Nature and Me Make Two: The Genesis of Biophilia

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Explorations

E. O. Wilson with the author's children during a bioblitz in Central Park, New York City. During a bioblitz, teams identify as many species as they can find in a given place. Biophilia may be innate but has a very strong learning component that can most easily be activated at a young age. © Charles Smith. All rights reserved.

by Dennis Liu

The search for personal identity and meaning often comes in the form of questions. Who do I want to play with? What do I want to be good at? Where should I live and work? Why do I like spicy food? Am I a cat or a dog person? While the identities we don are deeply personal, their effects resonate in public, profoundly impacting our families and friends, our communities, and ultimately nations and societies. Two twentieth-century scholars, German-US social psychologist Erich Fromm (1900–1980) and US biologist E. O. Wilson (1930–2022), despite highly divergent backgrounds and training, converged on the importance of nature in shaping our personal, cultural, and societal identities.

The four-billion-year history of life on our planet involves a dynamic interplay between the biosphere—the network of living things—and the physical planet—geology and ocean–atmosphere—each modifying one another. Our physical planet, like all things in the universe, is traveling downhill in energy and in the direction of homogenization as things fall apart into small component parts, a concept captured in the term "entropy." In striking contrast, living systems move toward increasing complexity, which may perhaps be the reason for our planet's beautiful and profligate biological diversity. The interplay between physical planetary systems and the biosphere is a defining characteristic of Earth, and although potential evidence of life in other parts of our solar system exists, we know of nothing that comes close to the elaborate biosphere of this planet. Earth's biosphere is full of complex interactions that make use of energy and intricate cellular machinery that defies the relentless force of entropy, allowing life to climb uphill against the downward forces of physical disintegration.

I suspect most readers take the presence of our nonhuman companion species for granted, and most of us have spent little to no time trying to count how many species exist, let alone questioning why there are so many. As it turns out, we humans share this planet with an astonishing 10 to 30 million other species.[1] Earth is home to so many suspected species that only two million have been named and described, leaving the vast majority to fall under the category of "yet to be discovered" by science.

Although I am an avid nature observer, looking through my old journals, and more recently my **iNaturalist** citizen science app, I see that I have only consciously encountered around 2000 species—from busy insects and fragrant plants to adorable fungi, cozy mosses, and magisterial cetaceans—less than a thousandth of one percent of our companion species on this planet. Despite several significant mass-extinction events, each one followed by a game-changing recovery—for example dinosaurs giving way to mammal dominance—abundant diversity has been the observed rule on Earth from the first spark of ancient life to the present day.

There is general agreement among biologists that planet Earth is currently experiencing a **new mass-extinction event**, often referred to as the Anthropocene as it is caused by the planet-altering activities of a single species of mammal: humans.[2] This extinction crisis is concerning. We, humans, like all of life on Earth, depend on other species for our very lives. From a utilitarian perspective, intact nature provides us with drinkable water, breathable air, and energy, including food. And from a theory-of-justice perspective, an ethical standpoint, we should be concerned with whether it is moral to eliminate other species by our actions even if done inadvertently. One way to phrase the question is, "Should I love other species as my siblings in the biosphere?" Enter the concept of biophilia, *bio* for life, and *philia* for love, and the two great thinkers concerned with the human condition who deserve the credit for coining the term: the German-US humanist philosopher Erich Fromm, and the US scientist E. O. Wilson, my friend and mentor.

Erich Fromm, who began his professional life as a Freudian, trained in Frankfurt and then hung his analyst shingle in Munich before emigrating to Chicago fleeing Nazism. He believed culture was paramount in developing personality and—parting ways with Freud—that mental traits were highly malleable. Perhaps this was Fromm's way of finding hope for the human condition following the devastation of World War II. As early as 1956 he was writing, in *The Art of Loving,* of nature as restoring "an active power in man," which "makes

him overcome the sense of isolation and separateness." He first used the term biophilia in his book *The Heart of Man: Its Genius for Good and Evil* (1964), describing a psychological orientation of being attracted to life and vitality. He later elaborated biophilia as "the passionate love of life and of all that is alive" in *The Anatomy of Human Destructiveness* (1973). In essence, Fromm equated a love of humanity with a love of nature.

