologically informative, and I was able to incorporate the information I collected into my poems and essays.

The writing of each poem was a separate and unique process in itself. The principle aim of each poem was to convey a moment of natural wonder in an unexpected manner. To distinguish my writing from the myriad of other nature poems focusing almost exclusively on the beauty of nature, I intentionally chose a number of topics that addressed the more mysterious features of nature. My intent was to avoid the clichéd and tired phrasing that has come to characterize nature poetry in past centuries. Figurative language, surprising imagery, and unlikely metaphors shaped the style of my poetry.

Results and Discussion

The poems featured in Appendix A focus on the same recurring themes of nature in which I felt an audience with environmental appreciation would have an interest. Creative details and strong, relatable metaphors occur in each piece, while the tone and style vary from one poem to the next. Each poem works on the level of at least one of three themes: the celebration of nature, the devastation of nature, and the cyclic tendencies of nature. Some pieces combine two or more themes, where appropriate, to allow for broader creative or emotional appeal.

The piece “After the Ice” exemplifies a theme of the celebration of nature. Throughout the poem, the formation of a lake is described in non-standardized fashion. Rather than describe the physical or geological process of glacial retreat leading up to the lake’s existence, I tried to extract creative details from the process and describe it in a more imaginative way. Instead of naming the glaciers that shape the lake, I refer to them as “cold carpenters” whittling away at the ground with rock and frozen tools. The piece experiments with relating past and present; it begins in present day, with the speaker and a companion dipping her toes in the lake. From there, it tours the glacial period leading up to the present, circling back once again to the speaker and her companion.

The poem “Toxic” (see Appendix A) addresses concern for pollution, placing it under the theme of earthly destruction. While the title suggests chemical waste, the poem never names the problem outright. Alternatively, it hints at the “heavy inheritance” future generations will suffer as a result of “scorched soil” and “wicked rivers.” The dialog “Here, dears, you try” that the piece ends with suggests a deflection of responsibility and an unwillingness to face the unpleasant effects pollution has yielded.

A creative study of a spider spinning her web, the poem “Captive” presents the cyclic tendency of nature in the form of the process of life and death. Like she does every day, the spider spins a web “of her own reckoning,” preparing herself a meal in order to provide nourishment for her body and the bodies of her future progeny. A metaphorical queen of the forest, the spider reigns over the woods and her net as if they combine to form her own personal kingdom. Towards the end of the poem, a gnat becomes entangled in her web, presumably becoming the spider’s food. A balanced tension between life and death steers the piece to its final conclusion; the web wrapping around the gnat is described as a “caul delivering only silence” – a play on the birthing process with the words “caul” and “delivering.” In this way, “Captive” explores the balance between one major cyclical component of nature: life and death.

The essays I produced are mostly written in light and conversational style to encourage a wide readership not limited to the academic arena. “The Curious Case of the Tomato Hornworm” (see Appendix B) is one such example. Using a personal experience gained at the Institute, I extended the topic of Tomato Hornworms into a demonstration on the importance of curiosity within the scientific community. Rather than explain my philosophy in the convoluted language of academia, I explained it in a way that I hope most readers will find relatable and interesting.

The essay “Monarch Migration” (see Appendix B) aims to inform readers of the migration habits of monarchs and explain why their strange tendency makes them so incredible. By emphasizing the unbelievable lengths monarchs go to in order to carry on their genes, I hope readers will recognize the resilience of this fragile creature and go on to have greater respect for insects and animals. Using comparisons between human seasonal migration and the monarch migration, I connected human interests with the habits of one fascinating animal.

After helping to capture Massasauga Rattlesnakes in the survey at Pierce Cedar Creek, I decided to write a piece about them to assuage some of the fear that the general public has for this surprisingly gentle animal. In “Debunking the Myth of the Massasauga Rattlesnake” (see Appendix B) I discuss in informative fashion some of the misunderstood habits of the snake, and how malice is overstated by the term “rattlesnake.” I was most concerned with giving an overview of the animal and its interactions with humans, and I feel the piece achieves this goal.

“The Value of Nature in the Modern World” (see Appendix B) adopts a more academic tone than my other essays. While not overly technical in language, its primary function is investigating philosophical questions like “what is the value of nature?” It points out how modern society has shifted our focus from the natural outdoor world to the indoor spaces of our own creation and considers whether or not this will have some negative impact on our species’ development. For example, would we be forgoing our connection with nature by privileging the indoors and its associated technologies over the natural world? Though difficult to say whether or not the essay comes to any definite conclusions or solutions to what some would deem as a problem, it certainly invites readers to consider what nature signifies for humanity.

