

More-than-humanizing the Anthropocene

Ramsey Affifi

NATURE IN THE ANTHROPOCENE: A THREAT TO MORE-THAN-HUMAN EXPERIENCE

A recent trend, at least within various earth sciences, has been to de-naturalize the Earth entirely, seeing the tainted print of the human blotched across even the most remote ecosystems and peaking portentously with the proposition that we inaugurate a geological epoch in our (dis)honour. While gaining steam in the eco-humanities, in this paper I hold that the work performed by this neologism is not what environmental education needs right now. While such a move shrewdly challenges the human / nature binary, it does so by reifying one side of the relation. And in so doing, it risks smothering alterity, otherness, and difference with a smear of anthropocentrizing concepts and percepts. We shall see that this move is neither accurate nor advisable. New materialist philosopher James LeCain (2015) highlighted the arbitrary nature of the term in a recent essay where he pointed out that “civilization,” for better and for worse would never have been possible without the innate powers of coal and oil, and that we are in the midst of the *Carbocene*, if anything. His point, as I take it, is not necessarily to ascribe “the cause” of the ecological crisis to some other nonhuman thing (as seems suggested), but rather to highlight the post-postmodernist pullback against logocentrism and insistence that human culture and its transformations are always constituted by their material relations. The move explicitly seeks to open up a type of experience that does not reproduce the sense that humans are unique and causally separate from the rest of the world, be it as agents of praise or blame. Unlike these de-centering moves, as a concept ‘The Anthropocene’ weakens the availability of a phenomenological encounter with something outside of the human domain, and presents instead an ontology where humans only ever see themselves diffracted through the various lenses of whatever they choose to lay their eyes upon.

Perhaps. But who could really doubt we are ‘the cause’ of the crisis? How is this not some new form of fancy-pants intellectual climate change denial or the like? According to David Abram, this *vanity*, this mirror-gazing and inflationary hubris, short-circuits what are really the most beautiful and graceful possibilities for our species. It is when we turn outwards, with awe and wonder (and perhaps also fear), that we foster an inquisitive appreciation and reverence for the processes and products of the world. And so, if it is the case that we really “are human only in contact, and conviviality, with what is not human” (Abram 1996, ix), the converse to Anthropocenic thinking is now required: we can recover our humanity through realizing that the more-than-human seeps through and carries us at all times -even in that apparently most blotched with our print. The task here is to take up Abram’s invitation and to advance his

project. The challenge is to *more-than-humanize* the Anthropocene.

What if the most cherished but also the most despised human attributes are suffused with the mysterious alterity of beings and processes that elude our control, wild and inhuman? What if 'I' am not 'I' nor you 'you'? If even the sunshine of consciousness only glitters through the intervention of countless others, without our will, without our creativity? We shall see that from the cells in our body to the flow of thought, all allegedly human acts and products are indissolubly saturated with otherness. Central to this reconceptualization/reperceptualization is the replacement of the concept of a fragmented linear causality (an epistemological construct that creates dichotomies by putting different things in oppositional relationship with one another) with an ecological conception which sees causality as circular, co-constitutive, temporal and contingent, and occurring simultaneously on multiple levels and scales. Such a view has been depicted beautifully and bountifully: within classical pragmatism, cybernetics, ecology, and evolutionary and developmental theory (without claiming too strong an identity between their various positions, see for example, Dewey 1929; Bateson 1979; Lewontin 1983; Oyama 2000; Noble 2013; Laland 2015). An ecological conception of causality views naive conceptions of human agency as problematic and is therefore equally suspect of educational and policy decisions premised on such a view. Ecological causality sees the penetration of nonhuman elements as necessary of all activity, casting doubt on any pretence we might have about our capacity to control the systems that we are not simply *in* but *of*. In what follows, and by way of invitation more than comprehensive exposition, I briefly discuss some of the many varied ways in which we are immersed in ecological relationships. What Abram calls the more-than-human can be seen to permeate all our endeavours, even when we think our agency most unshakeable. These can be grouped into categories, at least for the purpose of illustration, according to both first and third-person, or phenomenological and empirical approaches respectively. A preliminary overview will assist in breaking up the notion that there is a category of exclusively 'human' things, replacing it with an alternate view that sees a deep causal interpenetration and mutual implicatedness in all phenomena. Besides being a more coherent understanding of both phenomenological and empirical evidence, we shall see that an ecological conception of causality also offers us a more feasible path of retreat from the ecological chaos that is currently unfolding, and so is ripe with educational implications.

