



In Context

A Publication of The Nature Institute

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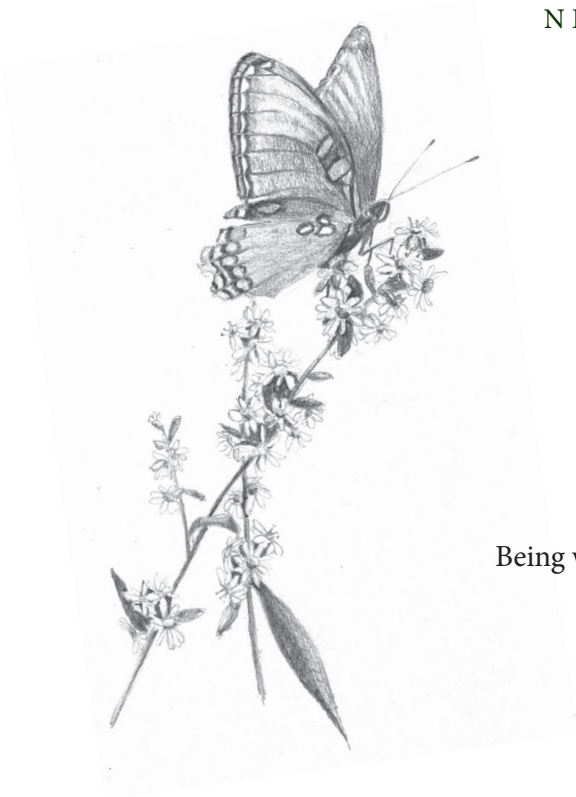
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Being with the World: A Path to Qualitative Insight

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#47

Spring 2022



The Nature Institute

Dear Readers,

We have never chosen a specific theme for an issue of *In Context*. What we present comes out of our ongoing work. It so happens that for this issue the contributions — without our having planned it that way — coalesced around the topic of qualities.

How do we perceive qualities in the world and in ourselves? How does abstract thought obstruct our ability to perceive and take seriously what we experience? How can we develop our capacities in a way that allows us to enter into a richer dialogue with the world, a dialogue that leads to deeper insights? In what way can quantitative assessment of phenomena become embedded in larger qualitative understanding?

Such questions arise in our research. We challenge each other with them in our meetings and research gatherings. They underlie much of the work we do in our courses. We pursue these questions in the effort to establish a more grounded relation to the world that supports our existence.

You will find contributions from five different authors in this issue. You can discover how each of us is grappling with similar concerns regarding qualities, each in our own way. And you will encounter a surprising variety of phenomena, ranging from the color blue to the quality of numbers in the different kingdoms of nature; from the experience of warmth to the anatomy and physiology of the cow; and from budding plant life to the long neck of the giraffe.

Many years ago, German scholar Fredrick Amrine wrote about “The Metamorphosis of the Scientist” in relation to the Goethean approach to science. The Goethean “method” — if one can use that term at all — does not have to do with applying one established framework to natural phenomena. It is an approach that, in my view, asks: How do I need to adapt my sensibilities to what presents itself in experience so that more can be revealed? This question relates to all my experience as a human being, not only to scientific inquiry in a narrower sense. Goethe spoke of the development of new “organs of perception.” He did not mean new physical organs. He meant developing capacities through a wakeful and immersive meeting with the world.

The need for such a metamorphosis becomes glaringly clear when we work toward a science of qualities. There are many habits of thought to overcome, and we come up repeatedly against our own boundaries. We can sense that the way we are thinking about things is not adequate to them, that our attention is not refined enough to take in the nuances we intimate. This “not knowing” is an invitation to engage differently; it creates an opening. When we return again and again in this unsettled awareness to the phenomena, explore them from different angles and in new contexts, the qualitative world begins to light up. In this issue we share some of this work.

Craig Holdrege

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Why Is the Sky Blue?

HENRIKE HOLDREGE

“The discussion of color has always brought some considerable risk, a fact that inspired a predecessor to say that waving a red flag before a bull will rouse him to anger, but any mention of color at all will send the philosopher into a rage.” (Goethe¹)

In a 2021 issue of *Science*, the journalist Daniel Ackerman writes in his review of the book by Kai Kupferschmidt, *Blue: In Search of Nature’s Rarest Color*:

The book’s most fascinating chapters, *Seeing* and *Speaking*, dwell on how we perceive and communicate color. “Blue light is not actually blue,” writes Kupferschmidt. Light is merely electromagnetic radiation — photons with particular wavelengths. It becomes “blue” only through a dance with the eye, the brain, and our shared understanding of the world.²

Kupferschmidt’s statement that “blue light is not actually blue,” expresses a conviction that is widely shared by writers, physicists, educators, and many other voices. It amounts to a definition of what color is. Blue light, and all other colored light, is said to be *merely* particular wavelengths. The word *merely* is expressive. It means that colors have no reality, that we *only see* things as colored, and that a colorful world is not the real world.

This understanding of color denies that human experience is the basis for all knowing. Doubt about human experience is a most deeply ingrained prejudice of modern western societies, and it is their bane, estranging us from the world we live in and from ourselves. In a time when virtual reality has become a dominant part of our experience, and when questions about “fake news” and “fact checking” have become pressing, the question whether we can rely on our experiences as encounters with a real world is of heightened urgency.

Centuries-long philosophical and natural scientific debate and reasoning seem to deny that the world we perceive and experience is real. However, there is a glaring inconsistency in the reasoning. People who speak like Kupferschmidt take the brain to be real. They take the instruments used for researching brain activity for real, as well as the researcher’s actions, interventions, and measurements. They take to be real everything that led to the science of electromagnetic radiation and photons with particular wavelengths. When

they then come to the conclusion that brain activity is real but the perception of color is not, the reasoning becomes unreasonable. They declare one set of observations to be real, another set of observations to be unreal. When you question sense perceptions, you must also question the sense perceptions, observations, and measurements involved in brain research. The claim that denies reality to sense perceptions undermines and destroys the foundation of all natural science. If color as perceived is not real, then the brain as perceived and the measuring instruments as perceived are also not real.

The late philosopher Ronald Brady argues that the statement that one class of observations (those of brain functions as observed by neuroscience) should be set apart from all other observations — like color, taste, sound, warmth, touch, balance, and so on — is not a result of experience-based science but the result of a preference for a worldview. It is believed, but not substantiated by observation.³

Once we realize that in science we cannot shun sense experience, that the basis of all knowing is human experience, we do not ask what “is behind” and “causes” color. We do not set the class of phenomena relating to electromagnetic radiation and brain research, or any other class of phenomena, above and against the class of visual phenomena. Phenomena relate to each other, certainly, but they do not cancel each other out, the one being real, others not being real. How phenomena relate to phenomena is the question of research rooted in experience. It is here that we meet hindrances and our own limitations. We need to ask ourselves: What underlying preferences help to shape our judgments? What are our hidden assumptions? What are our rigid thought forms? What are our conceptual limitations?