Summary

Through my project as the Nature in Words fellow I feel as though I have further developed my creative voice and tuned it in a way that will enable me to better express myself in my future work. My studies in the environmental writings of Thoreau, Emerson, Barbara Kingsolver, William Stafford, Bil Gilbert, and Wendell Berry have helped me to refine my expression of environmental issues and allowed me to explore the more creative side of environmental communication. I am indebted to Pierce Cedar Creek Institute for helping me pursue my interest in environmental writing. I plan to expand my collection of environmental

poetry and publish it in a presentable and more accessible format in the near future with the hope of sharing it with a larger audience. In doing so, I hope to share with others some of the concerns reflected in my work.

**Appendix A:
Poetry Table of Contents**

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**Appendix B:
Essays Table of Contents**

The Curious Case of the Tomato Hornworm
Massasauga Rattlesnakes
Monarch Migration
The Value of Nature in the Modern World

After the Ice

On the dock we dip our toes
in the flow of natural history.
Each water droplet recalls the lake's making,
muddling puddles of our past,
our present.

In this place, years before,
Cold carpenters whittled a basin
dragging rocks across the stiff soil
and splitting the ground at its seams.
They carved a frozen home
for the melting that came after.
For the fish and the dragonflies.
For you and I.

Apart

The woods have many names for "stranger."
Errant footfalls send crackles of leaves flying into the watchful trees.
Ants tremble the ground.
A croak dies in the bullfrog's throat while
crows trumpet "intruder!"
Reeds screech into one another,
waving furiously with the wind.
Deer scatter and wave their snowy tails in retreat.
Even the boldest creatures blink out like fireflies,
slinking silently toward home.
In such a place, what two-legged visitor
could hope to teach the word for friend?

Captive

Last night some quiet highness of the underbrush
Flexed her many legs over the land like scepters
And murmured to the branches what they would become.
She heaved her mighty bulk across curious leaves
And doled out thread of her own reckoning.
Stitch by stitch it grew
Until silvery trappings stretched tight across her kingdom
Waiting to ensnare those who dared.

Now, in the slender light of morning,
Dew pustules cluster in her net.
The web wraps a gnat into its folds, a slick caul
delivering only silence.

Eulogy

I stand shivering upon a giant's grave,
one uprooted by the tug of time's clever hands.
Limp roots litter the ground
recoiling at the bite of open air.
Severed from familiar forest floor
they plead for the outstretched arms
of earth's sturdy embrace.

Sap settles inward
refusing to betray the wounds in weeping.
It clings to the rough spaces in between
and prepares for the tedious rot of eternity.
Bits of soil fleck the tree's fraying tendrils
and flake away in a brown flurry of defeat.

Mottled bark gathers silently 'round the remains
whispering a soft eulogy for swaying branches
and the winds they carried.
Leaves rattle in a forest's lament
of the sentinel that once rose high
in the thin morning air.

Goodnight

The ground pulls before me, spinning out from below the trees.

Roots rattle up from the grass, sweeping my feet like twisted
bed sheets and hugging me to the forest's slumber.

No velvet moss bed, just a brutal palette of hard-tempered
earth and heavy footprints.

Nettles pillow beneath my head, hushing
protests and humming the beginnings
of a far sung lullaby

Just before dawn, I slip between folded ferns and kiss the leaves.

Ours

We push into the dark with the assurance
of animals much larger than ourselves.

As the forest retreats, our yellow eyes
fly up at the moon and we gulp our fill of starlight.

We are such little things to chase fear into the night.

What darkness crawls through us,
gnawing our ribs and sewing stalks of lupine at our feet?

At our howls, solace flies from the trees.

There is a sound like breaking bird bones.

Then reason inclines its head,
slits its eyes,

and arches into the wind.

We stop wondering what has happened
and make it our own.

Picking Berries

You can't buy happiness this ripe.
Four bruised-black orbs cluster in your hand
rolling warmth into your palm.
Each segment is a gem
swollen with the moment's pleasure.
Every bolt of sweetness is a question
popped between your teeth.

Pieces

At the seam between forest and field, a canyon yawns.
Rough-hewn by the pestle of time and some heavy hand unseen,
its edges swell, rock relief puckering like scars
around branches and scattered bones.