I will not be suggesting that it is never important to employ the categories human and nonhuman in mutually exclusive ways. Whether or not a particular way of slicing up the world is advisable eventually comes to depend upon the effects of what such punctuations *do* rather than their alleged correspondence with some world 'in itself.' But by and large, our efforts to police the division between these categories is not leading to ecologically or socially sustainable culture, making it at once metaphysically and pragmatically dubious. Accelerating environmental destruction is usually met with a strengthened call to action, imploring that "you

can be the change" required to evade the impending doom that is the consequence of the human hand. But these calls re-inforce the already bloated beliefs about human power and uniqueness that propel the crisis. I realize that for those who hold dualistic interpretations of the ecological crisis, my attempts to more-than-humanize human activity lock-stock-and-barrel will be met with great suspicion. It will be seen as undermining the sense of agency we supposedly need in order to pull ourselves out of this deepening rut. I will argue, that holding onto such a concept of agency is part of the cycle of destructive habit that is exacerbating the crisis and that overcoming it is an important first step in reconstructing a more ecological epistemology. Arguing that all allegedly human activities are in fact 'more-than-human' *does not* lead to laissez faire fatalism (i.e., that wretched rebut environmentalists fear to their core: "well, the world is destroying itself through us so there is nothing we can do!"), as some would insist. In fact, naive determinism is born of the same troubling logic as naive agency. Each approaches causality as something linear, with a distinct beginning and a distinct end. It is because we are immersed in networks of circular causal relationships that the naive causal conceptions of both freedom and determinism are so destructive. It is because these circular relationships always enfold something more than an isolatable causal 'I' that a new more-than-humanized concept of agency awaits uncovering.

MORE-THAN-HUMANIZING THE HUMAN

So, for Abram, what is 'more-than-human' anyway? In dealing with a sleight-of-hand magician we should not be surprised to find that, after appealing to the index to find a definition of the term, we are redirected instead to a much less used term, the "sensuous world," which is itself not defined either. However, as his work progresses, meanings of 'more-than-human' gradually emerge. Many meanings, suggestive and rich, but not always consistent. While this ambiguity has lent it some attractiveness—many people can see their own projects pressed in his own—it invariably means that the term is adopted in truncated ways. Here I hope to restore and extend what I think is the most important sense of the term and show some of its continued relevance for environmental theory and education.

Before moving on, it is worth highlighting some of the varied aspects the term evokes. First, in some sense, the perceptual experience of the lived world as a whole is conceived as a domain or "*field of animate presences*" (Abram 1996, 56, italics added) that is bigger than us but with which we are continuously in reciprocal engagement. Perception is in this way the "constant thwarting of such closure" (Abram 1996, 49) that is presupposed by various forms of idealism. Here, perception can be spoken of as the perpetual reciprocal 'dance' between a body and those various things in the world that that body inhabits, between perceiver and perceived, between the subject and the sensible (Abram 1996, 53-55). In this sense, Abram describes "the sensible world" generically as "active, animate, and in some curious manner, alive" (1996, 55).

In a second sense, this reciprocity is discussed in specific rather than general terms: the particular sensory engagement with *this* rock or raven at *this* moment reveals the more-than-humanness of the particular beings in this experience. This sense is different because here he seeks to get at the phenomenological experience of a specific encounter, while with the former sense he strove to describe the more-than-human structure of experience in general. A third sense has Abram evoke *the body* itself as more-than-human, insofar as it is a thing of this animate world and is itself capable of being denigrated through the mechanistic interpretations of a divorced consciousness. A fourth sense has this body itself also now generalized as “the flesh” of the world (Abram 1996, 66). While these four senses follow the progressive development of Merleau-Ponty’s thought, Abram does not settle on “the flesh” as the most ontologically appropriate or phenomenologically accurate description of the more-than-human. He re-employs the various phases of Merleau-Ponty’s thought, sliding back and forth at different points in ways that often go unannounced. He also adds additional eco-phenomenological dimensions to these. For example, in a fifth sense Abram identifies the sensible more-than-human world with “*the earth*” and “*the biosphere*” as “experienced and lived from within” (1996, 65). In a sixth sense, he contrasts the more-than-human with the human and the artificial. And in a seventh sense, he acknowledges that the more-than-human pervades everything *including* what is artificial. For example, he writes that “[t]o the sensing body ... artifacts are, like all phenomena, animate and even alive,” even while these artifacts’ animateness is “profoundly constrained by the specific “functions” for which they were built” (Abram 1996, 64). And beyond these seven uses, Abram also sometimes employ the term third-person empirically rather than first-person phenomenologically, as when he laments about how “Western industrial society ... with its massive scale and hugely centralized economy, can hardly be seen in relation to any particular landscape or ecosystem; the more-than-human ecology with which it is directly engaged is the biosphere itself” (1996, 22).

Throughout, Abram’s use of the term often seems to skip between these sometimes contrasting meanings. It is sometimes used to refer to specific other beings (like the squirrel, the nuthatch, or a particular experience) but other times to a general other (like “the sensorial world” or “the perceptual field” or “the flesh”). He also jumps between including and excluding humans from “more-than-human”, as he does between having it serve as a phenomenological and as a third-person category. Within the dichotomy of concrete and abstract, Abram seems to accept the value of certain abstract conceptions of more-than-human (such as “the perceptual field” or “the flesh”), while cautioning against others. His rationale for valuing these generalizations seems to be based on the degree to which he believes they emplace people back into their sensory world. This explains why he seems to avoid the dichotomy between human and more-than-human when the experience is sensorial. Something like “a hint of diesel fume” is not a dangerous imposition of humanness when part of a broader sensory field that

one is immersed in with full attention. Rather, it is precisely a part of the flood of rich more-than-humanness that one encounters with the directness of one's eyes and ears and nose. On the other hand, Abram is disturbed by that which is divorced from direct sensory engagement, as when he maligns studies of subatomic particles and vast galaxies for leading to a sense that reality is not accessible without much theory and instrumentation and a distrust of the senses (2007). We are therefore faced with a strange situation where the smell of diesel fuel is to be considered *more* more-than-human than the atoms that preceded our arrival on earth by many billions of years.