How can color research based on phenomena unfold? Phenomena inform and modify our knowledge. By attending to appearances of color in the world, the question “Why is the sky blue?” becomes the question “Where and how does the color blue appear?”

Attending to Colors

Smoke from fire is usually not colorful. But under certain conditions, it appears blue. I create these conditions at The Nature Institute by hanging a black cloth from a windowsill under a large window. In front of the cloth, an incense stick burns. The smoke curls up and takes on a blue hue when seen in front of the black cloth (see photo). Where the smoke is more concentrated, it is light blue; where the smoke is less dense, it is darker blue.

When you shift your position and see the smoke in front of the bright wall, the blueness disappears. When you move the incense stick closer to the wall into the space shaded by the windowsill, the color blue disappears. For the smoke to appear blue in front of a black background it must be illuminated.

During the winter months in northeastern North America, we have ample opportunity to observe the same phenomenon on a larger scale. The smoke from wood stoves rising from chimneys is beautifully blue seen in front of dark hillsides, especially on sunny days. Against a bright overcast sky, the same smoke is yellowish.

Opalites too provide the opportunity to study these color phenomena. Opalites are man-made and of milky glass. Lying in a white bowl, they are milky white. Lying on a black cloth on a window sill and seen from above, they show a beautiful blue. The more translucent parts appear darker blue, the less translucent parts lighter blue. If you place an opalite in front of the window and look through it at the cloudy but bright winter sky, the stone shows a warm honey yellow. The opalites lying on white paper take on a slightly yellow hue. (See photos.)

These color phenomena arise through colorless media. Here, the medium is smoke or milky glass. It is turbid — translucent but not transparent.

When in recent summers wildfires raged in the western United States and smoke obscured the sky, on some days



the color of the sun high in the sky was orange or red. And we in the northeast knew that smoke from these wildfires was drifting on high winds eastward when our sun on cloudless days turned to yellow/orange long before setting. At the same time, the sky was not clear blue but rather

leaden grey blue.

Distant mountains often appear blue, the more distant ones a lighter blue than the nearer ones (see photo). Even the wooded hill near my house that I see every morning from my study is dark violet or even blue on some days while the sun is rising behind the hill and shining into the atmosphere in front of the hill but not yet on the trees.

The sky is darker blue above us and lighter blue toward the horizon. On days with high air humidity it is of a paler blue than on other days. On high mountains, the sky appears dark blue-violet.

Air borne particles from dust, smoke, or pollution, and air humidity with its tiny water droplets make the atmosphere a turbid medium. Looking to the horizon, we look at the darkness of space through a medium more turbid than when we look up at the sky. This is why the sky near the horizon is paler blue or even white. Looking at far distant mountains, we look through a greater depth of turbid atmosphere than when we look at nearer mountains. This is why the nearer ones are darker blue than those in the distance.

The sun high in the sky is bright and blinding. When setting it shines with a warm yellow light. Everything it illuminates takes on a warm hue. On certain days the setting or rising sun is orange or red. Also the moon can be yellow, orange, or even red.

I remember the early morning of June 8, 2004. That day, Venus was in transit, which is a rare



cosmic event. I went out after sunrise to observe the tiny, dark disk of Venus in the bright disk of the sun. I had the glasses with me which we use to observe solar eclipses. Looking through them at the sun, I could not see anything. Then I noticed how red the sun was. It was a very hazy day. With naked eyes I saw the silhouette of Venus.

With each phenomenon we study, we look and observe carefully. That is not as simple as it might sound. Once in a workshop, I showed smoke rising in front of a dark background but did not mention color. Afterwards, none of the participants remembered

having seen blue smoke. Instead, they all had enjoyed watching the movements of the smoke. When we direct our attention, we often see only what we attend to. When, in courses, we work with phenomena in the way I have described, participants notice how they become more attentive and awake in their perceptions.

While observing the various phenomena, questions arise. Do the different situations in which colors appear relate to each other? Can we find a principle that manifests itself in various phenomena? For the color appearances described here, we find colorless turbid media to be one condition. In the case of the cool colors, the turbid medium — in front of darkness — is illumined and brightens the darkness with a violet, blue, or light blue veil. In the case of the warm colors, the turbid medium — in front of a light source (or luminous background) — darkens the brightness to yellow,

orange, or red hues. In the interplay of matter and light, of darkness and brightness, the colors arise. The interplay creates the splendor of sunrises and sunsets and the immense blueness of our skies. Such splendor of atmospheric colors we do not find on the moon. Since the moon has no atmosphere, its sky is black and its sun is blindingly bright, always.

In the phenomenological way of approaching color and the visual world, phenomena arise out of the interplay of other phenomena. They “explain” each other, or we might say, they illumine each other. They call to us for attention. When we attend, we engage and perceive; and we are rewarded with experiences. The world gets richer and richer.

In high school and college, I learned to think about color in the framework of optics as taught by modern physics. I remember a winter morning when I was on my way to school as a young public school teacher. I noticed

how grey my surroundings were. The world was not colorful, and I did not yet have the appreciation for the subtle colors of winter. When some years later I met a different way of studying the visual world, I began to awaken to the reality of a colorful world. Since then, my interest continues to deepen and broaden. My appreciation for the world I see is ever growing.



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Qualities of Number in Relation to Nature

GOPI KRISHNA VIJAYA

This is an excerpt from the beginning of an in-depth article by Gopi titled “Avogadro’s Number: Is the World Granular?” You can find the whole article at <https://www.natureinstitute.org/s/gopi-vijaya-avogadros-number.pdf>



Consider the experience of taking a walk in the woods. As the gravel crunches beneath your feet, the wind blows through your hair, and the sunlight plays hide-and-seek from between the leaves overhead, you focus on the path in front of you and pick out the details that draw your interest. What looked like a patch of shimmering yellow from a distance, for example, now resolves itself into a more differentiated experience: an aspen tree, with its leaves dancing in the wind. You focus your attention on specific details, and the details of the aspen leaves enrich the overall impression of the tree.

In relating to such details, you may, if you choose, pay attention to numerical patterns. Is there a pattern to how many leaves unfold and fan out from a twig? Do the veins on the leaves divide out in a particular way? As you observe, you can hold the original totality of the tree in your mind and look for specific patterns. You can start counting the number of leaves that appear on the twigs that developed during one growing season. There are rarely only one or two leaves on such a twig and usually not more than ten, but everything in between. You do not find a pattern. But when you look at the veins in many leaves you will notice a pattern: five veins usually branch out from the base of the leaf blade. This is not always the case, sometimes there are only three veins. The numerical pattern belongs to the aspen tree and there are variations; it is not fixed or rigid. What we think of as number in this context does not lead an abstract existence. It is intertwined with all the other features of the tree and can show itself when we study the tree from the perspective of numerical pattern.

