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RESEARCH

How Stones Think: Thinking with Eduardo Kohn and Alfred North Whitehead In a Panpsychist Direction

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This article will defend a panpsychist orientation to think with and beyond anthropologist Eduardo Kohn's semiotic understanding of life. Kohn's book How Forests Think was inspired by semiotician Charles Sanders Peirce in order to develop a semiotic definition of thought that could include not only other animals, but even ecosystems and forests. But unlike Peirce, Kohn does not adopt a panpsychist position, choosing to retain an animate/inanimate distinction in order to avoid a generalization of intentionality that could lead to "the flattening of the world." In order to access the semiotic particularities of living organisms and allow for ethical prerogatives to protect these forms, Kohn claimed that differentiating between material forms was essential. After elucidating such a "flattening of the world" in the work of philosopher Freya Mathews and Jane Bennett, this article will show that such distinctions can and have been integrated into a panpsychist system, that of philosopher A. N. Whitehead. Though stones may think in a rudimentary way, developing a Whiteheadian panpsychist framework can help us to differentiate between natural living and non-living entities, aggregative structures and human-made artefacts so that we can understand how complexity evolves in particular ways that allow for the development of sentience and intentionality. By distinguishing material forms in this way, we can retain an ethics that allows us to differentiate between a leopard and a laptop, a rose and a rock, and in this way provide an ethical framework to address the Anthropocene age.

Keywords: Eduardo Kohn; biosemiotics; panpsychism; posthumanism; Anthropocene; Ecological ethics; Charles Sanders Pierce; Alfred North Whitehead

Following upon the Holocene, the Anthropocene is the name given to a new geological epoch to indicate the fact that the strata of the earth have been indelibly marked by the presence of the *anthropos*, the human species. From the Greek *anthropos*, human, and *kainos*, new, the term Anthropocene was coined in 2000 by atmospheric chemist Paul Crutzen, winner of the Nobel Prize for his research on the ozone layer, in order to signal the dissolution of the divide between nature and culture (Crutzen and Stoermer 2000).

> The Anthropocene represents a new phase in the history of the Earth, when natural forces and human forces became intertwined, so that the fate of one determines the fate of the other. Geologically, this is a remarkable episode in the history of the planet. (Zalasiewicz et al. 2010: 2228)

The term has now been adopted by many geologists and environmental scientists, and the International Commission on Stratigraphy has organised an Anthropocene Working Group to decide upon the geological relevance of the human-wrought changes to the eco-sphere, and the best date for the end of the Holocene and the beginning of this new geological era. Crutzen himself initially favoured the Industrial Revolution as the major shifting point, focusing his research on the hole in the ozone layer humans have created over the Antarctic, the level of methane in the atmosphere, and the 30% rise in carbon dioxide emissions (other scientists have since added the acidification of the oceans, the rise in global temperature, the rate of species extinction, the loss of soil fertility due to fertilizers, and the loss of arctic ice). Other scholars locate the start date for the Anthropocene with the birth of capitalism in the 16th century (Jason Moore 2016), since it sets into place a strategy of 'cheap nature' that was implemented by techno-industrial means, while others prefer the atomic bomb at mid-century (Jan Zalasiewicz et al. 2015), since it left significant levels of plutonium in the earth's strata, or even the birth of agriculture in the 6th century BCE, due to deforestation and land clearing. In 2019, the Commission selected The Great Acceleration around 1950, when population, GDP, energy use, and fertilizer consumption spiked noticeably. But in 2021, because of so many different convincing start dates, the Commission concluded that the Anthropocene was better understood as a geological event, rather than an epoch, leading to a rejection of a dated epoch in 2024, since dating the

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epoch in the 1950's ignored too many earlier important contributions to the Anthropocene. But notwithstanding the lack of consensus regarding its beginnings, scholars are in agreement that the Anthropocene undermines the core Modern tenet of the nature/culture divide since, from deet-resistant mosquitoes to the ozone heavens, there is no nature untouched by culture. Philosopher Ulrich Beck explains as follows:

> At the end of the twentieth century nature *is* society and society is also '*nature*'. Anyone who continues to speak of nature as non-society is speaking in terms from a different century, which no longer capture our reality. (Beck 1992, 81)

Though the term has become immensely popular,[1] scholars often fail to acknowledge the ontological consequences of this new age, and the many ways it deconstructs Modern ideology. If nature and culture can no longer be differentiated, it is the entire foundation of modernity in Cartesian substance dualism that opposed the *res cogitans* and the *res extensa* that now appears both unsustainable and irrelevant. Binaries such as 'nature' and 'culture' and 'mind' and 'matter' have thus come to be understood as regional anthropological contributions rather than universal objective criteria, the product of a particular historical process with a specific distribution of ontological properties developed and structurally maintained by Western modernity.

Though the deconstruction of these modern dichotomies can be traced back to biosemiotics, and in particular to Jakob von Uexkull's life-environment Umwelt,[2] Watsuji Tetsuro's fudo,[3] or Charles Peirce's semiotics, today such efforts have been taken up in the fields of philosophy, anthropology, sociology, environmental science, and many other disciplines in order to understand the social causes of climate change and seek ways of conceptualizing 'nature-cultures' (Haraway 2003) beyond the boundaries of Western Enlightenment dualism. Such ontological dualisms have been held accountable for justifying a hierarchy of values that placed the immaterial soul or mind over and against the material body, the world of culture over and against the world of nature, and human values, over and against a valueless nonhuman world. Such dualities and antagonisms have created a world divided against itself, where nonhuman nature has been deprived of value, and the material, animal, sentient, and mortal human being has falsely understood its identity as somehow transcendent, purely rational, and heaven, rather than earthbound. Once we take seriously the new ontological framework of the Anthropocene Age, we can see that an ethical framework that addresses the more-than-human world has become necessary. But such a framework requires the organizational differentiation of material forms in order to avoid treating the born and the made, aggregative and teleonomic entities, as equivalent.

One of the most important movements attempting to counter the dualities set up in modernity to avoid the implications of the relationality and interdependence of all of matter (subject/object, nature/culture, matter/mind, human/nonhuman) is the philosophical movement called New Materialism. New Materialists reject anthropocentrism and portray the agency of the more-than-human world as entangled with human agency, undermining the subject/object divide. Because the human being is no longer understood as exceptional, and set over and against a world of objects, many new materialists also consider themselves to be posthumanist, since agency is generalised to all animate and non-animate entities. Anthropocentrism and humanism are indeed allies, since it is the belief in humanist exceptionalism that informs the human subject against a world of objects, human culture against a world of nature, and human reason against a world of matter. This anthropocentric vision is being replaced by a flurry of studies from disciplines as diverse as biology, physics, cognitive science, information technology, anthropology, sociology, philosophy, political science, palaeontology, archaeology, primatology, geology, and indigenous studies that seek to show that, rather than an autonomous creature somehow standing apart from material conditions and relations, the human being is part of and dependent upon a web of material relations.[4] Following philosopher Bruno Latour in undermining the modern divide between interiority and exteriority that differentiated between actors and acted upon in terms of inner intentions, such studies understand all matter as forces or what Latour calls 'actants' which assemble into collectivities to express interdependent agency.