Part of the problem, I suspect, resides in Abram's overambitious equating of the phenomenal sensory experience of more-than-human with the sensory body. It seems at times that Abram has two separate projects that have been partially conflated: calling us back to our sensing body and disclosing the more-than-human as an essential phenomenological experience. His call to pay attention to the senses is obviously welcome advice; our direct sensory engagement with the world around us can provide a deeply responsive understanding and engagement. And indeed, it also connects us viscerally and vitally to that which appears as 'bigger' than us. But this does not mean that the more-than-human and the sensory are isomorphic –empirically or phenomenologically. Unfortunately, his enthusiastic call back to the sensory body led him to devalue the work we needed in deconstructing *conceptual* aspects of our phenomenological experience to reveal their more-than-humanness as well. When discussing concepts and their material progeny, Abram often wavers back into dualism. For example, he writes that "our organic attunement to the local earth is thwarted by our ever-increasing intercourse with our own signs. Transfixed by our technologies, we short-circuit the sensorial reciprocity between our breathing bodies and the bodily terrain" (1996, 267), and

[o]nly when we slip beneath the exclusively human logic continually imposed upon the earth do we catch sight of this other, older logic at work in the world. Only as we come close to our senses, and begin to trust, once again, the nuanced intelligence of our sensing bodies, do we begin to notice and respond to the subtle logos of the land (Abram 1996, 268).

I argue here that humans can experience forms of more-than-humanness everywhere, from the human body itself to the most seemingly detached realms of consciousness, of thought, and of technology. That we (and a multitude of other inhabitants of the planet) would benefit from catching sight of the nuanced intelligence of our bodies and subtle logos of the land is likely. Educators certainly need to enable more sensitive and responsive manners of engaging with the varied beings around us. It will remain essential that educators focus on experiential encounters with things that strongly reveal themselves as self-originating and self-developing such that we can feel the power of the creative processes that persist without us. But we can

devote ourselves to that sort of phenomenological work *and* the complementary work of more-than-humanizing the allegedly exclusively human sphere that Abram sometimes sets it against. In other words, the task is now to see that these same processes are creative within us, too. I believe this carries Abram's project forward. Indeed, Abram devotes several chapters to the Herderian vision of articulating how oral and written languages were inflected by the presence of influences and agencies that are not our own, in effect de-privileging our role in our most prized possession and that which we constantly employ as a justification for reifying a discontinuity between us and 'the rest' of the world. He disclosed language as a more-than-human process in the hopes that we may experience it as such. But Abram's methodology can be applied further to uncover what may additionally be revealed as more-than-human. It is not our experience with what is 'merely-human' (as an ontologically stable or robust category) crowding out the more-than-human (as a diminishing set of actual beings or processes) that leads us to the dull and destructive lives that Abram resists. It is our experience with what we *believe* is human, and the hubris and inattention that arise from this, that is really at issue, affecting and distorting the quality and relational potential of our interactions with the many denizens that compose our environment.

The term 'more-than-human' is primarily a phenomenological category, referring to the way things are presented in experience. But it is not a stable phenomenological category because the same thing can appear as 'human' or 'more-than-human' at different times or in different contexts. This instability is a part of the reason why Abram's use of the word sometimes appears contradictory. This instability is also why the term is phenomenologically and pedagogically so important for environmentalism. Many factors currently reduce our felt experience of the more-than-human. Cities, reduced biodiversity, a rise in enthralling and absorbing technologies, and certain ways of framing 'nature' (such as those wrapped into Anthropocen(tr)ic thinking) have meant that increasingly many things are now disclosed to us as 'human.' This paper represents an attempt to push against this trend. We see image of our species now nearly ubiquitously knotted into the things around us, from the plastic bags that float past us to the winds that guide them along, which have now become almost inconceivable without thinking of "human-induced" climate change. In light of this trend, it is increasingly imperative to develop counter-strategies that can protect the wild and wondrous more-than-humanness in our field of experience. Environmentalists and educators can assist people in developing skills for uncovering the more-than-human all around them, not merely in the hills or the forest, but in the various dimensions of humanity that we cherish as unique and that we use to erect the categorical distinction between us and others. In other words, the *concept* 'human' can be more-than-humanized. This paper will nudge toward such an uncovering, focusing in particular on breaking open the notion of causal agency that seems so critical in establishing a separate ontological status for humans in an otherwise mechanical universe.

Linear causality, the idea that a cause begins at a point in space and time and leads to an effect at some other spatiotemporal point, is a crucial yet problematic foundation upon which we come to consider the human as such a unique agent. It is this sense that provides for a notion of 'free will' that contrasts so strongly with an otherwise physicochemical order. The world, void of teleology through the efforts of the scientific revolution, is seen as increasingly different from humans, whose capacity to direct and control simultaneously appears all the more powerful. But it is possible to uncover causal circularity within experience and to see how, in various ways, such pure and unidirectional concepts of agency are not as compelling as they may seem. Such circularity reveals that wildly other processes breathe into and circulate our thoughts and actions, and that more-than-human dimensions animate all our endeavours and not merely our "sensory field."

