# Pedagogy at the End of the World:
# Weird Pedagogies for Unthought Educational Futures

by

Jessie L. Beier

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Department of Secondary Education
University of Alberta

## Abstract

This study of *Pedagogy at the End of the World* investigates the "end of the world" scenarios that now characterize education and its reasons in Anthropocene times. Emerging through an interrogation of the apocalypse habits and anthropo-scenic views through which educational futurity is most often imagined, this study is oriented towards the creation of pedagogical concepts that work to problematize and resituate questions of educational futurity in relation to the planetary realities raised by today's pressing extinction events. This research proceeds through a series of speculative studies of educational futurity, each of which is positioned as an experimental site for probing the limits of pedagogical un/thinkability so as to speculate, through concept creation, on alternative orientations to educational futurity. Importantly, each of these speculative studies endeavours to move beyond just analysis and critique of the epistemic constraints and conceptual affordances that have come to condition pedagogical possibility. By putting (apparent) educational givens into contact with a range of seemingly alien objects, transversal theories and strange examples, the speculative experiments that make up this work reframe and reorient both the educational problems and solutions raised by today's end times scenario. It is from this experimentation that a weird pedagogy emerges, that is, an experimental (albeit always insufficient) pedagogical anti-model, a speculative programme for the unprogrammable that seeks to problematize, and ultimately counteractualize, potentials of and for *Pedagogy at the End of the World.*

Through conceptual experimentation and weird encounters, this study aims to probe the limits of educational futurity, not as a way of surmounting or domesticating the unthought, but instead, as a mode of resituating educational problem-posing in relation to an unknown and

unknowable future. As such, this study aims to practice experimental approaches to educational research that do not entail a rejection of the actual world and thus the real of impending ecocatastrophe, but instead opts for speculative modes and transversal styles of inquiry that might be capable of mutating and bifurcating educational future imaginaries. As such, this study asks: how might pedagogical thinking proceed when confronted with the unthinkable scenarios and unfathomable conditions raised by today's anthropo-scenic milieu and its extinction events? What does educational inquiry entail when it confronts its own thresholds of rationality, or the limits of thought and thus a thought of limits, which, given education's commitment to thinkability are demonstrably unpopular? How might educational problem-posing approach questions and issues that resist thought itself? And further, what are the conditions, preclusions, and exclusions that make something thinkable in the first place? By exploring the way in which contemporary educational un/thinkability is itself conditioned, this study is geared towards counter-actualizing both the narratives and methods that have come to overdetermine discussions of educational futurity so as to unsettle and singularize otherwise diminished conditions of pedagogical possibility. Through the speculative development of a weird pedagogy, this study of *Pedagogy at the End of the World* is not only framed as an experiment in pedagogical thought, but also aims to intervene within educational theory and research — into the process of *study* itself — so as to counter today's apocalypse habits and the banality of those end of the world concepts that have come to limit pedagogical possibilities, both now and into the future.

## Preface

This dissertation research has been informed by my ongoing collaborations, including my work as an artist-researcher on the interdisciplinary research-creation project *Speculative Energy Futures* (funded by *Future Energy Systems* at the University of Alberta) and my role as co-creator of the *Ahuman Pedagogy* lecture series (hosted at the University of Alberta in 2020-2021) and co-editor (with jan jagodzinski) of the forthcoming book *Ahuman Pedagogy: Multidisciplinary Perspectives for Education in the Anthropocene* (Palgrave MacMillan, 2022). In addition, parts of Chapter Four of this research (titled "Sustaining the End of the World") have been published as a chapter called "Tracing a Black Hole: Probing Cosmic Darkness in Anthropocenic Times" in the edited book titled *Reimagining Science Education in the Anthropocene* (Wallace, M.F.G., Bazzul, J., Higgins, M., Tolbert, S., Eds., Palgrave MacMillan, 2022).

## Dedication

This work is dedicated to my late dad, Paul C. Beier, the weirdest weirdo of them all.

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## Table of Contents

## List of Figures

# CHAPTER ONE: Un/Thinking Pedagogical Problematics for the End Times

## 1.1 The End

It seems, today, that *the end is all over.* Dispatches from various ends-of-worlds, for instance, now circulate across social, cultural and political domains, offering assorted warnings and wake-up calls about the end times seemingly taking place all around. Where the streaming services that keep us company amidst ongoing isolations continue to pump out a range of apocalyptic tales, and it is now commonplace for scientists to relay frightening facts and figures that signal the devastating, and now unavoidable, ecocatastrophic conditions caused by anthropogenic climate change,[1] some have even suggested that "apocalypse is now a chronic condition" (Garber, 2019). While *the end* has, for centuries, functioned to help humans understand their place in the cosmos (Kermode, 2000), it's hard not to feel like *these* end times are particularly calamitous. Reports on the environmental conditions of the planet now describe a world of mass extinctions, unprecedented biodiversity loss and a range of presently-unfolding ecological annihilations. Meanwhile, war, poverty, pandemics, famine, apartheid, violence, dispossession, extraction and suffering now characterize life for many on planet Earth, leading to a range of announcements about today's world-ending scenarios: it's not only the end of history, but the end of democracy, the end of politics, the end of work, the end of food, the end of oil, the end of the economy, the end of Man, the end of civilization, the end of nature, the end of the world.

In academic spheres, the concept of the end has become a popular vantage from which to write about the convergence of crises now gathering force and speed across the globe. In addition to academic books such as Anna Tsing's (2015) *The Mushroom at the End of the World,* Natalie Loveless' *How to Make Art at the End of the World* (2019)*,* Laura Watts' *Energy at the End of the World* (2019) and jan jagodzinski's *Schizoanalytic Ventures at the End of the World* (2019)*,* the "*x* at the end of the world" formula is now commonly used to title articles, art projects, conferences and courses. Alongside artistic propositions for *Nests for the End of the World*

[1] The most recent of such communications (at the time of writing these words), can found in the UN-sponsored Intergovernmental Panel on Climate Change's (IPCC) sixth comprehensive Assessment Report (AR6), which warns that limiting the disastrous impacts of global warming is now a scientific impossibility unless there are immediate, rapid and large-scale changes in CO2 emissions (IPCC).

(Calvelli, et. al., 2020) and courses on Feminism or Media or Literature at the end of the world, for example, today's apocalyptic zeal has also been discussed (but also debated) in articles such as Joshua Clover's (2018) "Voting for the End of the World," Jacob Mikanowski's (2017) "Language at the End of the World," and the highly circulated "Choclear Implant at the End of the World" by Liz Bowen (2017). And, just as crises continue to converge, mutate and accelerate all around, so too has the "*x* at the end of the world" format, suggesting that the end is perhaps here to stay.

While today's end times scenarios are often represented, in turn, as entertaining or ironic or cynical or playful or even hopeful, it is important to remember that grappling with the end is a serious affair. The world-ending events brought on by COVID-19 and its related social, political and economic emergencies, for instance, are not mere sites for analysis and critique, nor should they be treated as fodder for post-apocalyptic imaginings. Instead, these ends of *a* world point to an end times scenario where preventable suffering is not only acceptable, but *necessary* for power to maintain its grip on reality. In the midst of a global pandemic, it's hard not to feel that this is, indeed, the end of the world, at least as we have come to know it. This feeling, however, is difficult to reckon with given the way in which the powers that be continue to deny and downplay the severity of the situation in the name of business as (un)usual. The occlusions and obfuscations necessitated in the name of such reality management thus bring forth a different vector of signification for statements like *the end is all over*. Where today's end of the world narratives, which continue to disperse and deform not unlike the viruses spreading across the planet, take part in ongoing dreams of overcoming planetary finitude and perpetuating all-too-human modes of existence, no matter the cost, the end does not signal any sort of finality or limit point, but instead marks the continuation of "the way things are" in the here and now. This fantasy of continuity and, ultimately, human permanence is nevertheless made possible by particular apocalypse habits and visions *of* and *for* the end, affirming that it may be the case that the end *is* all over. Supplied with a never-ending selection of world-ending narratives that nevertheless promise a future beyond, after, or in spite of the ends on the horizon (or that are, in many cases, already here), today's end of the world imaginings rarely signal the end, but instead offer productive fulcrums for actualizing particular lines of futurity, albeit ones that are increasingly at odds with the ecocidal conditions shaping planetary realities today (Colebrook,

2012; Zylinksa, 2018). This is especially the case within educational domains, where the alien axiomatics of climatological change and the encroaching horizon of human extinction are scarcely detected, let alone addressed. Instead, education — including both its research and practices — continues to labour in a mode of obligatory optimism wherein "children are, indeed, the future," that is, if they are adequately *educated*.