Consider a different experience. You take a walk in a desert full of sand dunes. Richness of life is here replaced by the dryness and heat of the air and sand that surrounds us. What could appear at a distance as a smooth mound resolves itself into myriad tiny grains of sand that you can scoop up with your hands. You wouldn't think of trying to count them and no numerical patterns show themselves.

The ever-changing shapes of the dune seem completely indifferent to the number of grains that are added to it or lost from it. It appears as if the numbers do not matter to the sand at all. One grain sits next to another.

When you pick up a cluster of quartz crystals and observe them in the sunlight, you can experience solidity in multiple ways — in the fixed shape, in its hardness, in the rigid features, and most importantly, in the inherent six-sidedness of the planar sides that make up the columnar sections. Here you have a specific relation to number, one that incorporates the geometric relationships of planes, lines, and points in the sides, edges, and tips of the crystal structure.

We can literally grasp and hold steady in our minds the fixed numerical relationships in a specific quartz cluster, just as we can hold the crystal in our hands. This is quite different from the form of a sand dune that changes as soon as we touch it. Numbers that we can attribute to this crystal-line experience are neither mostly indifferent, as they are in sand, nor are they burgeoning with life and variety, as they are on a tree. Here we mostly experience numerical relationships that, in a way, appear to have come to rest.

These experiences highlight different ways of engaging with the world numerically. In each case, we focus on certain details — the veins in a leaf, the grains of sand, or the facets of a crystal — and different kinds of number relationships appear. In the case of plants, they retain an organic quality; they are usually not fixed in any rigid sense. Any statement we can make about the appearance of numerical relationships in the plant world always has the intrinsic “wobble room” that is related to natural variation. A species of plants that normally has five petals in its flowers may surprise us with a four- or six-petal flower. These surprises are part and parcel of the way numbers exist in the living world. This does not mean these relationships are arbitrary. But they are imbued with the dynamic quality of the living world. They come into being and pass away in growth and decay.



PHOTOS: Craig Holdrege

When we see the five-pointed star at the center of an apple we have sliced in half, or the six petals and six stamens of a lily flower, we sense the connection of number to the whole. The number of grains in a handful of sand or a sand dune does not have this quality of inherent connection to the whole. There is a disconnect between number and the whole in this kind of granular phenomenon. This disconnect also extends to our own participation, since we are not drawn into any numerical relations; they are not essential when observing different piles of sand. Surely we can find, for example, an average number of grains in a small volume and extrapolate to a large volume. This method of relating to numbers is used in statistical analysis.

In the case of the crystals, where numerical and geometrical relationships are stable, our capacity to work with these relationships takes on a mathematical quality. Calculations derived from the study of crystals have historically led to the development of many fields in mathematics, as crystal observation and mathematics work hand-in-hand. For example, this interrelatedness led the famed 17th century astronomer, Johannes Kepler, to declare that: *Where there is matter, there is geometry.*¹

Confidence in the stability of crystal structures was so deep-rooted that it led Kepler to create a picture of the entire solar system that contained crystal-like structures (the Platonic solids) embedded one inside the other, whose relative sizes gave the size of the orbits of the planets.

Kepler was also deeply interested in the musical quality of number, which is distinct from the spatially-oriented relationship to number that I discussed above. He saw the solar system as a harmonious arrangement in addition to being a spatial geometric arrangement. He went so far as to name his fundamental work in astronomy, which gave birth to all of modern astronomy, *Harmonices Mundi* (The Harmony of the World).

The experience of music can be something deeply inward. It moves our feelings and stems from a reality beyond what

we can see with the eyes or touch with our hands. The experience of music seems to go beyond just the ears and penetrates the entire human organism, as any lover of music will attest. It is intimately woven with our living in time. We perceive rhythms and can find numerical patterns in music. As Kepler's contemporary, the philosopher-scientist Gottfried Leibniz, stated: *Music is a hidden arithmetic exercise of the soul, which does not know that it is counting.*²

We are largely unaware of numerical relations in our experience in music, while in crystals geometrical patterns are perceived clearly and consciously. In the living world numerical relationships show a flexible character. In a handful of sand, in a sand dune, number is arbitrary.

The landscape of numerical relations, as it is drawn out of our deeper feelings into the clear light of day, shows its own distinctive features. These features are essential in determining the way we approach measurements of physical properties in the world. It is important to keep the distinct quality of number in each given instance clearly in mind. We need to distinguish whether we are speaking of eight beats in music, or spatially, of five petals, seven grains of sand, or of a six-sided crystal.

The same numbers are embedded in contexts that reveal additional qualities such as inwardness, fixedness, flexibility or disconnectedness. We can train ourselves to see these different qualities. Before we engage in the task of measurement, we should take care to notice what quality of number relationships we are dealing with.

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News from the Institute

Events

- The institute's senior researcher and educator, Jon McAlice, led a Waldorf teacher workshop in San Francisco last November titled "**In Search of the Ineffable.**" He focused on practices of observation and imagination that enhance a teacher's capacity to live into the learning activity of their students.

- Our staff continues to have an extensive collaboration with the **M.C. Richards Program** — a full-time, yearlong course in trans-disciplinary and holistic learning for young adults run by Free Columbia. Meeting at the institute this past fall and winter, Henrike taught a course on the four elements as well as a course about light and color. Craig introduced the students to the practice of Goethean science in relation to the living world.



- Over the course of this past winter, a collaborative group comprised of institute staff and invited participants (including current and former attendees of our foundation course) met at the institute to investigate the **Phenomenon of Warmth** in its variety of expression. In March a group of invited participants and staff gathered for three and a half days to work further on the topic of warmth. On page 10, Jon McAlice shares some of the discoveries and fruits of this experiential work.



- At the end of January, our staff enjoyed an unexpected visit from Tomáš Daněk, a science professor at **Palacký University of Olomuc, in the Czech Republic**, who was traveling through the states with



his colleague, currently a fellowship student at a university in North Carolina. As an environmental studies teacher exploring holistic approaches to understanding nature, Tomáš first learned of our work from a colleague who interned at the institute. He was eager to see our campus and meet our staff. In conversation, Tomáš cited an all-too-common handicap for his students in environmental studies: Too much time in the classroom, not enough learning from the natural world.

- On March 1st, a new cohort of 15 participants began the institute's foundation course in Goethean science, "**Encountering Nature and the Nature of Things.**"



This intensive, low-residency program, offered since 2018, was extended from 12 to 15 months as of this year to allow students three months of online engagement with our teaching staff before arriving at the institute for their first residency in July. The 2022 cohort includes participants from Germany, Brazil, Malaysia, Egypt, the UK, as well as states throughout the US. Many are teachers themselves seeking a deepened encounter with phenomena and dynamic thinking to enliven their work. Other applicants come from the fields of art, medicine, farming, philosophy, or social work. We look forward to bringing this group together in-person this summer, when they will also be joined by students from a previous cohort who, due to Covid-19, have not yet attended a summer intensive.

