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Stability in the heart of chaos; (Un)sustainable refrains in the language of climate crisis

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ABSTRACT

Set in the Capitalocene, this conceptual paper examines 'sustainability' in ecological education through a posthuman lens. I demonstrate how the Deleuzoguattarian concept of the refrain helps reconfigure the function of 'sustainability' as an affective force of unstable-stabilizing when facing increasingly violent climate crisis events. Currently, ecological education and 'sustainability' are presented as solutions to these effects. How 'sustainable' something is, is increasingly used as a standard to expound its virtues – especially in the marketing of products, consumables, and energy. However, aligning with eco-feminist new material critiques, I propose that sustainability has sedimented into a regime of inertia, functioning to perpetuate practices known to be harmful to the environment as an order-word of stoppage. This paper offers new perspectives to problems presented in the language of environmental education, in order to suggest radical reimaginings for practice in the development of pedagogy capable of harnessing the chaos of climate crisis.

Introduction

This paper considers the concept of sustainability as an affective force on human practices, and the impact of its increasing presence in formal education policy. I argue that the concept of 'sustainability' functions in environmental education—and indeed in wider society—to articulate the continuation of harmful human practices and lethargic attitudes toward climate crisis. In offering this reading of sustainability, the paper gives a demonstrable account of its material-discursive (Barad, 2007) capacities, and implications of detrimental practices therein, as definitive of the Capitalocene epoch (Moore, 2017). As curricula in diverse contexts increasingly focus on sustainability and ecology (cf. Ardoin et al., 2020; Dunlop & Rushton, 2022), this work offers a distinct and timely contribution to reconceptualizing 'sustainability' in education. Exploring various conceptual shifts in the language of sustainability through a posthuman, Deleuzoguattarian methodology, I suggest alternative perspectives of the issues present in how we conceptualize (and thus come to embody) our impact, role, and position on/in/through/with ecologies, aligning with eco-feminist new material critiques. My proposition is that, when viewed through the Deleuzoguattarian concept of the refrain (Deleuze & Guattari, 1987/2013), it is possible to consider how 'sustainability' belies a form of safety in the frightening chaos of climate change events. Demonstrating this as a false sense of security, I consider how sustainable endeavors thus come to function in education within the dangerous territory of apathy. The work culminates in suggesting educational imaginaries in response to this, and a call for research that radicalizes ecological[1] pedagogies by developing curriculums for chaos.

Cole (2022) incites the 'unwriting' of climate crisis to disrupt distancing tendencies that traditionally position academics as objective observers. Taking up this call, I attempt to unwrite sustainability through 'diagrammatic features' (Deleuze & Guattari, 1994, p. 75) such as found in ants, the Divine Right of Kings, fungi, carpentry, and death—examples to "follow the witch's flight" (Deleuze & Guattari, 1994, p. 41) in their capacity for generative thought (MacLure, 2022). The hope is to create a demonstrable conceptual bridging of phenomena, acting as a membrane between the abstract/virtual and the animate/material connections affected through the concept of sustainability in education. I bring together philosophical understandings of language and environmental education practice that are affective, material, bodily, and sensed (rather than comprised in scientific categorizations, rationalism, and objective truth—traits of Modernity critiqued below).

The paper's methodology deviates from analytic approaches traditional to mainstream language-based inquiry (such as discourse analysis). A growing area of interest within critical language studies (see Gurney & Demuro, 2023; Toohey et al., 2020), posthuman scholars increasingly ask questions about the ontological basis of language. I utilize the conceptual thinking tools of Deleuze and Guattari to explore the material-discursive, affective possibilities of language as an immanent force. In attempting to also map a contemporary conceptualization of sustainability, I draw from critical perspectives of sustainability found in eco-feminist new materialism[2]. Whilst I recognize the distinct trajectories and genealogies of ecofeminism, new materialism, and Deleuzoguattarian theory (for the first two, cf. Gough & Whitehouse, 2020), the 'plugging into' (Deleuze & Guattari, 1987/2013) of diverse paradigmatic positions offers new potentialities for thought. Furthermore, as Gough and Whitehouse (2020) state;

> …strictly delineated 'schools of thought' are possibly more relatable to the modernist project than the post[s]… scholars are running out of the luxury of time in which to debate the fixities of categories…[as] climate emergency is forcing the realization that no one conceptual model is going to see us through (p. 1422).

In current posthuman permutations, environmental education critique takes significant influence from eco-feminist new materialism. Naming but a few, scholars such as Alaimo (2010, 2016, 2019), Myrstad et al. (2022), Gough and Whitehouse (2018), Cutter-Mackenzie-Knowles et al. (2020), MacGregor (2021), have explored persuasive arguments concerning the role of human, non-human and more-than-human relationalities with/in environmental education. Thus, following established thinking practices converging Deleuzoguattarian philosophy with feminist new materialism (cf. Cole & Mirzaei Rafe, 2017), these concepts and critiques are put in conversation in this paper to contribute to posthuman perspectives on environmental education. As such, I do not explore the 'meaning' of sustainability, or delve into a sociolinguistic perspective to mine the depths of representational significance (cf. MacLure, 2013). Instead, language is understood as coming into being through ontological relationality; as a *becoming*. The broad project of Deleuzoguattarian methodology is to create generative spaces for thinking new thoughts through concepts, paying close attention to how a phenomenon may be *functioning* within the event in which it is deployed (Deleuze & Guattari, 1987/2013). Essentially, I aim not to understand what 'sustainability' means, but what it *does*.

Following my previous work (Evans, 2021; Evans et al., 2022), I am interested in the possibilities generated when normative terms are read through theoretically diverse means. Whilst accepting that the idea of a normative term is not an innocent one, it is fair to state (as others have, e.g. Seghezzo, 2009; Scoones, 2007) that the word 'sustainability' is now so integrated into everyday vocabulary we might assume an accepted definition. And therein lies the problem, and indeed the difficulty with all normative, generalized, agreed upon phrases; it gives sense of stability to something in constant flux. The 'something' here not only relates to language generally, but also to the practices and implications of human/non-human ecological relationships. Indeed, the idea of sustainability becomes futile and even a little absurd when considering that everything is in a constant state of relational variation. This understanding therefore begs the question (alluded to by O'Grady (2003), and Alaimo (2016)); what is actually sustained in sustainability?