In recognition of education's non-confrontation with the ecological, but also social and psychic breakdowns (Guattari, 2000) that increasing characterize planetary realities, this study approaches *the end of the world* as a distinctly *pedagogical problematic*. The use of *pedagogy* here does not merely refer to the methods and approaches of teachers in schools and other sites of institutionalized education, but instead refers to a broader conception of pedagogy, what Gilles Deleuze calls a *pedagogy of concept*s. As Deleuze and Guattari (1994) propose, through both the content and form of their philosophical experiments, philosophy is the practice of *creating concepts.* A concept, in this philosophical sense, is different than the typical, more everyday use of concepts. As Deleuze and Guattari develop, the day-to-day use of concepts adheres to models of representation and opinion that assume a present, thinkable world that can and should be re-presented by communicating information and garnering agreement. In this way, the "day-to-day usage of concepts work like short-hand or habit," and, as such, actually make it so that we *do not have to think* (Colebrook, 2002, p. 15*).* The problem with everyday concepts, then, is the way in which they provide the conditions to move from a particular experience in and of the world and use it to form some whole that ultimately reduces the difference of the world to that which can be represented and expressed through commonsense communication. Everyday concepts, then, do not capture what a concept truly is, or more accurately, what a concept can *do*.

Philosophical concepts, on the other hand, are creative rather than representational and, as such, do not follow opinion and everyday models of consensual communication. Working against the tendency to reduce difference and attach it to pre-determined categories and determinations, philosophical concepts are what *create new ways of thinking.* Philosophical concepts are not labels or names we attach to things, but instead produce an orientation or direction for thinking. As Claire Colebrook (2002) outlines, "concepts do not label or systematize reality, for reality in itself has no order or fixed being; concepts create this order" (p. 17). It is in this way that concepts are *philosophical*. That is, concepts are philosophical because

they create possibilities for *the event of thinking*, for pushing thought beyond what is already known or assumed. Concepts, in this radical philosophical sense, do not just add something new to fields of thinking, but, importantly, render present conditions and terms of thinking *incoherent*. This is what Deleuze and Guattari (1994) mean when they say that "concepts are only created as a function of problems" (p. 16). Or as Deleuze (2000) writes elsewhere, "thought is nothing without something that forces and does violence to it" (p. 96).

With this problematizing approach to philosophy in mind, a *pedagogy of concepts* understands concepts as that which create possibilities for thinking. As such, a pedagogy of concepts is one that is practical, experimental and oriented towards problems that defy univocal solutions but nevertheless lead to the creation of new concepts. Taking cues from this understanding of concepts and their pedagogical power, that is, their power to create, but also destroy, conditions for thinking, I wager that today's end times proclamations and provocations are *pedagogical* in the sense that they hold the potential to produce encounters with the problematizing force of concepts, or that which might make us think. In what follows, I continue to develop this wager, while also setting the scene for this study of *Pedagogy at the End of the World,* by further examining today's purported end times scenarios in terms of the conditions they enable, but also limit, for un/thinking pedagogical problematization. This set-up starts by unfolding *the end of the world* as a philosophical concept that conditions strata for thinking in and of educational futurity. Following this contextualization, which focuses on today's end times apprehensions and apocalypse habits, I examine the very material ends and extinction events that now characterize planetary realities. With this background in mind, I then hone in on the site of academic discourse, focusing on contemporary Anthropocene debates and discussions so as to further probe the anthropo-scenic views of the end that have taken hold across disciplinary divides. I conclude the chapter by bringing today's end time scenario — habits, histories, hesitations and all — in contact with the question of pedagogical un/thinkability at the end of the world. Drawing on the philosophical method of Deleuze and Guattari, alongside a range of contemporary thinkers invested in the problem of "the end," this introductory chapter sets the scene for this speculative study of *Pedagogy at the End of the World* while also experimenting with un/thinking the concept of the end in ways that might unsettle and singularize otherwise diminished conditions of pedagogical possibility.

### 1.2 End Times Apprehensions

Writing about *the end of the world* might evoke a certain kind of skepticism. Or perhaps it should. The very idea of an end, after all, relies on a logic of continuity that produces time as an *a priori* given, an infertile subjective yet ideal all-too-human form, a rational line, which conditions the possibility for cutting up time into discrete beginnings, middles and ends in the first place. In this order of time, temporality is constructed in a rectilinear and progressive fashion through the production and maintenance of tidy origins and conclusions. As literary scholar Frank Kermode (2000) asserts, human beings have been known to grasp on to this order of time and the ends it furnishes so as to provide consistent patterns through which anxieties about understanding the world might be alleviated. If there is a beginning of the world then there must be an end of the world, which in turn gives a satisfying consonance with the logical understanding of the linearity of historical time. Or as Kermode (2000) puts it, "[w]e project ourselves […] past the End, so as to see the structure whole, a thing we cannot do from our spot of time in the middle" (p. 8). While such logical ordering might, as Kermode suggests, provide a conceptual schema through which "we" humans can graft some sort of order onto the cosmos, it also works to obscure the intensely irrational sense of difference through which the continuous labyrinth of temporality might otherwise be understood.[2]

Investigations at, in, or of the end of the world might also be made suspect due to the way that such finalist thinking construes *the world* itself*,* in turn raising questions such as "the end of *what* world?" or "the end of the world *for whom?*" Many of today's cinematic apocalyptic imaginings, for instance, depict the end of the world as nothing more than the end of dominant social orders and privileged modes of living (Colebrook, 2018a), in turn disappearing the various ends-of-worlds that have been necessitated by, for instance, the relentless projects of progressive colonial petro-capitalism and its ecocidal drive for expansion. The "post-apocalyptic simplifications" that dominate end of the world narratives, such as those within popular

[2] As Gilles Deleuze (1989) writes, the order of time is not given in advance, but is instead constructed as a productive power of synthesis determined by a caesura, or cut*,* that distributes on both sides a before and after — a past and future — that are only discernible because they no longer rhyme together. In this formation, what Deleuze calls the Third Synthesis of Time, "the past is the time before the caesura; the pure present is the becoming equal to the event [of the caesura] and the experience of internal difference; the future, finally, is the time after the caesura" (Voss, 2013, p. 199).

cinematic genres, "allow for the past world to be 'erased' as the world-builder desires," and, as such, places constraints on how the future might be imagined (Woodard, 2015, para. 3). As (geo)philosopher Ben Woodard (2015) declares, by denying any imagination of a future beyond the conservative norms drawn from the "elaborate junkyard of the past and near-future," post/apocalyptic narratives function as a "world-simplification device" that "suspends and replaces contemporary political concerns with an emphasis on self-reliance, survival, and a more generalized sense of order versus chaos" (para. 5). The reference to simplification here not only signals the narrative reductions inherent to representations more generally, including end of the world ones, but also points to the concerted removal of the political, ecological and ethical questions that might otherwise be raised by today's world-ending scenarios. Where, as Woodard (2015) writes, "the world" is conceived in terms of a "human-centred notion of the global system, as opposed to either the Earth as a habitable place in terms of biosphere and climate, or of the Earth as a planet in the universe," (para. 8) the end of the world merely refers to the end of modern human civilization. And so, while it may now be commonplace to suggest that "it is easier to imagine the end of the world than it is to imagine the end of capitalism," Jameson's "cute phrase" (Colebrook, 2018a, p. 152) reflects the broader assumption that the end of the world today is merely the end of affluent capitalism and the civilized dreams of progressive futurity on which it relies. As (inhuman) geographer Katherine Yusoff (2018) contends, while today's apocalypticism "might seem to offer a dystopic future that laments the end of the world, […] imperialism and ongoing (settler) colonialisms have been ending worlds for as long as they have been in existence" (p. 3). Or, as cultural theorist Claire Colebrook (2018a) puts it, the "world at the end of the world is perhaps, if one takes away the disdainful 'first-world' framing, what a great deal of beings have known and respectfully lived as life" (p. 153). Here, Colebrook draws attention to how end of the world thinking not only presumes a particular world, and thus its end, but also a very specific form of life at the centre, namely, *the human*.

Where the world at the end of the world is subtended by a unified expression of humanity, the very notions of life and thus non-life are correlated to a singular figure — *anthropos* — a figure that now undergirds both the world and its apparent endings (Colebrook, 2016; 2018a; 2018b; 2020a; 2020b). This conception of the human is constituted as that which stands at the centre of all things, distinct from animals, machines, and other nonhuman entities,

and is, most importantly, absolutely known and knowable to "himself" (Badminton, 2004, p. 1345). Under the doctrine of Enlightenment humanism, but also more contemporary forms of liberal humanism, the human has been correlated and reduced to an ideal subjective form characterized by bounded individualism, self-regulation and a distinct separation from the ecologies it inhabits. Further, this ideal human form has been developed as an undifferentiated and depoliticized category where the supposedly universal "human" is always "white, Western, modern, able-bodied and heterosexual man; the 'subject' who is nothing other than a capacity for self-differentiation and self-constitution is the self of market capitalism" (Colebrook, 2016b, p. 91). Through such reductive correlations, life itself is perpetually subsumed under a human-species supremacist planetary politics, bolstered as it is by patriarchal, white supremacist, ableist and colonial logics, and thus the end of the world merely refers to the end for (some) humans, or, the end of the world as that which is always-already given for "us."

