Thorey Munro
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The Bracken Fern through Poetry:
Experience Translated Language

ABSTRACT

The language of scientific research is increasingly divorced from the poetic experience of observation. Descriptions are often stale and highly specific in a way that doesn't encompass the entire character of the organism. By practicing Goethean science, one can use science and art to describe specific scientific findings with the subjective experience of being in contact with phenomena. The body emits electromagnetic frequencies from the heart that are constantly in flux with its environment. These waves manifest as emotions: in short, the sensory input from the heart as emotions is important data to use when perceiving phenomena. It is difficult to translate emotions into linear language, which is why poetic language and art can be more effective tools for conveying the sensory input of experience. This paper is about the search for knowledge about the Bracken fern through observation of the plant and observation of the observer as she observes. It strives to use poetic language alongside specific facts to compose a holistic portrait of the bracken.

1. Sensing Boundaries

I once enrolled in a class called “Physics for Poets”. I had always thought there was something terribly poetic about gravity, about light and color, and the electro-magnetic bonds that hold us together as solids but with buzzing, vibrating electrons whirling at our surface and at our core. Nothing is ever still, everything is fluid. During the first few minutes of class, however, the professor made quite clear that it was not a class about the poetic “mysteries” of physics, but instead about the quantifiable answers to those mysteries. She made clear to us then (to me) that in academia and in many of the most powerful institutions of the world, there is a deep rift between science and art. Right now, objective proof dominates alone, manifested in the increasingly specific jargon of science. We ignore the power of metaphor and the ways our emotions and stories affect our perceptions. We use fragmented language that separates the object of study from its context. We don't recognize the inherent, subjective biases of research conducted by humans with other living organisms. What if we were taught to appreciate the metaphors of science? What if we were taught to dream beyond the literal, to view ourselves even as we observe the world, to trust our instincts? What if we incorporated poetic language back into science?

2. Delicate Empiricism: Science as a Conversation

It was sunny on the day we toured the Organic Farm. The morning light cast long shadows and filtered through the trees. I felt myself guided, drawn to the outskirts of the farm, where nature was still wild and native plants found their way through the surface of the earth. I saw the fern, its wingspan spread like a canvas to catch the dappled sunlight from above, its curl connecting sky to ground and light to dark.

This is the first step to Goethean Science: recognize honestly what you are attracted to. What warms your passions and incites your interests? Knowledge always starts with a spark.

Next, observe. Observe the context, the landscape, the smells, sounds, tastes, temperatures and light of the place where the plant grows. The bracken grows along the edge of the lawn of the farmhouse, at the foot of a pine tree among salal bushes and alders. Also, note how this place *feels*. How it feels through your body. Honor all thoughts and connections and associations to memories or particular emotions as legitimate sensory input about the external environment.

Direct your attention to the specific characteristics of the plant: color, shape, repetition, texture, parts. The bracken is all leaf: one simple slender stalk that rises from the ground and bends its green fan of fractals over to angle towards the sun. Here, note how the phenomena makes you feel as its image and particular tone begins to enter you through observation. Note emotions, bodily

sensations, metaphors, words and memories that may arise.

Next, begin to fabricate sentences that would describe the plant. Use words that convey the experience of the phenomena as well as the details itself. Research the phenomena to see how other scientists and observers translated their experience into communication. Discover technical terms and specific names so that you may begin to use a common language with other researchers to communicate. Be careful not to lose the initial experience in the increasingly separate and specific words.

Scientific language has increasingly shifted to a more linear, specific, segmented and intellectual way of description. Historical botany books use far more evocative and descriptive words when describing the phenology and behavior of plants. For example, this is an excerpt by Theodore C. Frye in his book *Ferns of the Northwest*, 1934 (line breaks added):

PTERIDIUM. Brake.
Greek: *pteron* wing. Featherlike leaves.
Plants of sunny or shaded places;
rhizome black,
subterranean,
branched,
creeping
woody;
leaves not tufted, pinnately 2-3-compound
or the first compounding somewhat ternate,
tough-herbaceous or
coriaceous,
stout,
up to 6 meters long;
leafstalks greenish;
blades triangular to elongate-triangular;
ultimate segments entire to lobed;
spore leaves
like the sterile ones;
sori marginal,
linear,
continuous;
indusia 2;
the outer one the reflexed leaf margin,
prominent;
the inner one on the receptacle,
facing toward the margin,
delicate,
obscure,
usually minute,

nearly concealed by the sporangia.