Another movement that similarly deconstructs the nature/culture divide and provides a strategy for exiting substance dualism is panpsychism, the philosophical position that generalises sentience or mind to all material configurations, thereby replacing modern dichotomies with an organic monism[5] capable of reintegrating mind into matter, culture into nature, and value into the nonhuman world. According to the Oxford dictionary, panpsychism is 'the doctrine that the physical world is pervasively psychical, sentient, or conscious (understood as equivalent).' Philosopher Thomas Nagel gives us the most well-known definition of the term, when he tells us: 'By panpsychism I mean the view that the basic physical constituents of the universe have mental properties, whether or not they are parts of living organisms' (1979, 181). Philosopher Galen Strawson has similarly claimed that the experiential 'can't emerge from the wholly and utterly nonexperiential', and therefore, 'There is no good reason to believe that anything nonexperiential exists.' Since 'all concrete reality is necessarily experiential' he concludes that 'we should favor panpsychism over all other substantive theories of the fundamental nature of reality' (2017, 80, 82, 98, 104–105). If matter is enminded and experiential, then sentience, awareness, and relationality can be extended to the nonhuman world, and with it, the values and rights attributed to the human person.

Understanding consciousness as a continuous and fundamental quality of the universe itself whose 'emergence with the birth of the universe is neither more nor less mysterious than the emergence of matter and energy' (Velmans 2014, 371) has led some scholars to follow philosopher and physicist David Bohm in equating

panpsychism with quantum field theory, a sort of 'swarm intelligence', 'hive mind' (Montero 2017, 225), or 'property of the breathing earth' (Abrams 2017, 222). Philosopher David Abrams espouses this approach, since it offers a resolution to the Western separation of the human mind from brute nature. For Abrams, attributing consciousness to the earth itself could help overcome anthropocentrism, or what he calls 'the era of human arrogance… that has now brought the current biosphere to the very brink of the abyss' (2017, 241). Suggesting 'that mind is not at all a human possession but rather a property of the breathing Earth – a property in which we, along with the other animals and plants, all participate' could bring to light 'the thorough dependence of human culture upon the continued creativity and flourishing of the more-than-human natural world' (Abrams 2017, 223).

Such a panpsychist understanding of the earth can have important ethical consequences, in that the human mind is integrated into a universe with which it shares sentience or even what philosopher Skrbina calls 'the quality of enmindedness' (2017, 5). Instead of taking for granted, as the Modern paradigm has done, that mind is what has set us apart from the rest of nature, sharing mind with the earth can in itself overturn human exceptionalism and replace it with more empathetic and ecological values that give ethical consideration to all minded matter. For philosopher Patrick Spät, in light of our climate crisis, 'The formulation of 'human dignity' is without a doubt very important and one of the greatest intellectual and ethical achievements in human history, but the present situation calls for widening its scope to all participants in the planetary ecosystem' (2009, 175–176).

Though both New Materialist and panpsychist scholarship are enabling this widened scope for value beyond the bounds of anthropocentrism, this article will seek to elucidate an ethical danger that can ensue from destroying the boundary between sentient and non-sentient matter and will use Whitehead's exposition of panpsychism to correct this danger. By using Whitehead's analysis of different material configurations, matter that suffers and 'thinks' can be distinguished from matter that does not, giving us a philosophical basis to enlarge ethics to the more-than-human world without confusing aggregative entities[6] with no centralisation (like a computer) from teleonomic centralised entities (like polar bears). Section I of this article will elucidate what has come to be called the 'flat ontologies' that treat all material configurations as equal, in the scholarship of panpsychist Freya Mathews and New Materialist Jane Bennett. We will then point to some shortcomings of this scholarship that ensues from treating the constructed and the evolved as equivalent. If we are unable to differentiate between centralised entities capable of experiential unity, and aggregative structures without centralisation and experience, such a conflation creates a night in which all cows are black, and undermines our ability to make moral judgments to defend beings that suffer and ecosystems that sustain life.

Though this article is philosophical in nature, we will use anthropology in Section II to illustrate a solution to such flat ontologies in the work of anthropologists Tim Ingold and Eduardo Kohn, who differentiate between animate and inanimate organisms. We will pay particular attention to Kohn's novel conceptualisation of thought as the capacity to remember a past to predict a future, a definition that allows him to include ecosystems and forests as capable of thought. In this way, agency and thought can be generalised to the more-than-human world while at the same time excluding inanimate entities, thereby allowing for a differential ethics.

But after using Kohn's scholarship to correct what philosopher Whitehead calls 'the fallacy of composition', the inability to differentiate between material configurations, we will develop the panpsychist theory that inspired Kohn's semiotic approach, that of Charles Peirce, which calls for us to move beyond Kohn's divide between animate and inanimate entities in order to espouse the continuity of material configurations. We will thus attempt to follow Anand Pandian when he tries 'to pry open a space for thought beyond the domain of biological life, by returning in part to certain neglected ideas proposed by C.S. Peirce' (2014, 246). In developing a panpsychist interpretation of matter in his exposition of matter as congealed mind, Peirce allows us to attribute thinking to all matter.

But unlike the 'flat ontology' of Mathews and Bennett, such a panpsychist interpretation can undermine anthropocentrism while at the same time providing an analytic framework that differentiates between material configurations and thus allows for ethical distinctions. Section III will thus elucidate the work of panpsychist philosopher Alfred North Whitehead, who develops a powerful analysis of different material configurations, only some of which merit our moral regard. In this way, we can enlarge the category of thinking actants to the more-than-human world, while at the same time elaborating specific categories of materiality in order to find a solution to the moral aporia created by flat ontologies.

I. The Night in Which All Cows Are Black

If New Materialist and panpsychist views can provide an ethical reorientation for the Anthropocene age to include the more-than-human world, such views can also be used to do just the opposite, by undermining the distinction between animate and inanimate matter, between made and evolved entities. Philosopher Freya Mathews is a good example of such a trend. Though she espouses dual-aspect panpsychism, rather than using it to undermine anthropocentrism in order to further the health of the ecosphere, she uses panpsychism to problematise the very possibility of making ecological moral judgments. Reducing the meaning of matter, or what she calls 'nature' to physics, and thus to particles, she claims that 'nature will not be of particular interest to environmentalists, since such a nature cannot be threatened, and does not, on the face of it at any rate, stand in need of human protection or conservation' (Mathews 2005, 26). If environmentalists focus exclusively on the biological definition of nature, 'since it is this biological realm which is clearly under threat from the engines of industry and

the appetites of global markets today', (Mathews 2005, 26) they are unable, she claims, to defend inorganic elements of the environment like rivers, caves, and mountains. When ecologists seek to defend 'elements or aspects of the world that have not been created or unduly modified by human agency' (Mathews 2005, 27) they divide matter over and against itself, as if the matter of a vacuum cleaner were somehow different from the matter of a kangaroo. But since panpsychism endows the entire material world with what she calls 'an internal or subjectival aspect', no distinction can be drawn between the agency of the living and the non-living, the human and the non-human, the made and the evolved. And she concludes:

> All material form is to some extent, from a panpsychist point of view, a manifestation of mentality; therefore to regard trees and rocks and animals, not to mention webs, hives, termite mounds, and coral reefs, as falling within nature, and cars and fax machines and cities as falling outside it, seems to be a case of oversimplifying the issue, to say the least. Any form of environmentalism resting on such a dichotomization of the human and the non-human will undoubtedly end up reinstating dualistic fault lines in the terrain of modern thought and practice, despite its own best intentions. (Mathews 2005, 27)

Once nature has been reduced to matter and matter to conscious molecules, there is indeed no distinction between a human artefact like a car and naturally evolved forms of matter like forests. Indeed, once she has reduced nature to molecules, Mathews is justified in claiming that letting a forest regrow is equivalent to letting a city go derelict, and indeed, this is precisely what she calls for, to allow ghettos to disintegrate, cars to rust, and weeds to grow.[7] Mathews' inability to differentiate between human-made artefacts, created by exterior aggregation to serve particular human purposes, and planetary evolution, developed to secure the present and future equilibrium of ecosystems leads her to diminish the importance of social welfare and ecological efforts to remediate climate change.