In addressing this question, I begin by briefly mapping out the origins, and subsequent evolutions, of sustainability as a concept, and the impact that Modern epistemic scientism has on a contemporary understanding of it (cf. Bonnett, 2019), specifically in the dawning of the Capitalocene (Moore, 2017).

I situate the thinking so to foreground recent pedagogical movements toward sustainability and the assumptions inherent therein. The discussion moves to posthuman conceptions of language to critically examine the functions of material-discursive practices involved in 'sustainability', ultimately suggesting potentialities for practice in the harnessing of the chaos of climate crisis. Applying a posthuman conceptual framework, this work makes an important contribution to the field of 'eco' pedagogies by offering alternative readings of 'sustainability' and its material-discursive functions.

Sustainability and the Capitalocene; Modern thinking and ancient problems

Concerns over ecological reserves heavily relied upon as resources, such as woodlands, are documented in Europe as early as the Domesday Book (Hemery & Simblet, 2021), but the emergence of 'sustainability' in the eighteenth century formalized articulation for mitigating exhausting natural resources in the pursuit of economic gain (Grober, 2007; Scoones, 2007). The Modern notion 'sustainable yield' in nineteenth century forestry spoke to the need for wood in shipbuilding to expand empires and industry (Grober, 2007; Lumley & Armstrong, 2004), evolving into 'sustainable development' in light of emergent tensions between neoliberalism and climate change in the 1970/80s (Scoones, 2007). What is evident in the genealogy of sustainability is its concurrence with Western humanist ideals of scientific and economic progress (Mensah, 2019), and the rise of the Capitalocene (Moore, 2017). Also evident therefore is that, used as shorthand for ecological conservation in contemporary understandings, 'sustainability' is a misnomer.

Common usage of 'sustainability' might assume understanding within the same issues/contexts, which is far from true (Mensah, 2019; Seghezzo, 2009). Multi-dimensional understandings of 'sustainability' suggest that the conflation with ecological conservation likely stems from ambiguity of its meaning and assumptions therefore inferred (Seghezzo, 2009). However, situated as a purely utilitarian pursuit, the true intentions of sustainability lie in the practicalities of human domestication and not with non-human habitats or ecologies, as many might assume (or are led to believe). Alaimo (2016) explains that sustainability "is frequently invoked within economic and other news stories that do not, in any way, question the capitalist ideals of unfettered expansion" (p. 170). Taking this further, she argues that:

> sustainability has become a plastic but potent signifier, meaning, roughly, the ability to somehow keep things going, despite, or rather because of, the fact that we suspect economic and environmental crisis render this impossible (Alaimo, 2016, p. 170).

In arguing for recognition of the Capitalocene epoch, Moore (2017) demonstrates capitalism's endeavor to wring as much profit as possible from natural resources depends on ideological constructs of ontological prioritization. In the Capitalocene, he argues, nature is commodified and endlessly mined under the premise of "the separation of Humanity and Nature…[wherein] we inhabit something called Society, and act upon something called Nature" (Moore, 2017, p. 7). The indelible mark of humans on earth begins with "'human supremacism' in the distribution of earth's resources" (Bonnett, 2019, p. 254), and illustrates the ontological privileging of humans foundational to Modern thought. This is an ancient problem as, even in the Holocene—regarded as the most 'stable' epoch for (human) life—the rapid and often violent social developments invariably affected geographical environments (Leichenko & O'Brien, 2020). For millennia humans farmed, recoursed rivers, built cities, waged wars, industrialized and so gouged marks onto the earth in a way no other species has (excepting the hard work of mycelium, perhaps). This understanding offers a tidemark in the antecedental factors from which we find ourselves in the current climatic moment. For the past few centuries, humans have been preoccupied with futile attempts to force order on an infinitely chaotic and utterly indifferent universe. In categorization is the possibility for knowable and stable entities and phenomena, things that we could perhaps even claim a mastery over in our naming them so (an idea explored further below). Modernity relies on humancentric blunt cuts of precedence, and the problem of sustainability lies in the prevailing epistemological dogma of objective scientism and Cartesian rationalism (Bonnett, 2019). However, using the refrain as a tool of rethinking such *a priori* knowledges, Kleinherenbrink (2015) explores the problems associated with defining 'being', suggesting Deleuzoguattarian ontology as a counterpoint to that which currently serves

the *doxa* of rationality. The operation of dialectic division, such as in how we might understand dichotomized nature ≠ culture, mind ≠ body, natural ≠ artificial[3], is the basis from which practices and 'accepted' knowledge foundational to formal education emerge. It is thus important to consider the implications for sustainability when it becomes schooled to conceptualize alternative potentialities for practice.

Schooling sustainability

There are increasing educational initiatives concerning sustainability across contexts (cf. Greer et al., 2023). Such environmental education interventions broadly aim to promote awareness of ecological issues in the hopes of widening participation in conservation (cf. Valderrama-Hernández et al., 2017; Sommerville & Williams, 2015). Taking examples from the English schooling context[4], interventions usually fall within either formal curricula (i.e. specific legislative policy, such as the inclusion of the Natural History subject in Key Stage 3 and 4 in England by 2025 (DfE, 2022)) or arise through adjunct projects in by-proxy settings (such as the National Education Nature Park (Natural History Museum, n.d.) and Forest Schools). However, what is incredibly difficult to parse, is the foundational assumptions of such initiatives and the resultant implications for practice. There are two apparent readings (though undoubtably multiple tacit ones) situated respectively into either the economic or ecological camps for understanding what is intended in educational approaches to sustainability (Bonnett, 2019). Though much of the literature situates environment education practices generally within a broad framework of ecological conservation strategies (Ardoin et al., 2020), a more critical view exposes political and ideological nuance, such as that introduced above. As such, there is a conflation of economical sustainability and ecological sustainability. At the time of writing, the GCSE Natural History curriculum framework is still under development, with climate crisis and sustainability otherwise absent from policy in England (Dunlop & Rushton, 2022; Greer et al., 2023). However, the Department for Education's (DfE) 'Sustainability and climate change: a strategy for education and children's services' (DfE, 2022) policy paper alludes to the agendas and perspectives that will inform future legislation. What is clear from this document, is the vein from which this new subject will draw in its objectives for;

> …giving young people a further opportunity to engage with and develop a deeper knowledge and understanding of the natural world. In studying this GCSE, young people will explore organisms and environments in more depth, gain knowledge and practical experience of fieldwork and develop a greater understanding of conservation (DfE, 2022, Climate education).

