

LOVE-THE FOUR LETTER WORD THAT SCIENCE FORGOT

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Good morning!

First, I'd like to thank the Brandwein Institute, Dave Foord and Dan Bisaccio, for inviting me here. And special thanks too, to my good friend Coreen Evans Weilminster for bringing my name before them in the first place at a meeting last year. It's an honor to be among such a distinguished line of lecturers. And I am thankful to you for your presence here this morning. I beg your patience and open heart as I dispense with power points devoid of any numbers, charts, graphs, citations or regression models.

A few things---

If my words offend, please know that it is not to harm but to facilitate.

If I presume, know that it is my naiveté seeping to the surface.

If I err in this effort, and I will, please accept it as mistakes made by my head and not ill feelings from my heart. It's my hope that this will be a different sort of exchange between us. One on one--and then spread exponentially and virally benign among us.

This morning I'll speak from the point of view I know best. That of a southern country boy raised by schoolteacher parents with a desire to simply know what was around the next bend in a woodland path, in the depths of a dark creek---what made birds sing and how they flew.

It is a simple equation. To me science and nature are synonymous. The miracles are in adaptation and evolution and more questions to answer with each passing day. This morning I will try to bind and wrap what we do for nature--for science-- in care and concern --for our own standard of being and for the next and coming generations.

As your president, Carolyn Hayes so eloquently outlines in her welcome the four strands that bind us all together in this gathering: Setting the stage with scientific literacy; Building the band by embracing community stakeholders; harmonizing concepts by integrating instruction; and stringing it all together by making learning three dimensional. I too hope to bring us all together in the effort to move our disciplines and society forward somehow.

I am a nature lover; an eco-phyte; a turned on outdoor addict obsessed with the sights, sounds, smells, and textures that nature offers on an all-you-can-sense seasonal buffet. I am a wildling, cast of mid-Carolina piedmont clay and molded by the once mighty but now sluggishly dammed Savannah River. I am born of bottomland hardwood forests where the splotchy- barked sycamore reigns and of weedy rank fallow fields where once the bobwhite quail whistled in midsummer's heat. Nature is my nurturer and in it I am more comfortable than among any construction hewn by human hands.

Nature is sacred to me and I make no apologies for worshipping at the sweep of a bald cypresses' buttressed altar; being baptized in a soft spring rain or taking communion from a Muscatine vine. Birds

sing, and I weep. They fly, and I wonder. In my wild obsession, I live Walt Whitman's exaltations as a seeker of the sensual personified; rolling and reveling in all that nature lays before me.

By nature, I mean astronomy, biology, ecology, mathematics, chemistry, physics and every other way we can think of science as the means for discovering knowledge beyond what we already know and building questions and the desire to robustly address them.

Who am I? Occupationally, I am an ornithologist, wildlife ecologist and college professor. I am a birder, a hunter, a gatherer. I am a seeker and a noticer. These are not just things I do but who I am. All of it is grounded in nature--in science.

Taxonomically tagged *Homo sapien*, I am a man mostly of west and central African descent, roughly three-quarters Cameroon Bamileke and Sierra Leone Mende. But then I am more according to the gene jockeys that drew a collage of German, British, and Irish, and a smidge of Scandinavian from my saliva sample. There is even a tiny portion of Native American, Southeast Asian and yes--a miniscule measure of Neanderthal thrown in. My double -helix is a winding staircase that bleeds duff green hues of Northern European peat bogs and the aboriginal ever-greenness of the Congo basin. The science says I am a mongrelized -man.

But most will call me what they see. And so I proudly wear the outer label. I am a black and mostly proud man, living in the United States of America. I am by modern, politically-correct nomenclature and hyphenated convention a Black- American. Labels matter. It is how we are often tagged to some task or sense of identity. Most of us here are fortunate that the lines between career and passions often blur to the point of being indistinguishable.

Who are you NSTA? You too are an amalgam of ethnic hues, culture, and regional identity. You come from a broad array of places. You've been trained at some of the best institutions and honed your skills with the wisest mentors. You are women and men with thousands of years of collective experiences and tens of thousands of hearts touched and minds exposed to the wonders of science and nature and the critical importance of connecting people to knowledge that will help us protect air and soil and water and wildlife. You are givers. You are magicians. You are science teachers. You are life pulse giving hope for sustainability through communicating science to the caretakers of the future.

Consider this CONCLUDING statement from the NEXT GENERATION SCIENCE STANDARDS on college and career readiness.

"Economic and education statistics make it clear that the United States is not educating enough students who can succeed in a global information economy fueled by advances and innovation in science, engineering, and technology. Research findings indicate that our current system of science education, which places more value on science as a knowledge base than as a way of thinking, is ineffective. Too few students are experiencing success in postsecondary institutions and therefore lack the wherewithal to qualify for gainful employment, including STEM fields, where the nation is seeing the most growth in jobs. They are, in effect, being closed out of middle class opportunities. However, as the research studies referenced in this appendix indicate, said there is a more productive path to follow in science education that entails linking important core content to the practices that scientists and engineers use as they go about their work. This shift in emphasis requires that we control the amount and kind of content, giving priority to powerful concepts that have currency because of their utility in explaining phenomena, predicting outcomes or displaying broad applicability in many fields, and that we use the practices in conjunction with core content throughout the grade."