The most promising dimension of the term "more-than-human" is not then that it is a more generous or respectful way of considering other beings, contrasted against the belittling negation performed by the word 'non-human.' The term acknowledges and positions humans as *within*, as *of*, something bigger than is generally apparent, as it invites us to further the incomplete (perhaps incompletable), though ever-necessary phenomenological project of disclosing more-than-humanness in experience. No matter how we try and circumscribe and bulwark the boundary between us and the rest of nature, the closer we look, we find opportunities to see something challenging our sense of agency and independence. In the following sections, I briefly describe some of the ways in which the more-than-human is available experientially through 1) the structure of first-person experience, 2) the way in which humans appear third-person biologically, and 3) through the technologies and artefacts we produce. I follow this survey with a discussion about some of the challenges we face in more-than-humanizing experience and the need to do so in order to foster an attitude of humility which seems key to shifting in to more generative directions.

THE MORE-THAN-HUMAN IN FIRST-PERSON EXPERIENCE

The strategy in the sections that follow is to first tackle epistemological approaches that follow or reproduce Kant's famous "Copernican revolution" in philosophy. The reason for this is that these various epistemologies (which include not only transcendental idealism, but also much of phenomenology, constructivism and social constructivism, linguistic relativity, critical theory, and poststructuralism) anthropocentrize 'knowing' in a broadly similar way. Unlike empirical or correspondence theories of knowledge, these epistemologies (which I will call "Kantian" despite the alarm bells this will set off) all claim that we preformat our experience of the world in such a way that our attempts to know the world really only reveal the manner in which we preformat it. In some way, each of these epistemologies is suspicious of notions that we have access to the world itself. The effect is that ontology (general claims about the world) is largely

reduced to human epistemology (general claims about knowing).

Many of the observations and analyses made by scholars within this thread of thought are important. For example, it is important to be aware that the way people in modern industrialized societies see the world may be preformatted in ways we are not immediately aware of, such as by the logic and demands of capitalist economies. Nevertheless, this thread of thinking also reproduces an extreme form of anthropocentrism that may turn out as dangerous as the naïve epistemologies of early correspondence theorists who saw no link between power and knowledge claims. The dying oak tree outside my window right now with its shadow cast northward, is preformatted by my perceptual machinery, or my language, my culture, my "faculties," my social class, or my economic circumstances. According to these epistemologies, I do not see the tree itself nor can I ever see it. What I see is an image of myself because I am only allowed to make claims about the elements I import or impose on the tree. Otherwise, the tree is forever slips beyond my reach. As we shall see, getting past this impasse involves thinking about the knowing process as a circular, unfolding process, not as a linear one where either the thing is unproblematically intuited or preformatted. This will also point the way toward more-than-humanizing our understanding of knowledge in experience.

Autopoietic theory initiates a circular reframing of Kantian epistemology. I choose this as the theory to scaffold out of these various subjectivisms because autopoiesis is rooted in Kantian idealism, but pushes beyond it. According to autopoietic theory, all organisms down to the cellular level constitute an organism/environment relationship by constructing their identity and a domain of possible interactions (Maturana and Varela 1979). While this "domain" seems like just another subjective bubble, the domain is itself continually shaped by the "external world," which perturbs the organism constantly, impinging upon the organism's meaning making activities and forcing it to adjust its semiotic interpretations of what is disclosed. As a history of interactions unfold, it becomes increasingly arbitrary to hold that the perceptual or conceptual formatting of the experience is the part played 'by' the organism or 'by' the external world, given that the organism's formatting is the product of prior organism/environment transactions (Affifi 2016). Given this circularity, it is simply an epistemological distinction to assert that the organism is acting towards the environment rather than responding to it. Causality is operative in each direction, and although each causal arrow can be considered in isolation, linear thinking is only possible because of an original circular unity in the living process and the conditions of this possibility afforded by the organism/environment dialectic. In other words, while each organism is perhaps confined to encountering a certain version of the world as its 'reality,' these versions are not constructed unilaterally. 'Experience' is better thought of as the joint developmental product of the interpreter and the interpretant (who may also be an interpreter), co-emerging and co-informing each other through time. And crucially: instead of 'nature' being the 'in itself' on the other side of some impassable divide,

the interaction itself, including all the processes that brought it into being and which sustain it, and also all the ‘phenomenal’ qualities that emerge along the way, all of it is ‘nature’—as much as anything is.

Already in the basic organization of any living organism, the boundary between the organism and what is ‘not it’ is therefore fundamentally in question (Affifi 2016). While organisms constitute an environment to which they can relate and interact with, this separation between self and other is a performance that brings increased intimacy and intercourse between nature's varied parts rather than isolation and atomism (Jonas 1966). Without autopoiesis, the world mainly engages in purely physicochemical interactions. With autopoiesis, in addition to physicochemistry, a new realm of interactivity opens up, probabilities are redistributed, and novel forms and activity emerges.