What compounds 'the problem' explored in this article, is how sustainability is constructed within the epistemological assumptions of mainstream education. Pedagogy in mainstream settings being grounded in a structural framework of logic and objective truth impacts how sustainability is positioned, such as in the too-simplistic binary notions it affirms. Rhetorics of 'doing our bit to save the planet' tend toward rational hierarchies, wherein nature and culture are separated and need falls to humans to swoop in to save what cannot save itself (glossing over humans' role in creating environmental jeopardy in the first place). This is embedded within policy initiatives through the language afforded to how environmental education can "engage children and young people with the natural world" (DfE, 2022, Initiatives to drive the strategy), so they might "do their best to protect it" (DfE, 2022, The challenge and the opportunity), by studying GCSE Natural History to "develop a greater understanding of conservation" (DfE, 2022, Climate education). Here, the Capitalocenic relationship between humans and nature is reflected—the distant observer, occasional tourist, and rapacious consumer "of pristine nature, [that is] awaiting our protection, fearing destruction at our hands" (Moore, 2017, p. 4). These discourses thus give rise to paradoxical notions and practices such as; 'rewilding nature', the 'reintroduction' of wolves in western Europe, the monetized 'foraging industry', and often disregard non-human life's capabilities to thrive in places deemed 'hostile' (the narwhal of the Arctic, and Sahara's sand viper are perfectly comfortable in places regularly taught as 'inhospitable', and Chernobyl's Elephant Foot fungus is positively thriving). Bonnett (2019) suggests similar arguments in his long-established project critiquing the dialectic in environmental education, understanding the division of nature and culture as ultimately futile and dangerous. He states:

> I have explored the idea holding sway in Western culture of a superordinate 'metaphysics of mastery' whose ambition is to make all subject to the human will. I have argued that this—and the scientism that it spawns—are both precisely the root cause of our current environmental crisis and the chief obstacle to human flourishing: they alienate us both from nature and our own nature (p. 252).

Indeed, this 'metaphysics of mastery' runs throughout the DfE's sustainability strategy. For example, learning about nature with the National Education Nature Park initiative, will "develop young people's data and analytical skills" (DfE, 2022, Climate education), leading to increased numbers of "young people that become data scientists, ecologists and biologists, which are needed for nature's recovery" (DfE, 2022, Green skills and careers).

Paramount to understanding the complexity of issues in this policy, is the tension between sustainability's broad aim of 'continuing human flourishing' and the dominant humanist understanding of nature. At the heart of this tension is how we teach children about humans' place in the world, the resulting image situating us at the top of an ontological hierarchy. To unravel where this tension is most fraught, it is worth exploring what is meant by 'nature' and 'natural' - slipperier ideas than they might first seem. "What is nature?" asks Bonnett (2019, p. 251) as he sets the stage for an interrogation of, not only our direct relationship with ecologies, but fundamental questions about how nature and the natural world can be understood in the twenty first century. Dualisms inherent in dialectical modern thought offer over-simplistic, and often pointless, delineations between human and non-human ecologies (Moore, 2017). Positioning nature as other to and separate from human society creates a hierarchical view of being—one that assigns us responsibility to 'conserve' nature which, as suggested above, is what many understand by 'sustainability'. Of course, it must be recognized that this is a specifically Western, European viewpoint. Indigenous lifeways necessarily understand the symbiosis of human and non-human worlds and all constitutive forces therein (e.g. Abram, 1997; Alaimo, 2019; Cutter-Mackenzie-Knowles et al., 2020; Donald, 2019; Tuck et al., 2014). Such onto-epistemological knowledges do not assign humans the role of custodian for an axiomatic 'natural world', but as being just one element wholly and inseparably enmeshed-with, and co-constitutive of, everything else. Drawing from these understandings, eco-feminist new materialisms amplify non-dominant voices to challenge and subvert normative doxa that promote harmful, exclusionary practices. Scholars such as Alaimo (2016, p. 1) deride the "commonsensical assumption that the world exists as a background for the human subject" wherein the "lively world [is rendered] as a storehouse of supplies" (p. 169). Reading this with policy perspectives given above, sustainability in education can therefore be viewed as teaching human exceptionalism—what is 'worth' conserving is ours to say. Afterall, the leaf cutter ant does not strive to conserve the trees a colony can decimate—the trees fight back, but the ants do not try to sustain their natural resource (or perhaps they do, and my limited human understanding is too reductive for sophistication of ant society?).

However hegemonic a concept, 'the natural environment' is a Modern invention. The extent of human activity's impact on every ecological system, including interventions to preserve that which has been pushed to the brink of destruction, suggests that the earth cannot be considered 'natural' (cf. Alaimo, 2016; Garoian, 2012), some having gone further to state that "earth…is already very largely an artificial construct" (Adcock, 1992 cited in Garoian, 2012, p. 294). Indeed, it is not outrageous to suggest that we may now be in a 'post-nature' paradigm. If this is the case, what is being sustained by the project of sustainability is undoubtably the pursuit of economic growth through the 'survival' of destructive short-termist human practices (Bottoms, 2007 cited in Garoian, 2012). However, as will become apparent below, there may be a more complex material-discursive (Barad, 2007) ontological function at play in how sustainability is conceived.

Refrains; stabilizing the unsustainable

Chaos, in Deleuzoguattarian terms, is the unknowable 'virtual' components of reality that we encounter as a heterogenous collection of affective forces (Deleuze & Guattari, 1994; Plotnitsky, 2006). The disturbance of external forces felt by lived[5] beings, chaos holds within it all potentiality for becomings as the 'milieu of milieus' (Deleuze & Guattari, 1994). The 'chaosmos' is the ephemeral yet infinite plane of existence from which everything originates, the virtual space as likely to snuff out a possible life as create

