

PREFACE

MY ENTHUSIASM for poetry and science began early: my first heroes were Emily Dickinson, whose poem “Success is counted sweetest” appeared in my fifth-grade reader, and Madame Curie, whose biography I read when I was seventeen. As a young adult, I revered Sylvia Plath and Rachel Carson equally, and I did not perceive any contradiction in believing in the power of both poetry and science, nor did I think of science as a field more congenial to the male psyche than the female one.

Since then, I’ve learned that all human cultures have poetry, and that Enheduanna, the first known author to sign her work, was a poet. This was in about 2300 BCE. The origins of modern science don’t appear in the human record, though, until almost 2,000 years later, in the fifth century BCE in Greece. It seems significant to me that poetry came before science. Perhaps this means that poetry comes more easily than science to the human brain and can therefore be used as a vehicle to help us understand science.

But that’s not all: as I continued reading about poetry and science, I learned that poets can make intuitive leaps, or pre-discoveries, that are later confirmed by science. Edgar Allan Poe predicted black holes, the expanding universe, and the Big Bang long before scientists thought of these things. He was also the first person to figure out that the sky is dark at night because the universe is finite. He did not write scientific papers about any of these things: he described them in *Eureka: A Prose Poem*, which was first published in 1848. Walt Whitman also made a pre-discovery. Going against the scientific teachings of his time, he argued that mind depends upon flesh. Gertrude Stein not only found a new way to write poetry but simultaneously showed that the brain’s neural structures for grammar are independent of

the meaning of words. She was way ahead of the linguists!

The history of poetry and science confirms my initial, intuitive conviction that these are not totally separate endeavors. This excites me greatly, and in *Poetry and Science: Writing Our Way to Discovery*, I wanted to bring together four of my favorite poets who use science extensively in their work: Alison Hawthorne Deming, Ann Fisher-Wirth, Elizabeth Bradfield, and Allison Adelle Hedge Coke. It is no coincidence that they are women, as women have often wrested science from its own biases (historically white, straight, and male) to dynamic complications. I hope you will enjoy their thoughts on poetry, science, and discovery as much as I do. It was an honor to collaborate with them on this book.

Lucille Lang Day
Oakland, California, July 2021

POETRY AND SCIENCE: THE BIG STORY

IN MY CHILDHOOD, books brought me joy, new knowledge, corroboration of my fears, the redemptive power of love, and an introduction to astonishment. My books were not only literature (such as *Stuart Little*, *Pinocchio*, my mother's original illustrated edition of *The Wizard of Oz*, and the remarkable feminist fable by Wanda Gág, *Gone Is Gone*). I also had pocket-sized guides to trees and wildflowers, editions that still grace my bookshelves. I am delighted to note that my copy of *Trees You Want to Know*, by Donald Culross Peattie, is marked with my first attempts to write my name (pretty good except that the capital "N" is flipped backward). I also had a children's natural history encyclopedia, perhaps purchased on a family trip to the American Museum of Natural History in New York City, an experience that certainly shaped my religious feelings as a child growing up in a secular family—religious in the sense of awe inspiring, of feeling that I belonged to something mysterious that stirred in me a reverence. Dinosaurs, those monstrous and beautiful beings that stood at the evolutionary portal of my very existence, were among the childhood gods of my godless childhood. I spent hours in daydream gazing at their images on those pages. Literature included art and science for me. These were not disciplines but windows into the larger world.

In a high school biology class, my teacher drew a diagram on the greenboard to illustrate a time in deep history when science and religion took separate paths as ways of understanding that larger world and our place in it. I realized that science had been a source of wonder and discovery for me since early childhood. That in some strange way it had been my religion, leading me to feel a part of something more vast than human life. And that the detail with which science investigated the world was a great, continuously unfolding story. I did not realize for another few decades that poetry would

become the road I'd travel, and that science would challenge me to rethink the language and form of what I might consider poetic.

From early on I had an epistemological sense of what poetry was for: How do we know what we know? What are the forms of knowledge that I yearn for? That I trust? I found that I could not separate poetry from science, particularly natural history, as a field of inquiry into how I came to be the creature I am or for understanding what the Alaska poet John Haines described as "the terms of my existence." Nothing was more interesting to me than the Big Story of Life on Earth. Nothing more soul crushing than the diminishment of life on Earth at the hands of human cruelty and greed.

The title poem of my first book, *Science and Other Poems*, began what has become a practice of being, as one colleague dubbed me, a lay scientist. I am not trained as a scientist, but I am inspired by science and read widely in various fields, as certain projects prescribe. This interest has acquired urgency as the denigration, suppression, and denial of science have rabidly spread in the last several decades, a time during which science literacy is essential to solving our most weighty challenges, including climate change, health care, environmental justice.