A gutted land scraped clean of purpose,
it swallows the centuries.
Castoffs fill its belly with relics:
An old stove groans at its hinges.
Slithering rivulets of water bow into the deep.
Shards of glass wriggle like worms into the soil
searching for something whole.
In this pitted earth, there are only pieces.

Ready

Swollen with summer heat,
an apple hangs desperate in the open air.
Its stem quivers as a drop of dew
skims the blushing hide
suckling on the too-smooth skin of an apple before its fall

The fruit gropes its branch, searching out some kind fault
where gravity lays no claim.
Where it might nest forever, from seed to tree
and back again.

But the wind reasons with the apple.
Nudges it from side to side.
Whispers there's no fear in falling.
So the apple lets go
and breaks open upon the world.

Silence

In these years of toil
Has there ever been a time
To contemplate the quality
Of silence?

To pull whispers from the air,
Splinter their weight
Against the rocks below?
Maybe here, in this place of clover
And woody consequence
We dare to kneel before the trees
And the winds they carry

Or maybe just breathe
The turn of a leaf
Or the stillness
Of a stone.

Spoiled

We lost something
the year the blackberries died.
A dark churl of man settled in their roots,
snatching the bounty before it began.
Pale green fruit clotted the branches in readiness
but harvest's plum blush never rested there.
Stubborn segments yielded no tenderness
and the birds balked with confusion.
Translucent with longing, our jam jars wondered at their purpose
as hope crumpled at its roots.

The Breakdown

A prickling of air, and the Earth stands on its haunches.
Someone is leaving.
The clouds yawn and discuss among them who will fill the space.
A crow screeches *Not I* and flies off again.
The worms bob their heads but say nothing;
There is much to be done in breaking down a life.

These Days

These days we don't remember
how cities went on glowing after sunset.
We don't remember why we read bank statements
or what they said about us.
We don't recall the convenience of canned soup,
the delight of a walk-in closet,
or the anticipation of a television show.

But in sleep we skim our feet across a stream's timid waters.
We scratch seeds into the earth and cradle in our hands
what is offered.
We say
 "You were there.
 You remember how it was.
 in those days."

Torching Heavens

After the rain
You held a single match to the sky and watched it ignite.
We rolled the clouds into soft stalks of kindling.
As cirrus became sticks
and cumulonimbus snarled into straw
we waited for smoke.
Flames licked at the underside of the moon,
picked hot coals from the craters and sent up a second sun.

Toxic

When it's our turn,
we gather up our scorched soil and our wicked rivers.
We tell our parents
 "Thank you"
but don't look them in the eyes.
We know this heavy inheritance presses on the backs of babes.

And for tomorrow's child, the same gift in different trappings:
Old earthly burden,
brushed with gold to deflect new eyes from the rotting inside,
its increase spilling over in our hands.
We fumble. We curse. We call it foe, then say
 "Here, dears, you try"

When You Were Born

When you were born

I plucked you from a cradle of cattails and
left it rocking empty in the breeze.

By the rough husks of your ankles I raised you up,
a prize begotten of sturdy seed and a patient plowing.

I thwacked you on the back with hands like willow branches
And sent your cries sprawling wordless toward the skies.

The river watched and murmured approval
as I bathed you at her shallow banks.

Mud from humble beginnings swirled off your frail shoulders
and swam downstream in a reddish haze.

Glistening and ruddy-cheeked, you nursed at apple blossoms
until pale nectar bled down your chin
and enveloped you in sticky humanity.

When your eyes lighted on midnight's moon

I laid you to rest on a bed of moss.

And as you fumbled for sleep

I swaddled you in starlight.

Wind Master

On a calm night you can tempt the winds from the trees with a whistle
You can draw them down with promises of fresh grass for the tickling
and water to be ruffled
You can ball them up in your pocket with lint and loose change
and take them home
You can unleash them in a field and watch the wheat wave thank you
You can chain it to you bed at night and listen to it howl
You can even
leave it be.

The Curious Case of the Tomato Hornworm

When you're the only English major in a group of 20 biologists, it's easy to feel like the odd one out. But after I was accepted to spend a summer practicing environmental writing at the Pierce Cedar Creek Institute for Environmental Education, I discovered a surprising thing: scientists aren't all that different from the rest of us. They don't walk around in lab coats all day or accessorize with safety goggles. To the surprise of some, they're capable of having entire conversations centered on something other than the intricacies of photosynthesis or the wonders of slime mold formations. In fact, I'd go so far as to say that the biologists at the institute are downright *normal*. But there were plenty of instances where their mystifying talk or unusual actions would demand that I sit back, grab a notebook, and jot down some observations of my own.