it. An incomprehensible paradox, pure chaos is inhospitable. Providing regularity in cosmically chaotic flux, refrains (or ritornello, see Kleinherenbrink (2015)) function as articulatory mechanisms by forming sites of recognition, allowing subjectivities to be understood in alien territories. Life experienced without the filter of recognizable features would be an unbearable cacophony of sensation and incomprehensibility (Plotnitsky, 2006), meaning the refrain is an essential ontological instrument. A refrain is a motif that recurs within an assemblage and works toward the creation of a territory (an organized body/collection of understanding), with recognizable haecceity. Through these territory defining functions, the refrain creates familiar and knowable centers within the maelstrom of chaos, allowing for safe passage to new or existing territories. Offering respite and restoration, a security against the threats and turbulence in the chaos of existence, becomings in unstable territories are made hospitable in the rhythm afforded by a refrain, giving stability in "the heart of chaos" (Deleuze & Guattari, 1987/2013, p.362). However, these territories are not ridged and stratified, refrains have malleability. Deleuze and Guattari explain that; "… the refrain is rhythm and melody that have been territorialized because they have become expressive—and have become expressive because they are territorializing…there is a self-movement of expressive qualities" (2013, p. 369). As unstable stablizers, refrains therefore offer a platform from which to leap; a territory from which to deterritorialize and reterritorialize elsewhere, configuring becomings. This functions "like a rough sketch of a calming and stabilizing" able to "open onto a future…[and] meld with it" (Deleuze & Guattari, 1987/2013, pp. 362-363). From this, we can begin to imagine how understandings and knowledges move with us ontologically, immanently unfolding in new ways with developing need.

The refrain is a helpful thinking tool in this conceptual project as it allows for alternative epistemological understandings to prevailing Modern 'common sense'. Here we can conceive of knowing as ontologically emergent, not presupposed or self-evident. Understanding how the refrain helps beings establish their subjectivities demonstrates why it is such an important tool when thinking about how language functions in becomings. 'Language' here, is not confined to the boundaries of verbal or written expressions, but is understood as 'languaging' that is affective and material (see Gurney & Demuro, 2023). Hence, the term 'material-discursive' (Barad, 2007) is used in attempt to encapsulate an affective, limitless, heterogenous understanding of language. However, one of the difficulties of working with/through language is its paradoxical operations. Whilst language creates incorporeally recognized boundaries, categories and typologies, it does so with an infinitely limitless array of possibility for transformation (Deleuze, 1990/2015). When specific, continuous discursive practices coalesce and repeat, the formation of bodies is actualized. That is to say, things *become*. Habits, material-discursive habits, are how a refrain creates the dependability key to all becomings through its brittle rigidity—form enough to build on, but that can be shattered to make way for the new. However, some refrains are more robust than others. Recurring patterns within political ideology, for instance, are hard dying habits. This is seen in discursive motifs of England's 'world class', 'excellence', and 'high quality' education peppered throughout policy documents, such as the sustainability strategy paper (DfE, 2022). The forces of repetition in such rhetorics create obstacles for critical views about education, embedding mentalities into the fabric of policy through its wording. However, that is not to say that such strong forces are totally immoveable; the Divine Right of Kings once held much of European society in its grip, until the Enlightenment broke its power and established a new paradigmatic stronghold, paving the way for capitalism (Stengers, 2008). Helpfully, Enlightenment thinking bridges us back into the problematic of sustainability and prevailing eighteenth century epistemologies in education.

As explored above, sustainability in policy operates on practical and ideological levels that reveal tensions in implementation. On a practical level, curriculums that strive to be sensitive of ecological issues, and thereby don the mantle of sustainability, encounter issues due to a lack of resources and competing priorities and agendas (Abegglen et al., 2021). As demonstrated in the DfE's (2022) sustainability strategy, an overarching priority for environmental education is employability in 'green' careers that serve Britain's role 'leading the Green Industrial Revolution'. Capitalocenic agendas for "the endless accumulation of capital" (Moore, 2017, p. 3) are further emphasized in this strategy by commitments to retrain and reskill employed adults "in line with the needs of the green economy" (DfE, 2022, Green skills and careers). This continued concern for economic growth is emblematic of climate crisis, and indeed the place of mainstream education therein, exposing the heart of the conflict. The practical issues

of sustainability in a mass schooling context are further demonstrated by the (perceived) inequalities of access to nature in urban settings (DfE, 2022)—an understanding that begets ideological issues of how decisions are made about what is, and is not, 'nature'. Furthermore, sustainability in the curriculum often falls short of the task (Leichenko & O'Brien, 2020) when tacked onto the 'proper learning' of siloed subjects (Dunlop et al., 2022; Everth et al., 2023). Such 'proper learning' is conceptualized on the assumptions of Modernity's dialectic and the powerhouse of scientific civilization. Thus, on an ideological level, epistemic scientism being foundational to mainstream schooling, gives a vision of the world wherein everything is knowable, and climate crisis "can be dealt with by providing more knowledge and understanding" (Dunlop & Rushton, 2022, p. 1088). Indeed, the policy (DfE, 2022) positions sustainable futures, possible within 'green' education and careers, exclusively within STEM subjects. When considering the felt and sensed chaos of being in the time of climate change, trouble arises as "we are unable to shed the sense, so endemic to scientific civilization, of nature as a rather prosaic and predictable realm" (Abram, 1997, p. 16). When 'nature' proves itself otherwise we falter on our stable ground of sustaining that which we know. Suggesting that there is unrelenting and inevitable chaos, and feeling its affects in climate change events, is terrifying. In the need for solid ground, ideas are cleaved to and linked by "a minimum of constant rules" (Deleuze & Guattari, 1994, p. 201), wherein understandings and knowledges can proliferate. In doing so, rules, constants and solid lines are created in otherwise chaotic, unwieldy places and understandings are created by way of control. The habitual reassurance of being able to 'sustain' is so powerful and affective because the alternative is to accept the terror of chaotic uncertainty. So, we teach that sustainability is not only desirable, but possible.