So, given those concerns in which facts are essential, the poet faces the challenges of (1) transforming information into images; (2) finding patterns in nature that suggest an approach to form; (3) getting beyond the outrage and elegy that are the dominant emotional hue of our discontent ("We must not let our grief rob us of our joy in nature," as I heard Bill McKibben urge after one of his depressing *End of Nature* talks); (4) taking on complexity without sacrificing clarity (Ross Gay's *Catalog of Unabashed Gratitude*, A. R. Ammons's *Garbage*); and (5) exploring the limits of scientific diction in poetic discourse (Kimiko Hahn's *Toxic Flora*).

My second book of poems, *The Monarchs: A Poem Sequence*, began when I moved to California for a Stegner Fellowship at Stanford in 1987. While there I had the opportunity to attend a conference on consciousness that featured neuroscientists and research psychologists and such. I was jazzed by the concepts but found the language stultifying, what an evolutionary biologist once described to me as

“journal-induced narcolepsy.” During that time in California, I was also encountering a natural world that was alien to me as a tenth-generation New Englander. Grass turning green in January? Species I knew as diminutive houseplants showing up as treelike versions of themselves in people’s yards? Most awesome and unsettling of all were the hundreds of thousands of monarch butterflies gathered at Natural Bridges State Park in Santa Cruz to overwinter in the eucalyptus groves. (One cannot see this now as monarchs in the West have declined 99 percent, according to the Center for Biological Diversity.) I was catalyzed by the sight of the monarchs bunched up like huge bags of laundry in the trees and by learning for the first time about their migration behavior—those in the West migrating to the remnant coastal forests, those in the East migrating to the mountains of central Mexico.

Surely such complex behavior could not be chalked up simply to instinct. It could only be, I thought, a manifestation of intelligence. And that launched me on a project that included visits with leading lepidopterists to the monarch refuges in Michoacán, Mexico, reading the most recent scientific papers on monarchs and studying the evolution of intelligence in nature across a broad span of species. This was a big question, and other questions clustered around it like magnetic bits in an Etch A Sketch. It wanted to be a poetic sequence—the long-form poem that helps resolve anxiety about challenges that plague shorter poems, like when does this poem start and when does it end? A poetic sequence just keeps going. I also liked the associations with the word “sequence,” as it speaks to both the genetic code and the lifecycle of a star. So, the subject announced its form and on it went for sixty linked poems.

I’ve given you an origin story here about my artistic practice in bringing together science and poetry. In recent years I’ve been engaged in another practice that I will call applied poetics. Notable in this effort are two projects sponsored by Poets House, in which I worked with professionals at zoos, libraries, and science museums to create poetry programs that enhance science literacy and conservation values. The first involved curating a poetry installation at the Jacksonville [Florida] Zoo and Gardens, and the second, developing

a poetry installation for the Milwaukee Public Library and Milwaukee Public Museum. Poet Katharine Coles has been an esteemed colleague in this work—and is certainly one of the smartest poets today working this field.

In the 1990s and 2000s the science documenting climate change and its consequences has become a central concern for anyone who cares about the future of life on Earth. “It’s all about global warming, baby,” writes C. D. Wright in her last book, *Casting Deep Shade* (2019). “We are the asteroid.” At the same time, science denialism in America has risen to a terrifying crescendo. So, for me, interests that once seemed on the margin of cultural imperatives have now taken center stage and inform everything I write, whether prose or poetry.

I’ll close with a new poem of mine that was first published in the January 2021 issue of *Scientific American* as part of a monthly feature curated by science writer Dava Sobel.

Letter to 2050

The Squamscott River
grew lazy in early summer—
muskrat rose and dove
heron swept the air and landed
and hemlocks that had survived
another century’s practice
of harvesting their bark
were thriving. Some suffered
beaver girdles and the predation
by woolly adelgids but still
the pileated woodpeckers
found what they required
in the snags. This is how it was
for us—pulling threads of hope
out of the air as if we had
the skill to weave them
back into webs. We surprised
ourselves when it worked—

so much needed to be undone.

And I promise you that
as paltry as our efforts
may seem to you—no.

I won't justify our failures.

The story of the alewives'
return—that's what I wanted
you to know because it helps
to think of desires that last
for centuries without being
satisfied. How far inland
did the alewives come,
I wondered, the dam removed
after three hundred years
and in the first year then
they came in a rush.

Locals could hear the gulls
gathered in the estuary
in their joy and the alewives
swam and swam to the reaches
of their ancestors—eleven miles
and three hundred years
of appetite for place
their genes remembered
and knew how to find.

The Abenaki offered
a welcome back ceremony.

And fishers gathered—human
cat and bird to feast
and the memory that had been
thwarted for centuries
became a fertile flow.