By treating structures created by humans for particular human uses as identical to structures evolved to sustain themselves as essential elements in the eco-dependent flourishing of an entire ecosystem constitutes an inability to judge what can and should be corrected and improved by humans (like tenement buildings) and what should not (like forests[8]), what is good for life on the planet and what is not. If panpsychism is used as an argument to claim that we are unable to differentiate the living from the non-living, the natural from the artefactual, we will be unable to develop critical judgments and work together to develop an ethics to address climate change. Cars don't suffer and are not going extinct. Trees and rivers, mountains and prairies are necessary habitats for the biodiversity of the planet and regulators of planetary CO_2 levels. Slums should be improved, forests should be protected.

Seeking to undermine not only the human/non-human divide, but also the living/non-living and made/evolved distinctions is also central to New Materialist scholarship, as it is of post-humanism, transhumanism and Object-Oriented Ontology.[9] Generalising agency to the non-living is a central component of the Actor-Network theory developed by Bruno Latour, and accepting the equal value and agency of non-life is central in the work of New Materialist philosophers Jane Bennett and Isabelle Stengers as well as anthropologist Elisabeth Povinelli. Since life depends upon non-life, and as Povinelli puts it, 'life is merely a moment in the greater dynamic unfolding of Nonlife' (Povinelli 2016, 176), devoting oneself to defending neutrinos or ancestors is as equally commendable as defending forests and rhinos. And if neutrinos, ancestors, and hair dryers are also sentient according to panpsychists, how are we to avoid indifference toward the destruction of the living earth, since, after all, everything has to die and decay at some point or another? If we are to treat a rock with the same consideration as a jaguar, and a washing machine as equivalent to an indigenous Anuar, it is difficult to avoid a certain moral nihilism intrinsic to commodity fetishism.[10] Such an attribution of sentience to human artefacts makes it difficult to differentiate between those animals with agency that can suffer and whose death is a loss for the ecosystem, and those things made to serve human ends that decompose without suffering and without participating in ecosystemic equilibrium at all. Though Mathews is correct at a very abstract level that the entire planet, petrol, hair dryers, streams, forests and tadpoles, is made of molecules which may be sentient to varying degrees, shifting from ontological essences to relational degrees does not create a 'night in which all cows are black', as Hegel put it. The fact that all of matter is sentient does not entail that it is all equally so, nor that it therefore demands a similar ethical response.

Just as Mathews uses panpsychism to claim that all matter is sentient and thus that we cannot differentiate between artefacts and evolved beings, philosopher Jane Bennett similarly applies the living criteria of health indiscriminately to all matter. She asks,

> What would happen to our thinking about politics if we took more seriously the idea that technological and natural materialities were themselves actors alongside and within us – were vitalities, trajectories, and powers irreducible to the meanings, intentions, or symbolic values humans invest in them? (Bennett 2010, 48)

Overcoming the modern distinction between the human and other forms of life, and replacing such a distinction with the materiality and health of bodies is certainly necessary and beneficial since, as she puts it, 'it can inspire a greater sense of the extent to which all bodies are kin in the sense of being inextricably enmeshed in

a dense network of relations (Bennett 2010, 47–48). But Bennett goes too far when she proceeds to treat 'technological and natural materialities' as synonymous and include human artefacts like cars and computers in the network of vibrant and healthy bodies. In what sense is a hammer's vitality irreducible to the uses humans invest in it? A chair is not vibrant the way a dog or a daffodil is, and a vacuum cleaner does not require the same type of care that a homeless person or an ecosystem does. By not distinguishing between 'technological and natural materialities' Bennett adopts a position similar to that of Mathews who used panpsychism to draw a parallel between forests and slums, anthropomorphising the non-living and using language usually reserved for the living – 'vibrant', 'kinship', 'healthy', and 'enabling' – to describe inanimate matter. Bennett has admitted that her work has 'a touch of anthropocentrism'[11] but claims this is essential in order to replace passive descriptions of objects with active ones. Yet the work of Bruno Latour amply demonstrates that objects can be understood as active agents, without needing to be described in terms of 'health' and 'kinship'. How can human artefacts and natural living materialities be treated as equivalent, in light of the physiological criteria of health she uses? Does she really think that animating a car as more or less healthy, and thus more or less alive is a good idea? There are bodies that enter into kinship relations, are healthy or ill, enabled or hindered, and bodies that do not. There are bodies that we treat as means to an end, and bodies that we do not. If confined to life forms, Bennett's physiological criteria could be used to defend an embodied ethics that could go far in overcoming the exploitation not only of certain humans (those historically identified with the body and embodied functions) but also of other living organisms. But attributing the same vibrant enabling criteria to inanimate artifacts undermines her project from within by reinforcing commodity fetichism and concealing human labour and human power relations behind such 'vibrant' commodities. As Bennett must herself be well aware, the advertising industry and capitalist market are happy to exploit the anthropomorphisation of artifacts for greater profit at the expense of the environment and the sustainable living she advocates.

By attributing sentience and health to human artefacts that stand outside of evolutionary ecosystems authors such as Mathews and Bennett undermine, perhaps unknowingly, the very possibility of moral engagement and judgement. The lack of distinction between living and non-living entities makes political and ethical considerations obsolete, since it leaves us unable to differentiate between sensate, conscious beings who suffer, intend and resist, and constructed entities devoid of sensation who carry out the programs they were designed for. Under these conditions, it becomes impossible to protect animals and ecologies from torture and destruction, since they are no different from paper-cutters, computers and trains. Isn't a technological tool made of human social relations in a way that a polar bear is not, and isn't such a distinction essential to understanding the nature of the tool and of the bear?

II. An Anthropology Beyond the Human

Due to this growing tendency to generalise all agency as equal (Bruno Latour), all matter as vibrant (Bennett), and all matter as equally sentient (Mathews), many scholars have developed theories that seek to differentiate between different material forms, and the levels of sentience and awareness their configuration enables them to express, in order to avoid the moral vacuum created by flat ontologies. Because scholars of AI have tended to anthropomorphise machines and mechanise humans, this tendency has become a widespread form of alienation and has reinforced a misunderstanding of the nature of nature, as material configuration. We will discuss two attempts to overcome this alienation, those of anthropologists Tim Ingold and Eduardo Kohn. Where Ingold differentiates between living and dead organisms, Kohn's biosemiotics is able to extend life to entire ecosystems such as forests. At the end of this section, we will use the thought of panpsychist semiotician Charles Peirce to enlarge the scope of thought beyond the animate boundary espoused by Kohn, without losing the ability to differentiate material forms and thus to make moral judgments.