Note the tone compared to this description from a contemporary plant identification book, *Plants of the Pacific Northwest Coast:*

General:
fronds large,
solitary,
erect,
deciduous,
to 3 (sometimes 5) m tall;
rhizomes spreading,
much-branched below ground surface,
clothed with numerous hairs.
Leaves:
Blades triangular,
2-3 times pinnate,
hairy;
stipes stout,
straw-colored to greenish, longer than the blades;
leaflets 10 or more pairs, mostly opposite, '
the lowest pair narrowly to broadly triangular,
upper ones progressively reduced and lance-shaped;
ultimate segments round toothed,
margins rolled under.
Sori:
Marginal,
continuous,
covered by rolled leaf margin;
indusium not evident.

Though both are descriptive, the first example sets a rhythm to its description and uses words associated with images such as “rhizome black, subterranean, branched, creeping, woody;” which accurately convey the powerful and dark character of fern roots. The second description falls short: it is dry and academic and too precise—it allows no room for the messy experience of observing a plant.

Scientific names are good sources for poetic language in science because they are remnants of the researcher's initial impression of the plant. The bracken fern's scientific name is *Pteridium aquilinium*. 'Pteron' is Greek for 'wing' or 'feather'. 'Aquila' means eagle. Thus the bracken is named after the eagle's wing. The person who scientifically named this plant recognized the airlike, winglike qualities of the fern and maintained its character even through the abstract act of language.

Poetic language brings us closer to the true experience of perceiving the world through our senses, through our body. As writer Lidia Yuknavitch describes in an interview,

> "Poetic language – and by that I mean the language of image, sound, rhythm, color, sensation – is probably the closest we bring language to experience – poetic language takes you to the edge of sense and deep into sensation...Even if some of the sentences seem to lose their meaning. I want the rhythm, the image, the cry to remain with your body."

Experience travels through our senses into our body: we feel, see, hear, taste, smell and perceive emotions. Poetic language attempts to capture experience as close to the body as possible so that it may most accurately convey the tone of an experience without reducing it to its parts. The power of poetry and art is that it can then pass on that original, raw experience of a phenomena to others through words and images. Poetry and art act as a medium for the constant conversation between experience with phenomenon, memory and translation.

3. Engaging the Conversation

This place feels old. It feels loved and respected. The moss feels warm against my legs. The dark cathedrals of shadow under trees and brush underscores the spiny and delicate skeletons of branches. Each tree sounds different, distinct in the breeze. Needles fall and sound like rain. The morning light here dances, delicately makes the greens more yellow. To my back, across a green grass lawn, a wood-clad farmhouse overlooks the forest, farm, and people of this landscape. I sit at the edge of the lawn where the moss from the forest floor starts to overtake the green planted grass, and I am confronted by the bracken. Its gentle wind-sway teases my eyes and I can't look away, I can't direct my focus on the towering fir trees which make blue puzzle pieces of the sky; I am not captured by the glossy green salal, not the ivy nor the alder or the persistent dandelions at my feet: I see only the lace and grace and sunlit dance of this late-summer bracken fern as it rises and bows on its single sinewy stalk to extend a quivering tip into my lap.

The bracken.

The fern.

Immediately I am drawn to the grace of this plant. How its form embodies a gesture, how it acts like a palm to catch the sunlight filtered through the forest canopy. The fern is lace, I realize. The fractal lobes, leaves and fronds form a lattice of intricate shapes through which the filtered sunlight falls like water through fingers. These fingers are interwoven to form one body, one roof. Dozens of individual ferns overlap and weave together a tapestry, a canopy. The multi-fern body

floats above the salal and moss of the forest floor and quivers with the wind as one, their long elegant tips dancing like hips.

The elegant cane-like stalk emerges singularly from the earth and in a grand gesture, rises swoops, and bends to earth, its arms outstretched to the rain and light from above. Each set of fronds rotates skyward along the stem, depending on their place along the bend. The tip, the triangle apex of the leaf blade, licks tantalizingly close to the earth, a flirty curl to the tongue.

You really are an elegant.
You hold the dew so delicately;
I trace your gesture,
I move your gesture,
I think your gesture.
Equal parts sunlight & water.