As Colebrook asserts, however, this all-too-human world that is bound up with the end of the world, does not work to simply over-code conceptions of life and reinforce violent hierarchizations, but, importantly, offers a mode for humanity to *find itself anew*. As she develops throughout various essays that explore questions of life and non-life in the age of the Anthropocene (Colebrook, 2016; 2018a; 2018b; 2020a; 2020b), the so-called post-apocalyptic, whether expressed through cinema or contemporary theory, is a relapse and domestication of the apocalyptic, one that follows in a long line of thinking wherein the human is not only defined in relation, or non-relation, to non-human bodies or dominant social structures, but *in relation to its own non-being*. As Colebrook (2020b) puts it, "[a]nthropos has *always* been defined by existential threats, that he is set apart from all life in the world by his existential fragility, by the always present possibility that he may not be" (p. 346). Woodard (2015) makes similar claims in his note on "post-apocalyptic simplification" where he highlights how apocalyptic genres serve to entertain both left- and right- wing fantasies about exiting contemporary life, be it "the conservative desire to start over in order to keep things simple or traditional" or the "prevalent leftist fantasy of escaping the contemporary technologically mediated world and going back to 'nature' or some other form of 'authentic' existence" (para. 4). In both cases, end of the world imaginings offer yet another mode to define the human in relation to *the threat of its own non-existence*. By projecting humanity past the apocalypse, albeit through fantasies of some pristine

pre-apocalyptic time, humans find themselves inhabiting a world *after* annihilation and thus the future becomes the territory, once again, for vanquishing existential threats though the affirmation of an anthropos both in need and worthy of saving.

Taken together, these end time apprehensions reveal how the very possibility for *thinking* the end of the world necessitates the affirmation of particular orders of time, existential categories and, ultimately, orientations towards the future. As unfolded in the next section, these affirmations are sustained by representations of the end that have now become *banal*, founded on generalizable opinions and everyday concepts that obscure the creative force that might otherwise be engendered by a concept like the end. Through these affirmations, other possible world-making, and world-breaking, conceptual apparatuses are obscured, dejected and disappeared through non-recognition. With this in mind, these active affirmations and refusals not only function as "world-simplification devices" that condition the way in which *the world* is itself conceived, but also produce the conditions for *thinking* about its potential end. Put another way, the everyday concepts through which today's end of the world thinkability has been conditioned not only assumes that the end is possible (and nigh), but such thinking reinscribes and reproduces cliched representations of the end that have now come to limit possibilities for thinking the future. In short, *it is only at the end of the world that the world finally appears*, bringing with it particular conditions for its present and future un/thinkability.

### 1.3 Apocalypse Banality

Apocalyptic thinking is, of course, not unique to contemporary times. As feminist theologian Catherine Keller (2015) asserts, every age is characterized by its own sense of apocalypticism, or what she calls *apocalypse habits*, which manifest in a "wider matrix of unconscious tendencies" that come to shape finalist thinking (p. 10-11). Today's apocalypse habits, for instance, show up in the expansive array of contemporary film and television portrayals of the end times, which range from the fantastic (*Avengers: End Game,* 2019*; X-Men Apocalypse,* 2016*; Thor: Ragnarok,* 2017; really, almost all of the recent super-hero blockbusters) to the realistic (*Children of Men,* 2006*; The Road,* 2009*; Take Shelter,* 2011), from the dramatic (*Into the Forest,* 2016*; Melancholia* [2011]*; Z for Zachariah,* 2015) and the horrific (*A Quiet Place,* 2018*; It Comes at Night,* 2017*; Bird Box,* 2018) to the comedic (*This is the End,*

2013*; Last Man on Earth,* 2015-2018*; You, Me and the Apocalypse,* 2015) and even romantic (*Seeking a Friend for the End of the World,* 2012). In addition to infecting a wide range of popular film and television genres, today's apocalyptic contagion has also spread to news spheres, with reports of, for instance, the coming insect apocalypse and related "ecological Armageddon"[3] circulating alongside a series of hot takes and bitter laments about ongoing retail apocalypses (Peterson, 2018), job apocalypses (Srnicek & Williams, 2015), wildfire smoke apocalypses (Osaka, 2020) and, in light of the most recent global pandemic, stay-at-home apocalypses (Alvarez, 2020). Today's apocalypse habits, characterized by varied ends that arrive not with a bang, but through a series of baited tweets, algorithmic preferences and spurious conflations, not only draw attention to the physical facts of a planet on the brink of ecocatastrophe, but also how the concept of the end has become commonplace, ubiquitous, *banal*.

For ecological philosopher Timothy Morton (2013), this apocalypse banality is what allows us to postpone "doom into some hypothetical future" in turn "inoculat[ing] us against the very real object that has intruded into ecological, social, and psychic space" (p. 103-104). In Morton's own investigations of philosophy and ecology *after* the end of the world, he points to how within today's apocalypticism "[t]he worry is not whether the world will end, as in the old model of the *disastron*, but whether the end of the world is already happening, or whether perhaps *it might already have taken place*" (p. 16). Against such apocalypse banality, Morton (2013) proposes the concept of the "hyperobject," which attempts to conceptualize entities, such as climate change, that are "massively distributed in time and space relative to humans" (p. 1). As Morton writes, hyperobjects "are real whether or not someone is thinking of them," and as such "force us to acknowledge the immanence of thinking to the physical" (p. 2). Hyperobjects — be it oil fields, plutonium deposits or plastic straws — are directly responsible for what Morton deems "the end of the world," which, for him, has been brought about by encounters with such unthinkable entities, "render[ing] both denialism and apocalyptic environmentalism obsolete" (Morton, 2013, p. 2). For Morton, then, the end of the world signals the way in which

[3] Recent data gathered in nature reserves across Germany demonstrates how the total flying insect biomass has plunged by three-quarters over the past 25 years, putting us "on course for ecological Armageddon" (Hallman et al., 2017).

the very concept of "world" is itself no longer operational, which in turn demands modes of thought that are liberated from all-too-human timescales, events and significance.

Like Morton, ahuman philosopher Patricia MacCormack (2020) also draws attention to today's apocalypse banality, noting that while there are small and large apocalypses for every age, it appears today that apocalypse is "going mainstream" (p. 174). Citing recent examples of this apocalyptic mainstreaming (i.e. the UK's Brexit apocalypse and the fascisms it has entailed and the ecocidal, and by extension genocidal, apocalypse taking place in Brazil under right-wing president Bolsonaro), MacCormack highlights the "deathbound and deeply fatalistic" character of today's apocalypticism, which does not signal some sort of "wholesale annihilation" or "end of days promise," but marks a series of "molecular apocalypses that become incremental until the trajectories they advocate atrophy into a kind of normality" (p. 174). Apocalypse banality, indeed. Whereas Morton counters today's apocalypse banality by proclaiming the end of the world — the end of endings, the end of telos — as the "beginning of an uncertain, hesitating futurity," MacCormack (2020) outlines a darker trajectory for countering the normalization of apocalypse today. As she writes, citing Morton (2013), "[t]he liberation of the world is not the romance of an inconceivable hyperobject made aesthetic" but instead, "the abstract vastness, inconceivability and imperceptibility of the world is precisely that which reminds us that we have the dubious honour of being utterly inconsequential in a meaningful way (by meaningful, I mean as a productive part of a disparate assemblage known as ecology) and utterly murderous in an anthropocentric way" (p. 177). What MacCormack highlights here is how today's apocalypticism is more than just a discursive trope, how it must not be underestimated the number of lives that have already experienced, or are currently undergoing, various molecular apocalypses. Such a realization brings forth a difficult situation wherein "us" humans "[know] what we are doing and why it is literally murdering the earth, but we do not know how to get out of this scenario" (MacCormack, 2020, p. 13). For MacCormack, then, the question raised by today's apocalypse banality is one that asks: "with what intensities will we meet the apocalypse?" (p. 184).

