

## Editorial Note

### Early Childhood Protostars, Formative Entanglements, and Later Environmental Advocacies and Actions

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Two of the lead articles in this issue address different parts of the process in understanding the enigma of children's connection with nature. One addressed the experiential entanglements of teachers from two different nature-based preschools, while the other addressed the many different types of entanglements involved in the process of connecting children with nature. The topic of children's connection with nature has been a long-standing interest of mine and many others and had, in fact, served as a significant motivator for the founding of this journal. While it may have been an intuitive notion early on, many supporters had unhesitatingly and inspiredly participated in the launch and success of the journal. The topic has maintained a prominent interest in the field-at-large today, as evidenced by the growth of research, related scholarly activities, and practices based on this foundation. My heartfelt gratitude to all contributors, including authors, researchers, reviewers, special issue editors, and leadership and staff at Natural Start Alliance and NAAEE, as always.

Following the journal's recent tenth year of publication, I took time to reflect on what had been achieved and what was needed to advance our collective work. After several months of both introspection and rumination, in relation to children's connection with nature, my thoughts clustered around two types of conclusions. One, more collective work is required to demonstrate the benefits of nature-based learning experiences on children's development, motivations, and educational outcomes. While research addressing these topical intersections has been represented prominently - and in a significant portion - in this and other academic journals, I do not believe we are quite there yet. More research is required, employing innovative and varying methodological configurations, that draw us further into contemplating and making sense at a deeper level regarding benefits of nature-based learning experiences for children. The second conclusion, it seems to me, is related to the first one in that there is an absence of convincing evidence that speaks to, or articulates about, associations among early nature-based experiences and later pro-environmental advocacies and actions. This gap, or lack of research, may be related to several factors, including dearth of nature-based early education programs and challenges related to conducting longitudinal studies. Nevertheless, I believe, where opportunities exist, many types of longitudinal studies are essential in understanding the nature of continuing pathways and needed supports along those pathways. Methodological innovations in research will be key again. Longitudinal research literature from fields of medicine, psychology, and sociology may be helpful in framing possible innovations in longitudinal research designs that trace children's early experiences to later pro-environmental behaviors.

A corollary thought that occurred to me related to the absence of more meaningful theoretical frameworks that linked children's early experiences and later environmental advocacy and action. While some of the traditional child development frameworks address life-span pathways, they do not, however,

explain or inform about trajectories specifically related to early nature-based learning and later pro-environment activism. I would like to speak more about this and offer a possible conceptualization using nomenclatures and ideas from astronomy and formation of stars, in particular.

Consider a *protostar* as being akin to an individual child who later adopts and practices pro-environment lifestyle, as a starting point. Protostars require further ignition and grow and expand to become stars. And consider stars to be individuals, each of whom are pro-environment in some way. Each star develops to produce a different magnitude of luminosity, and where each of the stars will affect the generation of new stars in different ways. See illustration below for a three-stage framework describing the astronomical process, followed by its alignment with nature-based early childhood development, growth in interest and sense of agency, and environmental commitments.

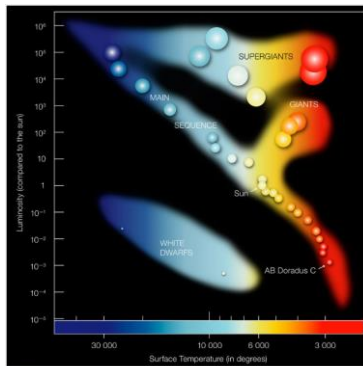
Stellar Evolution Globule Stage: Development of Protostars	Stellar Evolution Main Sequence Development: Ignition and Expansion	Stellar Evolution Main Sequence Lifetimes: Solar Magnitudes
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The Tarantula Nebula, captured by the Hubble Space Telescope, 3 February 2023

Source: <https://www.skyatnightmagazine.com/space-science/beginners-guide-nebulae>

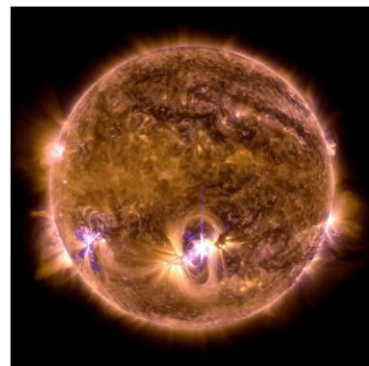
Nebulae are nurseries where protostars may be born. Each nebula composes of large clouds of cosmic matter and gases. Nebulae take many forms and not all nebulae produce protostars. A protostar, formed as a result of gravitational pull of gases into a ball, is a very young star.