Let's think about this from an experimental design standpoint. We frequently talk about predicting outcomes. But what about the inputs that generate those outcomes?

I WOULD LIKE FOR US TO THINK ABOUT OUR INPUTS AND STANDARDS FOR NOT JUST THE NEXT GENERATION BUT FOR ME, FOR YOU---FOR US. NOW!

We are more than teachers. We are practitioners of a love craft. We are quilters, stitching the broken patchwork pieces of ideas and dreams together, fragments of imperiled emerald forests, remnants of climate-challenged blue sky, shreds of amber prairie under assault by pipelines and meager measures of coastal marsh minimized by those who would envision them as something more productive—perhaps a strip mall or parking lot.

We see urban green spaces sprouting from abandoned alleys and nature connections in the concrete jungles waiting to be discovered. We are the imaginers--working together to make our real world whole again. We are dream weavers-- hoping and working for what might be. Science is the key.

There are muses and magicians among you, inspiring others in wondrous ways to share purpose and passions in words and actions. I know this because I have been moved to make words that mean nothing to the peer reviewer, mean something to those kindred spirits seeking passion in their nature-loving mission.

I know of their magic because I have seen them create programs with little or no support and even less funding. They bring smiles to once broken faces and squeals of joy to silenced sadness. I've watched them make something greater emerge than the sum of the paltry parts they've been given by limited budgets and agencies and legislatures that all too often see science as an afterthought.

Yes, we are nurturers of knowledge. We are purveyors of passion. Our purpose here is to pass on the best we know to make things better than they are. Because ultimately we are connectors....putting together those things gone asunder...putting others in touch with a better understanding of the environment around us.

Falling back for a moment into introspection--the place of looking into our inner selves to move outward and onward, I invite you as I wander for a moment --to wander and wind into your inner selves. Think deeply about who you are. Think deeply about where you are and amongst whom you sit. Think about why you are. What has brought you to THIS place and THIS time? What is YOUR story?

My story? My nature? A teaching gene ---a grandfather returning from the horrifying realities of trench warfare in world war 1 where science had been abused to create weapons of mass destruction and suffering to the terrifying reality of home where black men were being hanged for the color of their skin. It's a story of a man passionate enough about life and learning to return to a country that despised him because of his color but who saw hope and a way out in learning, and so he returned to teach in a one room schoolhouse; a man passionate enough about life and learning to raise a son with the curiosity to become a science teacher; that man who then married a science teacher that would become my mother. And the tendrils of teaching then are my story even to now with a daughter who teaches.

My nurture--curiosity and learning were expectations, high achievement was the standard. And so these tendrils of teaching that pervade my life. I'm sure somehow are the same in yours.

What is your story? Have you shared it? It is data that demands mining.

And so here I stand before you. New in some ways to this EE world and ready to be a part of the movement to make nature relevant in new ways and science the sharpened tool we use to expose the wonders, issues, concerns and solutions to conserve it. Here I stand before you. The black boy who thought he could fly grown into the black ornithologist obsessed with flying feathered things. The scientist within urges me on to search for the answers that will puzzle together the pieces that will help us to conserve nature—and ourselves. But now after all the years of being the idea generator and objective data gatherer, I yearn for more than some statistical explanation for why a wood thrush's song makes my soul quiver. I need something more than a 300 word abstract to touch me --bone deep.

I have come to the realization that we've done a piss poor job of reaching the hearts and minds of the rest of those folks who don't hold advanced degrees with an "ology" at the end. I'm actually wondering how many of them really care beyond the next publication. Instead of embracing the wonder through the science we often take the multi-dimensional array of creatures, places, and interactions to boil them down into the flat pages of some obscure journal most will never read. There is indeed data to be collected. Yes, science—robust science-- is the critical nexus that gathers the information that we must have to act.

There is no question that our world is warming. Conventions of the world's best brains tell us so. Species are being drawn down into the vortices of extinction and spin faster in that swirl as the end of their existences are accelerated by what we build, frack, mine, cut or covet. There are reams of data-numbers and statistics enough to convince anyone who would dare to open their eyes and see. There are volumes of refereed journals—the fossilized ones bound and gathering dust in library stacks and the new-fangled ones staring back at us from the numbing screens on our laps. This information is the basis for our actions. The data heaped upon data and squeezed through peer review --but that never sees the light of inspiration---is the reasoning for my reaction; the reason we must all act!

There is something missing. There is something immeasurable, un-publishable, absent from the necessary process we call conservation. We must re-find the art in conservation and re-focus to doing and not talking. If an ounce of soil, a single sparrow, or an acre of forest is to remain then we must look to the hearts of the masses to push things forward. For the sake of saving wildlife and wild places the traction has to come not from the regurgitation of the data that tells the bad news but instead from the poets, prophets, preachers, professors, presidents; all of them potential educators who have dared to inspire.