This acceptance of ongoing apocalypse not only defines and delimits future possibilities, but has resulted in a detrimental loss of care for the present. As MacCormack (2020) writes, where "[w]e fear death with more fascination than we live life," today's apocalypse banality

offers yet another articulation of the deep, and deeply narcissistic, fear that we are perhaps not as special as we think we are (p. 190). This projection of human specialness marks yet another aspect of today's apocalypse banality, one wherein the end of the world is framed as a productive catalyst for relaunching and affirming an undoubtedly positive human time to come, which requires annihilating present modes of life and living that do not fit into such relaunch plans. As media theorist and artist Joanna Zylinska (2018) contends in her proposal for a "feminist counter-apocalypse," today's apocalypse habits provide a "new epistemological filter through which we humans can see ourselves" (p. 3). In her admittedly ironic counter-apocalyptic project, Zylinska specifically hones in on the gendering functions of prevailing stories proffered within end of the world discourses today. For Zylinska, today's apocalypse habits are underscored by narratives wherein "Man" is consistently rehabilitated through, for instance, the ongoing revision of conservative Christian eschatology, which sets the scene for underlying narratives of dominion and salvation. Such revisions take place alongside tales of masculinist-solutionist techno-ambitions and white supremacist orientations that simply assume that "Man" can and should be upgraded. Referencing the immortality projects of Silicon Valley and the interstellar colonization projects of Elon Musk's SpaceX, Zylinska (2018) highlights how today's apocalyptic narratives position the current end of the world situation as that which merely requires a "technical fix," and thus, anthropos himself is also "fully fixable" (p. 18). Drawing on the work of Colebrook, among others, Zylinska discusses how today's apocalyptic narratives fail to recognize the ways in which their own discursive tropes and points of reference "bring forth a temporarily wounded yet ultimately redeemed man who can conquer time and space by rising above the geological mess he has created!" (Zylinska, 2018, p. 12). Finding itself threatened by a nonhuman other, be it zombies or climate catastrophe or resource scarcity or an uninhabitable planet, today's common apocalyptic refrains bring forth a humanity that is able to "refind itself by reaffirming its proper mode" (Colebrook & Weinstein, 2017, p. xxii).

The projection of a redeemed and redeeming all-too-human future, which is nevertheless fuelled by visions of and for the end, underscores the way in which today's apocalypse habits are characterized by fantasies of overcoming finitude. As geophilosopher Elizabeth Povinelli outlines, finitude represents a Western metaphysics that understands death as merely the end of carbon-based life forms. As researcher of plastic (and its queer futurity) Heather Davis expands,

"[f]initude represents the drama of existence played out in relationship to the teleological orientation of time towards our own end: a one-way trajectory from birth to growth to death, focused on the individual" (p. 353). This "drama of existence" affirms linear accounts of time and the production of discrete, all-too-human, individuals who "fulfill this narrative teleology by advancing a notion of the human as the masculinist technological agent doomed to bring about humanity's own end" (Davis, 2019, p. 353). What is troubling about finitude, and the (non)ends it projects, is how the logic it proposes, namely, that there will be a clear and defined end that will nevertheless be overcome by human intervention, obscures a more likely, or "realistic" end times scenario characterized by "ongoing devastation, species extinction, and mutation towards a future that will become increasingly toxic but otherwise difficult to predict" (Davis, 2019, p. 353). Indeed, while the future is inherently unknown and unknowable, today's plastic oceans, space junkyards, toxic waste dumps and melting permafrosts provoke a range of weird climatological futures that now deform and mutate the "drama of existence" offered by finitude and its dreams of containment and clean breaks.

Opposed to the logic of finitude and the futures it projects, Povinelli proposes that we might rethink today's ecocatastrophic conditions in terms of extinguishment, a concept that "recognizes that things live and die, re-composing in a different form, but without the drama of the end" (Davis, 2019, p. 355). As Davis (2018) notes, referring to Povinelli's conceptual intervention, where "[a]pocalypse or the 'end of Man' rids us of the questions of inheritance, of a sense of obligation and responsibility to a future, however bleak, too easily" extinguishment instead requires an "acknowledgement of biological, technological, and social limits, but without the drama that would have those neatly encapsulated into a clean break" (p. 355). MacCormack (2020) also draws attention to this more likely, and, in fact, already occurring, scenario wherein the various extinguishments and "minor apocalypses" taking place today have been pushed aside in the name of the "great, single apocalypse that will wipe *us* all out" (my italics, p. 172). For MacCormack, it is the concept of "us" that is the problem here, and not just conceptually, but in quite material ways. Where today's apocalypse banality prioritizes narratives of overcoming finitude so as to project, and actualize, a positive future for "us," it plays a key role in both the proliferation *and* obfuscation of the various extinguishments taking place all around. As Davis (2019) puts it "[i]n our quest to escape death, we have created systems of *real finitude* that mean

the extinguishment of many forms of life" (my italics, p. 353). By affirming images of humanity as a species that is able to free itself from its tainted past while launching itself into an ultimately hopeful future, today's apocalypse banality provides a way to ignore the unthought possibilities, and I wager, the pedagogical encounters, that might otherwise be raised by the ecocatastrophic trajectories characteristic of today's particular end of the world scenario.

### 1.4 Extinction Events

The promise of a positive future founded on human permanence and continuation is becoming increasingly out-of-synch with the reality of contemporary planetary conditions, characterized as they are by a range of very real, material endings and *extinction events*. In Canada, for instance, companies are currently extracting millions of litres of water daily from traditional Indigenous lands, forcing the end of potable water (for some) in a country that is home to 60% of the world's lakes and one-fifth of the world's fresh water (Shimo, 2018). This disastrous, albeit preventable, scarcity situation comes alongside the ongoing dispossession of Indigenous land more generally via the extractive projects of colonial petro-capitalism, which are continuing to decimate cultural traditions and ancestral knowledge through the physical, not to mention violent, removal of people from the land (Moore, 2015). This ongoing land-grab is concomitant with the expansion of global agricultural practices that continue to ravage farmlands and disrupt crop cycles (IPCC, 2018), leading to global starvation crises, unprecedented climate migrations and the end of food. The end of water and the end of food, in turn, have contributed to rising carbon emissions, which, alongside historical wildfires, have led to a literally suffocating situation and the end of breathable air (Wallace-Wells, 2017). Warming temperatures, raging wildfires, extreme weather, uncontrollable feedback loops, rising waters, devastating droughts: these are just some of the current environmental phenomena that have led to record-breaking climate statistics (even amidst times of pandemic stoppages) and thus calls from international bodies such the United Nations to put an end to humanity's "war on nature" (Harvey, 2020).

These unprecedented material upheavals, and indeed, they are unprecedented, are intimately involved in today's mass extinction events, or what scientists have termed the sixth mass extinction. While species extinction now occurs at 1000 times the "background rate," with literally dozens of species going extinct every day, we have entered a new era of "biological

annihilation" (Ceballos, Ehrlich & Dirzo, 2017). This already-occurring extinction event not only marks disastrous biodiversity loss, both in terms of scale and variety, but also, as the National Academy of Sciences puts it, indexes a "frightening assault on the foundations of human civilization" (cited in Carrington, 2017). Despite continued efforts to separate and manage "nature" and "culture" as distinct categories, warnings of the sixth mass extinction highlight the undeniable fact that humans, in their very co-constitution, rely on a range of plants, animals and micro-organisms to maintain a livable climate (for us). As such, today's mass extinction events mark the end of the Sumatran Rhino, the Spix Macaw and the Catarina Pupfish, while also bringing forth the unthinkable realization that "there will be, perhaps sooner rather than later, not merely a speculative imagination of a time without humans but an actual experience of ending" (Colebrook & Weinstein, 2017, p. xii).

In addition to the various material extinguishments taking place, today's era of extinction also involves a range of social breakdowns and psychological degradations that mark their own series of extinction events. As Felix Guattari (2000) asserted over thirty years ago in his prescient essay "The Three Ecologies," the catastrophic effects of anthropogenic planetary transformations are not only characterized by environmental breakdown, but also a broader erosion of social and mental ecologies. In his own words, Guattari (2000) outlines the situation as follows:

> [t]he earth is undergoing a period of intense techno-scientific transformations. If no remedy is found, the ecological disequilibrium this has generated will ultimately threaten the continuation of life on the planet's surface. Alongside these upheavals, human modes of life, both individual and collective, are progressively deteriorating. Kinship networks tend to be reduced to a bare minimum; domestic life is being poisoned by the gangrene of mass-media consumption; family and married life are frequently 'ossified' by a sort of standardization of behaviour; and neighbourhood relations are generally reduced to their meanest expression… It is the relationship between subjectivity and its exteriority – be it social, animal, vegetable, or Cosmic – that is compromised in this way, in a sort of general movement of implosion and regressive infantilization (p. 27).

For Guattari, then, the breakdown of environmental ecologies not only destroys so-called "natural" environments, but erodes social relations and engages in an insidious penetration of

people's inner-most sensibilities (p. 6). One of the key points that Guattari makes in his assertions on ecological breakdown is how, through a disintegration of the three ecologies, social and political possibilities are themselves undergoing extinction. As he writes, "the increasing deterioration of human relations with the socius, the psyche and 'nature,' is due not only to environmental and objective pollution but is also the result of certain incomprehension and fatalistic passivity towards these issues as a whole, in individuals and governments" (2000, p. 41). With Guattari's words in mind, today's extinction scenario involves the extinction of various species alongside the extinction of "words, phrases and gestures of human solidarity" (p. 44), all of which are perishing as fast as those species disappearing from the planet daily.