The repetition of 'sustainability' in education acts as a refrain that generates comprehensible spaces from which we can operate within an otherwise volatile and uncertain future. In the coalescence of language and material affects a stable space is created in the chaotic plane of immanence, giving form to an understanding from which behaviors and practices can generate. Indeed, educational policy demands teachers "integrate sustainability into their teaching, through modelling sustainable practices and promoting sustainable development principles in relation to their subject specialism" (DfE, 2022, Climate education). However, even the United Nations (whose 2030 Sustainable Development Goals serve as the context to the DfE's strategy) have long recognized that "education often contributes to unsustainable living" through dangers of "reproducing unsustainable models and practices" (UN, 2012, p. 6). The material-discursive interplay in saying that something is un/sustainable is affective; the way in which we talk about it creates lived sensations that become behaviors/systems of operation. Considering the origins of the concept as a way to create an understanding of and processes for resourcing societal growth, as a plastic construct, sustainability has moved with humans as a means reach new territories of need despite feeling the resultant affects of climate crisis it has wrought. An example of this mechanism is the global dependance on fossil fuel, compounded by the invention of the car in response to the 'unsustainability' of horses as modes of transport. Thus, the habitual reassurance of sustainability gives us a safe center in the storm of terrifying and violent uncertainty, from which we can continue with daily life without succumbing to the terror of the pure sensation of climate crisis events. I would therefore go as far to suggest that the refrain of sustainability is a machine that responds to the understanding of an impending endangerment event, allowing society to carry on in the sensed knowledge of becoming-extinct—the mechanism through which we can compartmentalize our grief.

In a more nefarious reading, it has been suggested that sustainability in education enables Capitalocenic greenwashing (Grindsted, 2018; Dunlop et al., 2022). Applying the concept of refrain, it is possible to see how in the stagnant pool of denial, there is safety from the threat of accountability. In the exploitative consumption of capitalism, the refrain of sustainability functions as a machine within the assemblage of the preservation of destructive human practices, the habitual reassurance of which becomes sedimented into a regime (Deleuze & Guattari, 1987/2013). Deleuze explains that with regimented language, "children are supplied with syntax like workers being given tools, in order to produce utterances conforming to accepted meanings" (Deleuze, 1995, p. 41). These territories being so established, the refrain of sustainability can be seen as dangerous—it creates a space of safety in the threat of our own undoing, but also one of inertia (Alaimo, 2016), one of *stoppage*.

No longer a concept of refrain capable of movement in relation to the continuous variation of life, the stoppage of 'sustainability' calcifies into an order-word (Deleuze & Guattari, 1987/2013). Sustainability now *demands* a sense of safety, but a false one—a hiding under the covers from the realities of climate change, destruction by atrophy. Curriculums established on the order-word sustainability thus become part of a regime of signs that work to formalize specific practices within an assemblage. Conley explains this process;

> Order-words function as explicit commands or implicit presuppositions. They lead to immanent acts and the incorporeal transformations expressed in their form. They also lead to assemblages of expressions. At a certain moment these variables combine into a regime of signs (2005, p. 199).

The regime now established, lethargy takes hold and "'sustainability' reveals the desire for inertia, propelled by denial" (Alaimo, 2016, p. 170). Formal education then becomes foundational to sustainability as a practice, some arguing that it thus can *only* be a vehicle for unsustainability (Gough, 2017) and the continuation of destructive behaviors (Donald, 2019). In this process, capitalism's rapacious mining of resources is not only continued, but organized into packages of acceptability. Mainstream schooling being established on knowledge-economy ideology, the link between capitalism and education is made stronger by the demands of the order-word sustainability—the sustenance of economy. The order-word of sustainability and its economical regime of signs are then sown at the most fundamental epistemological level, and belie the need to sustain current practices on the false premise of environmentalism. Indeed, the very notion of sustainability falters when considering that everything is in a constant state of flux through multiplicious intra-action (Barad, 2007). As Deleuze and Guattari (1987/2013) state, "*you will never find a homogeneous system that is not still or already affected by a regulated, continuous, immanent process of variation*" (p. 120, original emphasis). Every entity and/or phenomenon—organic, sociological, political, metrological—is always in a state of greater or lesser fluctuation, the only real constant of existence is chaos and the change it brings. Even in conceptions of death there is no stasis; organic matter melds into different compositions, strata erode into sandy beaches, historical events are framed through myriad subjectivities and sociocultural filters. In its immanence, all manner of death is still very much 'a life' (Deleuze, 1995/2005).

The Modern habit to want to fix and 'deal with' problems, to science our way out of trouble by producing products and services (that one can purchase for a competitive price!) to make life comfortable in adapting to climate change, only continues the cycle of telling ourselves we can sustain and then acting on it to produce and use more and more. But, 'adaptability' is no more a solution than sustainability, as recognized by atmospheric scientist Katherine Heyhoe (Harvey, 2022); we are beyond the point of simply developing new technologies to adapt our way out of climate crisis. Whatever comes next needs to be far more radical, it needs to force humanity out from under the covers and stop "changing the environment rather than itself, relying on technological 'fixes'—either actual or hoped for" (Bonnett, 2019, p. 254). In its unique position to influence foundational perspectives, education should respond appropriately; rather than teaching to sustain, we need to learn to harness the chaos.

Curriculums for chaos

In charting the fluctuations of the refrain of sustainability from its origins to its current application in education, I hope to have illustrated not only how language works as a material-discursive force, but also that sustainability is not the panacea it is held by many to be. I now put forward initial suggestions for how educators might respond with radical shifts in pedagogy. Posthuman pedagogy reimagines how we educate—or reeducate—the very notion of existence between connections of human, non-human and more-than-human worlds through non-dominant, flattened, ontological understandings (e.g. Abegglen et al., 2021; Cole, 2021; Cudworth & Hobden, 2018, as well as many more; Everth et al., 2023; Leichenko & O'Brien, 2020; Valderrama-Hernández et al., 2017). As explored above, part of the issue that needs to be reconciled is humanism's tendency to render blunt cuts in ontological prioritization. Abram encapsulates this viscerally;

Caught up in a mass of abstractions, our attention hypnotized by a host of human-made technologies that only reflect us back to ourselves, it is all too easy for us to forget our carnal inherence in a more-than-human matrix of sensations and sensibilities. Our bodies have formed themselves in delicate reciprocity with the manifold textures, sounds, and shapes of an animate earth—our eyes have evolved in subtle interaction with other eyes, as our ears are attuned by their very structure to the howling of wolves and the honking of geese. To shut ourselves off from these other voices, to continue by our lifestyles to condemn these other sensibilities to the oblivion of extinction, is to rob our own senses of their integrity, and to rob our minds of their coherence. We are human only in contact, and conviviality, with what is not human (Abram, 1997, p. 23).