CWDE ESO

Source: [The Life Cycle of a Star - Stages of a Star and More from Little Passports](https://www.littlepassports.com/learn/the-life-cycle-of-a-star)

Protostars expand and grow through nuclear fusion and complex cosmic entanglements. A protostar turns into a star when it has enough mass, reaches temperature of about 18,000,000 degrees Fahrenheit, and does not collapse under the force of gravity.



Our Sun, a main sequence star, emits a strong solar flare flares in this image captured by NASA's Solar Dynamics Observatory NASA/SDO

Source: <https://science.nasa.gov/universe/stars/>

Stars have different magnitudes of brightness or luminosity. The luminosity of each star is affected by its size, temperature, and amount of energy it generates.

Magnitudes of stars or suns include:

- Hypergiants
- Supergiants
- Bright Giants
- Normal giants
- Subgiants
- Dwarfs or Main Sequence Stars
- Subdwarfs
- White dwarfs

The energy and material cast by each star until its time of death affect the generation of new nebulae and new star formations.



**Experiential Funnel:  
Nature-Based Early Childhood  
Development**

**Experiential Funnel:  
Growth in Interest and Sense  
of Agency**

**Experiential Funnel:  
Environmental Commitments**



Source:  
<https://blogs.bcm.edu/2022/08/23/gardening-with-kids-promoting-healthy-eating-and-responsibility/>



Source: <https://floristkid.com/tree-planting-activity/>



Source:  
<https://www.childhealthinitiative.org/blog/2016/october/unicef-2-billion-children-affected-by-air-pollution-with-huge-health-impact>

Early experiences take many forms and are provided in many types of settings

Childhood and adolescent entanglements - formative influences through adolescence and later life

Strength of environmental advocacies and actions – different levels of commitment to environmental causes (conservation, restoration, and sustainability)



**EXAMPLES OF HELPFUL RESEARCH QUESTIONS**



What are the benefits of children’s connections with nature? How do enjoyable and motivating nature-based experiences look like? What experiences promote early development of pro-environmental behaviors?

What experiences promote ongoing development of pro-environmental behaviors in adolescence and adult life? How do adolescents become community leaders? What opportunities, supports, and skills development are required?

How may magnitudes of pro-environmental behaviors be conceptualized? What experiences and entanglements are related to the different levels of magnitudes or environmental commitments? What implications can be drawn to inform experiential funnels?

In applying this framework, please carefully consider the nuances of stellar evolution (i.e., nuances in experiential funnels in the human lifespan) and how concepts, entanglements, and transformations might

be appropriately aligned, defined, and studied in research and practice. For example, Ruth Wilson, a long-time educator, and Research Library Curator at Children & Nature Network, articulated the importance of child-nature reciprocity studies (personal communication, March 2, 2024). The topic of child-nature reciprocities alone can generate countless number of studies considering all the distinct variables available related to children, flora and fauna, contexts, facilitation and learning processes, settings, and possible outcomes. One other notion to keep in mind is that pathways moving through this proposed human lifespan are likely not to be linear. And lifespans are not separated into distinct experiential funnels either, but rather as singular flowing and enmeshed experiential funnels. Although this framework is rudimentary and unpolished in its presentation, the overall idea here is start generating lifespan views, and that it is both specific and generic enough to fit many explanations. Work is needed to start mapping the many pathways where children can be nurtured and guided on their journeys to becoming environmentally literate citizens and who, at the least, become main sequence stars. The proposed framework, and others that can be generated, must be frameworks that can accommodate many starting points or early experiences, many intervening influences, and many ways of expressing environmental advocacy and action.

Now I should like to further consider the idea of environmental commitments or the many ways of expressing environmental advocacy and action. If I may be presumptive and beg your indulgence, my proclivity for the Romantic verses may inform of a type of a priori outcome. The desired outcomes must ultimately be defined, I believe, if we are to have direction and advance in the work we do, through both a priori and a posteriori outcomes. Otherwise, the whole of the end result looms large and blurry and it would be difficult to link later advocacies and actions back to earlier experiences.