Anthropologist Tim Ingold holds Latour, Bennett and Mathews to account for eliding the distinction between living organisms and inert matter and flattening all forms of matter to an external expression of agency, vibrancy, or sentience. Imagining a discussion between an ant (Latour) and a spider (himself), spider claims that 'it is simply absurd to place a grain of sand and an aphid on the scales of a balance and to claim that they are equivalent' (Ingold 2011, 94). Aphids, he points out, have nervous systems, which gives them, and all other creatures with nervous systems, a capacity of 'attention' that differentiates the grain of sand from the aphid, and the spider from a leaf. He writes:

> It is the attentiveness of this movement that qualifies it as an instance of *action* and, by the same token, qualifies me as an *agent.* To put it another way, the essence of action lies not in forethought (as our human philosopher would claim) but in the close coupling of bodily movement and perception. (Ingold 2011, 94)

It is due to this attention that humans and spiders and other living beings can remember what they learn and develop skills over time to adapt to their environment, and these skills differentiate our actions from those of inanimate entities. A car or a rug does not have the attentiveness to context and the perceptual abilities to transform itself and grow in light of its context the way living agents do. And he concludes: 'To attribute agency to objects that do not grow or develop, that consequently embody no skill, and whose movement is not therefore coupled to their perception, is ludicrous' (Ingold 2011, 94). We are the particular animal that uses inanimate

tools to increase our perception, and thus to modify our skills to respond to a world that speaks to us through the agency of myriad living entities, whose voices can be heard and whose health can be fostered, but only if we are able to differentiate between bodies that suffer, intend, and flourish, and bodies that don't.

Ingold's analysis points to some important distinctions between perceptive organisms with nervous systems that grow and develop, but his distinction is unable to take into account the rivers and mountains that Mathews rightly mentions as requiring consideration. In the age of the Anthropocene, when ecological concerns have become so crucial for the survival of the planet, we must develop a politics and an ethics that can engage with polar bears but also with glaciers, with clown fish but also with coral reefs. So, though nervous systems should certainly be important criteria to help understand living animals and develop animal rights, it is not in itself sufficient to implement a politics and an ethics for the Anthropocene. The lives of spiders and aphids, as well as human lives, are to a large extent determined by inanimate forms of matter that do not have nervous systems, and we must find a way to account for their agency, their status as ends, and the ways they enter into an interdependent mesh with living bodies.

Anthropologist Eduardo Kohn has found a way to enlarge his definition of life to include animals, plants and their habitats (he excludes the mineral and chemical) without sacrificing the distinction between living and non-living organisms. Kohn's anthropology 'beyond the human' extends thinking, and with it 'strivings, purposes, telos, intentions, functions and significance' to entire ecosystems.[12] His book *How Forests Think: Toward an Anthropology Beyond the Human* describes his field-work in the Colombian rain forest working with indigenous peoples. In order to describe emergent meanings that do not revolve around the human, he uses Pierce's semiotic system to develop a system of signs to characterize selves. In this way he is able to convincingly explain what differentiates living and non-living matter, and to develop a philosophy of life that includes not just the animals in the forest, but the forest itself. Because life is semiotic, and signs have meaning only for selves, a self is a living organism that maintains an individual form over time. Kohn agrees with Ingold that such forms 'learn by experience, which is another way of saying that, through the semiotic process I've been describing, they can grow' (2013, 77). But unlike Bennett he claims that materiality is not enough to confer vitality (Kohn 2013, 92) for it is only thinking matter that is alive. He defines thought as the semiotic ability of form to remember the past and predict a future, and it is such thought that accounts for vitality and differentiates animate from inanimate matter. Rather than distributing agency to matter indiscriminately, Kohn asks us to understand agency as the unique attribute of animate selves that interpret and represent the world around them and therefore think: 'life thinks; stones don't' (Kohn 2013, 100). Recalling Uexküll's famous explanation of the lifeworld of the tick, Kohn uses the example of the anteater to show that it is formed by past knowledge of ant tunnels, which are other to it yet essential to the form it seeks to maintain. Agency should not be attributed indiscriminately to all action but rather only to the action of an organism that 'acts for itself' in order to maintain its form in relation to an otherness that it is not but that it depends upon to survive and project itself into the future. Anteaters therefore think, since thought is 'the product of an expectation – of a highly embodied 'guess' at what the future will hold' (Kohn 2013, 76), in this case ant tunnels similar to ones to which it adapted its snout in the past. In his own words:

> Living beings differ from snowflakes because life is intrinsically semiotic, and semiosis is always for a self. The form an individual anteater takes comes to represent, for a future instantiation of itself, the environment its lineage has come to fit over evolutionary time. Anteater lineages selectively remember their previous fits to their environments; snowflakes don't. …any kind of life, be it human, biological, or even, someday, inorganic, will spontaneously exhibit this embodied, localized, representational, future-predicting dynamic that captures, amplifies, and proliferates the tendency toward habit taking in a future instantiation of itself. (Kohn 2013, 77–78)

In accord with complex systems theory, for which 'external causes are conceived as unchainers of inner processes' (Bunge 1979, 197), Kohn uses a causal analysis to trace agency back to a form of interiority that is not expressed as inner intention, but rather as the ability to remember and project a form in conformity to an environment. Such an ability to remember a past and project a future is necessary both to understand change over time, and to cultivate the foresight that is necessary to project a liveable future in a shared world. In Kohn's analysis, cause and effect is intrinsically linked to the temporality that constitutes selves as open to the future. Without such an ability to project ourselves into the future based upon causal analyses of the past, we will always arrive too late, once a nuclear plant or oil rig has leaked and contaminated an ecosystem, once there are no more honey bees to pollinate flowers, once we have run out of fossil fuel and can no longer sustain our economies.

Such a wide definition of semiotic signs and thus of 'living thought' allows Kohn to differentiate between forms of agency, and thus to accuse Latour and Bennett of attributing to both things and humans 'mixtures of thing-like and humanlike properties' (Kohn 2013, 91). Latour is unable to capture the specificity of living organisms for Kohn, because he reduces agency to what can be represented or what resists representation. He is thus left with 'the actuality or brute factuality of the entity in question', thereby reinstating the 'material/meaning divide' (Kohn 2013, 91) that he sought to overcome. As we saw with Bennett, Kohn similarly accuses Latour of anthropomorphizing nonhuman matter, speaking of the

'sufferings', 'interest', and 'trials' of inanimate matter (Kohn 2013, 91). As Kohn makes clear:

> But resistance is not agency. Conflating resistance and agency blinds us to the kinds of agency that do in fact exist beyond the human. Because telos, representation, intentionality, and selfhood still need to be accounted for and because the way such processes emerge and operate beyond the human is not theorized, Latourian science studies is forced to fall back on humanlike forms of representation and intentionality as operative in the world beyond the human... This approach to nonhuman agency overlooks the fact that some nonhumans, namely, those that are alive, are selves. As selves, they are not just represented, but they also represent. And they can do so without having to 'speak' (2013, 91–2).

Where Latour was able to account for climates and rivers by not distinguishing between animate/inanimate agency, Kohn accounts for them by including them amongst the living. Indeed, by developing a theory of semiotic relationality in opposition to Latour's material agency, Kohn is able to achieve similar results and interpret ecosystems as living materialities. Forests and all other ecosystems are alive because they think and represent using semiotic signs. As active agents, they can represent themselves, and do not need human delegates to 'speak' for them in a representational democracy. Kohn's semiotic analyses were inspired by the socially imbedded patterns of everyday life that he shared with the human and more-than-human thinkers of Avila and would not have been possible for an armchair anthropologist. In order to hear these many agents, the human person must be reintegrated into a sonorous world filled with other thoughts and other semiotic messages, so that she can communicate directly with the ghost jaguars, the trees, the flying ants and the spirits of the dead.

