

# Drawing Analogies in Environmental Education

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## **Abstract**

*Reconsidering the origin, process, and outcomes of analogy-making suggests practices for environmental educators who strive to disengage humans from the isolating illusions of dichotomizing frameworks. We can view analogies as outcomes of developmental processes within which human subjectivity is but an element, threading our sense of self back into its constitutive contexts, and into possible affinity with kinship practices of the world's diverse cultures. The article suggests that analogies create and perpetuate not only ideas and identities but relationships, and that what we surround ourselves with becomes the basis for engaging in and forming further relationships. I invite educators to consider practices (here I explore just one) that repopulate our analogical repertoire, that we may have more organic and vitalizing interactions with all our relations.*

## **Résumé**

*Reconsidérer l'origine, le processus et les résultats de la construction d'analogies suggèrent de nouvelles pratiques pour les éducateurs en environnement désireux de détacher l'humain des illusions produites par les cadres dichotomiques. On peut considérer l'analogie comme le résultat d'un processus développemental au sein duquel la subjectivité humaine n'est qu'un élément, tissant notre perception du soi et le contexte qui la constitue, ainsi qu'avec certaines affinités possibles avec les pratiques des réseaux familiaux de diverses cultures mondiales. Cet article suggère que l'analogie crée et perpétue non seulement des idées et des identités mais aussi des relations; ce qui nous entoure devient la base pour un engagement à former d'autres relations. J'invite les éducateurs et éducatrices à envisager des pratiques, au-delà de celles explorées dans cet article, qui enrichissent notre répertoire analogique et ainsi permettent des interactions plus organiques et revitalisantes avec tout notre entourage.*

**Keywords:** analogy, anthropomorphism, dualism, kinship, cybernetics

## Introduction

Those who suffer an illusory sense of dislocation need practices that can reintegrate their sense of identity back into the world. Until the stories we live are consonant with our larger ecologies, we will continue to elaborate structures grounded in error—order disordering what are otherwise generally integrative systems. Environmental educators have the task of imagining pedagogies to heal this dislocation, notably among them those that sanction the infamous

Cartesian dualisms. Success depends on finding convincing alternative frameworks and effective de-dichotomizing practices for others, and to be sure, for ourselves.

Oppositional thinking establishes ontological clefs in our metaphysics and therefore our perception by overemphasizing differences in phenomena while understating similarities. Antipodal fracture facilitates certain types of political relationships and technologies, but only by separating humans from the very possibility of contributing to the more general cohering tendency that underlies the emergence of differentiation and meaning in the cosmos. And now, on the tail-end of modernism, science itself is revealing that indigenous people the world over were right all along to cultivate practices that resist alienation. The relatively tight integration of “internal” parts constituting the “self” is mistakenly given a separate ontological status from the relations that the self is less tightly integrated into, whose constitutive role in the individuation process is attenuated or ignored entirely. Multilevel interactional approaches to biology, from the behaviorist accounts in developmental systems theory (Oyama, 2000; Oyama, Griffiths, & Gray, 2001) to the phenomenological approaches of enactivist cognitive science (Varela, Thompson, & Rosch, 1993) can help build a theoretical bridge out of the pitfalls of modernity.