- Craig gave a half-day workshop in March at the **Pfeiffer Center** in Spring Valley, NY, for participants in the center's year-long biodynamic agriculture training. Also in March, students in the fourth-grade class at **Hawthorne Valley School** came to the institute to study our extensive bone collection as part of their Human and Animal block.

- Jon McAlice gave a lecture in April on "Different Ways of Being on Earth — A Fourfold Perspective," at the Field Centre in Stroud, England. Later that month he spoke on "Flow, Form, and Imaginative Thinking — Steps Toward a Goethean Understanding of Water," for the **International Flowform Association** in Forest Row, England.

- On April 27, English professor Christina Root of St. Michael's College in Vermont, presented a public talk at the institute on **"Enlivened Seeing: Literary Encounters with the More than Human World."** Christina used two Shakespeare plays (*A Midsummer Night's Dream* and *King Lear*) to illustrate visions of nature that reflect very different kinds of consciousness. Her presentation articulated the importance of how the creative imagination, focused through Goethean practices of a delicate empiricism, allows us to see differently and, as Wordsworth said, "see into the life of things."

- **"Plants and the Living Earth"** was the focus of a four-day course from April 29 – May 1 at the institute led by Henrike Holdrege, Jon McAlice, and Craig Holdrege. The groups' activities included careful sensory observation and equally careful attention to how one learns to *be with* the phenomena being considered in an alive way. The intent of the course mirrored the overriding mission of the institute: to truly see and experience nature as dynamic, interconnected, and whole so that our interactions support a healthier co-evolution of humanity with the natural world.



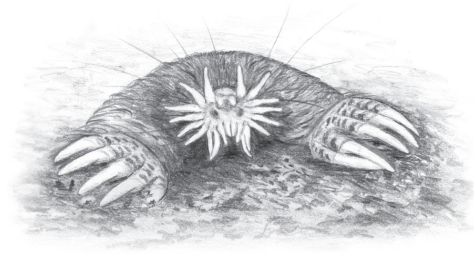
New Podcast Episodes

at *In Dialogue With Nature*



Enjoy our work in audio! At our podcast page (<https://www.natureinstitute.org/podcast/in-dialogue-with-nature>) or wherever you access podcasts, all our episodes are available including recordings of these recent events:

- At the **Annual International Conference of Biodynamic Agriculture** in Dornach, Switzerland, in February, Craig gave a keynote address on the qualitative experience of nature as a conscious practice. The full talk, "Being with the World – A Pathway to Qualitative Insight," is now available at our podcast. (A distilled written version of the presentation by Craig is featured in this issue on page 15.)



IN MEMORIUM



GERTRUDE REIF HUGHES, 1936–2022

We note with sadness the passing on January 4 of Gertrude Reif Hughes, an important friend of The Nature Institute and a member of our Advisory Board. Gertrude was born in Amsterdam, The Netherlands, but in 1940 her family emigrated to New York City. There she was a student at the Rudolf Steiner School. After graduate work, she was a professor for 40 years in the English Department at Wesleyan University, retiring in 2006. She loved teaching and was one of very few women teaching at Wesleyan in the 1960s and 70s. During that time, she also helped found its program in Women's Studies (now Feminist, Gender and Sexuality Studies) and served as its Chair. She had a deep interest in the phenomenology of nature, and we are grateful for her longstanding support.

- The mole was featured in the March episode of our podcast, in a reading by John Gouldthorpe of Craig's article, **"How Does a Mole View the World,"** which first appeared in *In Context* #9 and is excerpted from Craig's new book, *Seeing the Animal Whole – And Why It Matters*. The reading, followed by a conversation between John and Craig, invites you to enter into the dark, cool world of the star-nosed mole and leave behind most of what is familiar to you.

- In a public talk given at the institute last November, senior researcher Steve Talbott shared personal reflections on his more than 20 years investigating quantitative versus qualitative approaches to the study of life. A link to an edited version of the live talk, **"Gestures of a Life,"** is now on our podcast page and a video of the full talk is at <https://www.natureinstitute.org/videos>.

Attending to Warmth

JON MCALICE

“Today the world warmed up to a lovely twelve degrees above zero (Fahrenheit)¹. The wind was still. It was pleasant to stand in the sunlight and feel its warmth on my cheeks.” That was my journal entry for January 22 of this year. The previous days had been colder with temperatures well below zero and biting winds. Those were days we only ventured outside to get another load of wood for the fire, days when the best place to be was next to the woodstove with its friendly mantle of warmth. When the children come in from sledding or skating, they congregate by the stove standing around it with their friends in a loose semi-circle. It is not a rigid semi-circle. It grows as the children warm themselves. Cold children stand closer to the fire than warm children do.

The cold days of winter give us an opportunity to appreciate the nature of warmth differently than a warm summer day does. The contrast between warmth and cold is more present, more immediate. It seems somehow sharper. In the summer we often find ourselves looking for a place to cool down and move from the sunlight into the shade. Although it is only marginally less warm in the shade, we experience a coolness. The opposite is not the case. We don't feel warmed when the temperature rises from -4 to 5 degrees. We may merely feel a little less cold.

Temperature changes in the middle of the summer affect us differently than the winter changes. In the winter we grow accustomed to the lower temperatures and a slightly warmer day feels pleasant even if the temperature remains low. If the temperature drops suddenly in the middle of summer, even a 50-degree day feels decidedly uncomfortable. These differences in how we experience the ambient temperature are illustrated dramatically in Ernest Shackleton's narration of the Endeavor expedition to the South Pole.² After weeks of living under the most primitive conditions at temperatures well below zero, the men would strip down to their t-shirts whenever a day came when the weather was warm enough to even begin to melt the top surface of the ice.

Our relationship to the warmth in the world around us is always dynamic. If I place one hand in cold water and the other in hot water, then lukewarm water feels quite different to the hand that was cooled than to the hand that was warmed. The cool hand is warmed by the lukewarm water while the heated hand is cooled. Something similar is apparent if I observe the movement of the alcohol in a thermometer. If I first place the thermometer in ice water, then in warm water, the alcohol is warmed. It expands and climbs up the capillary tube in the center of the thermometer. I see the temperature rising. The opposite holds true for a thermometer placed first in boiling water. The alcohol is cooled. It contracts and

1. All temperature readings are given in Fahrenheit.

2. Shackleton E. *South*. The Lyons Press; 1998.



Top to bottom:
Submerging hands in water to compare sensing of warmth.
Watching how colored cold water at the bottom of an aquarium rises when it is warmed from below.
Heating a copper pipe with steam and observing how it expands.

sinks in the tube. In each case I perceive a change resulting in a state of equilibrium as the warmth of the object and the medium equalize. If the warm water into which I have placed my hands is close to body temperature, at a certain point I am no longer certain where my hand stops, and the water begins. The warmth boundary, as it were, disappears.