Undergraduate biologists are an excitable breed of scientist; if there's something scientifically intriguing nearby, no matter how small, they will scent it out. With over 660 acres of woods, wetlands, and prairies, Pierce Cedar Creek Institute practically guarantees a constant supply of such intrigue – so much so that there is often no telling what strange creature will emerge from the earth to capture the group's fascination. An encounter with a particularly ornery beaver might spark a three-day investigation into the territorial nature of *Castor canadensis*. A sighting of a viceroy butterfly might brew an argument about animal mimicry. Some striking specimen of a full-flowered ladyslipper may start a debate over the government's role in plant conservation. And although the majority of students specialize in one area of biology or another, they often find it difficult to resist the allure of other more mysterious branches of study outside of their own. In another line of work, jumping from one interest to another may be misinterpreted

as boredom or a classic case of “the grass is always greener.” But in exploration of the natural world, such curiosity becomes necessary for success.

To a zoologist, botanist, or ecologist, the secrets of nature crouch beneath every rock. They swim unseen in each puddle and pond. They perch, waiting, on the highest branch of every tree. Chance encounters in nature between scientists and subjects produce all sorts of niggling questions. Why do butterflies seem partial to a particular flowering plant? How do squirrels store up enough food for the winter? Why does contact with a certain plant result in an allergic reaction? Nature confronts the human brain with an overwhelming amount of questions, and each question pokes and prods at our yearning to understand the world around us. This curiosity, not logic or a love of complex calculations, supplies the passion for discovery that keeps science moving forward.

Witnessing the power of curiosity at work is entertaining as well as awe-inspiring. One day during lunch at the institute, Chef Richard came out of the kitchen’s double doors with an unusual treat. “Look what I found in the garden,” he said, plunking down a large salad bowl on the dining table. I leaned forward, expecting some prized vegetables and the makings of a delicious homegrown salad. At first, I saw just that – a heap of vibrant leaves and some curiously green tomatoes. Then it occurred to me that one of the leaves was inching along the bottom of the bowl and was, in fact, not a leaf at all but a shockingly well-camouflaged caterpillar. My experience with caterpillars being limited to smaller varieties like monarchs and swallowtails, the enormous four-inch worm and its swollen girth came as something of a surprise. The caterpillar shortly became the most popular organism in the lunchroom. Students from all fields of biology crowded around the table, nudging the worm inquisitively and exclaiming at its size.

After some collaboration, they decided the creature was a tomato hornworm – a particularly ravenous insect with a gastronomical fondness for, that’s right, tomato plants. Leaves, stems, fruit and all, this hungry little worm devours plants piece by piece. And after about four weeks of round the clock snacking, this worm is anything but little. Stretching to four inches in length as a grown caterpillar, it burrows into the soil to pupate and then surfaces later as a moth. For a vegetable gardener, few things can be more frustrating than the unexpected onslaught of the tomato hornworm. For a biologist, it was a fascinating find that invited all sorts of questions.

After identifying the unwelcome garden guest, talk turned to the worm’s fate. There was some debate over what would be done with the worm, since it could hardly be allowed to return to gorging itself on the institute’s tomatoes. Suggestions circled the table. The etymologists argued for dousing it in alcohol and dissecting it to look for parasitoids. Sympathizers for both worm and garden wanted it relocated to another patch of green. Students with experience in botany were interested to see the amount of damage it would do to the tomatoes but were loath to put the succulent cherry tomatoes, a lunchtime favorite, at risk. In the end, it was decided the worm would be allowed to pupate and mature to a moth – but on the scientists’ terms. A comfy new abode was constructed for the worm according to the etymologists’ specifications: a plastic Tupperware container, a few cups of loamy soil procured by the soil expert down the hall, some tomato leaves from the garden, and, voila, a homegrown experiment sure to impress any middle school science fair!

Anyone with an advanced degree in biology may cringe at such a playful handling of the scientific method. They might look at the worms beginning to pupate below the soil and demand to know the point of such an obvious experiment. They might leave in a huff because of the lack

of data or complex mathematical formulas involving half of the Greek alphabet. They might even take up a thesis on why undergraduates should never be allowed outside of the lab. But underneath the logical exterior and the stark white coat is that same curiosity that prompts college kids to play with garden worms.