Environmental educators can reshape experiential learning to include practices that assist students in disengaging from dualism. The metaphysical grounds justifying its dissolution are now known but the enactment of patterns that sustain alternatives are harder to come by. This paper attempts to forge such a pedagogy through an exploration of analogy consonant with nondualistic threads of post-Cartesian biological theory. Thought is often conceived as the product of humans (brains or bodies) or the cultures they reside in. As hermetic isolationism captivates, knowledge seekers obsess with ridding “nature” of any trait deemed constitutive of “culture” or “self,” mandating their frenzied asepticism methodologically as a call to evade anthropomorphism. I view this as a tragic error. Through discussing the process of analogy formation, considered the root of mental activity (Hostadter & Sander, 2013; Lakoff & Johnson, 1999), I hope to invite the reader into a consideration of practices that redraw the human identity. The point is not to replace duality with mystical unification. Dualism emerged as a feasible metaphysical explanation because developmental interactions coalesced a being sufficiently individuated that its identity became an existential question. This cannot be simply transcended, and thankfully so, for the same process also provides the possibility of encounters, relationships, the capacity to learn, love, care for, and grow. We do not need to choose between deep ecology and ecofeminism (Plumwood, 1991) if we are careful about how differentiation emerges and in turn reconstitutes the world it emerges from. The paper’s plotline explores three broad themes: a discussion of analogies inviting kinship rather than opposition, a consideration of how disorder and reintegration are possible in a nondualistic metaphysic, and a call for habits that draw

the human mind back into networks of more-than-human processes. Although I end the paper with an example of a concrete activity for pedagogy, the entire paper is intended to be practical. Thought and action are indissociable; to focus on one we must focus on the other.

### Totemizing Experience

From *Rodnidze* in Poland to *Mitupo* of Zimbabwe, for millennia people have nurtured practices that sustain identification with other beings, be it types of animals, other organisms, or larger entities such as mountains or streams. The term for these varied kinships has become *totem*, derived from *Nindoodem*, or “my clan” in Anishinabe (Bohaker, 2010). There are significant differences in the mythologies and rituals represented under this term (Descola, 2013), and Anishinabe people may not agree with the generalization made by (mostly) white, Western anthropologists. To avoid misappropriating the original sense and context, I use the word *Doodem* to refer to those practices particular to Anishinabe people and *totem* to refer to the constellation of less specified practices that deliver kinship with the world. This distinction is consistent with some First Nations people who use the spelling *Doodem* to refer to their own practices (such as LaDuke, 1999; Miller, 2010; Treuer, 2010).

From a historical perspective, the spreading conceptualization that de-animates the rest of the world while hyper-animating a solitary “sapient” subcomponent of it, is a brief experiment in the evolution of thought, one not proven ontologically or epistemologically tenable, let alone ecologically feasible. That totemic rituals are vital to diverse, long-lasting cultures indicates that developing care and kinship with nonhumans is fundamental to human experience. From a post-Cartesian perspective, such practices acknowledge, on the one hand, our ontological co-constitution with those around us, and on the other, the role that the individuation processes which brought us forth play in making this possible. And yet, totemic practices are not often taken seriously as an approach to environmental education, in part for some clear limitations (lack of teachers with deep totemic learning or commitment, fear of misappropriating indigenous wisdom, fear of being “New Agey,” lack of time, a culture that does not encourage the practice, etc.). If we want to seal the nature-culture rupture by inviting other beings into our experience, as teachers and as learners in their own right (it is, after all, *environmental* education) (Affifi, 2011), we should consider practices of kinship anew. As Anthony Weston points out (personal correspondence, citing Abram [2010]), totemism can gradually provide a “stereoscopic” perspective on reality. Our lived experience takes on attributes of the totemic species’ world. In this sense, ancestral kinships toward animals, plants, and other beings are multi-generational apprenticeships wherein humans find their sense and grounding in the world in ways of life provided by, and nurtured through, relationships with their totems.