For the past year, we have focused our shared research at The Nature Institute on the phenomena of warmth. Can we do as Goethe did for the phenomenon of light and develop a series of considered experiences of and experiments with warmth that allow us to understand more clearly this presence in the world? The work has taken practical form in weekly studies and observations with local colleagues and two intensive research symposia in November 2021 and March 2022 during which we have been joined by others from further afield. Each time we have focused our work on specific experiments or series of experiments.

Both the weekly studies and the symposia serve as testing grounds for developing collaborative research methodologies.

Why warmth? In conversations over the course of the last two years, we have returned periodically to the question of the role science can and should play in addressing the challenges facing us today. One aspect of a future-bearing science rooted in the experienced present is to recognize what we don't understand. At the moment, much of what we don't understand is of a

paradigmatic nature, meaning that the way we approach understanding blinds us to the nature of what it is we are trying to understand. Warmth is one of the factors in our world that asks to be understood differently. The shift in understanding begins with taking our experiences of warmth seriously. These experiences extend from the sensuous through the psychological into the ideal. In the ideal we experience warmth in relation to an idea. The radiant warmth of the sun, the presence of a much-loved friend, the enthusiasm that gives birth to a new initiative — these all bear the signature of warmth. If you search for synonyms for warmth, enthusiasm is at the top of the list. The current mechanistic model of heat sheds some light on a rather narrow aspect of the way warmth comes to expression in matter. It does nothing to help us understand warmth as we meet it in the world and as it brings itself to expression within us. Nor does it help us understand how what we experience as inner warmth — for instance attentiveness, engagement, compassion — relates to the health and vitality of our surroundings. Is perhaps human warmth, or the lack thereof, also a factor in the shifting of our planet's warmth organism?

From Our Mailbox

To Steve Talbott:

"I just read your excerpt "Genes and the Single Organism" from In Context #46. Your articles have a wonderful effect on me, providing a much needed counter-balance to the patterns of thought I encounter on a daily basis as a professional geneticist and breeder. Keep up the excellent work!" — Jeffrey Endelman, geneticist

To Craig Holdrege:

"I heard a lot of positive responses to your speech. Though it lasted only 50 minutes, you made your points rather clearly and powerfully. In particular, Prof. Lin, the Dean of the School of Education, was deeply impressed with your thoughts. Just two days ago, echoing your discourse, she openly made a claim to all faculty of the university that the School of Education would adopt an ecological vision for its future development. Although I consider her voice to be still unique in the dominant market-oriented higher education realm, at least such a voice is no longer inaudible. I believe more and more people will choose to join the stream of living thinking and to make concrete actions for sustainability. Thanks for your enlightening contributions."

— Hornfay Cherng, Director of Center for Waldorf Education, National Tsing Hua University, Taiwan

To Henrike Holdrege:

"Thank you for leading me down the journey of noticing. Since the start of this course, I have begun to notice so many wonderful phenomenal events and instead of passing them by with explanation, I now stop and observe."

— Ann Pasquinely, teacher

Drawing Closer

ELLA LAPOINTE

In 2021, as part of my distance learning portion of the institute's foundation course in Goethean science, I read Craig Holdrege's book *Thinking like a Plant*. Craig then invited our cohort to take up a weekly practice to observe phenomena of growth and decay in plants and make notes and drawings of our observations. Craig also mentioned we could team up with another course participant and share our impressions.

I sprouted a garlic knob, lemon seeds, and a fava bean and later brought in a few budding twigs to watch leaves or blossoms unfold. I observed and drew the same plants every day for several weeks. A student on the West Coast and I decided we would meet virtually once a week. We tried to describe what our plants were doing and what qualities we noticed, showing each other our drawings. We both experienced, at times, difficulty when describing the plants we observed. Saying "it's growing" or "the bud is opening" fell short when what was essential was not *that* it is growing but the quality and specific gesture of this plant's growth or decay. There were moments in the plant's unfolding that we didn't yet have words for; often, we had to use physical gestures to show what appeared in the plant and utilize *borrowed* words such as "those tight little envelopes," "those tiny fans," and so on, to try to convey what we perceived.

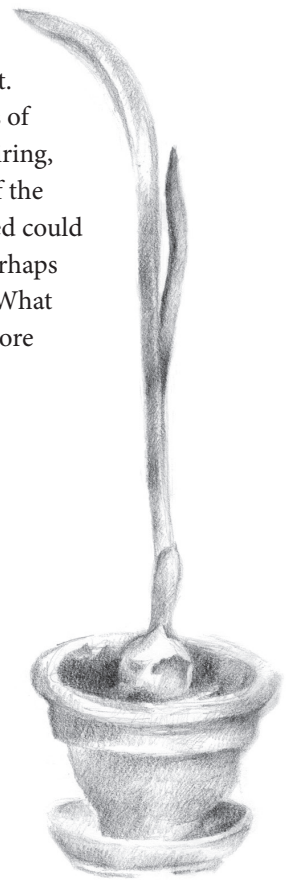
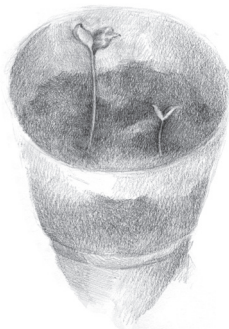
I remember that earlier in the course, I was impressed by the portrayals of natural phenomena in our "course reader." I was amazed by the excerpts from Nan Shepherd's *The Living Mountain*. The capacity to be with the mountain (or nature) so entirely and describe it so faithfully and beautifully seemed a worthy endeavor, almost an existential one. I felt this capacity was quite out of my reach. And I wondered, does being *experienced* in this way matter to the mountain?

Drawing plants began to facilitate an experience of returning to the *same* phenomenon and finding *it* changed. The humble little garlic sprout on my windowsill created its very substance, given a touch of water and enough sunlight. The growing plants displayed a generosity of form

and transformation. Sometimes a change was so subtle I only noticed it once I began drawing, and sometimes, so much happened in just 15 minutes or overnight (my fava bean sprout grew like a magic beanstalk). Drawing also became a way to study — Where does plant growth happen? What changes? What extends and how? Growth appears differently in a fava beanstalk than in a budding forsythia twig. Each plant's unique rhythms and forms, and one leaf to the next in the same plant, felt worthy of attention. It is hard to overstate how nourishing it can be to attend to this mystery of growth and decay in various plants.

In the process of drawing, we attend to the shapes of *things*, but paying close attention to the forms of in-between spaces (negative space) is equally essential for accuracy in a drawing. I think these in-between spaces, of light and the air around and between the leaves, are also vital to the plants' healthy development.