Debunking the Myth of the Massasauga Rattlesnake

There's a killer waiting outside your home. He moves belly to the ground, with all the slyness of Satan and twice the malice. His forked tongue creeps in and out of his mouth, scenting the air around him for prey. His fangs hold enough venom to kill a small herd of cattle, and he's waiting outside your door, ready to sink his teeth into the ankles of your unsuspecting toddler, your frail grandmother, and your defenseless cocker spaniel pup – with enough poison left to send you into a coma.

Despite the efforts of countless scientists, nature centers, and conservation coalitions, this is what many people think of at the mention of the Eastern Massasauga Rattlesnake. As human populations in the Midwest increased over the last 200 years, people living in areas inhabited by Massasaugas grew less tolerant of the snakes and oftentimes resorted to killing them. Such merciless slaughtering of the animal, along with destruction of its wetland habitat, has contributed to its sharp decline in population. And while the Massasauga now receives protection from its status as a threatened or endangered species (depending on which state you live in), it is not enough to prevent the continued destruction of this surprisingly shy animal.

The term rattlesnake, while accurate, may be what's keeping the Massasauga from gaining popularity among Midwesterners. But at an average of two feet long, the Massasauga is dwarfed by most other rattlesnakes. The rattle at the tip of its tail is also quite small, its warning rattles feeble by comparison. And while it does produce venom, the Massasauga only uses it as an absolute last resort. It prefers instead to hide or retreat from predators, saving its valuable venom for mice and other tasty rodents (and making it a handy pest exterminator). So rather than worrying about running into one of these creatures every time you set foot outside your home,

remember their non-confrontational nature. If you do happen to spot one or hear the buzz of its warning rattle, back away and capture a photo from a safe distance.

By spreading awareness of this snake's habits – and habitat – we may yet see the day it's restored to an established and thriving species of the Midwest. Whether you appreciate it for its rodent-ridding ability, its distinctive rattle, or its gentle nature, know that the Massasauga has its place in the world as an intriguing species of Midwestern wildlife.

Monarch Migration

Anyone that's experienced Michigan's dark and snowy months would agree that Mexico is a fine place to spend the winter. Now, as the leaves start to rattle and fall approaches, some people may already be planning to head south. But for some Michigan inhabitants, overwintering in Mexico is not a carefree season of margaritas by the pool and siestas in the sun but an absolute biological necessity. To the millions of monarch butterflies that make the trip each year, Mexico serves as the sanctuary where new generations of monarchs get their start.

As scientists learn more about this creature, the mysteries surrounding its annual migration to Mexico and back continue to surprise us and force us to question how much we really know about the fragile nature of the animal migration. While individuals of our species regularly hop around from state to state or country to country, timed mass migration such as what monarchs undergo remains completely foreign to us. Many other animals migrate seasonally, but none have a migration pattern as complex as the monarch's. When Canada Geese flock to the southern states during the fall, the same birds return again in the spring to nest. That this instinct to migrate is passed down through some biological cue, without the benefit of discussion and planning between generations, is remarkable.

The migration mystery deepens in the case of monarchs, which move to Mexico and back each year through a succession of generations. Those monarchs that fly south for the winter never again return to their homes in the milkweed fields of the northern United States. The insects' children, grandchildren, and finally great-grandchildren will accomplish the return trip in stages. To realize the extent of this biological marvel, imagine that many years ago your great-grandfather, a Michigan native, had the sudden overwhelming urge to hike down to Mexico to start a family. A generation later, his children are overcome with the unexplainable desire to

move a few states north to raise some kids of their own. If this pattern of moving farther north which each generation continues, you would find yourself feeling instinctively compelled to complete your family's gradual move back to Michigan – all without ever discussing the move with previous generations of your family.

Any long-distance migration – especially one which involves the efforts of several generations – requires an incredible amount of time and energy. The nearly 3,000 miles from Michigan to the oyamel fir forests of Central Mexico is physically draining for monarchs, and many monarchs die during the journey as they meet obstacles like treacherous winds and hungry predators. With their fragile wings marked by some amount of wear and tear, those that do survive do not make it back unscathed. Most arrive in Mexico with frayed wing edges or missing scales, but the luckless of the bunch may land with torn antennae or entire wings unaccounted for. So what makes the journey and the resulting risks worthwhile?

Typically, animals migrate for one of two reasons: to gain access to resources like food, water, or shelter; or to give the slip to predators. Thanks to the guiding hand of natural selection, the butterflies have, over time, gathered a couple of inventive tricks for evading predators. From the moment they hatch, monarchs feed almost exclusively on milkweed plants. The poison from the milkweed concentrates in the monarch's body as it grows and continues to feed, making it a very bitter and unappetizing meal for any bird looking for a quick bite to eat. After feeding on just one and experiencing its gag-worthy poison, a bird will forever after recognize the colorful pattern of a monarch's wings and avoid future snacking.