Thinking about totems risks disrespecting those who birthed the practices. I am tempted to avoid the word, to jump directly into interspecies relationships or interspecies pedagogy and the place of analogy making in these processes. However, I feel it is important to acknowledge that the styles of thinking and engaging offered here share a fidelity and perhaps a constitutional genesis with practices evolved and evolving in the earth's richer cultures. Nevertheless, people who share my mixed up placelessness and clanlessness need tools befitting their historically contingent struggle that they may rejoin others in finding a home in the grander firmament. As an educator, it is these people I am trying to reach. I do not suppose that the western, post-Cartesian understanding of kinship explored in the pages to follow should be universalized, nor replace the senses evoked by other midwives to its practices. In fact, for people steeped in cultures with totemic practices, my thinking will seem quite superficial. Nevertheless, I hope to stand in ontological solidarity with people of the world who take affinity with the more-than-human world seriously. What I pledge is to address the precarious place between the secularized, urbanized, and disenchanting, and the inauguration of an embracing participation with all our relations. The West is gasping its first breaths after a long stretch of reductionism and humanism, accentuated through the methodological and ontological consequences of the great Cartesian split, and ways of knowing, thinking, and acting have changed. We need practices that can bind us (from here) into those connective tissues from which many indigenous worlds drew sustenance and identity. Like the Transition Towns popping up across the continent, we need Transition Ideas to initiate the long reunion that is our mission for centuries to come. Saturated in the promises and perils of our culture, we cannot hope to implement The Solution, but we can perhaps position ourselves in a more regenerative direction with farsighted humility and grace. In this context, I see any work as totemic so far as it nurtures relationships between humans and other beings so as to constitute our thought and action patterns. It is this capacity to learn from, respect, and grow through the organic world around us that educators must cultivate, whether this come out in our science, our art, or our direct and daily relations.

A misplaced condemnation of anthropomorphism in western cultural narratives has made the notion of kinship with other beings seem incredulous. However, I maintain that anthropomorphism is an incoherent concept. Eschewing it follows a logical scheme stemming from the influential Kantian critique (2007) that claims that knowing is possible only because it consists of statements about regularities in the world as it appears pre-constructed by our sensory and conceptual faculties. Kant grounded the possibility of scientific knowledge through a distinctly Cartesian approach: he created another isolating dichotomy. By making an absolute distinction between what we can know (experience constructed) and how things are (the world itself, which we can say nothing about), the world around us simply reflected back whatever human dimensions we put into it in order to be able to experience it in the

first place. The nonhuman world was quarantined into oblivion, catalyzing two centuries of defiant yet anguished humanism (most phenomenologists, social constructionists, and poststructuralists reiterate his fracture).

Conceiving knowledge as constructed in this way made the jump to anti-anthropomorphism easy. The alleged identification with another animal (or whatever else) could be quickly reduced to being “just” a property of our modeling system, not the thing [sic] itself. Entraining repeatedly to this objection, critiques of anthropomorphism distance us from possible points of supra-human contact and blind us to the fact that every idea, every feeling, every goal, and every memory is melodically and morphologically animated by more-than-human presences. In fact, self and other are tangled up such that we can never talk about one without the other already present as a precondition for its differentiation. Alterity (the “more-than-you”) abounds, but it is not Derrida’s (2002) absolute and un-engage-able otherness that creates chasms in our phenomenal experience. It is always just within our reach, the nonself that we are ready to receive, that can flow into us, and combine with us as we grow. A thread of re-integration, promising a new order of causal bridging between the universe’s individuating entities, emerges in the system’s evolution. As we will see, our sense of affinity ties us to other beings and infects our thinking thereby, but these affinities also open us up to being led by their differences, guided into novel parts of ourselves. Alterity is not a permanent existential fact, some categorically alien presence splitting our experience apart. It is that signpost within experience that shows us who we can meet and how we can grow. We grow into our alterity without encapsulating it, it becomes a part of us, of who we are, while always providing the horizon for new novelty.

### A World of Overflowing Kinships

Taking seriously a totemic apprenticeship to another species quickly gets one’s empathy and imagination entangled in a multitude of other, perhaps unexpected, species. If one’s totem is a wolf, one may soon have various herbivores as totems too, because these are surely in some sense already totems *for* the wolf, who synchronizes, lives, and breathes her world with a stereoscopic vision of what it is like for those whom she tracks. What is the co-evolution of a predator-prey relationship but the multigenerational apprenticeship of one group of animals towards another? This too is an arbitrary stopping place because to come to know the deer or the rabbit, one must also know how they perceive their worlds, which are in turn shaped by a sensitization to species that matter for them. The wolf must know how the grasses grow. Our wolf-relationship may claim primacy or depth in our lives but it is itself threaded to the rest of its ecosystem by its own totemic relations.