In light of scientific findings in the field of ethology, attributing value exclusively to the human animal is no longer justifiable in scientific, ethical, and ecological terms. As philosopher John Cobb puts it, 'there is no reason to restrict value so narrowly. On the contrary, there is every reason to assume that living things in general enjoy living and want to continue living' (Cobb 2004, 187). Once we realise that organic entities have centralised experience and value living and seeking to achieve their subjective ends, we can reinterpret the Anthropocene, not as the age of human stewardship over the natural world, but rather as the age when we find ourselves 'amongst a democracy of creatures' (Whitehead, 1978, 68). The Anthropocene, writes anthropologist Eduardo Kohn, 'is a problem because value is intrinsic to life; life uniquely involves value' (Kohn 2017, 195).

Kohn's biosemiotic system uses Peirce's semiotic system to include ecosystems and all living organisms capable of using the past to inform the future. But Kohn is no panpsychist and he focuses on reflexively individuated volitional entities made up of cells to the exclusion of non-living matter. Such a biosemiotics is an excellent means of valuing life and differentiating sentient volitional material configurations from non-sentient, non-volitional ones. But in order to fully address the challenge of Mathews and Bennett, a more complete schemata of material forms of agency and experience is needed in order to distinguish different material configurations, understand the relationship between parts and wholes and differentiate between constructed and evolved entities. Indeed, panpsychist philosopher Bertrand Russell will use Kohn's same criteria to grant rudimentary thought even to non-living material configurations. Russell, for example, uses the criteria of volitional memory to grant thought to a river bed as follows:

> This [memory] also can be illustrated in a lesser degree by the behaviour of inorganic matter. A watercourse which at most times is dry gradually wears a channel down a gully at the times when it flows, and subsequent rains follow [a similar] course... You may say, if you like, that the river bed 'remembers' previous occasions when it experienced cooling streams. ... You would say [this] was a flight of fancy because you are of the opinion that rivers and river beds do not 'think: But if thinking consists of certain modifications of behaviour owing to former occurrences, then we shall have to say that the river bed thinks, though its thinking is somewhat rudimentary. (Russell 1956, 155)

According to Russell, learning from the past in order to create habits that are conducive to flourishing in the present and predicting the future cannot be limited to living organisms alone. Indeed, Peirce himself moves beyond the semiotic limits of Kohn's 'living thought' by postulating continuity as an absolute principle of reality. Because 'we ought to assume things to be continuous as far as we can,' Peirce will contend that we cannot separate matter from mind, and thus that we should think of matter as 'congealed mind' (Peirce, 1992, 277), or again matter is 'specialized and partially deadened mind' (Peirce 1892a, 533). Based upon his understanding of habit as responsible for congealing into laws, Peirce will claim that the laws of nature are nothing but material habits, acting with a 'peculiarly high degree of mechanical regularity, or routine' (1992, 277). Peirce will thus be led to adopt a panpsychist position[13] in his well-known essay 'Man's Glassy Essence,' published in the *Monist* in 1892. He explains as follows:

> It would be a mistake to conceive of the psychical and the physical aspects of matter as two aspects absolutely distinct. Viewing a thing from the outside, considering its relations of action and reaction with other things, it appears as matter. Viewing it from the inside, looking at its immediate character as feeling, it appears as consciousness (Peirce 1892b, 20).

Mind thus pervades all of nature, and all material configurations, not just living organisms, can project a future based upon learning from the past. When Kohn claims that 'life thinks; stones don't' (2013, 100) he is defending living organisms in order to allow for moral judgments to be made in such a world. But if we were to follow Peirce a bit further than Kohn is willing to do, and admit the continuity of all material configurations, we could adopt a panpsychist position without sacrificing the differential characteristics that allow for moral judgments.

III. Whitehead: Differentiating a Stone from a Stork

Due to the difficulty of his writing and his concepts, Alfred North Whitehead's philosophy has not always been recognised for what it is, one of the most important and original philosophical contributions of the 20th century. A major influence on philosophers such as Gilles Deleuze and Félix Guattari, Hannah Arendt, Maurice Merleau-Ponty, and more recently Isabelle Stengers, Whitehead has developed the differential characteristics of the real into six specific categories, elucidating and giving analytic precision to different material configurations. Though he never called himself a panpsychist, Whitehead gives a panpsychist justification for indigenous attributions of personhood by deconstructing substances and understanding reality in terms of transitory experiential events which exist only relationally. He is thus able to provide the most rigorous counterargument to those scholars who conflate constructed and evolved entities.

Because he holds that there are no substances, only events, each event is only the accumulation of its effects on other events. In this way, our perception is not something enclosed inside a soul, or a self, but is part of the world, directly in contact with those events that cause its sensual organization of the world. Because subjects are not substances with inner qualities and states that might constitute an unchanging soul, independent ontological substances represent,

> ...the misconception which has haunted philosophic literature throughout the centuries... There is no such mode of existence; every entity is only to be understood in terms of the way in which it is interwoven with the rest of the Universe (Whitehead 2011, 687, cited in Henning 2005, 29).

Whitehead calls this perception *prehension*, a general form of experience that can include unconscious sentience as well as conscious mental states. It is by including unconscious sentience within the category of prehension that Whitehead is able to extend experience to events that Western philosophy has categorized as unliving matter, and hence as falling outside the realm of moral considerability. Never merely representations of an external world or unfeeling physical events, prehensions are themselves experiential events in the world, and thus sentient subjects. By generalising experience to all of matter, Whitehead is able to move beyond the divide between mind and matter, as well as that between subject and object, and thereby 'lead to more penetrating ways of understanding' (1968, 135).

Since all events are self-organizing and self-determining to varying degrees, all events can be considered organisms, and Whitehead does indeed refer to his philosophy as a 'philosophy of organism'. Yet, rather than entailing that all of matter is equally sentient, Whitehead clearly differentiates between different modes of organising matter, detailing gradations of experience for different material configurations. Organisms that are entirely aggregative with no internal centralisation form what Whitehead calls a nexus (and Ferré calls 'aggregate entities'), whereas different degrees of organization between constituting parts create a 'social order' (Ferré, 1996, 337) constituting what Whitehead calls societies. As philosopher Joseph Bracken points out, these societies resemble 'natural systems' in that they refer to what he calls organic, suborganic, and supra-organic systems, to trees, to molecules, and to human communities (1985, 3). Non-living societies are typified by stable behaviour, inherited from the past, and show next to no signs of spontaneity or change. Living societies, on the other hand, show signs of creative spontaneity (Henning 2005), conforming to Kohn's understanding of life in learning from the past to adapt and conform to their environments in order to predict a future and thus to project their own survival and well-being into the future. Such societies are often interdependent, living organisms working with unliving nexuses in order to create conditions of equilibrium (Armstrong-Buck 1986, 247). There are thus no ontological differences amongst organisms, but rather differences of degree of organization and centralization. Susan Armstrong-Buck clarifies this point as follows:

> The differences then between inorganic material and the highest reaches of human consciousness are due to differences in the organization of the constituent actual occasions into nexus and structured societies. A conscious thought entertained by the dominant occasion of a human psyche is dimly foreshadowed by the conceptual prehensions of the simplest actual occasions in a piece of iron ore, tradition-bound though they are. (1986, 249)