In this paper, I will examine two dimensions of the autopoietic process: how it appears from within and how it appears when observed externally. The former is a ‘phenomenological’ stance, the sort we take when examining the structure, processes, events, and *qualia* of lived experience, such as thoughts, feelings, beliefs, and intentions. The latter is an ‘empirical’ stance, and is concerned with describing living beings through how they interact with other beings and things and what consequences result. I do not claim that either stance is ‘better’ than the other or that they are separable in living systems (because the way we experience the world does influence the interactions that occur between us and others). Rather, I believe that both need to be more-than-humanized and that the conceptual work needed in each case is different, though partly complementary. For the sake of exposition, I will treat them separately in this paper. However, as will be made clear, the empirical and phenomenological stances interact with one another and it will be necessary to examine the phenomenological consequences of results from the empirical stance.

Even in common language we often acknowledge the fact that ‘we’ are not the directors of our own experience: we are gripped by a story, distracted by someone gossiping, moved by a piece of music, we fall in love. Although such descriptions are pervasive, we are still haunted by the subject-verb-object structure of many grammar systems, which tends to give a false simplicity to the way we experience our own motivations and activities and what sort of power we command with respect to these. Through the guidance of such grammars, it seems like I am the agent, the verb is the thing I do, and the object is the thing that receives my verb-activity. For example, I ‘decide’ to do something. What is clear, however, is that even in subject-oriented languages, any sentence that can be stated in the ‘active tense’ can be rephrased in a way that dethrones the subject as causal agent. Nietzsche (2000), in criticizing Descartes, pointed out that the latter’s “I think” (which was the beginning of his proposition, *cogito ergo sum*) already contained up to six dubious assumptions, and that more precisely the evidence points to the

fact that a thought comes when “it wishes.” People struggling to meditate learn this fact the hard way, a fact which is resolved not through combatting these pesky thoughts but by accepting the reality of their occurrence within the stream of the world. When meditators do develop ‘self-control,’ looked at more closely, what they have acquired is a set of habits for thinking about thinking, which funnel thought in specific directions, and they are just now as susceptible to these new thinking patterns as they were to those that are now being controlled.

Even those who claim that the most fundamental thing about being human is the fact that we are born free acknowledge a paradox. Sartre (1947) insisted that our freedom is primary and absolute, a part of the structure of our experience before we try to make sense of it, and that we should be suspicious of any framing that dislodges this fundamental aspect of our being. But he also observed that we did not choose to choose, that we are “condemned to be free.”¹ So even if he is right (which I question because it seems to again reify a notion of linear causality and human exceptionalism), the problem is only deferred to a meta level. Even for Sartre, by virtue of the fact that we are “thrown into the world,” (27) human existence is more-than-human.

Phenomenologists have long recognized that the basic structure of consciousness is that it is ‘intentional’ (Husserl 1990). Intentionality has a specific meaning here rooted in its etymology, where in Latin it originally referred to “an arrow directed at a target” (Thompson 2007, 364). Consciousness is intentional not because we ‘intend’ to do things but because it has a basic directionality. Consciousness is towards something, or better still it is ‘about’ something. Regardless of one’s commitments to Kantian epistemologies, there is already something of the ‘transcendent’ or ‘other’ appearing within the structure of experience itself. Consciousness is always consciousness of something other than it itself. Even when consciousness takes aim and intends itself, it can only do so by conceiving an abstraction: a memory of itself, a future projection, a conceptualization, etc. It seems to put itself into relation with itself only by making itself an *object*, and thereby opening up the possibility of being informed by what is ‘other.’ It would therefore seem unable to grasp itself except through conceiving of itself as something more than the immediate conscious subject. But the continual objectification of the subject is also what brings a sensed relationality back into subjectivity. This is because one’s subject *as object* appears within concrete spatiotemporal developments, ongoing cultural and linguistic flows, social circumstances, and the like, all of which continually remind us that the unanalyzable conscious subject that exists in the immediate present is itself entangled in these very same processes.

Of course, to say that something is ‘other’ than us is a different statement than to say that it is

¹ “Condemned, because he did not create himself, yet is nevertheless at liberty, and from the moment that he is thrown into this world he is responsible for everything he does” (1947 [2007], 27).

'more-than-human.' One might accept that thought, consciousness, and freedom are all not properties of some free-willing homuncular entity residing somewhere in our brain (or soul) while still maintaining that they can be disproportionately influenced by things that can be called 'human.' For example, when I 'use' my computer it may well be that I am being controlled by it but that I generally misapprehend the causal relationship between me and this technology. But because the technology is created by and for humans, I am nevertheless being controlled by something essentially 'human,' and this would justify our continuing to maintain a split between experienced objects. Shortly, I shall argue that there are no technologies that have not been infected by that which is not human, such as through biomimicry, or through some direct engagement with a nonhuman. But here I want to clarify an ontological claim. The categorical distinction between 'human' and 'nonhuman' depends upon a more primary distinction between self and other that is the basic structure of consciousness, so if the primary distinction is unwarranted ontologically then so are subsequent distinctions dependent upon it. Further, if the organism and environment are already and always interpenetrated, then there is no possible product (including ideas, language, goals, technologies, etc.) that can come out of the organism that will not already also have the environment as co-conspirator in its elaboration. When a phenomenological examination of consciousness problematizes the agent, it provides further experiential evidence to the assertion that our being is grounded in a process that is bigger than it. This process may seem to include apparently 'human' thoughts but even when it does so, it is only because that is the way the process as a whole is constituting the experience at that time. And that process as a whole cannot itself be human. As we shall now see, the category 'human' is not self-generating but rather emerges out of particular physicochemical and biological properties of the world that have enabled the very possibility of 'human' existence and semiosis.