There are other reasons to be flexible. Suppose I acknowledge my affinity with the lupine world and end up in an ecosystem that has no wolves (or wild

dogs of any kind—or maybe no alpha predators at all). I can certainly still perceive the ecosystem with my wolfish training and undoubtedly attune myself sensitively to my surroundings by doing so. But there may be other teachers in this new context, ones that have been coordinating styles of acting and perceiving coherent with that ecosystem (or, rather, styles that contribute towards the coherence of that ecosystem). Our lives are increasingly transient and ecosystems more dynamic, so we may need several means of learning and developing as our contexts change. If we live in urban worlds and make frequent trips to the forests, the species in each community are sufficiently different that we could perhaps have different teachers to fall in love with for each.

It may be suggested that apprenticeship is not a frivolous thing: one cannot learn to be a plumber and a carpenter and a farmer and a sculptor and a midwife. Learning the trade of the wolf is an occupation, not as a pastime, and mastery a continuous process spanning thousands of hours. Further, it is a multigenerational occupation establishing the co-evolution of lineages in an ecological community. I have no objection to the spirit of such concerns. It may well be that groups of people living in tight communion with members of a specific bioregion come to rely on and enrich ecologically beneficial longstanding kinships. What I suggest is that the same spirit of openness that enables people to engage in such sustained partnerships can also facilitate shorter-term relationships. Multispecies totems exist in some cultures, such as the *Wiradjuri*, who have both clan totems and personal totems (Rose, James, & Watson, 2003). City dwellers, detached from ecological communities (even many ecologists tend to consider ecosystems as third-person, mechanical systems), need pedagogical strategies that bring them in contact with the intersubjectivity, indeterminacy, and lived presence of their actual encounters. Having a more amorphous conception of interspecies kinship or apprenticeship can enable this.

It may also seem that my proposal only recognizes totems insofar as they help us establish better relations within ecological communities, that I am concerned with the *performance* of an epistemological orientation, and that I am thereby *reducing* totemism to its pragmatic value. Indigenous groups, the criticism would go, often insist on totems for ontological reasons: the clan really has this identity with wolves, and the fact that the relationship has ecological values is an effect of the relationship, not a rationale for it. I agree. But pluralizing kinship need not make this move. I attach importance to the performativity of our epistemology, but I do not deny its ontological reality either. When we take up another being as our teacher and dedicate ourselves to learning and relationship, they really do become a part of us, altering our manner of thinking, feeling, and acting. They are not tools for thinking or techniques for sustainability. It is not that “animals are good to think with” (Levi-Strauss, 1963). The relationship is an end in itself, one that modifies each of its participants’ manner of being (and becoming). This is social psychology à la G.H. Mead (Mead & Morris, 1934): our kinships really are parts of us, they become inner voices, that very chorus of “significant others” that dialogues our Self into being.

Our role in the process is to cultivate an openness to kinship with those we encounter. We can work at enabling unannounced creatures we encounter to infect us with their novelties and passions, growing our souls with their struggles and accomplishments, elegance and grit. We can surrender our subjectivity and allow ourselves to be subjected to the process. Totemic identification is more than just an imposition of a similarity. We do not “construct” experience as a condition for having the sense of “affinity.” This is not a transcendental move: as long as we remain Kantian, we lose out on possibilities and intimacies, and become ontologically impoverished. Practitioners often speak of their animal choosing them. This protects the very real mystery and romance of the encounter. This way of speaking, of inverting “the chooser,” may however be less convincing to us post-Cartesians, for whom the mystery is perhaps better kept alive by eliminating the notion of “chooser” altogether. Such a term, from our historically situated, scientizing metaphysics, seems to invoke too much agency and teleology. A complex progression both individuated and brought the beings together, enabling care, love, and surprise, blossomed surely by the fact that the world can be open to itself, to interact with itself and grow in new ways, breaking symmetries, modulating, harmonizing, and counterpointing in all its rejoinings and differentiations.