Though we cannot grasp the quality of their experience, feeling exists even in electrons and living cells. But an earthworm would, to cite Frederick Ferré, 'seem a Mozart by comparison' (1996, 356). Likewise, a sparrow experiences its environment far more intensely than does an earthworm, and the bonobo can achieve even more complex and rich experiences than a sparrow. The more developed brain structure of homo sapiens means that humans are capable of even more complex and hence even more valuable experiences than the bonobo.[14]

Whitehead focuses upon six primary configurations of matter: aggregate entities (for example a rock), systematic entities (for example an airplane), formal temporal and nontemporal entities (for instance, a species), organic entities (like a possum), compound entities (for example a cell), and fundamental entities which cannot be further

reduced (like water), all of which, as he puts it, 'influence each other, require each other, and lead on to each other' (1968, 156–157 and Ferré 1996, 336–338). As composed of these different typologies, matter is constituted by differences, with varying degrees of internal relations and hence centralisation. Since ontological entities do not exist as more than passing events for Whitehead, these differences are always a matter of degree. Though the molecules that constitute them may have a very basic level of unconscious experience, inorganic aggregates like rocks possess no centralisation, and thus no subjective experience. Having no experiential unity that might allow for feelings and individual agential action, such aggregates are created from without, often in layers. Such aggregates can form into societies, such as billiard balls or mountains, that give them constitutive properties that a mere pile of sand does not have. But such properties do *not* give these aggregates experiential unity, and lacking strong internal relations, they cannot respond to their environment as individuals. As Deacon explains:

> Only living organisms are truly individual in the sense that all aspects of their constitution are organized around the maintenance and perpetuation of this form of organization. It is the circularity of this consequential architecture – teleodynamics – that both delineates and creates the individuality that is organism self. Organism functions are in this way indirectly self-referential and self-projecting. In the inanimate world around us, we find no trace of this circularity of generative processes. Though bounded and unified, neither stones, nor drops of water, nor automobiles, nor computers, nor any other non-living artifact is reflexively individuated in this way. (2012, 465)

Misunderstanding panpsychism by amalgamating these six different configurations of matter together is a category mistake. The different ways that matter is organised produce different modes of functioning, different teleologies and causes, different levels of sentience and awareness, and thus different explanations. If Nagel ascribes mental properties to the basic constituents of matter, this does not in any way presuppose that the composite entities formed by means of these basic constituents unify such mental properties into a sentient, thinking whole. This error is known as the 'fallacy of composition'. Philosopher Pierfrancesco Basile explains as follows: 'Surely, to believe that a whole (a rock) must have all the properties of its parts (the rock's ultimate constituents) is to be guilty of the mistake known as 'the fallacy of composition'' (Basile 2009, 181).

Whitehead's organisational schemata allows for a clear and convincing means of differentiating between material events and explaining how consciousness and self-consciousness can be enjoyed only by those individuals whose molecules form cells that form nervous systems and brains capable of individualising experience. So, when scholars demean panpsychism by claiming that such a position holds that rocks can think, they misunderstand it. Firstly, thinking must be redefined in order to understand those scholars such as Kohn (2017) and Russell (1927, 1956) who do indeed claim that thinking can be generalised to all entities capable of learning from the past to predict the future and adapt to the present. And secondly, if we choose to retain a definition of thinking that includes self-consciousness, then only those compound individuals possessing centralised experience are capable of it. For Whitehead, if all compound individuals do indeed have experience of varying degrees some of which are capable of thought, aggregate entities do not, since their parts are not centralised in such a manner as to allow for individualised experience.

Whitehead's environmental ethics entails understanding that all experience is valuable, and we should feel obligated not only to recognize the significance of all entities' experience, but also to recognize that the richer and more complex the experience is, the more significant and valuable it is (Armstrong-Buck 1986, 251). Panpsychism can thus help us to overcome human exceptionalism, without leading to a night in which all cows are black. Matter matters, in many different degrees and many different configurations, only some of which communicate, suffer, and think, and only some of which are essential for the planetary equilibrium that we must strive to redeem.

Conclusion

In this time of ecological crisis, it is essential to recognize the conceptual framework that has facilitated the commodification and expropriation of the non-human world. Mind-body dualism must be held accountable for justifying a hierarchy of values that placed the immaterial soul or mind over and against the material body, the world of culture over and against the world of nature, and human values over and against a valueless non-human world. Such dualities and antagonisms have created a world divided against itself, where non-human nature has been deprived of intrinsic value, and the material, animal, sentient, mortal human being has falsely understood its identity as somehow transcendent, purely rational, and heaven rather than earth-bound. Panpsychism could go far in overcoming these illusions and replacing them with an organic monism capable of reintegrating mind into matter, culture into nature, and value into the non-human world. If matter is enminded, then sentience, awareness, and relationality can be extended to the non-human world, and with it, the values and rights attributed to the human person.

Because panpsychism is intrinsic to the religious worldview of animism (Conty, 2021),[15] today many animist societies have been using this ontology to defend their ecosystems and give legal and moral rights to natural 'persons' considered inanimate and without value by Western naturalism. Their battles to defend their ecosystems show how an ontology not founded in Modern dichotomies can respond to the Anthropocene Age and work concretely towards enlarging the scope of our values to include the more-than-human world. Today, examples abound of enlarging personhood to

include other animals, as well as rivers and mountains, as a means of gaining rights to protect habitats essential for ecosystem survival.[16] Such work has been taken up in the field of the law in 'Indigenous Governance Systems' as well as 'Earth jurisprudence' and 'Wild Law' (Cormac Cullinan), which adhere to laws where 'the Earth itself is the source of law' (Hosken 2011, 25–6, cited in Alberts 2015, 136). Such a non-anthropocentric legal basis has enabled animist communities to give legal personhood to non-human entities such as rivers (New Zealand's Whanganui river, India's Ganges and Yamuna rivers, the Vilcabamba river in Ecuador, as well as the Atrato and Amazon rivers in Colombia). In these cases, the rivers were indeed allowed to defend themselves in court, with the help of 'negotiators' or 'legal guardians', who were in all cases interlocutors and not Western scientists. In the case of the Whanganui river, its negotiator, Gerrard Albert, defended the river as an ancestor:

> ...we consider the river an ancestor and always have...treating the river as a living entity is the correct way to approach it, as an indivisible whole, instead of the traditional model for the last 100 years of treating it from a perspective of ownership and management. (Roy 2017)

The Vilcabamba river defended itself as plaintiff, with the help of legal guardians Richard Frederick Wheeler and Eleanor Geer Huddle, calling for its own right to 'exist' and to 'maintain itself' over and against the Loja government, which wanted to build a highway that would interfere with the river's flow. The river won.

Ecuador decided to recognise the intrinsic value of its eco-system legally in its constitution in 2008, establishing in article 255 the principles of 'harmony with nature, defense of biodiversity and the prohibition of private appropriation for use and exclusive exploitation of plants, animals, microorganisms, and any living matter' (Cited in Avelar 2013, 270). Bolivia then similarly passed the *Ley de Derechos de la Madre Tierra* (Law of the Rights of Mother Earth) in 2010. These examples reveal the political implications of enlarging personhood to the more-than-human world, in order to both stretch and deconstruct legal categories to enable an enlarged scope for ethics. Personhood, like thinking for Kohn, can be defined in semiotic terms that includes all of life rather than just human beings. But to do so, we must rigorously differentiate material forms, to avoid conflating aggregative and teleodynamic entities.