Transposed to the present situation, Guattari's analysis hits close to home. Beyond familiar warnings associated with what has been euphemistically referred to as "global warming" (i.e. greenhouse gas emissions and subsequent temperature ascensions), today's ecological crises are intimately tied to widespread social breakdowns and the ongoing implosion of subjective enunciations, raising troubling questions about political possibility given the challenges on the horizon. Faced with unprecedented environmental crises, responses from across the so-called political spectrum remain wedded to the imperatives of capital accumulation, colonial expansion and extractivist logic. Evidenced by ongoing support for "green capitalism," "clean growth," and various "sustainable" mitigation schemes, which advocate, for instance, the use of high-tech cannons to shoot sulphur particles into the stratosphere in order to geo-engineer the Earth's reflectivity,[4] even so-called "progressive" proposals for mitigating the unexpected and damaging impacts of anthropogenic climate change contribute to a human species-supremacist planetary politics wherein humans can and will overcome finitude and threats of extinction, no matter the cost. As Colebrook puts it, "[i]f the history of human technology has unfortunately rendered the planet uninhabitable then we can embark on interstellar travel, reverse extinction, create various forms of carbon sinks, find other forms of energy or become some form of super-intelligence that leaves those requirements and limits behind" (Colebrook, 2020b, p. 379-380). In these examples, today's extinction events are not simply denied, ignored or downplayed, but instead positioned as

[4] Solar Radiation Management (SRM) or albedo modification is a geo-engineering strategy that proposes using balloons, aircraft or cannons to shoot reflective particles or engineered nanoparticles into the stratosphere in order to intentionally manipulate climate forcings with the goal of counteracting undesired climactic change (Crutzen, 2006).

rationale, or *reason,* to push forward solutions that actually work to perpetuate present omnicidal trajectories.

Beyond reinscribing dominant political agendas and the inadequate solutionist logic on which they most often rely, today's extinction events raise difficult questions about the *parameters of reason* that have come to subtend concepts of life and death in an age of extinction. As Gilles Deleuze (1988) proposes, reason has unfolded from human beings as way to grasp life and its temporality. However, because humans are but a slice of life, reason is always-already honed upon that which would correlate reason to all-too-human forms of life. As such, reason and the "thinking" that unfolds from it is at the same time defined as a unique human capacity to grasp the infinite while also gesturing to the "tragically finite" capacities of the human to reason beyond its own rational parameters (Colebrook, 2018a). With this reasonable provocation in mind, the very possibility for thinking about species extinction, including the extinction of the human species, works to intensify the presumption that reason is bound to a particular form of life and that this singular vision of life is bound to the potential of its own extinction. As Colebrook (2018a) puts it, "[o]nce humans think of themselves as a life-form, and then as a life-form with the exceptional capacity of thinking or reason, it becomes possible that the potentiality for thinking could cease to be, and that such a non-being of thinking is what must be averted at all costs and without question" (p. 152). Here, the notion of non-being is one at odds with typical notions of extinction and its assertions that everything might end. That is, extinction here does not figure the *end* of life, but instead figures the *affirmation* of life, one that takes the form of a distinct, not to mention exceptional, human species that is defined, above all, by the rational vanquishing of its own non-being.

As Colebrook (2020b) explains, "[i]n the face of non-being we all become members of a humanity whose future must now be focused on life as such. Existential threats are not diminutions of one's being – not catastrophes where there is a massive loss of life – but an event where *who we are* is at risk" (p. 349). This approach to extinction, which is founded on the anthropocentric conceit that current threats of ecological crisis are dangerous based on how they threaten *human* survival, work to recenter the human as undeniably redemptive. As MacCormack (2020) writes, referencing the anthropocentric rhetoric and tactics of groups like "Extinction Rebellion," all-too-human frameworks for understanding extinction "make no room for the grace

of stepping aside and embracing human extinction so that the world may flourish, which would actually be the most effective form of rebellion against individual death, the death of diversity or species extinction" (p. 146). For MacCormack, then, while human extinction is indeed a reality today, it need not necessarily be thought as a problem to be overcome. As she writes, while prospects of human extinction often appear "unthinkable because the idea of a world without humans is understood as an apocalyptic end rather than an opening of the world" (p. 48), extinction might be otherwise encountered as a forceful concept for grappling with approaches to ecosophical ethics that necessitate unthought modes of existence, practices of care and strategies for leaving alone and letting be. Far from being a nihilistic response to the pressing issues and mass suffering raised by today's extinction events, MacCormack's abolitionist proposals[5] position the encroaching event of human extinction as that which conjures modes of empathy and care that require dismantling the human privilege and anthropocentric signifying systems of representation that continue to destroy and decimate life in the present. Drawing on both Colebrook and MacCormack, and with the broader context of today's extinction events in mind, this study approaches extinction as a concept that does much more than describe species annihilation, instead offering a site of struggle for un/thinking questions of life, and thus non-life, through pedagogical problematization.

## 1.5 Anthropo-Scenic Views

### *1.5.1 Proclaiming the Anthropocene*

Questions of life and non-life, especially in relation to "the human" and its reasons, have become a central topic within academic discourse today. This is especially the case for those academic debates and discussions that situate themselves in relation to the geologic era of the *Anthropocene*. As early as 2000, when Nobel Prize-winning atmospheric chemist Paul Crutzen exclaimed "[w]e're no longer in the Holocene but in the Anthropocene!", the role of human impacts on the Earth have been at the forefront of "natural" and "social" scientific discourse alike (cited in Bonneuil & Fressoz, 2016). Coined almost twenty years prior to Crutzen's

[5] Central to MacCormack's (2020) ahuman manifesto is a series of abolitionist calls that propose forms of activism that involve direct calls to "forsake human privilege, practice abolitionist veganism, cease the reproduction of humans and develop modes of expression beyond anthropocentric signifying systems of representation and recognition [so as to generate] care for this world at this time until we are gone" (p. 10).

proclamations and the subsequent popularization of the term, the language of the Anthropocene was first introduced by ecologist Eugene Stoermer, an expert in freshwater diatoms, to refer to growing evidence for the transformative effects of anthropogenic activities on the Earth (Haraway, 2016, p. 44). Fast forward to today, and the term Anthropocene is most often used to signal the current geological era, where, through its activities and its growing population, the human species has emerged as a geological force now altering the planet's climate and environment (Lewis & Maslin, 2015).

Initially introduced within scientific domains, the Anthropocene has invoked the need to not only name, but also come to terms with, the increasingly damaging role of human impact on ecological systems, which can now be measured in the stratigraphic record. As geologist and chair of the Working Group on the Anthropocene (WGA), Jan Zalasiewicz, contends, "[t]he significance of the Anthropocene is that it sets a different trajectory for the Earth system, of which we of course are part" (Carrington, 2016). Since its introduction, the Anthropocene label has proliferated through influential scientific papers and even the creation of specific journals dedicated to the study of this new geological epoch.[6] Within the sphere of geology, Anthropocene studies typically focus on how to index the current epoch, including what "evidence" or "formal criteria" might be provided to properly define such a geological time unit (Lewis & Maslin, 2015). For instance, the general scientific consensus is that global-scale changes of the kind necessary to mark geological epochs must be recorded in geological stratigraphic material, such as rock, glacier ice or marine sediments, providing what is referred to as Global Stratigraphic Section and Point (GSSP) locations or "golden spikes." Some of the most prominent golden spikes referenced in terms of dating the start of Anthropocene include: the advent of the Colombian "exchange" (1492; 1610), which not only resulted in the mixing of previously separate biota but also marks a measurable decrease in atmospheric CO2 that can now be seen in Antarctic ice core records[7]; the Industrial Revolution and James Watt's steam engine (1800), a start date that is supported by abrupt changes in CO2 concentrations in ice core records

[6] Examples of such scientific journals include *The Anthropocene*, *The Anthropocene Review* and *Elementa*.
[7] Lewis and Maslin (2015) suggest naming the dip in atmospheric CO2 the "Orbis spike" so as to mark 1610 as the beginning of the Anthropocene. The "Orbis hypothesis," comes from the Latin word for world, signalling how, post-1492, life on the two hemispheres of the planet became connected through global trade, leading to prominent social scientists to refer to this time as the beginning of the modern "world-system" and thus an appropriate start for the Anthropocene (Lewis & Maslin, 2015, p. 175).

alongside associated changes in levels of methane and nitrate produced by the acceleration of fossil fuel use (Lewis & Maslin, 2015, p. 175-176); and the "Great Acceleration" that occurred after World War II (1945), which points to the development of novel materials (such as plastic) and the global fallout from nuclear bomb testing as unprecedented evidence for geological change (Lewis & Maslin, 2015, p. 176). While the jury is still out on exactly when the Anthropocene began, proponents of this geological lexical entry tend to agree that we have nevertheless "entered a distinctive phase of Earth's evolution that satisfies geologists' criteria for its recognition as a distinctive stratigraphic unit, to which the name Anthropocene has already been informally given" (Zalasiewicz, et al., 2008).