### Analogies and Anthropomorphisms

Totemism is sometimes interpreted as analogical or metaphorical, but most who traditionally practice would reject this phrasing. It recalls Western anthropologists discrediting different cultures, convinced that their own conceptual frameworks are universally valid means by which to gauge others. Calling a totem an analogy certainly *seems* to weaken it, to render the affinity “just” a construction of the mind, and to smuggle back the epistemologist’s echo-chamber (borrowing Jensen’s (2011) terrifying term) that this article emphatically rejects. As mentioned though, the task here is to make kinship a conceivable pedagogical project for the Western world pulling out of modernism, not to explain its origins or functions in other cultures. A way to do this, I believe, is to warm to the notion that there is an analogical element to *this* emerging sense of totemism, but to shed our entirely sterile notion of what analogies are. Analogies themselves have a mysterious otherness and are no more anthropomorphic than totems. An analogy jumps out of nowhere, drawing together the unanticipated present with various pictures, feelings, or thoughts from vastly different places and times. We should be suspicious in assuming that we are authors moulding the process. Analogies may well be the “core of cognition” (Hofstadter & Sander, 2013), but cognition is not something that happens “in the head” (or the body!). A complex circuitry, webbing the murky past with what is immanently bubbling forth in ongoing sensorimotor couplings with “the environment,” delivers the

analogy. It is this circuitry itself, enfolding on multiple scales in all its physico-chemical ebbings and semiotic exchanges, that is composing the linkages and unities. Analogies are a part of a process whereby the world rethreads kinships between its individuating parts, tethering new connective significance, birthing new shared trajectories and themes. They are our micro-kinships. If a totem is that to which we are wed, organizing our life with a broad and sustained sweep that contextualizes our daily encounters, analogies are our friendships, acquaintances, and passersby. They may require less commitment or discipline, apprenticeship or fidelity, they may indeed later prove misleading or foolish, and yet they are born of the same interthreading world.

People who most closely interact with, observe, and depend on other species are those most likely to do what Westerners label “anthropomorphize.” Many turn the finger backwards: is it not *we*, by distancing ourselves from other species, in our shelters, our cities, our food production systems, who are really the anthropomorphizers, laying our perceptually vapid experience of other species onto them? Are we, through the constraints of scientific protocols, really improving the clarity and objectivity of our understanding of other species? Are not machines, computers, and other constructed devices activating mechanistic analogies that anthropomorphize our conceptions of other species? This criticism is tempting, indeed I often make it, but it reifies much of what I am trying to shed. To accuse anyone of anthropomorphism reveals a still-too-simple conception of human activity, one that does not admit of the messy, interlocking, historical, recursive nature of the process of thought production in the world. We assign authorship to the location out of which the final idea emerged, the mouth or pen, without acknowledging the long centripetal process that preceded it. Our errors are multitudinous and serious, but if we seek to experience the world less *anthropocentrically*, perhaps the first step is to realize (playing with Latour here), that we have never been anthropomorphic.

The movement in analogy generation that pulls an essence out of one context only once it is seen in another bothers analytic philosophers because it is certainly neither deductive nor inductive (and are even those logical distillations, at bottom, really “human?”). There is a magic otherness in it that we cannot exactly schematize. Douglas Hofstadter (Hofstadter & Sander, 2013) describes an experience with his family at the Grand Canyon. After marveling in the awesome expanse, he glanced down at his 15-month old son. Instead of gazing wondrously outwards, the boy was fixated on a few ants on the sandy dirt. Fifteen years later, and now in Egypt, he visited the Ancient ruins of Kamak. On the trip, he noticed someone collecting bottle caps instead of paying attention to the vast, timeless temples. He immediately recalled his child’s preoccupation with the ants decades before. At that moment, the meaning of the event in Egypt got defined by that in the Grand Canyon. The Grand Canyon served as “the source” for an analogy, lending the new experience (the target) its structure and significance. Hofstadter now recognized that both were instances of people