It is thus essential to study material forms in terms of their causation, their relationality, their unity and their intentionality in order to clearly differentiate between different material configurations. Natural living entities find their cause in evolution which allows them to grow based upon autonomous morphogenesis. They are transformed by adapting to an ecosystem and its many inhabitants, which they also transform. They have united perception and intentional structures imbedded in their morphogenetic structure, and their actions are intentional, as they seek teleonomically to survive and reproduce. Natural non-living forms find their cause in the Big Bang but rather than evolving, they undergo geological and atmospheric transformation caused by outside sources, which can transform both their form and substance. They have aggregative structures and thus no internal unity that would allow for perceptual and intentional awareness, though their parts (molecules) may be sentient at a very basic level. Human artefacts are caused by human beings to serve particular ends. They do not evolve nor constitute environmental eco-systems, though they can be programmed to relate to such eco-systems. They are transformed by geological and atmospheric pressures from without, but as aggregative structures, they have no internal intentionality that could allow them to grow by means of morphogenesis. They have no intrinsic teleonomic unity and cannot reproduce, though they may be constituted with a unitary structure given to them by the human beings that create them. As aggregative structures, they are not sentient, though their parts may be sentient at a very basic level. Natural non-living forms and human artefacts differ in that such natural forms constitute the fundamental elemental structure of the earth and its atmosphere. These elements are essential to eco-systems and the forms of life which inhabit them, whereas human artefacts are not. Human artefacts can destroy, abet, and transform living and non-living natural forms, but are not necessary for the survival of either. Taking into account these different material configurations is essential to constitute the values that are so lacking in the conceptual attempts to address climate change. Contrary to the tendency we saw at work in the scholarship of Mathews and Bennett, such differences cannot be sublated, for they allow us to understand how complexity evolves in particular ways that allow for the development of sentience, awareness and intentionality.

Without studying the material configurations of each entity in order to understand its level of complexity and sentience, we tend to characterise the nonhuman world in the Cartesian terms of *res extensa*. Yet by claiming that there are no 'brute facts', devoid of experience, Whitehead provides a necessary critique of what he calls the 'vacuous actuality' of Cartesian dualism. Since the universe is a process that organises itself to allow for greater complexification and thus greater awareness and sentience, all extension (*res extensa*) is vibrating subjective experience (*res cogitans*) and 'apart from the experiences of subjects there is nothing, nothing, nothing, bare nothingness' (1978, 167, cited in Henning 2005, 38). Each experiential event thus seeks to sustain itself in order to reach its own goals. Whitehead writes: 'If we discard the notion of vacuous existence, we must conceive each actuality as attaining an end for itself. Its very existence is the presentation of its many components to itself, for the sake of its own ends' (1929, 30–31, cited in Henning 2005, 39–40). In seeking to maintain itself, each entity is a self-valuing experiential event, leading to what Henning calls an 'ontological democracy' where 'everything has

value in and for itself. To be actual is to have value' (2005, 39–40).

The stone then, cannot feel, if by sentience we mean the intentional structure of subjective experience. As a nexus, it is an aggregative entity with no internal centralisation, and thus no ability to respond to its environment as an individual. But perhaps, to repeat Bertrand Russell's point, 'if thinking consists of certain modifications of behavior owing to former occurrences' (1956, 155) then the river bed, and the stone, have rudimentary thought. Indeed, Kohn himself has recently acknowledged this fact. He writes: 'I should note here that my recent work in the Amazon… has convinced me that stones, one way or another, do indeed think' (Kohn 2018, 118–119). In an article on cosmopolitics, anthropologist Viveiros de Castro repeats a comment from philosopher Michel Serres on the myth of Sisyphus and the importance of considering the rock:

> Everyone talks about Sisyphus, [Serres] points out, and no one says anything about the rock! 'The myth shows the continual fall of the rock,' yet we notice only 'the guilty, unhappy hero working like a slave (Hache & Latour 2010, 319).

And Viveiros de Castro continues: 'Indeed – what about the rock?… Panpsychism. That's what we should be moving to. Animals are just the first step. We'll get to the rocks eventually' (Viveiros de Castro 2013).[17] Riverbeds and rocks do not suffer, but perhaps, in their own way, they do think, as they remember, in the very event of coagulation of their aggregative parts, thousands of years of erosion, of wind and sun, of flood and flow.

And perhaps, in their own way, they speak. In their ethnographic research amongst the Australian aborigines and the Nayaka people of India, anthropologists Elisabeth Povinelli and Nurit Bird-David both mention that stones can occasionally become people, when they speak. Thus Bird-David describes a Nayaka woman and man who tell her about the moment a particular stone became what she calls a dividual[18] (*devaru*) by communicating with her: 'this *devaru* came towards her', and 'this *devaru* jumped onto her lap'. Amongst the Nayaka there is no universalization of stones as a category of dividuals, since only some stones speak.

Similarly, anthropologist Elizabeth Povinelli has sought to enlarge semiosis beyond the bounds of the living by describing a particular manganese mountain range in Australia that the Aborigines call *Two Women Sitting Down*, which communicates dreaming paths to those who propitiate it, and is thus attributed intentional personhood. Using the enlarged semiotic system developed by Kohn, which attributes thinking to the semiotic communication not only of other animals, but also of forests, Povinelli claims that the mountain range can remember the past and can thus tell aboriginal Australians about the future. Yet such persons can 'be' only if they are heard. She asks:

> How blithely should we extend the features of human subjectivity in language to all other existents? What covert categories of human language models the call to let the inanimate speak, to having their voices heard? (Povinelli 2016, 106)

To enlarge our perception in order to hear these stones, we would need to develop argus eyes and elephant ears. Instead of the monolinguism that is so widespread today, we would need to learn the language of the Nayaka and the Aborigine, but also to learn fungus language and whale language. And perhaps even, to extend our perceptual acuity to include the non-living, and learn wind language and stone language. By enlarging our semiotic forms of communication beyond the linguistic, Povinelli asks how we might thereby also transform political forms of governance to become more inclusive. She writes:

> Do the concepts of Logos and subjectivity place a limit on the kind of noise that can enter the dialectic of the demos, who can speak and who can only be spoken for…? Or will other sensory interpretants become the norm—the olfactory rather than linguistic, the ephemeral quasi-event rather than a concrete and enduring major explosion of change? Does noise need to go to Logos, or is it Logos that must first be decentered by noise in order to become something else? (Povinelli 2016, 122)

In the Anthropocene age, when *logos* has escaped the cage of human culture, scholars like Kohn and Povinelli have been tracing this decentering of *logos,* tuning our ears to the noise become voice, and to the ephemeral semiotic quasi-events that speak louder than words. A manganese mountain can be both *Two Women Sitting Down*, and the site of a profitable manganese mine, both dead matter, and a speaking dividual. Perhaps a panpsychist orientation can help us to accept the multiplicity and permeability of the real and come to understand how 'congealed mind' can respond to those who have ears to hear. I will conclude with the words of Lynn White Jr, when he asks us if 'people have ethical obligations towards rocks?'

> If the time comes when to any considerable group of us such a question is no longer ridiculous, we may be on the verge of a change of value structure that will make possible measures to cope with the growing ecological crisis (White 1973, 63).

Notes

[1] The term has also received sustained critique, many scholars proposing alternative terms in order to put emphasis on the capitalist economy (Moore's Capitalocene), extractive monoculture colonial plantation agriculture (Haraway and Tsing's Plantationocene), chthonic forces as kin to foster liveable futures (Haraway's Chthulucene), or war

and systematic ecological destruction (Christophe Bonneuil and Jean-Baptiste Fressoz's thanatocene). All of these alternatives are relevant and important, but they will not be developed here due to the focus of this article on panpsychism.