### *1.5.2 Conceptual Shockwaves*

Unlike other geological time unit designations, defining the Anthropocene has already had effects beyond geology, sending *shockwaves* across academic domains and drawing the attention of humanities and social sciences scholars committed to grappling with the growing acknowledgment that the planet is undergoing uncertain and irreversible transformations brought on by human activities. Across domains, Anthropocene debates have amplified and accelerated calls for a paradigm shift in thinking about, for instance, what it means to be human, what we mean by the natural environment, and about our place and agency in the world (Latour 2014; Gibson, Rose, and Fincher 2015; Haraway, 2016). While such calls are far from new, the amplifcations afforded by the Anthropocene, as a concept, index a growing realization that it is no longer "feasible to deny the inextricable enmeshment of human and natural histories, fates and futures" (Taylor, 2017, p. 1449) and thus what is needed are new kinds of scholarship and practice that resist the all-too-human tendency to enact the epistemological nature-culture divide that separates our species off from the rest of the world and thus the thought that "we" are the only ones shaping the world. In this way, and as scientific historians Christophe Bonneuil and Jean-Baptiste Fressoz (2016) assert, the "shock" of the Anthropocene comes in the way that it marks "an event, a point of bifurcation in the history of the Earth, life and humans [that] overturns our representations of the world" (p. 29). Similarly, philosopher of science, Isabelle Stengers (2015), relates the Anthropocene moment to what she terms "the intrusion of Gaia": a "'nature' that has left behind its traditional role and now has the power to question us all" (p. 12).

This is not unlike media and cultural theorist McKenzie Wark's (2015) take on the Anthropocene, which she asserts marks a significant shift in Western thought, "a world-historical moment" (p. 15) akin to other "great discontinuities in perspective such as the heliocentric universe of Copernicus and Galileo [or] the evolution of species in Darwin and Wallace […]" (p. 227). In each of these takes, the Anthropocene is not only positioned as a geological event, but as *a conceptual event* that holds the potential to challenge some of the major representational schema and frames of reference that have structured (Western) ecological thought for centuries.

Positioned as a history-altering and potentially world-ending conceptual event, the "shock" of the Anthropocene is not the result of some "foreign body that strikes the Earth from outside and derails its geological trajectory," but instead, it is a "shock" to our own political, social, economic, and by extension, ecological postures and sensibilities. As Bonneuil and Fressoz (2016) put it, "[i]t is our own model of development, our own industrial modernity, which, having claimed to free itself from the limits of the planet, is striking Earth like a boomerang" (p. 27). Or, more bluntly, as Wark (2015) remarks, "[i]n the Anthropocene, some neutral, pre-given planetary nature is no longer available as a fiction of the real. We fucked it up" (p. 227). The ongoing debates raised by the Anthropocene signal a shift in critical social, ecological and (geo)political discourses by abolishing the illusory break between nature and culture, in turn shifting understandings of the environment as "backdrop for boundless human progress" towards a different understanding of environmental crisis defined by a finite Earth and thus the end of "sustainable development" (Bonneuil & Fressoz, 2016, p. 30). In this way, the Anthropocene marks a "double reality" where, on the one hand, "life" will continue with or without us, while, on the other hand, new conditions created by anthropogenic impacts will bring about "disorder, penury and violence" (Bonneuil & Fressoz, 2016, p. 31). Indeed, such anthropogenic impacts are already making themselves known around the globe. With constraints on resources, climate migration and geopolitical turmoil, alongside rising and unevenly distributed death-tolls brought on by politics, pandemics and pollution, if the Anthropocene promises anything, it is violence. In this way, and as Bonneuil and Fressoz (2016) put it, given the advent of the Anthropocene, "[t]he question in the twenty-first century will be how to inhabit the Earth less frightfully" (p. 33).

With this in mind, the ongoing question about when the Anthropocene began is not only driven by desires to produce certainty around stratigraphic categorization, but also by a desire to figure out where, when and why things went wrong. Dating the Anthropocene therefore has implications beyond scientific domains such as geology, impacting political frameworks for understanding today's anthropo-scenic reality. As Zoe Todd and Heather Davis (2017) assert, "it is not only the decision of *whether or not* the current geological time frame should be considered the Anthropocene, but the question of *when* that opens up political consequences" (p. 762). For Todd and Davis (2017), the task of dating the Anthropocene is a political one in the sense that it enables, but also limits, opportunities for evaluating how the concept of the Anthropocene itself plays a role in maintaining and reproducing particular political commitments. As they write, "[i]f the Anthropocene is already here, the question then becomes, what can we do with it as a *conceptual apparatus* that may serve to undermine the conditions that it names?" (my italics, p. 763). For Todd and Davis, this question leads to their assertion that the Anthropocene must be explicitly linked to the beginnings of colonization, which in turn would assert it as "a critical project that understands that the ecocidal logics that now govern our world are not inevitable or 'human nature,' but are the result of a series of decisions that have their origins and reverberations in colonization" (p. 763). This time around, the "shock" of the Anthropocene is the seismic shockwave of dispossession and violence used by colonial forces to make claims over Indigenous lands and bodies, which is now being felt by those who have benefited from the organizations of material life that created the shock in the first place. As Davis and Todd (2017) put it, the "Anthropocene – or at least all of the anxiety produced around these realities for those in Euro-Western contexts – is really the arrival of the reverberations of that seismic shockwave into the nations who introduced colonial, capitalist processes across the globe in the last half-millennium in the first place" (p. 775). Todd and Davis' assertions highlight the way in which the Anthropocene is intimately intertwined with material practices of exploitation and domination, and thus must be examined as a concept that not only enables possibilities for thinking, but also impacts the formation of very real political responses.

### *1.5.3 Counter-Scenic Proliferations*

While the arrival of the Anthropocene has been positioned as a catalyst to question and counter-actualize deep-seated conceptual, and by extension political, commitments, it is not without its contentions. Todd and Davis' (2017) questions around dating the Anthropocene concept, for instance, are ultimately a critical interrogation of the concept, one they assert is necessary for expanding environmental discourses in ways that take seriously the plural human and nonhuman entanglements that shape the present so as to move towards liberating humanity from the horrors of the Anthropocene (p. 775). Todd and Davis' call to study and story the Anthropocene in ways that challenge narratives of Man's salvation by tending to "the ruptures and cleavages between land and flesh, story and law, human and more-than-human" (p. 775), take part in a growing chorus of critical interrogations of the Anthropocene. Within these critical takes, one of the key assertions is that the Anthropocene concept does not work to de-centre the human and its dreams of unfettered progress, but instead remains faithful to legacies and logics of human dominance and exceptionalism, in turn reifying a new set of grand narratives and naive universalisms (see, for instance, Crist, 2016; Davis & Todd, 2017; Haraway, 2016; Mirzoeff, 2018; Moore, 2017; Todd, 2015; Yusoff, 2018; Zylinska, 2018).

As Anthropocene critics from across various disciplines have argued, our current ecological situation did not, in fact, begin with "Man" and his ever-increasing needs, but is instead the result of the systematic installation and perpetuation of particular organizations of power and oppression. As Todd and Davis (2017) point out, for instance, the Anthropocene does not signal the disastrous impacts of "humans" on earthly conditions, but more accurately points to how those invested in profiting from petro-capitalism and colonialism have left their mark — via radionuclides, coal, plutonium, plastic, concrete and genocide — in the geologic strata (p. 765). In this instance, the Anthropocene is critiqued in terms of how it seems to hail a universal call to humanity, rather than a focused critique of the vast inequalities regarding who uses resources, let alone who is most at risk, and thus who is privy to this concept. This is in line with Kathryn Yusoffs'(2018) critiques of the Anthropocene, where she outlines how the Anthropocene's re-installation of a standardized and perpetual humanism not only prioritizes the human over other life-forms, but also offers a "planetary analytic" (p.13) that fails to grapple with how geology, and thus the conquest of geological time, produces particular world-making effects. As she writes in her book *A Billion Black Anthropocenes,* through the installation of this

new planetary analytic, one that attempts to unify vision across time and space in a seemingly undifferentiating and indifferent manner, the geologic inscription of what has been termed the Anthropocene fails to "properly identify its own histories of colonial earth-writing, to name the masters of broken earths, and to redress the legacy of racialized subjects that geology leaves in its wake" (p. 4).