paying attention to small details because they were unprepared (developmentally in one case, culturally in the other) to see something larger. But the source also got redefined by the target. Until that point, the source was contextually less defined and semantically more nebulous. We can imagine a different target might have linked up differently: had Hofstadter seen a child gleefully chasing a butterfly, the connecting sense may instead have been about children having a natural appreciation for life without judging insects as less worthy on some hierarchy of value. It was, in Hofstadter's words, "the mental mapping onto each other of two entities—one old and sound asleep in the recesses of long-term memory, the other new and gaily dancing on the mind's center stage" (p. 504). Our memories and present experience are both beyond our grip, forming and reforming in a duet with one another, fed constantly by the irrevocable tendency for each to feel out the other. We cannot (as the straw-man epistemologist I keep resuscitating would have it) "apply" categories that we have formed from earlier experiences to constitute new ones because the categories themselves are in flux, open to the very experiences to which they get associated. Something quite delightful is happening here. Was the story of the ants just sitting await for something with some similarity to come along? Did the story have an indefinite number of tentacles (or, as Hofstadter elusively suggests, a "halo"), reaching out for future encounters to join with in kinship, for a partner to complete it? The number of events waiting for relevant connections may literally be infinite because it is always possible for an experience to join with others or split to form new ones (for example, the ant story plus whatever happened just before it might end up as an example of something else if a situation came up that conjoined them). And this happens continuously and daily. Details of the transaction are a matter for further empirical study, but what is key here is that neither the phenomenology nor the physicality of the process indicate either a reductionistic determinism or any privileged agency on behalf of the human. Either side of the dualism collapses under the indeterminacy and opaqueness of the world's subterranean networkings.

Once formed, the mutual semantic modification between memories and experience may slow but it does not ossify. Even concepts considered to have become fixed, with meanings triangulated by countless sources and targets, are hardly permanently etched. Each analogy ages according to its own élan, with a tempo and rate of change specific to the type of events it draws together. Partnership continuously re-adjusts, re-qualifies, or re-calibrates, but never fully settles as a completed linkage. The initial basis for kinship sometimes dissolves only to be replaced with another kinship more attuned to the dynamism of experience's integrations and differentiations. When we do use humans as direct sources, such as when we say that a river is sad, we need to recognize the analogy's role within a broader trajectory that it helped instigate. Over time, how we understand comes to be less and less orchestrated by that initial interpretation and more about the perceptual reshaping that it subsequently aroused. We leave

equipped with dimensions of thought and feeling not possible before because apparently anthropomorphic concepts can seamlessly de-anthropomorphize through the encounters with nonhumans that they make available, in a process within which we are merely afloat.

Analogies emerge out of our interactions with the things around us, be they other people, technologies, other organisms, or systems, molecules, cities, or mountains. Granted that the process of forming analogy is more-than-human and that many of our ideas, feelings, and projects emerge through encounters with nonhuman presences, does this necessarily imply that all analogy is non-anthropomorphic? Are we mixing up process and content? Can we not admit that the process is nonanthropomorphic while maintaining that the content is not, *at least* when the source of the analogy is a human? But even this won't do. Even surface-level anthropomorphism hides a vast history of more-than-human apprenticeship. To claim anthropomorphism is to punctuate the process incorrectly. Humans that become sources for analogies are never purely and hermetically *just* people because their thought and activity has been constitutively invaded since inception by interbreeding with countless other elements, from European buckthorn to the starling's evening exaltations, from library cataloguing systems to iPhones apps. If someone is suffused with these experiences, the analogies based on her are as well. Analogies derived from technologies that may have first seemed technomorphic are more complex for the same reason. For example, we may use a technology based on a biological analogue to understand some other biological phenomena (with some amazing eventual inversions: "look mom, thistle is like Velcro!"). Concepts bear the traces of intermixed biomorphic, geomorphic, and technomorphic pedigree. Typically when we call an analogy anthropomorphic, technomorphic (or vegemorphic, etc.), we only refer to the last manifestation of an enormous historical crafting. If an idea comes to us through directly examining a person and we call it anthropomorphic, what we are really saying is that the *direct* source was a human, even though that source itself emerged through some more or less translucent past.