Monarchs also have the benefit of camouflage. When opened, the vibrant black and orange of a monarch's wings makes the insect easy to spot. But when folded together, its wings expose only the dull brownish gray exterior, allowing the butterfly to remain unseen by birds

circling the milkweed patches above. So while monarchs may occasionally meet their doom at the sharp end of a bird beak, there is no predator threatening enough to send them on an exhausting one-way trip to Mexico.

With such clever tricks for escaping the interest of predators, a monarch's main challenge in the wintertime is finding shelter from the violent winds and heavy snowfalls that makes every northerner yearn for spring. Cold enough to paralyze any butterfly, the winter weather of a monarch's summer home threatens to end both the butterfly and the flowering plants it feeds on. Mexico, with its milder climate and abundance of flowering plants, offers a solution to both problems.

After a grueling two-month journey to Mexico, the surviving monarchs flock to the oyamel fir forests. There they cluster together, feathering the trees with their wings and huddling together to create a shield of warmth and protection against the elements. Once the warm weather signaling spring returns, the monarchs begin their trek back to the northern United States, one generation at a time.

The Value of Nature in the Modern World

As technology becomes increasingly integral to how we work, play, and socialize as a species, we have grown accustomed to exercising control over every detail of our existence. With the proper resources, it is possible to manipulate myriad variables to maximize our comfort, minimize our pain, and completely restructure our circumstances to our own advantage; by creating indoor spaces removed from the whims of nature, we are free to determine temperature, noise level, who or what has access to our homes, and how we spend our free time. By adjusting these details of our lives, we construct a barrier between our artificial world and the natural one outside. As a species, artificial spaces increasingly become our preferred places of interaction as we assume the safety and comfort afforded by such artificial spaces symbolizes the progress of a civilization in its prime. But what are we sacrificing by erecting barriers between the artificial and nature world? What consequences does it have for our appreciation of nature, if one is even relevant to our modern world?

Placing monetary value on nature, while theoretically possible, is simply not practical. While some of nature's ecological services may benefit the healthy functioning of our world and create a balance we could not hope to mimic on our own, assigning numbers of cost and benefit to such services brings us no closer to fathoming their necessity. For example, processes like waste decomposition, seed dispersal, and water cycle regulation all occur naturally in a healthy ecosystem, without human interference. These services and many others are irreplaceable, and as yet cannot be matched by any configuration of human technology or design. Some argue that naming a price tag for these services may foster within humanity a deeper appreciation. However, this becomes problematic when assessment of the value of a service remains unclear or when the implications of the service act more far-reaching than anticipated. How, for example,

can we account for all the benefits of a service as vital as oxygen renewal? They may seem obvious, but it is important to consider that for all our wealth of scientific knowledge, we still have not come close to approaching the ability to understand the limitless intricacies of natural processes. In attempting to assign value to nature in such a way, humans arrogantly assume there exists no other way to form appreciation.

If the value of nature cannot be assessed monetarily, how then may we appreciate nature? In a modern world where the safety of artificial spaces may seem preferable, perhaps the more pressing question is *why* must we form an appreciation? The answer, while more straightforward, may also be more troubling. As humans become more withdrawn from outdoor spaces, our appreciation diverges into two halves: the real and the perceived value of nature. If the real value of nature is unknown but nonetheless essential to our living world, then the maintenance of nature and all of its processes remains essential – and must consequentially remain fixed. Our perceived value of nature, however, fluctuates as our relationship with nature builds or deteriorates over time. At the present, the human tendency to detach from the natural world and accept one of artificiality hinders this capacity to connect with and appreciate nature, creating a rift between the real and perceived value. The consequences of this disconnect cannot be overstated. The undervaluing of nature leads to a restructuring of priorities wherein the natural world receives little of the attention and protection it deserves; it becomes displaced by economic concerns and short-term goals that fail to consider the long-term reality of putting our natural ecological services at risk. Proof is everywhere: water contamination, climate change, and animal endangerment are but a few indications of this problem.

Unfortunately, these problems come ill equipped with solutions. Until humans learn to fully appreciate nature and all of its benefits, we will continue to exploit it – to our own peril. It will take time to rebuild the bond between our species and the environment; we may only hope that time is something we can afford.