MORE-THAN-HUMAN FROM AN EMPIRICAL STANCE

From a third-person empirical perspective, the category "human" is also problematic for many reasons. First of all, the concept of a species with distinct and well-defined traits has become suspect. Not only is it unlikely that there are certain universal qualities that all so-called humans share (Hailwood 2016), it is also uncertain whether or not many of those aspects we think define human existence are in fact exclusive to our species (such as syntactical communication (Gentner et al. 2006; Zuberbühler 2002), tool-use (Seed and Byrne 2010; Shumaker et al. 2011), empathy and sociality (de Waal 2009; Beckoff 2002), and inherited traditions (Avital and Jablonka 2000). However, even if we do come across universal traits that are exclusive to humans, there are still a number of reciprocally determining ecological interactions, which challenge the notion that these traits are 'our own.' These go back to examining the nature of circular causality, now from an empirical point of view. Doing so reveals a number of different ways in which the human organism is interpenetrated by other biological systems that co-

inform and collaborate in 'human behaviour.' Each of these are special cases of the general organism/environment developmental co-emergence described in the section on autopoiesis, above. I will sketch out some of these now.

From an empirical third-person perspective, organisms are influenced by their environments, which include various biotic and abiotic elements. Multicellular organisms have inner environments made up of such biotic and abiotic elements as well, and the individual cells in their bodies have their own inner and outer environments. On each of these scales, the organism is simultaneously constrained and enabled to behave in certain ways and not others by the particular dynamics that such interactants afford. It is possible to punctuate the interaction and to say that the organism is 'the actor' or 'the responder' depending on at what point we treat the beginning of the interaction and what point we consider its end, but interaction is an ongoing recursion which primarily does not differentiate between action and reaction. With abiotic objects, the object elicits behaviour or is acted upon (depending on the epistemological distinction made), but in any case, it changes and in turn alters subsequent elicitations/acts on the part of the organism. Sometimes this can lead to mutually interlocking recursions, positive feedback loops that create grooves or habits, and addictions. Instead of actors or reactors, we have interactors developing and breaking patterns of interaction.

First, by being open to an environment in general, human organisms are also open to particular other species. They are able to engage in ecological relationships where their behaviour is calibrated and choreographed through the ongoing co-evolutionary dynamic between their own and other species. Humans may either be interacting with other species directly or with the products of other species. According to niche construction theory (Odling-Smee et al. 2003), organisms construct niches by modifying their abiotic environments, which are in turn inherited by their own and other species (Odling-Smee 2011). From a third-person perspective, the ecological worlds we live in are therefore composed by the present and past activities of nonhuman organisms. Not only the decisions, but also the nature of human languages and communicational systems, is informed by and inseparable from this larger sphere of more-than-human interactivities. According to Abram (1996), this influence has not disappeared, as it still imprints upon the melodies of the spoken word, which he believes often correspond with the regional soundscapes of the language-speakers' surrounding ecological communities. According to Abram, such an attunement is "imperative for any culture still dependent upon foraging for its subsistence" (1996, 140) because it helps people engage emotionally, empathetically, and perceptually in the environment of other species with whom they depend. Most words in modern usage, he argues, are direct descendants of concepts derived through encounters with the more-than-human and are still imbued (if perhaps now subdued) with their presence even if this is not generally recognized. In fact, in general, while thought and language are also involved in a causally circular relationship, each is also recursively interacting with the world

itself, which is constantly updating and adjusting the use and meaning of words, offering new possibilities for metaphorical relation (Affifi 2015).

Second, consider symbiosis, a phenomenon ubiquitous across the biosphere. An organism is often composed of countless other organisms within itself as it is also co-dependent on those around it. Humans are estimated to have ten times as many microbial cells as those with their own somatic DNA lines (Luckey 1972)². The form and behaviour of an organism is falsely reified when considered in isolation from the contributory influences circulating throughout by these collaborating organisms. From the mitochondria powering eukaryotic cells (Margulis 1981) to the gut microbes turning on and off intestinal genes affecting their hosts' moods and dispositions (Mayer et al. 2014; Dinan and Cryan 2013), from emotion altering *Toxoplasmosis* (Pearce et al. 2012) to carbohydrate cravings induced by *Prevotella* (Alcock et al. 2014), we see the pervasive contribution of otherness in our humanness. The physiological point of view, just like the phenomenological one, reveals that human agency is entwined in perplexing symbiotic assemblages with causality distributed throughout and circulating in ongoing transactions between the wholes and their varied parts. Once this is realized, physiology provides yet another way to access thinking and perceiving that disrupt notions of linear human agency and enfold our felt experience back into the larger ecological webs of interaction that sustain it.