Eco-prophet Aldo Leopold said that "Our ability to perceive quality in nature begins, as in art, with the pretty. It expands through successive stages of the beautiful to values as yet un-captured by language." Heart and mind cannot be exclusive of one another in the fight to save anything. To help others understand nature is to make it breathe like some giant, revolving, evolving, celestial being with ecosystems acting as organs and the living things within those places, humans included, as cells vital to its survival. My hope is that WE might move others to find themselves magnified in nature, wherever and wherever they might be. And so our task is to connect. The way for us to do so lies close at hand.

Consider the human heart; a fist-sized mass of muscle that sits deep in the chest of every human being. It is a miracle of evolution, a blood-pumping, "*lub-dub-lub-dub lub-dubbing*" machine that pushes life's tide through the vessels that nourish us. Consider the heart, a symbol of life. It's a symbol of health. It's a symbol of hope. It's a symbol of LOVE.

It is the heart that symbolizes the essence of the living breathing loving human soul. With an ailing heart we suffer. With a broken heart, we molder. Without our hearts—we perish. We all came to our hearts the same way. At some point the cells in our embryonic beings differentiated collected themselves and began to pulse and pump. Life ebbed within that gathering and then became the emergent spirit within us that is greater than the sum of all our organic parts. Even Without the pudding-like lump of neurons collected in our craniums, the heart in me—the heart in you—still beats; my heart-your heart. All our hearts have lives of their own--no thinking required

As a boy, I wandered in the woods of my Home Place in Edgefield, South Carolina, and my little heart would beat fast at the sight of clouds racing overhead. It would pulse and pound when I ran through fields of the greenest head-high grass growing, it seemed, in some prayerful attempt to touch cerulean blue skies. My heart would flutter like a blood red butterfly trapped in a bone-bound ribcage when I climbed high in my grandmother's pecan tree to see the world from a squirrel's perspective. It would almost fly from my little brown chest when I saw whitetail deer bounding or when I watched birds flying, seemingly somehow defying the gravity and going somewhere unknown that I was sure I wanted to be.

As things around us seem ever in some state of crumbling, of coming apart at the seams as the news stream flows undammed with unsettling things. Wars erupting across the globe at rates beyond diplomacies reach. Differences between us generating unspeakable violence and unwarranted death; diseases evolving and spreading faster than our technology can keep pace, the best we have cannot outrun the evolutionary capacity of virulence and bacterial reproduction.

Ecological wrongs, climate change, pollution, habitat loss, and extinction spinning together to weave an unhealthy brew. The losses spell disaster for all of us. We treat one another with less and less respect, often assuming the worst and disrespecting the best. We treat the other beings who we share the globe with in shameful ways. We revere them even less. So then how do we move forward into some different space to make things better?

It is again, at the very heart of the matter, we consider as we gather in this place to pursue a passion of expression; a desire to reach out and teach, to inform and educate. We must be inspired to do any of it. Inspiration lies in the heart, not in the head. The data lies in embracing whole-heartedly what draws us in. The work to be done lies in connecting the two, head and heart. We must once again find the connections between our heads and our hearts. We must rediscover the connections that have led me, led you, led all of us to the missions to which we've all been called. The connections will lead us to new experiments in understanding, new data sets of empathy, and to results that are relevant.

We'll connect the struggle of climate change not just for struggling polar bears looking for places to haul out in warming Arctic waters or pikas losing ground to climbing temperatures in Rocky Mountain heights. We will make sure that we are inclusive and connecting conservation to people in ways that are real and impact their everyday lives. Climate change will be equally critical for rural residents of South Carolina, urban children in Atlanta, and Arctic ecologists in Nunivak.

The air that the birds and bison and bullfrogs breathe is the very same air and water and woodland and prairie that we also depend upon. It is our mission to make sure that people of every hue are made a part of the conservation conversation and stakeholders in the science we do.

Relevance, it means making things real. It means making the complex, simpler. It means bringing global environmental issues home. It means making a glacial event immediate. It means seeing green in dingy brown fields. It means giving hope where there was none. It means making things that are happening to millions mean something to me. Yes—making things real. It means engaging the unconventional and relishing the uncomfortable. It means undoing what's been done wrong and doing right what should be.

I think Finding our hearts is the key. Connecting them to what we know and what we can imagine is critical. Speaking those feelings born of heart and rushing to head is what I call education. Learning; teaching--they are the tidal ebb and flow of information that nourishes our existence.

Ours is a mission of love that we are now tasked with invigorating. It is a mission to inspire ourselves, our peers and the public with the need to understand and care for the natural world around them. Love is the incalculable indispensable latent dataset we can no longer afford to ignore. It is not subject to peer review, and yet it is always (ALWAYS) significant, though not statistically provable. We can no longer afford to classify it as an outlier or spurious factor

Love is the four letter word Science can no longer afford to ignore. Love. It is the data that demands gathering. It is the observation we need to work harder to reveal. It is the experiment we need to fearlessly replicate. Each one we teach with passion is a multiple working hypothesis of faith that teaching is worth the effort. It is the analysis of profound depth that no statistician can normalize. It is the result easily read and the conclusion we can all understand. Find the love in the science you teach, in each student you reach. And pass it on.

Thank you.