Eventually, the limitations of this indoor investigation became apparent. A bean needs a garden bed, a twig needs the entire bush, a garlic sprout needs deeper soil, and more light than my studio could offer. At first, almost all the plants were thriving, but each one reached a point where they didn't have the environment they needed to continue. I continued to draw some of the plants as they revealed more of this reality of the inadequate environment. Observing and sketching this process of withering and decay was no less inspiring, but this was an uncomfortable side of the process. I realized that what I sprouted could not thrive under these conditions. Perhaps a shift began to happen, away from "What can nature give me?" and toward a more whole encounter.



Thank You!

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Thank you for your vital support.

Being with the World

A Pathway to Qualitative Insight

CRAIG HOLDREGE

This article is based on a talk I gave at an international Biodynamic Agriculture conference in February 2022. You can listen to the talk at natureinstitute.org/podcast or on most podcast platforms. In reworking the talk into an article, which involved substantial editing, I strove to maintain the character of the spoken presentation. Unlike most of my other articles, this one is not accompanied by images. I want to encourage the mode of inner picturing and don't want images to distract from that activity.

I WANT TO ADDRESS THE ISSUE OF THE QUALITY of our experience in the world, our experience of ourselves, and our experience of nature. What qualities can we perceive in the world? What are the consequences of placing ourselves in different ways in relation to the world? Let me begin by describing different aspects of my daily experience. Perhaps you can find echoes of some of your experiences.

Each day I walk from my home about five minutes across one of Hawthorne Valley Farm's fields to The Nature Institute. I have been doing this for 20 years. And I do it in different ways. Sometimes, I don't experience much of anything that is around me. And not because I'm sleepwalking, but because my mind is full of what I have to do that day. Who do I need to contact? What do I have to write? All the issues about work fill my consciousness. I make it to The Nature Institute without any problems, but I haven't experienced anything of the world around me. Although without that world, I wouldn't have been able to get from here to there. That's one way that I often live: I'm not in my experience of the sensory world. I'm in my thoughts about what I need to do in the day ahead.

At other times, I notice things. I notice that it's cold. And I go around the back of the house, look at the thermometer and read minus 10° Celsius. That's cold. I go out onto the field and feel the icy breeze. I feel the crunching of the snow under my feet. I notice deer bounding off. I keep going. I notice that the sun is just peeking out from behind a cloud, the world is brighter now. I arrive at The Nature Institute. Noticing one thing after another, I'm more in the world than I was when caught up in my thoughts. But in this mode, nothing is taken in very deeply. I notice and register something I've perceived and move on to the next impression.

A third way of engaging happens only once in a while.

I go out onto the field and notice the glistening of the little ice crystals on the grasses. But I don't just register and move on, I actually kneel down and look carefully. I see how the glistening changes depending on my movements. I also notice that the wind from behind is really cold. Turning my face to the sun, I feel warmth. I stay for more than a moment feeling that warmth. When I move on, I notice all the tracks of the deer and then other smaller tracks. Following them, I get a sense of how the animal, probably a fox, moved through the landscape last night. In this way of being on my walk, I'm more with the world, I'm participating and taking time, as we say. Maybe I should say instead *giving* time, since when I walk in this way,

I expand into my experience of the sense world. I move beyond noticing and registering. I dwell and participate.

I don't get to work in five minutes. I slow down and the world appears differently. I expand into my experience of the sense world. I move beyond noticing and registering. I dwell and participate.

Another way of engaging on my walk happens when I stop at the beginning of the field. The ground is frozen with packed snow underfoot. I think back to a month or so ago when the field was very wet. I had to walk around little puddles and my feet sank into the squishy clay soil. I ponder how the field changes through the seasons, and through the activity of the farmers and the grazing cows. In a few months the field will begin greening with the growth of the grasses and forbs. Since I walk through the field throughout the year, I can call forth memories and contemplate this place. This is not thinking about office work. It is being contemplative in the place.

Such are everyday experiences that you probably have in your own way. What's interesting for me is that the first two are the more common ones in my day-to-day life. In the first, busy with my thoughts, I'm disengaged or abstracted from sensory experience. In the second, I notice and register, bouncing in and out of meeting the phenomena around me. It's only when I begin to dwell with what appears, when I slow down, observe, describe — when I willfully give my attention to what is around me and engage as a full-bodied person — that I notice how distanced I normally am from the things around me. I realize how little I normally perceive, how disconnected I am from the world as a field of potential experience.

Events

Imagine taking five minutes every day to go outside, in whatever environment you're in. You go with the intention of inviting the world in. By world, I mean here everything that can come through sensory experience. You go with an opening gesture, an active gesture, and you perceive what comes toward you. You can notice that things appear that you've never noticed before. You feel the air moving across your cheek smoothly in a way you haven't felt before. You notice the way the light shines. You notice the feel and the texture of the soil, trying to experience consciously its sensory qualities.

While you are in this open, sauntering attitude of mind, you can be drawn into something. You begin to dwell. Participants in a recent workshop explored a fruit or vegetable in its shape, texture, color, smell, and taste and compared it with a different fruit or vegetable. All of us reported — and this was striking — observing things we'd never noticed before. And most of us had looked at and tasted these foods many times.

If you go out intentionally, and then focus and explore, the world appears fresh. It loses some of the quality — I'm speaking now out of experience — of muteness, of remoteness. I can experience myself as being more alive and then something comes toward me and engages me that has the quality of aliveness.

In contemplating this kind of experience, I realize that I'm experiencing the world as a world of events. In the registering mode we speak about facts — this tree, that apple, that shape. Facts have the quality of being clearly circumscribed; we separate them out from their spatial and temporal surroundings and register: there it is, it is that. But an event is something that happens. It happens now. It's an occurrence that is there as long as I'm participating in it. And it has a freshness. It has a vibrancy. It tingles. That is different from a fact.

What you can also notice when contemplating an event is that, during the experience, you are not separate from the world. Separation in consciousness comes when you step back and reflect. In the sensory experience I am with the world; world-in-me and me-in-world. Those are moments in which the disconnect I mentioned before is overcome.

There is a contemplative practice that can strengthen the ability to live eventfully. Towards the end of the day, I look back on my day and ask: Where did I meet something in experience that resonated? Where did I feel that I actually met something? When was I participating in an event? It's a bit embarrassing for me when I have to admit: There were hardly any such experiences today. I wasn't engaged in that way. On other days, I was. To reflect on how I was with the world can enhance qualitative perception.

Process and Transformation

The event character of the world is not the whole world. Take interacting with plants. I have a seed and I plant the seed. I know where I planted the seed; that's where noticing and registering is a really good capacity. And I come back in a few days to the place and notice that the plant is germinating. The plant is growing and developing. Each time I return I experience an event. I could register the changes: the plant has gotten bigger, now the leaves are like this, and then they're like that. I may experience wonder at each event, something of the aliveness of the plant touches me. That can help me to go further.

I "know" the plant is a developing being. If I stay in the mode of events, I'm not yet with the plant as a growing, developing being. I'm not yet with the plant's stream of life. The events are connected. To gain an intimation of the life stream of the plant, I need to engage differently. It's about awakening from a dreamy (and important) sense of the plant's aliveness to a conscious participation in it. How might I get there?