Many posthuman, eco-feminist, new material and posthuman works (to name a few: Cole, 2019; Cutter-Mackenzie-Knowles et al., 2020; Myrstad et al., 2022; Abegglen et al., 2021) have already begun to suggest ways for reconciliation of human, non-human and more-than-human lifeworlds. Aligning with this work, I agree that education oriented toward environmental concerns should be sensitive to posthuman onto-epistemologies. Indeed, there is much scope for pedagogies of multiplicity for education that can respond to the flux of existence. However, implementing such practice within the demands of teaching in a neoliberalised, Capitalocenic schooling system is incredibly challenging—the two positions being paradigmatically, ideologically, diametrically opposed. Despite (and perhaps because of) these tensions, it is imperative that environmental educationalists seek practical ways to meet climate crisis in their practice as it unfolds. Therefore, I suggest there may be radical potential in harnessing the possibilities of chaos in creating curriculums that are empirical, not epistemic. Building on nomadic notions of education (Semetsky, 2008), I propose the possibility of a minoritarian (Deleuze & Guattari, 1987/2013) toolbox of concepts for educators as a remedy to schooled sustainability, allowing for ways into thinking with (and thereby confronting) climate chaos as it unfolds and the reconciliation of human and non-human worlds therein. Importantly this would need to be enlivened with potentialities enough for radical change in how climate crisis is conceptualized in mainstream education, whilst not falling into the trap of 'the model' common to educational research (Cole & Mirzaei Rafe, 2017). Whilst this might help to stave off sedimentation possible in refrains that become regimes, Jukes, et al., explain that when "practices become normalised, they can lose their radical potential" (2022, p. 3). Therefore, a 'solution' to the problem of sustainability in the curriculum, needs to be akin to *a solution at hand*[6]. The implementation of a 'type' of education always runs the risk of formulaic sedimentation, but proposing the tool that makes the tools within the immanent conditions in which they are needed, offers a solution to 'the problem' (Deleuze, 1991). Thus, I suggest developing a pedagogical toolbox of plugged-in Deleuzoguattarian concepts and eco-feminist New Materialist critique, that "pack a potential in the way a crowbar in a willing hand envelops an energy of prying" (Massumi, 1987/2013, xiii). Generating subversive reimaginings of sustainable agendas within the National Curriculum new territories may be created, interrogated, and unmade; unsticking the stoppages created in the order-word sustainability. This continual process is not an easy one, but it is the anthesis of, and hopefully antidote to, lethargic attitudes toward climate crisis. The tools to make the tools for a solution at hand would be a practical, minor, toolbox for practitioners. After all, Deleuzian philosophy is a practical philosophy of pragmatics, a 'tool box' of concepts that "that do not add up to a system of belief or an architecture of propositions that you either enter or you don't" (Massumi, 1987/2013, xiii). Such practices could provide practical ways for educators to address how climate issues are embodied with and through language, in order to actualize changes in behaviors whilst averting the dangers of reproduction of models in learning heeded above (UN, 2012). As Deleuze famously states of learning:

…there is an innate or acquired practical familiarity with signs, which means that there is something amorous - but also something fatal - about all education. We learn nothing from those who say: 'Do as I do'. *Our only teachers are those who tell us 'do with me', and are able to emit signs to be developed in heterogeneity* rather than propose gestures for us to reproduce (Deleuze, 1968/2014, p. 27 emphasis added).

In seeking to develop these ideas, I propose more empirical work that utilizes radical methodologies, such as proposed by MacLure (2022), in order to explore reimagings of environmental education. Education crafted through immanently emergent means, would be generated through the Deleuzoguattarian notion of "'minor' knowledges [that] evade the striations or the straight jacket of official science" (MacLure, 2022, p.4) that currently dominates environmental education. However, I recognize the

difficulty in doing so whilst having to operate in ways unoffensive to neoliberal rationality in order for ideas to be taken seriously enough for larger-scale change (cf. Cole, 2019; Dunlop et al., 2022). Indeed, MacLure (2022) acknowledges the danger of failure fraught in "trying to harness the dark forces of the cosmos, we can get the mixtures wrong, and fail to effectuate anything" (p. 4). Whilst this is something yet to be attended to, I believe it is not insurmountable. Therefore, I call for more radical empirical work into the potentialities for the development of a minor toolbox of concepts for environmental education that develop pedagogy that is; generative, co-constructed, situated, responsive to sensation and forces—in short, curriculums for chaos.

Notes

1. There is a difficulty in articulating the parameters of this context, as 'ecology', 'environment' and 'natural/nature' are not innocent terms, but blunt cuts made in humancentric representations of non-human worlds. Indeed, ecologies can be abstract and sociological, environments exist in a laptop circuit board, and picking apart what may or may not be considered 'natural' and 'of nature' far more than a simple process of delineation – it's now natural for microplastics to be apparent in nature. Alaimo (2010) illustrates the point that terms concerning 'environment' and 'nature' have been "drained of [their] blood" (p. 1), and now signal different understandings than is wise to assume innocence of. However, in seeking some stable ground for myself in this work, I identify words regularly used to denote the context of environmentalism and use them interchangeably throughout the text. There is now a whole lexicon of words that are often employed to lend a sense of virtuous legitimacy to practices, products and services in capitalist practices. 'Eco', 'green', 'organic', 'natural', 'kind' (to the environment) – all of these words and more are often used in place of or tandem with 'sustainable/ity' to signify some form of sensitivity to ecological concerns.
2. Whilst I am aware of the significant implications in the terminologies associated with feminisms, new materialisms, and broader 'environmental' theoretical frameworks, I do not have the scope to address these in this paper. For an in-depth discussion on this matter, see Gough and Whitehouse (2020).
3. The use of '≠' here is to illustrate the hierarchical view of Cartesian logic that places the cognitive, human, and progressive above that which it deems lesser, ie. That human rationality, logic and culture are privileged above nature, sensation, matter, etc.
4. School governance in the UK is devolved between England, Wales, Scotland and Northern Ireland. All examples pertaining to this context in this paper refer to the English school system.
5. Deleuze and Guattari do not restrict the concept of 'life' to biological lifeforms, but to any arrangement of events that encounter one-another creating an assemblage.
6. In keeping with the Deleuzian notion of the 'toolbox', the solution at hand is an idea that comes from a woodworking manual of the same name (Wearing, 2019), in which simple but effective tools and guides (often called jigs) can be made by the woodworker in response to the specific requirements of a workpiece.

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References

Abegglen, S., Blundell, D., & Bustillos Morales, J. (2021). Eco-education: A response to the Anthropocene and an uncertain future. *Educational Futures*, *12*(1), 31–47.