The topside of the leaf is dark green, waxy and curls over itself. Underneath, the concave hollow holds a secret of fine white hairs, a downy fuzz. This late in the summer, the brown pattern of sori have already descended to the wind and soil so the underside is left smooth and soft and pale green-white. The stalk is of a paler green, but at the nexus where branches intersect, their pigments darken to a secret maroon which fills the crevice of this joint. The maroon deepens down the stem on the shaded side to where it sinks into the earth. The sturdy shell of the stem is hard, smooth, and cool to the touch, the same texture as the inside of a seashell. Below the earth, the stem darkens to black, is covered with a fine brown fuzz, twists, flares and narrows to a point where it breaks when I try to pull it up. I know from my garden that fern rhizomes are black bear-claw-like bulbs which are sharp and otherworldly. They are hard and rooted somewhere dark and practical and mysterious, the realm of darkness and moisture, necessary to and hidden from the ephemeral beauty of the light lace leaves.

The fern is all leaf, from the stem to the tip. It is composed of fractals, units of triangles. The stem to the tip is all part of the *leaf frond.* Starting from the first *leaflet* (or *pinna*) to the tip is the *leaf-blade*. There are 49 leaflets with one tip on the fern that reaches out from the forest towards my page. These are divided into 49 *subleaflets* with one tip, separated out like earlobes on the largest leaflets at the bottom, and with only 20-30 on the smaller leaflets towards the end. The subleaflets are composed of *lobes*. The lobes are rounded and flow into each other's shapes close to the tip, but they start to delineate and separate as individual lobes near the stem. The stem is as strong and flexible as a spine. The leaflets curve around like ribs to create a light-speckled hollow

below.

The overall shape of the fern is angular: it is a large triangle composed of triangles composed of triangles. At the smallest unit, however, the triangles are rounded. Everything is rounded: the tips of each lobe and the rounded stalk and the curvaceous shape itself. It is both masculine and feminine, angular and curvaceous, solid and fluid, flexible and rigid.

I touched my tongue to the perfect water orb clutched in the last leaflet's curl: it tastes like air, like sunlight, like the grey mist caught between trees, like wet spider webs and like green. It tasted like brown moss, like the grateful rush of water in fall, like wool, like rust, like iron, like blood. It seeped, cool, from the upward reach of my tongue, down through the hot saliva of my tastebuds, absorbed. Not enough to swallow, not enough to swish. Just a memory of mist, a memory of the deep earth.

Fern tips feel like the stiff tips of feathers: flexible but sure of their form. They are textured, hard and dry-feeling, but they move like water. They move generously across the body and compassionately bend, make room for one to pass. They are gentle and touch the skin in a tender motion with fine points of contact along each lobe.

First mist, first rain. The greens are deepened to an emerald with the morning dew. The moisture reflects the white-grey of the sky. I watch as the drops collect at the curved tips of the leaflets and lobes, as the dew falls along the center lines. I peek underneath to the downy white underside and see the mist cling. I look up from under and the outline of the fern seems to emanate like a halo. I think, *Your greens are richer today. They are like a royal velvet. Your mood is a little less carefree and lovely and a little more dramatic as if you are working hard on your beauty. As if you know the winter is coming with the springtime of death, the rain, autumn.*

Weeks later, fall starts to creep. The fern yellows unevenly. The green gradually retreats towards the center stalk and maroons, burgundies, siennas, golds, oranges and yellows push back from the tips. The green sucks out of the leaves even as the rains drop from the sky.

Weeks later again, and I begin to notice the death curl of the fern. Instead of collapsing, broken-stemmed to the earth, the bracken first makes one final curl. As the burgundies and browns replace the green, the leaf dries and curls upwards. The life spiral reverses and the tip curls back, arched along the spine of the leaf blade towards the sky. The leaflets also curl back in spirals. The lobes close in on themselves like mouths.

The bracken curls like the earth's breath.

The back-arching curve only occurs without rain, for the sky moisture is enough to droop them back earthwards, soggy but deep and rich in color. The tall stalks curve and bow towards the ground. With the long stalks bent over the base becomes exposed, solitary, flexible. I see the loose soil made from last year's fronds where they bent over to make a bed for the next generation.

4. Exact Sensorial Imagination and Living Understanding

The next step after observation is translation—into words. With Goethean science this includes images and the poetic impressions that a phenomena instills on the observer. Sit, eyes closed, and imagine the bracken in my mind's eye. I picture its details, its nuances, its movement, color, shape, character. Then, let it go. See what fills the void in your mind. Note these associations and emotions, for they are what the heart illuminates.