One way is through the following practice: I observe the plant. I use different senses to perceive and be with the plant actively. I feel the ridges on the stem, I notice the leaf shape and move along in touching and seeing its surface and edges. I can smell the plant. It's a kind of feeling-perceiving. Not reactive feeling, but a being-with feeling. Then I can step back, perhaps later in the day, and in my imagination consciously re-create that experience. How did the leaves smell, what was their green like, how was it different on the upper and lower surface? Through sensory engagement the plant has become part of me, and I can re-create as vividly as possible in my imagination what I perceived. I am active in a willful and feeling-imbued pictorial thinking.

I return to the plant a few days later. It has changed and I observe again. In my imagination I try to connect what we often view statically as stages of development. But there are no stages, there is continuity and ongoing transformation. I work to participate in that by letting the stem get longer in my imagination, by picturing the unfolding of the leaf. I know I am not doing exactly what the plant did, but I am entering the element of transformation that the plant lives in. I move out of a static mode of consciousness into process. I gain an intimation of the life of the plant by letting the life of willed pictorial imagination be with the plant as a process and transformation.

Process and transformation are inherent characteristics of the living world. They are everywhere around us and in us. The question is: Do we participate consciously in them or not? Stages are an artifact of our way of looking at the things. What we are dealing with is a unified process of development that we can participate in and get a sense of. The plant becomes qualitative as a living creature.

In my imagination I try to connect what we often view statically as stages of development. But there are no stages, there is continuity and ongoing transformation.

There's another aspect I've ignored so far. Without soil, moisture, warmth, air, or light, the plant would not have germinated and developed. To do justice to the plant, I have to bring together in my imagination the sense of the whole environment of the plant that is allowing the plant to be plant. The plant is unthinkable without environment, and in this sense the environment is not outside the plant when we think of it in a living way. It's what the plant participates with to be itself. It is a potential that comes to expression in and through the plant. All language that is accessible to me seems inadequate to express this relation, since the way I phrase things suggests that what belongs together was first separate.

When I formulate relationships in contrasting ways and feel in thought a tension that arises through the juxtaposition, I get closer to reality. I can say: a plant develops out of a seed. And I can also say: the world develops through the seed into the plant. Both are correct and together they point to the reality of living relations. The plant-forming potential lies in the seed *and* in the environment. They belong together, they are not separate. What appears as plant is the result of plant-world activity. It's a coming to appearance of potentials in the environment and in the plant that belong together. The plant does not exist as a thing among things. It lives in relatedness. In this realization we overcome notions of separation that restrict our understanding of the world.

Gesture

World as event experience; world as transformation, growth, and development. Now I want to address a third layer of qualitative experience. This is the world as gesture. I'll start with an example from an area that we are all familiar with. Every day we swim in it qualitatively. Here are two sentences:

She listened to a tall tale and smiled.

She listened to a tall tree swaying in the wind and smiled.

We understand each sentence without any difficulty. When I say, "tall tale" and then "tall tree," although "tall" is the same word, the meanings differ. Yet we have no trouble understanding each out of the movement of the sentence and the context. And her smile when listening to a tall tale is not the same smile as the one accompanying the swaying of a tall tree. The words have a potential that manifests within the specific relationships. It is a highly qualitative relation to the world that we express in everyday language. We perform a remarkable qualitative weaving in meaning so easily in language. And we are hardly aware of this capacity.

The question is: Could we achieve something like this in our relation to nature? Could we find a gestural relation to what we discover in the natural world? Many people speak of "reading the book of nature." I'm not sure how much I like that metaphor, since a book as a physical thing mediates the qualitative experience of meaning, while a rock or a plant is the meaning itself. Nonetheless, the metaphor can help us see a possibility: Can we discover how the parts of something are dynamically integrated within and expressive of the larger whole of which they are a part?

Here is an example that allows me to speak out of experience. Many years ago, I was researching giraffes and came across an article by a well-known scientist, Stephen Jay Gould.¹ He claimed that the giraffe's front legs are not really longer than its back legs. They just appear to be so. I immediately thought: that's wrong. I needed to check and see if my assumption was right. So I went to the Natural History Museum in New York City and measured the length of the bones of the front legs and hind legs from a number of different specimens. My result: The front legs are definitely longer than the rear legs. Subsequently I found that other people had done such measurements and found basically what I had found. I felt confirmed. I knew something. I had the facts, the data. That felt good. I experienced the satisfaction that measurement can bring.

I also had a contrasting feeling: So what? Does it matter? It was as if I had a definition of a word, a word in isolation. But does it matter to the giraffe that its front legs are longer than its rear legs? Does this fact have meaning in the life of the giraffe?

You gain clarity when you work quantitatively. And it is fairly easy to come to agreement with others about quantities and measurements. At the same time, the numerical quantity

(40 cm long, 50 grams of protein) distances you from the full qualitative reality you are dealing with. You need to overcome the isolation of facts and quantities by finding the relations through which they take on meaning. Otherwise, facts, data, and quantities remain mute and qualitatively poor. In my work I try to discover whether seemingly isolated facts or measurements can, when re-embedded into a living context, help illuminate richer meaning.

To get beyond isolated facts you need to start relating. In the other four-legged hoofed mammals (except for the giraffe's relative, the okapi) the back legs are longer than the front legs. So there is something special about the giraffe. Both front and back legs are very long in the giraffe. In its overall form the giraffe has a short body. The body is not horizontal. When you observe a cow or a deer, you see a lovely horizontal spine. The giraffe's spine slopes upward toward the front. The front legs lengthen, the spine orients upward and from it extends, even more upright, the very long neck. Lengthening and "uprighting" occur predominantly at the front of the animal.

And there is more. The giraffe has a special joint between the last neck vertebra and the back of the skull. It allows the giraffe to extend its long head in line with the neck — something a zebra or an antelope can't do. And out of that long head it can extend its 40-centimeter-long tongue. Up, up, up. That is a gestural quality that begins to speak through the giraffe's anatomy. When I wrote about the giraffe, I spoke of "soaring upward" to point to that quality.²

To see such qualitative features of an animal I observe the anatomical features carefully and activate my mobile and exact imagination. I could also say: I'm not thinking about the parts, I'm thinking with or through them. It is a pictorial thinking that has will (effort) and feeling in it. Through actively recreating what I observe I catch glimpses of gestural expression.

The meaning of a sentence is not found in individual words but arises in the weaving relations. It is similar in the gestural knowing of nature.

In these moments I move beyond event, and beyond transformation or process, to something appearing as an integral whole. I participate in a way that allows things to speak gesturally. And the world becomes qualitatively rich. This is something I cannot "make happen." I can work diligently in the manner I've described, but the expression, the gestural quality either appears or it doesn't. The meaning of a sentence is not found in individual words but arises in the weaving relations. It is similar in the gestural knowing of nature. It depends on the way I engage. There is no guarantee that the meaning will show itself. It is a potential gift of the interaction.