Consider these two quotations as examples of as possible intermediaries, nascent or concurrent requisites, or demonstrations of desired individual or collective environmental literacy outcomes, a priori as mentioned, that could be sought through our work in education and related fields (for those beguiled or to revisit, please see more complete verses in Appendix A):

***The exceeding beauty of the earth, in her splendour of life, yields a new thought with every petal. The hours when the mind is absorbed by beauty are the only hours when we really live... all else is illusion, a mere endurance.***

(From *The Life of the Fields* by Richard Jefferies, first published by Chatto & Windus of London, England, in 1884), and

***Inebriate of air am I,  
And debauchee of dew,  
Reeling, through endless summer days,  
From inns of molten blue.***

(From *I Taste a Liquor Never Brewed* by Emily Dickinson, first published in the Springfield Daily Republican, May 4, 1861, and later in the *Collected Poems of Emily Dickinson* in 1982)

I cannot resist, here's another one, from William Blake:

***To see a World in a Grain of Sand  
And a Heaven in a Wild Flower***

*Hold Infinity in the palm of your hand  
And Eternity in an hour*

(From William Blake's notebook referred commonly as the *Pickering Manuscript*, likely written in 1803, and later published in several collections of poetry and biographies of William Blake)

These three favored quotations have kept me in awe of everything nature. The verses have assisted me in making more meaningful and deeper connections. But how is one facilitated, or how does one get, to those state of minds, those states of deeply felt awe or emotion and understanding? I believe many of us - and not just environmental educators, naturalists, researchers of biological diversity, and nature advocates and conservationists - have cultivated different manifestations of this state of mind, some more purposely or intently integrating it in life and work (at the level of giant stars, if you will, in astronomical nomenclature presented earlier, or main sequence engagement at the least), while others content with ongoing journeys of further self-discovery (somewhere along a continuum of protostars, if you will) related to this sense of the mind. The process has seemingly many random components, beginning with the shaping of each nebula (akin to an individual child's early childhood environment and influences) to the many varied adoptions and consequences in environmental behaviors. And imbedded within journeys or pathways are consideration of different personalities and vast, diverse, competing, conflicting, and changing and dynamic social and cultural experiences in one's lifetime. The advocacy effort and work of Rachel Carson, Richard Dawkins, Jane Goodall, Wangari Maathai, Greta Thunberg, E.O. Wilson, and other trusted persons (or hyper- or supergiant stars, if you will), however and for example, does point to the power of this state of mind in influencing human actions for the greater good. Love of the earth at a deeply felt magnitude, to put it in another way, can be a significant leverage on individual actions. Many good people, both living and those who have passed on, have been involved in preserving the beauty of our earth through a wide range of thoughtful actions. Thus, circling back, and justifiably, the preoccupation with how early experiences influence later understanding and actions in the preservation of the earth's splendour has been, and continues to be, an important subject of study in many education and related disciplines. And, especially in recent times considering the urgencies about and surrounding children's futures, the concept has emerged as a forefront consideration in both early childhood education and environmental education disciplines of study.

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APPENDIX A

I TASTE a liquor never brewed,  
From tankards scooped in pearl;  
Not all the vats upon the Rhine  
Yield such an alcohol!

Inebriate of air am I,  
And debauchee of dew,  
Reeling, through endless summer days,  
From inns of molten blue.

When landlords turn the drunken bee  
Out of the foxglove's door,  
When butterflies renounce their drams  
I shall but drink the more!

Till seraphs swing their snowy hats,  
And saints to windows run,  
To see the little tippler  
Leaning against the sun!

(Emily Dickinson, *I Taste a Liquor Never Brewed*,  
in *Collected Poems of Emily Dickinson*, 1982, p. 28)

The exceeding beauty of the earth, in her splendour of life, yields a new thought with every petal. The hours when the mind is absorbed by beauty are the only hours when we really live, so that the longer we can stay among these things so much the more is snatched from inevitable Time. Let the shadow advance upon the dial - I can watch it with equanimity while it is there to be watched. It is only when the shadow is not there, when the clouds of winter cover it, that the dial is terrible. The invisible shadow goes on and steals from us. But now, while I can see the shadow of the tree and watch it slowly gliding along the surface of the grass, it is mine. These are the only hours that are not wasted - these hours that absorb the soul and fill it with beauty. This is real life, and all else is illusion or mere endurance. Does this reverie of flowers and waterfall and song form an ideal, a human ideal, in the mind? It does ....

(Richard Jefferies, *The Life of the Fields*, 1884, p. 14)