[2] Von Uexküll, Jaco. A Foray into the Worlds of Animals and Humans: with A Theory of Meaning. University of Minnesota Press, 2010.

[3] Tetsuro, Watsuji.Climate and Culture: A Philosophical Study, Geoffrey Bownas (trans.). New York: Greenwood Press, 1988.

[4] In line with such research, we can now read about How Things Shape the Mind: In Defense of Things, Vibrant Matter: A Political Ecology of Things, Evocative Objects: Things We Think With, Cognitive Life of Things, The Social Life of Things, The Moral Status of Technical Artefacts, and The Democracy of Objects, to name only the most catchy book titles.

[5] This term is used in contrast to mechanistic materialism, to signal that all entities are enmeshed and entangled in ecosystems rather than isolated outside of an integrated material universe.

[6] Aggregation is a Whiteheadian term that refers to entities that are built in layers, from outside in, with no internal centralisation, in opposition to entities like cells that grow from within and possess experiential unity. Whitehead understands centralisation to entail teleodynamics with experiential unity, due to the fact that all aspects of their constitution are organised around the organisation of internal relations, such as a nervous system.

[7] She writes: 'When we say, "let's fix the world up – let's pull down these slummy old tenement blocks and build a brand new permacultural-urban-ecovillage in their stead" – we are just as much in the grip of the old ethos of domination and control as the city fathers were. We are rejecting the given in favour of an abstract or imagined alternative of our own – we are refusing to let things be – and it is this hubristic mentality which is the motor of modern civilization and the source of the environmental crisis' (Mathews 2005, 37).

[8] Due to massive deforestation, many forests today are plantations, existing only due to human intervention. In addition, humans have always transformed their environments, helping certain tree and plant species to flourish and discouraging others. In his book *In Amazonia: A Natural History* Hugh Raffles gives us an excellent example by showing the nature-culture symbiosis at work in the Amazon rain forest. My point here is simply that natural habitats do not require human intervention to thrive, and indeed, that much of Modern intervention has been utilitarian, seeking human benefit over and against ecosystem health, leading to massive species extinctions.

[9] See for instance Verbeek (2009; 2014) and Bryant (2014). Such a position is also quite common amongst transhumanists like Nick Bostrom (2005), and those seeking a future on the unliving star Mars. It is also fairly common amongst philosophers of technology like Lucas Introna (2009), who see no difference between stones and dogs, and claim that it is ontologically unfair to discriminate against the stone.

[10] Commodity fetishism 'was notably articulated by Karl Marx in his seminal work, Das Kapital, where he described how consumers often lose sight of the labour and processes involved in the production of goods. In such environments, the relationship between consumers and commodities becomes depersonalized, leading individuals to evaluate products based on their perceived status or cultural significance rather than their inherent utility.' https://www.ebsco.com/research-starters/economics/commodity-fetishism.

[11] Cited in Gratton 2010, 99. In a 2010 interview with Peter Gratton, Bennett defends anthropomorphising the inorganic as follows: 'the human body is itself a composite of many different it-bodies, including bacteria, viruses, metals, etc. and that when we recognize a resemblance between a human form and a nonhuman one, sometimes the connecting link is a shared inorganicism. I think that anthropomorphizing can be a valuable technique for building an ecological sensibility in oneself, but of course it is insufficient to the task' (100). Cited in Speculations, 1 no. 1 (2010): 84–134.

[12] It should be noted that animism is the rule, not the exception, in anthropological studies of indigenous peoples. Readers can consult Philippe Descola (1993; 2005; 2011) and Eduardo Viveiros de Castro (2009; 2015). What is original in Eduardo Kohn's research is his fruitful integration of indigenous anthropology and Peircean semiotics. Such an integration could go far in pointing to the ways that animistic worldviews contribute to a politics of nature with important repercussions for the Anthropocene.

[13] Lawrence Cahoone will confirm this position as follows: 'In his accounts of pragmatism Peirce conceived mind within a naturalistic context as a means by which an organism accomplishes its tasks. But in his metaphysics, because he wished to avoid dualism, yet despaired that mind could be derived from matter, he concluded that matter must be "frozen" or "coarse" mind, mind whose capacity for taking on new habits was exhausted. Hence, he endorsed "panpsychism." What enabled him to locate his naturalism inside an idealist or panpsychist conception is that he did not take the view of most historical idealists that the human mind makes an end run around physical law to be continuous with a Divine or Absolute mind. The later falls afoul of all modern science, because cosmological, chemical, and biological evolution show that minds anything like our human or animal minds must be latecomers to the universe. Peirce's conception avoids their error by putting human minds in nature before deriving nature from inchoate mind.' (55–56) Cahoone, Lawrence. "Reduction, Emergence, and Ordinal Physicalism." Transactions of the Charles S. Peirce Society, 44 no. 1 (2008): 40–62.

[14] Some may take issue with gradations of value being attributed by means of the criteria of complexity. Not only does this criteria appear insufficient for value judgments, but our ignorance of other animals makes it somewhat arbitrary. Though we may be able to claim that human cultures are more complex than Chimpanzee cultures, since we share 98.8 of our DNA with chimpanzees, we are only beginning to fathom the complexity of cephalopods, whales, elephants, and the hive mind and swarm intelligence of insects.

[15] "Graham Harvey defines animism as the belief 'that the world is full of persons, only some of whom are human, and that life is always lived in relationship to others' (2006a: xi). When constituted in terms of relationality, personhood is no longer the exclusive property of human beings. All animals are persons, meaning they all share consciousness and soul. In the terms of anthropologist Viveiros de Castro, to be a person 'is to be conscious and self-conscious, to act intentionally, with agency, and to communicate intelligently and deliberately' (2017: 187). See my article: Conty, Arianne. "Animism in the Anthropocene." Theory, Culture & Society, 39, no. 5 (2021). https://journals.sagepub.com/doi/10.1177/02632764211039283.

[16] These procedures have met with some success, as can be witnessed when indigenous struggles for ecological sustainability led to fourteen indigenous organisations and twenty-four ONG signing the Indigenous and Environmentalist Alliance for an Amazon for Humanity in 1980, and subsequently forming the Alliance for the Environment, a network of organisations struggling to protect all the living beings of the Amazon Basin (Alberts 2015, 151–152). More recently, Tebtebba Organisation in the Phillipines, as well as Indigenous Partnership on Climate Change and Forests, and Indigenous Peoples Global Network on Climate Change and Sustainable Development (IPCCSD), are amongst the largest ecological organizations in the world, operating in sixteen countries.

[17] Eduardo Viveiros de Castro is repeating a phrase that philosophers Bruno Latour and Emilie Hache had themselves repeated, from Michel Serres. Viveiros de Castro, Eduardo. "Economic Development and Cosmopolitical Re-Involvement: From Necessity to Sufficiency,' (28–41), In Contested Ecologies: Dialogues in the South on Nature and Knowledge, edited by Lesley. Green. Cape Town: HSRC Press, 2013.

[18] Dividual is the term chosen by Bird-David to translate the Indian Nayaka word devaru. Unlike the individual, the dividual is interdependent, configuring 'objectifications of sharing relations' (Bird David 1999, S68/S72) rather than representing an isolated mental substance.

Competing Interests

The author has no competing interests to declare.

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