Agency: Nature Naturing

There is a layer of qualitative experience that is implicit in what I have described so far. I now need to bring it into the foreground of our attention. I invite you to consider cows with me.³ The Nature Institute is bordered on two sides by fields of Hawthorne Valley Farm. I walk through one every day. The dairy farm has a herd of about 60 milking cows. I see them often during seasons when they are out on pasture. I also go out with the farm's apprentices to observe the cows. We bring a focused attention to the herd.

Cows roam in the midst of their potential food. A cow lowers her head into the pasture plants. The tongue whips out, she enwraps and rips off the grass as her head sweeps sideways and upward. She takes about one bite per second. I've been thinking recently about where the metric of the second came from and wonder smilingly: Did it come from people observing cows grazing? The cow-grazing second is such a dynamic second, different from a clock. It's a rhythmic movement of an engaged creature, breathing in and out strongly, with rapid movements of the tongue and lips, the moist snout immersed in the pasture plants.

During the approximately eight hours a day that a cow grazes it takes around 30,000 bites and gathers about 170 pounds of fresh pasture. With every bite her mouth secretes saliva, over 20 gallons a day. That's what the veterinary books tell us. Impressive numbers. All the grasses and forbs disappear into the rumen. This voluminous inner space is populated by a microbiome that has developed out of all the microorganisms the cow has taken up from the environment, including by licking its fellow cows. This microbial world, swimming in the swallowed saliva, becomes an organ within an organ. The grasses and forbs begin to break down, the cow regurgitates cuds back up into the mouth. Usually lying, often with eyes closed, she ruminates, grinding rhythmically for 50 to 60 bites until she swallows the cud. Attending to this activity, I become quiet and calm.

The cud makes its way through the other three chambers of the stomach and the intestines. It no longer remotely resembles the pasture plants. Through all this activity, plants disappear and the cow creates cow out of what she has broken down and transformed.

In one sense it is perfectly clear: you are not what you eat; you destroy what you eat. And of course, without what you eat, you would not exist. From this perspective food is the peripheral half of a living organism. Through the interaction with pasture the cow makes cow bones, cow muscle, cow blood, and all the other organs. The cow is creating herself continually through the grass and making all sorts of substances. Think of milk, which serves both her offspring and human beings. Here a bunch of grass and there a glass of milk. In between is the cow as transforming activity.

Consider what else a cow gives off to the world. She jettisons large amounts of feces and urine — manure — out her rear end, substances that contribute to the growth of the plants that feed the cow. She also breathes out warm, moist carbon dioxide-rich air. And when she belches, she releases methane into the atmosphere. Everywhere substance transformation.

In her interactions with the world the cow takes in, transforms, creates, and gives off. A cow is activity, a cow is agency, a cow is doing, a cow is a being-at-work. So is a giraffe or a mouse; so is a plant in a different way; and so are the microbes in the soil. Everywhere we can discover organisms as activities. I call this “nature naturing,” drawing on the Latin phrase *natura naturans*. Nature naturing is nature creating itself at every moment; it is not a finished product. Here we enter a further layer of qualitative engagement and qualitative insight.

Does It Matter?

I have described four different ways of connecting with the world qualitatively: event, transformation, gesture, agency (nature naturing). When I enter these experiences, I realize: the world is a connected whole and I’m part of it. My usual distanced relation is for a few moments overcome. In those moments I consciously participate in the dynamic weaving of the world.

As human beings we continually interact with our fellow creatures — in our everyday thoughts and actions, in our technologies, in farming, in education. We too are agency, we too are beings-at-work. As human beings we also have the ability — with smaller or greater hindrances — to place ourselves in manifold ways in relation to the world that supports our existence. One possibility is distancing from the world in thought and altering it on that basis.

Some years ago, scientists interviewed 113 conventional dairy farmers in the United States about their animal welfare practices. The farmers reported that overall “they were treating their cows well, because they follow the recommendations of university and veterinary specialists.”⁴ They mentioned improved nutrition with concentrates and additives, better ventilation in the barns, and free stalls in which the animals can move around. It struck the researchers that, in describing the quality of the cow’s life, the farmers “seldom mentioned a cow preferring pasture.” On most of the farms, cows had little or no access to pasture throughout the year. (Eighty percent of dairy cows in the U.S. have no access to pasture⁵). The farmers also did not mention that the cows had been dehorned; that in many cases their tails were cut off to half length; and that such factory-farmed cows are typically slaughtered after only a few lactations due to the stresses and ailments associated with confinement husbandry practices and with having been bred to produce large amounts of milk.

Addressing the issue of factory farming in an article in a peer-reviewed journal called *Neuroethics*, a neuroscientist notes that animals suffering on factory farms is a moral issue.⁶ In his view factory farms are needed to produce adequate amounts of food for the growing human population. So what can we do? Since we can already genetically engineer mice so that they don’t feel certain types of pain, we could genetically modify cows in a similar way so that they can remain on factory farms, where they are unhealthy, but they won’t feel pain.

These are stark but not atypical examples of present-day disconnected human thought. Such disconnection leads inevitably to actions that are harmful to nature naturing. Wherever I look — in my own life, in the lives of other people, in devices and systems we have created — I see nature naturing ignored, and all too often trampled upon.

We all know what it means to not be seen, to be ignored as a human being. How do we respond? We might withdraw or we might rebel. Those are two poles of a spectrum. Now take the perspective of nature naturing and consider how it is to be ignored and manipulated by human beings who make use of you but don’t acknowledge your living qualities. What happens to your vitality? How do you respond? Do you rebel? Do you withdraw?

We can certainly see the latter in the diminished health of factory-farmed animals. We see it in the loss of biodiversity. We can see it in many ways. We can register that such things are happening. We can take steps to mitigate the problems we cause. But it is not enough if we stay in the same intellectual frame of mind that objectifies nature and is the cause of the problems. A stronger ability of human beings to be in the world qualitatively would enable us to work *with* rather than against the creative activity that is nature naturing. How might the future look if this potency could come ever more to expression in the way human beings live on earth?

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“Occasionally, sitting amid young trees in the clearcut, I’d pick up some small thing, a Sitka spruce cone or the translucent wing of a dragonfly, and attempt to sketch it. I failed repeatedly to create with my pencil anything worth a second look; but in that hour of drawing, I would gain insight, not only into the shape of the object but into its overall form, its third dimension. I’d grasp the temporality of it, or on occasion, the fractal scaling of its parts, or in some other way be drawn into intimacy with it.

These innocuous palm-sized bits of life were as provoking of thought and emotion for me as the sudden appearance of a mountain lion might have been.”

— Nature writer and world traveler Barry Lopez, who passed away in December 2020.

This excerpt is taken from his last book, *Horizon*.