> During this process, the verbal-analytical mode of consciousness does not invent the linguistic phrases to describe the meaning of the phenomenon; instead, the linguistic descriptions of the phenomenon emerge of their own accord out of the store of memories, information, and experience that you have accumulated during your lifetime. Here the heart and brain work together. (Buhner 170)

You remind me of tanned leather, soles of boots, raw wood-fired ceramic mugs, the hot air in the loft of a cabin. Foraging, spring. Baskets on wool sweater arms with the scaly green gems of fiddlehead spirals, then the hot energy of friends and ovens. Devil's club, butter, garlic, fiddleheads

in a red colander waiting to be stripped naked of their fur. Spirals in the secret of their root. Snow holding on in shadows, rabbits, snipes, sparrows, sticky cottonwood buds. Air, toast, wax candles, bread pans, red cloth, animal, bitter, green.

Billowing. Bones. White. Skeleton. Like ribs. Ghost. Brown and warmth. Like a wedding skirt. Rust. Veil. Lace. White paper falling. Opal. White cotton lace collars, lace cuffs (why do we adorn the edges?); fern a celebration of the meeting of trees to the earth: that juncture.

A bed, a rest. A shelter . Architecture: the space and shape of light and air.

Amber. Nostalgia, anticipation balled in the chest and in the jaw.

The fern is like a cloud or like smoke. It takes up a lot of space yet does not have mass or weight or substance. It is flexible but strong. Ferns can fall through your fingers, just like sunlight and mist falls through theirs. What is left of the sunlight and mist undergoes an alchemy to create the forest green of fern lace.

Plucked ferns dry and curl like small fists, a motion observed. They miss the sun on their skin, they miss the earth on their roots, they miss their roots, miss the origin spiral of fiddleheads underground.

Black sunlight through water. Subterranean. Creeping. Rhizomal. Flat. Fact. Layers.

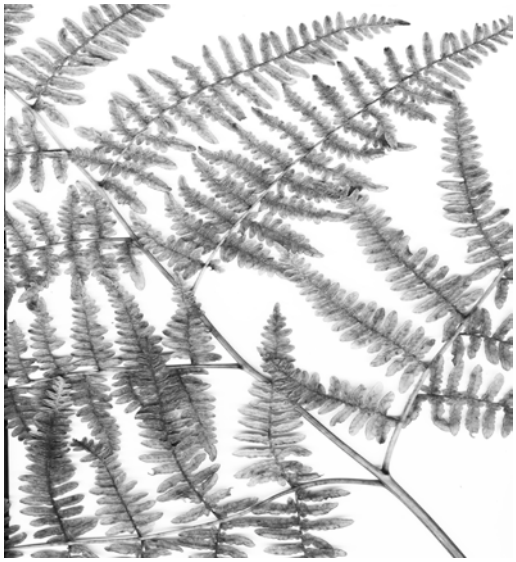
5. A portrayal

The bracken fern has become not only an object, but a subject to me.

I am confronted with the bracken.
Delicate curls like eyelashes.
Bold curves like architecture.
Graceful fingers that hold light like water.
Filterer of filtered forest light,
gatherer of silver fall mist.
Old green, wax green, water-eddy green.
Maroon stems, dark nexus.
Maroon-dark sink towards earth.
A feather flume in wind, held by
nib rhizome stained to black soil ink.
Water and green fall with the rains.
Burgundy, gold, copper feather flush.
Bracken arches, tips back spine skyward,

leaflet ribs sprayed open,
rounded, reversed, remembered.

The fern, like poetry, is born
from a place of darkness and
moisture. Deep in the loam, water
ignites the spore, unlike the sunlit germination
of flowers.
The meeting of water and earth
on this spore is much like
the meeting of body and mid
no this soul.



The fern stalk curls beneath the soil
then unspirals to the sky.
The lace leaf catches sunlight and
is made half of air.
The fern roots in the dark mystery
of water and earth
It leafs as a canvas to catch air
and lights between lobes.

It is ephemeral but not without its blackness.

6. The Whole as A Part

The bracken fern, in the deep green of summer, is full of water. It is a cascading, flowing, encompassing mess of eddies, spirals and vortexes. Moisture collects along the waxy cuticle of the up-side of the leaf. Come fall, the water, and the green Water: cascade, how it gathers water, how it swirls like water. Ferns are fluid. And yet when the rains fall they begin to dry and curl up and back into itself. The fern life cycle begins in water when the archegonium is moistened and the sperm become mobile and swim. The fern grows in the thaw and moisture of the springtime. It protects its internal water with its waxy cuticle and thrives, even in the most desperate of summer droughts. In death, the water leaves behind the light, dry, delicate finger structure of leaf lobes made of earth.

I love the curves and the cascades of you. The ripples and waves, the eddies and spirals.