In his book *Biophilia* (1984), Wilson—at the height of his biological research career—defined biophilia as an innate tendency of humans to strongly relate to other life-forms and the human desire to affiliate with living things and processes. He hypothesized that this biophilic trait evolved in humans, arising from their intimate coexistence and dependence upon other life-forms. He further speculated that biophilia was likely under complex genetic control, involving the action of many genes influencing learning propensities, attitudes, and capabilities. Geneticists call this a complex trait in contrast to a simple Mendelian trait under the control of a single gene. Myriad scholars have been moved to explore how biophilia might be adaptive, and to conjecture about the evolutionary processes and mechanisms underlying the trait.[3]

In my many conversations with E. O. Wilson, we mostly talked about ideas in biology and the amazing adaptations and behaviors of different animals. We took each other's biophilia completely for granted, marveling, for example, at how very distantly related species may converge on strikingly similar adaptations to support their shared relationship to another species, such as a flower. Consider the hawkmoths, for example, with 1500 distinct species! These insects bear a striking similarity to hummingbirds (350 species!), with an ability to hover and reach deep into flowers for nectar, despite insects and birds being separated by tens of millions of years of evolution. Biologists call this convergent evolution.

Eurasian hummingbird hawkmoth (Macroglossum stellatarum) drinking nectar from a butterfly bush at the Rachel Carson Center (RCC) Landhaus in Glonn, Germany. These moths bear a striking resemblance to continental US hummingbirds and are a remarkable example of convergent evolution. *© Dennis Liu. All rights reserved.*

Wilson focused most intensely on ants in his own research, insects with a remarkably complex social structure, and made fundamental discoveries concerning their evolution and sophisticated social communication.[4] His Pulitzer Prize-winning writing, usually aimed at a more general audience, focused on biodiversity and its preservation and protection, culminating in the publication of *Half-Earth: Our Planet's Fight for Survival* (2017). *Half-Earth* embodied a call to protect half of Earth's lands and waters for the rest of nature, rallying scientific evidence in favor of the goal while also appealing to ethical and moral motivations, to our biophilia and very identity as a species.

As a biologist, Wilson's work and writing has provided me with deep and lasting inspiration. From my perspective as an educator, I also affiliate strongly with Fromm's emphasis on the potential for individuals to alter their thinking, and even their temperament, through learning and experience. To my knowledge Wilson and Fromm never met, nor did Wilson ever mention Fromm to me, but I think Wilson would have found consilience between his own scientific views on biophilia and Fromm's humanistic perspective. And this consilience is essential, now more than ever, since reversing the ongoing extinction crisis will require global action across contrasting cultural landscapes.[5]

To this end, what I am interested in understanding is the best ways to generate biophilia among diverse people. In my current position, leading educational efforts for the E.O. Wilson Biodiversity Foundation, I am engaged in both academic and applied research focused on biophilia, learning, and conservation action. To understand how learning more about nature might enhance biophilia, I've turned to literature on music appreciation, as well as studies of hunters, bird-watchers, and even sports fans. Members of these affinity groups covet detailed knowledge in their domain of interest, and understanding their attitudes and experiences can inform our ongoing work in biophilia studies (manuscript in preparation). On a more applied research level, in cooperation with educators who are members of the E.O. Wilson Biodiversity Foundation's **Educator Ambassador Group**, we've conducted studies aimed at focusing on whether students exposed to information about species and natural areas near to where they live become more interested in visiting and protecting such natural areas. What our preliminary classroom studies have already begun to reveal is that after students use our **Half-Earth Map**[6] to learn about nature reserves near where they live, a significant proportion of them feel more motivated to protect and further discover places they have previously held little to no interest in.

While the search for personal identity and meaning is a lifelong project, it is perhaps most poignant and pressing when we are young. As a scientist and an educator, I hope to foster—especially among students and future educators—a love for nature, a curiosity for other species, and an interest in how we can thrive by appreciating our interdependence in the biosphere. As E. O. Wilson wrote in 1993's *The Diversity of Life*:

> Our troubles, arise from the fact that we do not know what we are and cannot agree on what we want to be. The primary cause of this intellectual failure is ignorance of our origins. Humanity is part of nature . . . a species that evolved among other species. The more closely we identify ourselves with the rest of life, the more quickly we will be able to discover the sources of human sensibility and to acquire the knowledge on which an enduring ethic, a sense of preferred direction, can be built.[7]

To put it simply, it's imperative that our human nature includes recognizing that we are part of, rather than separate from or somehow above, nature.

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