TECHNOLOGY AS MORE-THAN-HUMAN

We also know intimately that our mental and emotional states are closely connected with our bodily states, which are themselves in ongoing intercourse with the world that the body is a part of. We cannot concentrate when we feel tired, we feel inebriated when we drink. We feel heavy when stratus clouds set low and imposingly overhead, but uplifted on crisp blue days. When Abram (1996) points out that the more-than-human makes us human, he is often referring to these sorts of experiences, which reveal the ongoing intercourse between 'our' emotional worlds and the dynamics of the 'outer' world. But now my iPhone squawks. I pull it out and do what it asks. It is set up according to a 'human' logic, its programs presenting options that succumb precisely to a seemingly unique cognition and fulfilling human goals by design. Its form and function appears as entirely 'for' us, in stark contrast to the grainy edges of granite or the white oak tree's long, slow reach for the sky. Experiencing these diverse textures and sentiences that are concretely revealed phenomenologically as self-generating is important for a felt understanding that humans are not the sole sources of order on the planet. But do we really gain what we hope to through introducing a coarse binary by asserting that seemingly human technologies are devoid of alterity? Here again we must avoid concluding that more-

² Some more recent estimates are more conservative. For example, Sender, Milo and Fuchs (2016) think it is closer to 3.9 to 3 (in favour of bacteria). But the point is much the same: 'we' are a superorganism and it is baffling to figure out what role the human 'I' subject plays in it.

than-humanizing our experience of technology would somehow flatten our perceptual worlds so much that there would be no reason to seek out, to admire and revere, to love and protect that places and things that are so obviously filled with nonhumanity.

The jagged granite remains an irreplaceable encounter at least in part because of the grace and ease at which it can pull us into visual and textual patterns so clearly not our own, and time scales vast enough to shrink anthropocentric pretensions. And yet, the iPhone has its more-than-humanness too, and the struggle with it is to uncover this dimension from beneath the thick sheen of apparent humanness. 'Whose' logic is the iPhone really designed for? And who, the designer? Who designed the logic that humans engage in and that the iPhone manifests? And who, the purposes that guide these designs? Surely both were not imported into the world but rather developed from within it. Does it really matter whether creative processes operate according to an imposed teleology, that the intricate patterns of ice freezing on a stream are not dictated from without, that intelligence in all its varied forms across the biosphere are the process and product of a giant complex system without 'purpose?' Instead of this insight diminishing our spellbound admiration of the products of intelligence, in a post-theological world we instead become stilled and inspired by the awesome power of the processes that created these intelligences in the first place. And these processes, though not themselves 'intelligent' are clearly able to produce more complex things than 'intelligence' itself can, evidenced by the fact that they have created, well... intelligence *itself*. Beneath the appearance of an iPhone's human bling lies the fact that it, like everything else, is of a more-than-human process. Environmental education must seek to uncover the more than humanness residing in technology.

Further, as soon as the technology is created and deployed, it enters into circuits of processes, acting in unexpected ways that continuously defy our control (Latour, 2004; Bennett, 2010), with side effects becoming only imperfectly understood through use, stoking desires we hardly had or creating new ones entirely, seeding self-validating cascades that are neither human nor technological but the joint product of both along with all other processes involved. That we may be increasingly habituated to technologies that destroy meaningful life, of great suffering and carnage, is independent of the fact that the sheer power of these vast processes is awe-inspiring. The giant avalanche of technology driven capitalism is creating radically new forms of complexity while effacing others, a storm swept into, and now sweeping, existence. While Abram might ask us to stand before the awesome power of the giant spinning hurricane in the skies above, what other hurricanes are now spiralling away? An understanding of feedback only adds to the felt sense of their mystery and power. We can appreciate their immensity while fearing or hating its outcomes, and can recognize our powerlessness while still being a part of its future waning.

AN ABIDING HUMILITY FOR ANTHROPOHOLICS?

One reviewer suggested I omit reference to addiction in this paper as it seemed to introduce an additional theme that would be difficult to substantiate within an article of this length. That may be the case. But I will risk doing so anyway as I see important parallels between the discussion of more-than-human that I have been developing and the alternative epistemology/ontology suggested by Gregory Bateson (1972) (and Alcoholics Anonymous (AA)). First, there are similarities in the types of situations that AA and the more-than-humanizing project seek to remedy. In both cases, various interlocking historical, material, conceptual and emotional factors conspire to show the impossibility of simple willpower to be a sufficient catalyst for change. And yet, both alcoholics and environment-destroyers are often rallied by those around them to be strong in the face of these forces. When environmentalists and environmental educators call upon people to “be the change” they are invoking a similar belief in linear causal agency that leads the alcoholic to believe that he or she can control the addiction. Friends and family cheer on the alcoholic in much the same way as David Suzuki’s Blue Dot campaign calls on individuals to take action.’ As this paper suggests, admitting that one is not strong enough is not necessarily to admit defeat. For Alcoholics Anonymous, recognizing that one is part of a field of processes that one cannot control is seen as the beginning of health. It marks the beginning of a correction of a pathological epistemology, pathological because the very belief in one’s own ‘power’ fed into a broader positive feedback loop that exacerbated the very conditions one was attempting to resist. The destructiveness of some more-than-human things are often partially the result of the fact that we mistake them as ‘human,’ and do not approach them with the circumspection required in the face of any wild and powerful process. If causality is circular in the way that is becoming clear in the ecological sciences, then there is no way out of it. We are trapped in the belly of the *Chthulucene* (Haraway 2015), a massive many-faced creature with countless tentacles reaching across and transforming the planet, sucking us up into itself, and spiralling in its frenzy towards some seemingly abominable end.