Also critical of the Anthropocene's disavowal of systems of production and power, environmental historian Jason Moore (2015; 2016; 2017) has been a key voice in raising contentions around the Anthropocene label. Moore asserts that today's "scene" cannot be attributed to humans generally, but instead must be traced in relation to how the capitalist exploitation of the "four cheaps" — food, energy, nature and labour — have in turn given rise to our presently degrading ecological conditions. For Moore, this recognition leads to a different naming of today's epochal situation, what he calls the *Capitalocene.* Environmental feminist thinker Donna Haraway (2016) has likewise suggested an alternative proposal to the Anthropocene, one she calls the *Chthulucene,* which is used to describe our epoch as one in which the human and nonhuman are inextricably linked in tentacular practices. According to Haraway (2016), the Anthropocene is not a story that can get us anywhere due to the way that the very notion of anthropos "saps our capacity for imagining and caring for other worlds" (p. 50). For Haraway, then, our present geological era should not be defined in terms of a universalized and autopoetic, or self-making, human, or *anthropos*, nor should it be attributed to capitalism alone. As she puts it, "[t]he unfinished Chthulucene must collect up the trash of the Anthropocene, the exterminism of the Capitalocene, and chipping and shredding and layering like a mad gardener, make a much hotter compost pile for still possible pasts, presents, and futures" (Haraway, 2016, p. 57). While their foci and political orientations differ, what each of the aforementioned critical takes have in common is their call to interrogate the Anthropocene *concept* in terms of how it frames the human as incontestable, further enabling human specialness to occupy the ecological imaginary, in turn endlessly expanding human dominion and conquest over the Earth from geographical space to geological time.

Alongside calls for a billion black Anthropocenes, proposals for the Capitalocene, and speculative stories of a tentacular Chthulucene, numerous alternative naming devices and *counter-scenic proposals* have been proposed so as to interrogate the conceptual limits and

affordances enabled by this lexical device. Like Todd and Davis, many scholars have proposed names that better capture the colonial logic and dispossessive legacies that have led to current planetary predicaments. Whereas Jairus Grove (2019) proposes the *Eurocene* to show how political violence, led by European colonization, is the principal force behind today's era of climate change, slavery, genocide, extractive capitalism, and other catastrophes, Michael Samways (1999) suggests that the *Homogenocene* might be a more accurate way to name the collisions created through the Columbian Exchange, which took place in a thousand different forms, but all had one ultimate result: "making the world's ecosystems more and more alike" (Mann, 2011). Others have proposed names that better capture the gendering functions of the Anthropocene and/or work to scrutinize the masculinities that have come to undergird environmental conditions, such as in Joanna Zylinska's (2018) feminist counter-apocalyptic proposal for the "end of man" or Kate Raworth's (2014) questions around the *Manthropocene*. In yet another line of contention, and taking cues from Haraway's sympoietic speculations for naming the current epoch, many of the counter-scenes proposed in response to the Anthropocene work to better attune to the non-human and inhuman relations that co-constitute today's ecological and geological systems. Some of these names include Natasha Myer's (2017) *Planthropocenes*, which she proposes as an "aspirational episteme and way of doing life in which people come to recognize their profound inter-implication with plants" (p. 299), the *Plasticene,* a label that works to describe the new reality of ecological, chemical, and geological systems in the age of plastics (Haram, et. al., 2019), and the *Anthrobscene*, Jussi Parikka's (2015) way of introducing the notion of an "alternative deep time in which media live on in the layer of toxic waste we will leave behind as our geological legacy." While this brief overview of counter-scenic proliferations outlines just some of the terms currently on offer (indeed, I have tracked over 50 in my relatively short time exploring Anthropocene discussion[8]), it nevertheless demonstrates the way in which the Anthropocene has catalyzed debate on the power and import

[8] Just some of the current names on offer in relation to the Anthropocene include Aerocene, Agnotocene, Anthroboscene, Capitalocene, Chthulucene, Elachistocene, Entropocene, Eurocene, Growthocene, Gynecene, Homogenocene, Mantropocene, Misanthropocene, Necrocene, Palaeoanthropocene, Phagocene, Phronocene, Plantationocene, Plantropocenes, Plasticene, Polemocene, Sustainocene, Symbiocene, Technocene, Thermocene, Thanatocene and White Supremacene.

of this lexical invention as a conceptual apparatus that not only conditions analyses of the nature and origin of problems, such as ecological ones, but also orients possibilities for resistance.

### *1.5.4 Un/Thinking the End*

Considering this proliferation of names, the Anthropocene is characterized by, on the one hand, a confrontation with the seemingly unthinkable nature of today's geotraumatic milieu and thus a crisis of representation, and on the other hand, a territorializing logic that seeks to code the current moment in terms of particular scholarly commitments, linguistic apparatuses, conceptual grammars and political investments. At the same time that each naming device draws attention to the specific conditions of power, modes of relation and historical contexts through which we might better understand ecological problematics, this proliferation of names also makes apparent the incredibly difficult task of *thinking* about, let alone naming, the incommensurable character of anthropogenic planetary transformation today.

What this brief, and thus far from complete, introduction to the Anthropocene (and its discontents) points to is not only how "we humans" have irrevocably altered the planet, but how this geological designation itself plays a part in today's apocalypse habits. As Yusoff (2018) asserts, for instance, the Anthropocene's faithfulness to what she calls "White Geology" offers a site for a series of shape-shifting apocalypse habits to take hold, habits that are both "world making in [their] epochal pronouncements of the 'New World' of humanity [and] world breaking in the formation of the 'Ends' of master subjects: Man, History, Civilization" (p. 4). In this way, and as Jedediah Purdy (2015) tells it, the Anthropocene describes an "all-purpose projection screen" amplifying preferred (capitalistic and techno-scientific) narratives of human exceptionalism, provoking heroic thinking and high stakes rhetoric "of the human mind pressed up against the wall of apocalypse" (para. 12). The apocalypse habits highlighted here fall in line with the broader way in which the Anthropocene is often narrated as a world-ending event that nevertheless affirms projections of a positive future for "us." As Colebrook (2016b) skillfully outlines, some of the main things "we" have been told about the Anthropocene and its world-ending demarcations include: first, that we have passed a tipping point; second, that this geological designation marks a major shift in scholarly practice and theoretical developments;

and third, that given the awareness of this new epoch, we must radically transform the world or we are doomed (p. 81-82). As she puts it:

> [i]f we have damaged the planet to this degree, then we all need to act as one, and for the sake of saving us all. If we have passed a tipping point, then we are faced with necessary and immediate measures that cannot indulge in the luxuries of democracy or doubt. If there is a way that we might survive then that is the path we must follow (p. 82).

In short, and important for this investigation of *Pedagogy at the End of the World*, the Anthropocene signals more than just a geological declaration, but also more than a conceptual "shock" that necessitates new modes of diagnoses and imperatives for salvation. What the Anthropocene signals is a *problem for thought,* one that draws attention to the thresholds of un/thinkability through which past, present and future trajectories on this planet we call Home are conditioned.

As pessimist philosopher Eugene Thacker (2011; 2015a; 2015; 2018) asserts (with a long sigh), today's situation is increasingly *unthinkable* not only due to the way in which planetary disasters, emerging pandemics and strange weather patterns frustrate familiar understandings of the world and our place in it, but due to the realization that *philosophy itself* must navigate the challenge of comprehending the world in which we live as "both a human and a non-human world" (p. 2). As Thacker (2011) alleges, despite our best efforts of "anthropic subversion," the philosophical conceit that reality exists as it does for a human subject is now confronted with the horrific thought of an impersonal planet in which human life and vitality no longer figure as privileged modes of being. Here, Thacker (2011) draws attention to what he deems the "horror" of philosophy, or as he writes, the limits of human thinking as it confronts "a world that is not just a World, and not just the Earth, but also a Planet (the world-without-us) [wherein] horror is not simply about fear, but instead about the enigmatic thought of the unknown" (p. 8). Thacker's take on unthinkability is echoed in Colebrook's (2012) claims about the Anthropocene concept, which, she asserts is, quite literally, "that of an irrevocable and inhuman humanity: man is that animal who has detached himself from putative ecological animality and lived in such a way that his life is destructive of his milieu" (p. 207). With these unthinkable thoughts in mind, the banality of today's particular sense of apocalypticism is perhaps less the result of over-saturation

or a desire for delaying inevitable doom, but instead a necessary mechanism for "domesticating" that which is inherently unknowable and unthinkable.