Abram, D. (1997). *The spell of the sensuous: Perception and language in a more-than-human world*. Vintage Books.

Alaimo, S. (2010). *Bodily natures: Science, environment, and the material self*. Indiana University Press.

Alaimo, S. (2016). *Exposed: Environmental politics and pleasures in posthuman times*. University of Minnesota Press.

Alaimo, S. (2019). Wanting all the species to be: Extinction, environmental visions, and intimate aesthetics. *Australian Feminist Studies*, *34*(102), 398–412. https://doi.org/10.1080/08164649.2019.1698284

Ardoin, N. M., Bowers, A. W., & Gaillard, E. (2020). Environmental education outcomes for conservation: A systematic review. *Biological Conservation*, *241*, 108224. https://doi.org/10.1016/j.biocon.2019.108224

Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning* (2nd ed.). Duke University Press.

Bonnett, M. (2019). Towards an ecologization of education. *The Journal of Environmental Education*, *50*(4-6), 251–258. https://doi.org/10.1080/00958964.2019.1687409

Cole, D. R. (2019). The designation of a deleuzian philosophy for environmental education and its consequences…. *Australian Journal of Environmental Education*, *35*(3), 173–182. https://doi.org/10.1017/aee.2019.16

Cole, D. R. (2021). *Education, the Anthropocene, and Deleuze/Guattari*. Brill.

Cole, D. R. (2022). Unwriting for the Anthropocene: Looking at the disaster from the inside. In B. Herzogenrath (Ed.), *New perspectives on academic writing: The thing that wouldn't die* (pp. 137–148). Bloomsbury Academic.

Cole, D. R., & Mirzaei Rafe, M. (2017). Conceptual ecologies for educational research through Deleuze, Guattari and Whitehead. *International Journal of Qualitative Studies in Education*, *30*(9), 849–862. https://doi.org/10.1080/09518398.2017.1336805

Conley, V. (2005). Order-word. In A. Parr (Ed.) *The Deleuze dictionary* (pp. 198–199). Edinburgh University Press.

Cudworth, E., & Hobden, S. (2018). *The emancipatory project of posthumanism*. Routledge.

Cutter-Mackenzie-Knowles, A., Brown, S. L., Osborn, M., Blom, S. M., Brown, A., & Wijesinghe, T. (2020). Staying-with the traces: Mapping-making posthuman and indigenist philosophy in environmental education research. *Australian Journal of Environmental Education*, *36*(2), 105–128. https://doi.org/10.1017/aee.2020.31

Deleuze, G. (1991). *Bergsonism*. Translated by Tomlinson, H. & Habberjam, B Zone Books.

Deleuze, G. (1995). *Negotiations*. Translated by M. Joughin. Columbia University Press.

Deleuze, G. (1995/2005). *Pure immanence: Essays on a life*. Translated by A. Boyman. Zone Books.

Deleuze, G. (1968/2014). *Difference and repetition*. Translated by P. Patton. Bloomsbury Academic.

Deleuze, G. (1990/2015). *The logic of sense*. Translated by M. Lester, & C. Strivale. Columbia University Press.

Deleuze, G., & Guattari, F. (1987/2013). *A Thousand Plateaus: Capitalism and Schizophrenia*. Translated by B. Massumi. Bloomsbury Academic.

Deleuze, G., & Guattari, F. (1994). *What is Philosophy?*. Translated by H. Tomlinson & G. Burchell. Columbia University Press.

Department for Education. (2022). *Sustainability and climate change: A strategy for the education and children's services systems*. Gov.uk. Retrieved December 2022, from https://www.gov.uk/government/publications/sustainability-and-climate-change-strategy/sustainability-and-climate-change-a-strategy-for-the-education-and-childrens-services-systems

Donald, D. (2019). Homo economicus and forgetful curriculum: Remembering other ways to be a human being. In H. Tomlins-Jahnke, S. D. Styres, S. Lilley, & D. Zinga (Eds.), *Indigenous education: New directions in theory and practice*. University of Alberta Press.

Dunlop, L., & Rushton, E. A. C. (2022). Putting climate change at the heart of education: Is England's strategy a placebo for policy? *British Educational Research Journal*, *48*(6), 1083–1101. https://doi.org/10.1002/berj.3816

Dunlop, L., Rushton, E. A. C., Atkinson, L., Ayre, J., Bullivant, A., Essex, J., Price, L., Smith, A., Summer, M., Stubbs, J. E., Turkenburg-Van Diepen, M., & Wood, L. (2022). Teacher and youth priorities for education for environmental sustainability: A co-created manifesto. *British Educational Research Journal*, *48*(5), 952–973. https://doi.org/10.1002/berj.3803

Evans, S. (2021). Material-discursive changes: Posthuman methodologies to (re)conceptualize postgraduate encounters in/with/through language. *Reconceptualizing Educational Research Methodology*, *12*(1), 50–65. https://doi.org/10.7577/rerm.4244

Evans, S., Harrison, M., & Rousell, D. (2022). Teaching in the afterward: Undoing order-words and affirming transversal alternatives. *Discourse: Studies in the Cultural Politics of Education*, *43*(5), 785–803. https://doi.org/10.1080/01596306.2021.1996695

Everth, T., Gurney, L., & Eames, C. (2023). Assemblage drawings as talking points: Deleuze, posthumans and climate-activist teachers. *Australian Journal of Environmental Education*, *39*(2), 152–165. https://doi.org/10.1017/aee.2022.48

Garoian, C. R. (2012). Sustaining sustainability: The pedagogical drift of art research and practice. *Studies in Art Education*, *53*(4), 283–301. https://doi.org/10.1080/00393541.2012.11518870

Gough, A., & Whitehouse, H. (2018). New vintages and new bottles: The "Nature" of environmental education from new material feminist and ecofeminist viewpoints. *The Journal of Environmental Education*, *49*(4), 336–349. https://doi.org/10.1080/00958964.2017.1409186

Gough, A., & Whitehouse, H. (2020). Challenging amnesias: Re-collecting feminist new materialism/ecofeminism/climate/education. *Environmental Education Research*, *26*(9-10), 1420–1434. https://doi.org/10.1080/13504622.2020.1727858

Gough, S. (2017). Education after sustainability. *Global Discourse*, *7*(1), 131–145. https://doi.org/10.1080/23269995.2017.1300435

Greer, K., King, H., & Glackin, M. (2023). The 'web of conditions' governing England's climate change education policy landscape. *Journal of Education Policy*, *38*(1), 69–92. https://doi.org/10.1080/02680939.2021.1967454

Grindsted, T. S. (2018). Geoscience and sustainability – In between keywords and buzzwords. *Geoforum*, *91*, 57–60. https://doi.org/10.1016/j.geoforum.2018.02.029

Grober, U. (2007). Deep roots: A conceptual history of "sustainable development" (Nachhaltigkeit). WZB Discussion Paper P 2007-002.