While intermixing is inevitable, both the sources and the targets that come to dominate our minds will be based on the sorts of environments we live in. Because what we see and how we see are mutual modifications of one another, perception is not merely a matter of gaining content. It is methodology-yielding. This is fundamental to totemism and analogy making: the process of engaging in a study modifies the way in which the study unfolds. What we pay attention to, what we think about, and what we observe feed back into how we pay attention, think about, and observe. Whether we pay attention to fixed or fixating systems or to growing and developing ones, in either case these enter our analogical repertoire. We can therefore accept that all our activity is part of the dynamism of nature while enabling practices that are congruent with the broader life-generating movement that our dissonance emerged in.

## Urbanizing and Industrializing Totems

In discussing totems, Bateson (1979) claims that overarching isomorphisms connect the way people view nature and how they organize their societies. Analogies have an interlocking, self-validating capacity that shapes future experience. They are performative because the ontological reconstitution which they bring forth entails new emotional, physical, and epistemological orientations that in turn further constitute ontological relations. Totems orchestrate feedback loops because the consideration that humans pay towards their kinships provides meaningful contexts, structure, and actions that lead to further respect and deeper consideration. However, what's good for the goose is not always good for the gander. As humans urbanize, their analogies and totems become increasingly saturated with the built-up environment, its organization, and the technologies that run through it. Just as 19<sup>th</sup>-century Europe's industrialization is putatively responsible for the organizing descriptions of both a capitalist social order and a competitive interpretation of biological evolution, we might expect that analogies taken from one sphere of experience might spread and duplicate in another (in social systems there is the tendency of oppressed people to mirror the oppressor's social order by becoming "sub-oppressors" (Freire, 1974)). Models become self-validating because each new successful application affirms the pragmatic validity of that conception of the structure of the world. Dualisms themselves, once evolved, were perpetuated in this way. But this can limit the creative growth of concepts. Like a hurricane gaining in strength by absorbing energy and matter into itself, a destructive analogy can destroy the diversity it encounters. This is why the same mechanisms that generate fertile semiotic diversification can also lead (temporarily) to pathological subsets.

In an urbanizing environment, the rest of the biotic community's contribution to analogies dilutes in potency. Nonliving things increasingly end up as direct analogues, and as our environment is evermore populated by such nonliving elements, the more-than-human component of our ontological constitution becomes increasingly technological. Kinships with nonliving things, regardless of whatever traces they carry with them, are empathetically void. If retaining other species as totems is important, short excursions into "Nature" are probably insufficient to curb the tide of urban self-validating processes. It is said that it takes at least four nights in the woods before the animals come and visit us in our dreams and it seems to me that they are much more quickly frightened off once we return. The best bet, I think, is to actively engage in practices with the nonhuman biotic realm in our cities to repopulate our totem and analogy worlds with living beings. In part this requires the very practical task of creating habitats to encourage urban biodiversity. It also requires an ongoing re-interpretation of emerging biological sciences that trouble our sense of human privilege, such as developmental systems theory and biosemiotics. In the next section, I introduce another of the many possible practices that educators can explore to invite organic life back into our inner worlds.