We need to replace a concept of linear causality with one that recognizes feedback. This can initiate the positive feedback of accelerating destruction into the negative feedback characterized by balance and regulation. Further steps in the AA program are directly aimed at creating and maintaining such negative feedback, by establishing a community, a discourse, and a set of practices that continually remind the alcoholic that she has very little causal potency within these broader dynamics. Whether or not psychologists will agree that we legitimately have another addiction here, whether or not we are *anthropoholics* addicted to a certain conception of unique and linear agency in the universe, is a moot point. I personally think that being locked in positive feedback such that solutions only re-enforce the problem invites such a diagnosis but it is not necessary to argue over the use of terminology. There are obviously

unanswered questions and it is not clear when the metaphor will break down: will we, or should we 'hit bottom' as AA demands occur? Are there withdrawal effects from not being anthropocentric? Can one really be addicted to a set of concepts or mental habits? And so on. In any case, what is apparent is that completing Abram's task of more-than-humanizing things in our experiential field that appear as dearly human is a move consonant with the epistemological remedies that AA proposes.

In an online essay, Abram articulates a mood underlying all his work: "An abiding humility in the face of the Earth's exuberant multiplicity, wildness, and weirdness is, I believe, a necessary quality of our kind and the best possible medicine for what ails us" (2013). His call for humility insists that humans are most beautiful and wise when they are receptive to the beauty and wisdom around them and that they suffer and decay when they become enthralled in the seeming glitter and majesty of their own making. In what seems fitting coincidence, Abram is clearly speaking within the bounds of his namesake, the Abrahamic tradition ("Humble yourself before the Lord, and He will lift you up"; James 4:10), but is calling for this same orientation towards the immanent instead of the transcendent. I call for this too. For Abram, this humility is generated through contact with the more-than-human which is immanent within experience but increasingly difficult to encounter.

I agree with Abram that humility is essential for a rich human experience and for the ongoing sustenance of our species and those of the planet. It should be a key concern for education at all levels. As we have explored, the question becomes: well, what is human, anyway? What does it mean to focus on the human instead of the more-than-human? As we have seen, when we try to answer this question, it becomes apparent that much of what we thought was human was already more-than-human, and much *more* more-than-human than we might suppose. This is true of thought, of technologies, of our bodies, and of all our alleged ingenuities. We praise our brains for their cognition but the praise is misdirected because without certain gut bacteria we would never have sufficient and appropriate neurotransmitters to think well in the first place (Reardon 2014; indeed Sagan 2011 has called our symbiotic bodies "more-than-human"). We praise our capacity to think but cognition is only possible through the organization of countless cells, each one alive and responsive to its environment, co-evolving for millions of years and orchestrating a wondrous feedback loop that marries the body and the environment. Phenomenologically, it has been pointed out, at least since Nietzsche, that a "thought comes when 'it wishes'" (2000, 214) and as we've seen, thinking does not conform to a subject-object structure. We seem immersed in the cascades and ebbs of a cognitive process circulating between our self and our world, and not as 'captains' of the vessel. Wherever we look, whatever we think 'we' have done collapses into countless circulating causes and factors responsible for producing outcomes that we did not invent and cannot control.

Growing numbers of geologists, ecologists, and now social scientists and humanities scholars, point out that there are few, if any, 'natural' places left on Earth. We are continually reminded that even the most remote ecosystems have been affected in countless ways by our species. I've tried to suggest here that extending what we label 'human' outward is arbitrary, hubristic, and ultimately counterproductive. While it is possible to see our print in all that catches our eye, it is just as easy to pull apart apparently human things and expose the colossal number of interactions, conditions, and processes that bear the print of a wild otherness, of unexpectedness, of causal relationships that are not of our own origin. If the issue is a need for humility and the consequent shift in attitude and behaviour it entails, then we ought to acknowledge that in all phenomena, *both* those protective and destructive of the intricate community of life around us, it is difficult, even paradoxical, to establish how and where the human is intervening.

Consequently, neither Abram's dichotomy between human things and more-than-humans nor that between sensorial and abstract experiences hold as tightly as he suggests. And his holding these dichotomies strongly are what impede the full realization of the project he initiated. The challenge for educators is to assist learners in understanding how current ways of understanding confuse by falsely separating the abstract and the human from the sensory and the more-than-human, and how these understandings can be shifted to foster acknowledgement of the varied creative capacities that gave—and give—birth to all things. Perhaps we are all *anthropoholics* through and through. In any case, it is a suggestive warning. We must abandon our assumption of having untenable causal potency and uniqueness as agents (of greatness or destruction) in the biosphere. Educators seeking to restore sensitivity, appreciation, and responsiveness to the secular—albeit reverence-worthy—forces that flow across the planet need to be ever vigilant at exposing conceptual frameworks that desiccate such experiences even while offering potential solutions to the problems at hand.

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