Gurney, L., & Demuro, E. (2023). Simultaneous multiplicity: New materialist ontologies and the apprehension of language as assemblage and phenomenon. *Critical Inquiry in Language Studies*, *20*(2), 127–149. https://doi.org/10.1080/15427587.2022.2102011

Harvey, F. (2022, June 1) We cannot adapt our way out of climate crisis warns leading scientist. *The Guardian*. https://www.theguardian.com/environment/2022/jun/01/we-cannot-adapt-our-way-out-of-climate-crisis-warns-leading-scientist

Hemery, G., & Simblet, S. (2021). *New Sylva: A discourse of forest and orchard trees for the twenty first century*. Bloomsbury.

Jukes, S., Clarke, D., & McPhie, J. (2022). The wisp of an outline ≈ Storying ontology as environmental inquiry↔education. *Australian Journal of Environmental Education*, *38*(3–4), 328–344. https://doi.org/10.1017/aee.2021.31

Kleinherenbrink, A. (2015). Territory and ritornello: Deleuze and Guattari on thinking living beings. *Deleuze Studies*, *9*(2), 208–230. https://doi.org/10.3366/dls.2015.0183

Leichenko, R., & O'Brien, K. (2020). Teaching climate change in the Anthropocene: An integrative approach. *Anthropocene*, *30*, 100241. https://doi.org/10.3366/dls.2015.0183

Lumley, S., & Armstrong, P. (2004). Some of the nineteenth century origins of the sustainability concept. *Environment, Development and Sustainability*, *6*(3), 367–378. https://doi.org/10.1023/B:ENVI.0000029901.02470.a7

MacGregor, S. (2021). Making matter great again? Ecofeminism, new materialism and the everyday turn in environmental politics. *Environmental Politics*, *30*(1-2), 41–60. https://doi.org/10.1080/09644016.2020.1846954

MacLure, M. (2013). Researching without representation? Language and materiality in post-qualitative methodology. *International Journal of Qualitative Studies in Education*, *26*(6), 658–667. https://doi.org/10.1080/09518398.2013.788755

MacLure, M. (2022). Resistance, desistance: Bad girls of post-qualitative inquiry. *International Journal of Qualitative Studies in Education*. Advance online publication. https://doi.org/10.1080/09518398.2022.2127025

Massumi, B. (1987/2013). Translator's forward: Pleasures of philosophy. In G. Deleuze, & F. Guattari (Eds.), *A thousand plateaus: Capitalism and schizophrenia*. Translated by B. Massumi. Bloomsbury Academic.

Mensah, J. (2019). Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences*, *5*(1), 1653531. https://doi.org/10.1080/23311886.2019.1653531

Moore, J. W. (2017). The Capitalocene, Part I: On the nature and origins of our ecological crisis. *The Journal of Peasant Studies*, *44*(3), 594–630. https://doi.org/10.1080/03066150.2016.1235036

Myrstad, A., Hackett, A., & Bartnæs, P. (2022). Lines in the snow; minor paths in the search for early childhood education for planetary wellbeing. *Global Studies of Childhood*, *12*(4), 321–333. https://doi.org/10.1177/2043610620983590

Natural History Museum. (n.d). *National education nature park and climate action awards scheme*. https://www.nhm.ac.uk/about-us/national-impact/national-education-nature-park-and-climate-action-awards-scheme.html

O'Grady, J. P. (2003). How sustainable is the idea of sustainability? *ISLE: Interdisciplinary Studies in Literature and Environment*, *10*(1), 1–10.

Plotnitsky, A. (2006). Chaosmologies: Quantum field theory, chaos and thought in Deleuze and Guattari's what is philosophy? *Paragraph*, *29*(2), 40–56. volumehttps://doi.org/10.3366/prg.2006.0017

Scoones, I. (2007). Sustainability. *Development in Practice*, *17*(4-5), 589–596. https://doi.org/10.1080/09614520701469609

Seghezzo, L. (2009). The five dimensions of sustainability. *Environmental Politics*, *18*(4), 539–556. https://doi.org/10.1080/09644010903063669

Semetsky, I. (Ed.). (2008). *Nomadic education: Variations on a theme by Deleuze and Guattari*. Sage.

Somerville, M., & Williams, C. (2015). Sustainability education in early childhood: An updated review of research in the field. *Contemporary Issues in Early Childhood*, *16*(2), 102–117. https://doi.org/10.1177/1463949115585658

Stengers, I. (2008). Experimenting with refrains: Subjectivity and the challenge of escaping modern dualism. *Subjectivity*, *22*(1), 38–59. https://doi.org/10.1057/sub.2008.6

Toohey, K., Smythe, S., Dagenais, D., & Forte, M. (Eds.) (2020). *Transforming language and literacy education: New materialism, posthumanism, and ontoethics*. Routledge.

Tuck, E., McKenzie, M., & McCoy, K. (2014). Land education: Indigenous, post-colonial, and decolonizing perspectives on place and environmental education research. *Environmental Education Research*, *20*(1), 1–23. https://doi.org/10.1080/13504622.2013.877708

United Nations (2012). *Learning for the future: Competences in education for sustainable development*. Retrieved from https://unece.org/filea dmin/DAM/env/esd/ESD_Publi catio ns/Compe tences_Publi cation.pdf

Wearing, R. (2019). *The solution at hand: Jigs and fixtures to make benchwork easier*. Lost Arts Press.

Valderrama-Hernández, R., Alcántara, L., & Limón, D. (2017). The complexity of environmental education: Teaching ideas and strategies from teachers. *Procedia - Social and Behavioral Sciences*, *237*(21), 968–974. https://doi.org/10.1016/j.sbspro.2017.02.137