The earth is the strength of the cane-like stalk. It is the spread of the wiry veins. It is the intricate folds and undulations of the leaf margins. It is, most powerfully, the black and mysterious rhizome where dozens of stalks are linked underground in the realm of darkness and moisture. At death, the ferns curl and twist but ultimately break and fall to become a new layer of soil. Not solid, but permeated with pockets for air and thus, decomposition.

The fern is made half of air, in life and in death: where the green earth-water of lobes leave negative space, air and sunlight illuminate. The fern is made of the air supporting the curl from below and the air pressing the curl down from above. The bracken is good bedding for its cushion and insulation. The air between the fern lobes can be warmed by the heat of the body.

Heat completes the fern not only of the body but also of the heart and mind. The fern is beautiful. Ancients found the fern beautiful and mysterious (how did it reproduce with no seed, no flower, no fruit?). But the interest comes from the delicateness and intricateness of the gesture of the fern's body. It is graceful, light, forgiving, encompassing, compassionate, generous. It provides shade and shelter, a curtain.

7. The Unity of the Organism

The fern's life is a spiral. It begins as a tightly spiraled head. It pushes upwards with that mysterious power of anti-gravity and uncurls upwards through the stalk to the end tip and outwards along the leaflets to their tips. At death, the leaves slowly turn a speckled brown and then a deep, red-warm brown the color of soil and they curl again, but this time the leaves curl up like fingers around a palm and the smaller lobes curl in around themselves like ribs. Like a dozen cats arching

their backs, reversing the teasing life lick of leaves down to earth back up, skyward, dry, before the inevitable break and fall to the ground, flattened by the winter rains.

The tight curl created underground rises up, gently, vulnerably uncurls then continues its revolution in direction of the earth, lives, retreats to rhizomes and arches skyward before the final fall with gravity.

8. Doing Goethean Science

Metaphor and poetic language are necessary elements to Goethean science because they are the best tools to recreate experience. Observation through the senses brings a part of the organism being observed into the observer. Likewise, the observer allows elements of herself to become one with the world she is observing. As Goethe said, "We know ourselves only to the extent that we know the world; we become aware of ourselves only within the world, and aware of the world only within ourselves. Every object, well contemplated, opens up a new organ within us." With observation and contemplation, observers cultivate empathy and a sense of inter-connectedness. This sense of unity can be recreated through poetry, art, and even well-worded scientific papers.

Since Goethe's time, science and the arts have developed a deep ideological rift where scientists are not taken seriously unless they can deliver visible proof and fact. However, scientists are humans with constantly- adjusting hearts.

> "When the heart's electromagnetic field and any other organism's electromagnetic field
> *whether it has a "heart" or not*
> are in close proximity, the fields entrain or synchronize and there is an extremely rapid and complex interchange of information." (Buhner 90)

As Andreas Schulkey writes in *Metamorphosis*, "Is that which is generally regarded as unscientific really objective or is restricting oneself to purely quantitative phenomena for fear of subjectivity not a kind of subjectivity in itself?" In essence, he argues that we must regard subjective experience as just as true as quantifiable facts of objective reality. This will help us develop a relationship with nature that fosters respect and appreciation similar to how we regard other humans. We will treat

her as an equal, a fluid, intelligent subject instead of a stagnant, inanimate object. Metaphors are important. It is only through emotional attachment that we gain an encompassing knowledge of phenomenon. Language – poetic language and metaphor are the tools through which we articulate our relationship with nature when we practice Goethean science. After all, thinking is internalized movement. Wouldn't that also mean that our thinking affects our bodily movement, our actions?

9. Practicing Goethean Science

Goethean science is about making connections and respecting the information from the heart. It's a continuing dialogue during which experiences are constantly absorbed, remembered and translated. The process begins with recognizing where our interests and passions take us. This is the spark, the draw towards a subject of study; if there is no love, there is no contemplation. Through open and holistic observation of context, the phenomena itself, and honest record of the observer, one gathers sensory input that brings the organism internal within the observer as pure experience. The observer can then recall the organism and the impression and associations it leaves behind and create a slightly more abstract image that encompasses the poetic associations. This poetic image invites the words and images stored within the observer from previous study and experience to begin the translation from raw sensory experience into communicable language. This language - more linear and clear descriptions interspersed with poetic imagery – will then carry some of the impressions of the original experience to the listener or reader who reads about the scientific study. Why is this important? Through thoughtful language, we will be able to change the metaphors of science from humans controlling and manipulating the *object* of nature to humans learning from and with the *subject* of nature and thus, instill a different, more respectful relationship with our planet.

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