## What Drawing Draws Out

Every plant I have drawn has transformed me through the process, not merely in what I learn about myself, but also in attuning me to the species, that forever afterwards jumps out at me as I walk down the sidewalk with a spirited presence and lovable animality. Still, I often ask myself: drawing is ocular-centric and many species on earth do not even have eyes, so is drawing an anthropomorphic way to engage? Of course, if we rely exclusively on a single mode of interaction we entrap imagination, so drawing should be part of a larger repertoire of organic analogue repopulation work, both sensory and theoretical. Nevertheless, drawing is important. Plant worlds flush with intensities of light and chemicals, not well-defined, spatialized objects, but they clearly have styles of growth and becoming revealed for visual beings. Drawing hones our perceptual sensitivity. Their flashes of colour and striking architectures are outward expressions of their being, even if they themselves do not see themselves in these ways. We do not need to put up unfair criteria here since much of what we consider “most authentic” in another human is what comes out unintentionally as well: the glimmer of a smirk, a glint in the eye, a blush. Plants have a physiognomy and our simian physiology is not a blinder to their essence, but another way into their being. We can experience the story of their life. Like wrinkles on a face, the particular architecture of a plant reflects its history, encoding its experiences in a visual medium. Phenotypic plasticity is expressive, not merely adaptive.

Staring deeply at a plant (is that the right word? The action is loving, like “gazing” but more focused) through the guidance of pencil and paper, our eyes open us up to the limitations of eyedness: we become evermore aware of this as we contemplate this hopeful being with a skin that grows towards the light. We see that the eye’s concentrated messaging creates a front and a back, blind spots, distinct assumptions about other creature’s perceptions, and sharp self/other boundaries. And yet without our having eyes, it would be impossible to conceive of how plants have a full bodied, distributed vision (and full-bodied eyes—even roots have light-sensing properties driving them *away*, rather than towards, the light (Burbach, Markus, Zhang, Schlicht, & Baluska, 2012)). Drawing establishes kinship, and kinship draws us into experiencing difference. Drawing is therefore an empirical method for postdualistic science, seeking integration and relationship rather than Goethean essences. Analogies that form through carefully considering plants, such as the analogy between their experience of light and our own, break down our sense of what vision is by shining an alterity accessible enough to be contemplated, imagined, and indeed, grown towards.

Organic totems and analogies, by definition, vitalize our thought. Luckily, there are still organic teachers all around us. Consider *Amaranthus palmeri*, known as pigweed, and present in most gardens and urban fields. We are currently so tone deaf to its mode of being that most of us have hardly paid it any notice. How might we sensitize? How might we approach it such that its alterity is within our reach, drawing us into it and passing through us so we grow and

develop? The extent to which we are capable of having our thoughts take on the balanced branching, the saturated inflorescence, the slow verdant pace, and the fluid dynamism of an amaranth plant depends on how much we are able to let it into, and in-form, our mental worlds. Drawing slows the mind and opens it to the form, harmony, symmetry, and edgy individuality of each plant. At some point we may be able to see how just *this* thought or *this* situation or *this* feeling is homologically related to the architecture or style of negotiating space of pigweed's particular manner. This might seem like a long shot, but the nature of analogy essentially guarantees this. The deeper we infuse ourselves within a phenomenon, the more we see its character in other phenomena in the world around us, and the analogy enables us to feel or see something new that we would not have otherwise. Since analogy reciprocally determines both source and target, we are now also capable of realizing that the amaranth plant also has characteristics of the conversation to which it intertwined. Its form becomes semantic and aural, just as our conversation becomes visual and structural. All the while, our receptivity stretches its arms to the latent possible interrelations between plants and experiences that once were not imaginable. If eventually, through exploring the matter further, we come to realize the limitations of an analogy, it is only because the amaranth plant helped us to see it: without the formal similarity between these two experiences joining each to the other and us to them, we would never have had the foothold to examine the issue further. Ever after it lingers in scent and residue in our future conceptions, vegemorphizing it according to its own modulation. In sum: educators can explore and diversify sensory activities to invite organic sounds, behaviors, smells, shapes, and struggles into their students' worlds, so that the empathic and conceptual repertoires available to analogical and totemic unfolding be ever richer, more hopeful, and alive.

### Notes on Contributor

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