Where dominant apocalypse habits rarely imagine a world "without us," instead opting for perpetual fantasies of a world beyond, or *after* the end of the world where (some of) humanity has inevitably triumphed against its own existential threats so as to live on in perpetuity, what now comes to pass for an apocalyptic imaginary "is genuinely post-apocalyptic insofar as the thought of an actual end is unthinkable" (Colebrook, 2012, p. 204). What is unthinkable here is not just the thought of humanity's end, for such a thought has now become commonplace, birthing a thousand new narratives of human dominion and redemption. What remains unthinkable, instead, is what might be left for "us" if "we" were to take seriously the pressing issues of insufficiency, extinguishment, diminishment, divestment and ecocatastrophic abolition that might otherwise be raised by something like the Anthropocene and its world-ending scenarios. As MacCormack (2020) writes, the *a*nthropocene,[9] or more specifically the *end* of the anthropocene, is "the opening of the world" (p. 48). That is, the end of the anthropocene is what opens up "thousands of voices, trajectories, relations and necessary activisms" (p. 1), in turn engendering powerful, albeit unpopular, calls for both the deceleration of human life, through for instance the cessation of reproduction, and the "the absolute end of perception that apprehends all living organisms and relations through anthropocentric-signifying systems" (p. 1-2). Importantly, this call for affirmation via negation is not a call to reimagine humans and their relations anew so as to perpetuate the primacy of an anthropocentric world, but instead this is a call for the diminishment, divestment and, ultimately, abolition of "the human both *conceptually* as exceptionalized and *actually* as a species" (my italics, MacCormack, 2020, p. 5). It is through this negative view of the end — the end of human life, the end of the anthropocentric world — where potentials for a very different approach to grappling with today's end times scenario, both conceptually and materially, emerge.

### 1.6 Pedagogical Deterritorializations

[9] Patricia MacCormack deliberately does not capitalize the *a* in anthropocene in order to enact an ahuman intervention into the term, one that works towards dismantling the dominance of the human, or anthropos, at its centre.

This study of *Pedagogy at the End of the World* starts from the wager that the unprecedented ecological, social and psychic conditions that characterize existence amidst today's extinction events and anthropo-scenic surrounds should not be treated as catalysts for relaunching and redeeming humanity (and its education), but instead *grounds for its conceptual and material overturning*. Far from providing a blueprint to which the future might be re-oriented towards human perpetuation, today's anthropo-scenic scenario and its attendant apocalypse habits offer a site to grapple with the very way in which we have come to *think* about the world and its apparent ends. The ecological conditions that have led to the sixth mass extinction, for instance, not only draw attention to how linear orders of time and nature-culture distinctions are themselves illusory, if powerful, fictions, but also how the world is not given to or for us, and is thus is not "ours" to save (Snaza, 2018). From the manifestation of planetary realities that challenge all-too-human timescales, to the intricate co-constitutions that make up who we think we are, to the question of how the world, and thus life itself, might be seen from an inhuman perspective after the extinction of the human species, today's end times situation raises difficult questions about being and non-being, about life and death, about finitude and extinguishment, all of which necessitate experiments in conceptual crafting, which, as I unfold below, is a *pedagogical task.*

As Deleuze and Guattari propose in their last work together, *What is Philosophy?*, "philosophy is the art of forming, inventing, and fabricating *concepts*," (my italics, 1994, p. 16). Once again, a concept, in the philosophical sense outlined by Deleuze and Guattari, is different than the typical, more everyday use of concepts, based on the way it conditions and enables new strata for thinking. The sense of the "new" here does not just reference the addition of new words to a language, but signals the way in which philosophical concepts "transform the whole shape of a language" (Colebrook, 2002, p. 17). Understood as problematizing forces that orient and enable thinking, philosophical concepts are not determined by *a priori* identities and representations, but instead are the *material processes* that form and deform the way in which thinking comes about through movements of *deterritorialization*. Deterritorialization, and its dynamically relational concept of reterritorialization, are concepts used by Deleuze and Guattari to understand the way in which assemblages of relations, what they call territories, are organized and disorganized. The concept of deterritorialization is developed in Deleuze and Guattari's

*Capitalism and Schizophrenia* (1983; 1987) series as a way to understand the mutation of social, cultural, psychological, economic and political processes, but also the formation of subjects, objects, languages and beliefs in relation to the territories through which they are formed and deformed. Deleuze and Guattari also use the concept of deterritorialization to discuss the way in which thinking occurs. For these thinkers, thought is that which emerges from the deterritorialized Earth, what they also call the plane of immanence, through concept creation, or the process of binding and shaping otherwise infinite virtual potentialities into internally consistent intensively-fused blocks.

Where concepts do not come ready-made, but instead emerge through deterritorialization, concept creation involves the process of concepts entering into relations with other concepts, in turn producing zones of intensity that set in motion new dynamic constraints, and thus the conditions for further concept creation (or not). Each new iterative reconfiguration in the meta-stable plane of immanence transforms conceptual affordances and constraints and, as such, it is not possible to predict or correlate the particular events to which a concept might give rise. It is through this materialist, albeit speculative, orientation to philosophy, that Deleuze and Guattari develop the assertion that concepts are not pre-determined nor are they representational, but instead emerge as a *necessity* to the problem of thinking. As they write, "concepts are only created as a function of problems" such that "concepts are connected to problems without which they would have no meaning and which can themselves only be isolated or understood as their solution emerges" (Deleuze & Guattari, 1994, p. 16). With this problematic approach to the creation of concepts in mind, deterritorialization is used as a way to discuss how commonsense opinions come to arrest the philosophical power of concepts. For Deleuze and Guattari (1994), if there is a blockage at the level of the concept, it is not simply due to a failure of communication or a representational challenge, but instead due to the way in which the superior positivity of representational models and regimes of communication work to reterritorialize the otherwise problematizing force of concepts by attaching them to habitual representational schema and everyday opinions (p. 288-289).

Both the Anthropocene and the anthropos it imagines at its heart offer examples of the way in which the problematizing potential of concepts is reduced and correlated to everyday opinions and representational tropes through processes of de- and reterritorialization. As

Colebrook (2020b) develops in her assertion that the "future is already deterritorialized," the *human* — the *anthropos* of the Anthropocene — is itself a deterritorialization. Where the human not only references an exceptional species capable of so-called rational thought, but also signals that which is "set apart from all life in the world by his existential fragility, by the always present possibility that he may not be," (Colebrook, 2020b, p. 346) the concept of the human is a specific mode of deterritorialization where what had formed as a species (i.e. homo sapiens) has become something quite different. As Colebrook (2020b) writes, the concept of the human takes on a deterritorializing mode by "orienting itself towards its threatened non-existence, and then allowing that idea of non-being to dominate all other relations, especially to those who do not count as Anthropos, [those who] do not feel this existential fragility" (p. 346). Here, the very concept of existential threat, which has, for instance, come to undergird today's Anthropocene designation, relies on the production of a virtual humanity where both "Anthropos" and "human" are formed through the thought of their non-being. As such, the Anthropocene, is also an event of deterritorialization, one wherein "the global diversity of humans as a species is overtaken by the way in which one species both alters the planet as a living system, *and* generates a deterritorialized future" (p. 351). What is important to note here is how the concept of the Anthropocene is involved in material relations, which in turn come to impact not just concepts in the world but the material forces of *desire* that condition and organize life itself. Where, as Deleuze and Guattari assert, deterritorialization refers to processes where the potentiality of a body takes on a new time and space, deterritorialization is not something that happens *to* bodies, but is what brings bodies into being. As Colebrook (2020b) puts it, "[a] whole new mode of relations is formed when the 'humanity' that had defined itself through a specific mode of civilized time comes to stand for that which is threatened, and therefore that which must be saved" (p. 351). It is this mode of relations, formed through the deterritorializing logic of the anthropos, that in turn enables the Anthropocene, both geologically and conceptually: "a potentiality of the species reaches such an intensity that it generates a whole new scale and range of relations" (Colebrook, 2020b, p. 356-357).

As Deleuze and Guattari are careful to note throughout their work, and as the above examples demonstrate, deterritorialization is not strictly opposed to reterritorialization, nor is it inherently liberatory. What is important within processes of deterritorialization, then, is the way

in which they work to capture and/or enable strata for thinking. As such, movements of reterritorialization cannot be viewed as inherently "bad" and deterritorialization as fundamentally "good" (or vice versa). In the example of the Anthropocene and its deterritorializations, "what needs to be negotiated — beyond good and evil — are the various ways in which deterritorialization either captures all other strata within the range of the Anthropos, or enables a thought of life beyond any single stratum" (Colebrook, 2020b, p. 368). As Colebrook (2020b) asks, "[w]hat might happen if deterritorialization were not thought of as a godlike emergence ex nihilo, as ongoing self-creation and renewal, but as always bound up with forces allowing for highly singular lines of flight?" (p. 380-381). It is this question that orients my own investigations of pedagogy at the end of the world and the deterritorializing movements through which it might be thought. Positioned in terms of deterritorialization, concepts are not concerned with the representation of essential truths or falsities, but rather, *concepts matter* in terms of how they relate, in terms of their capacity to enter into relations with other concepts and for the events of thinking that such relations might produce. In this way, concept creation is *future-oriented* in the way that concepts generate unthought relations, in turn calling for new concepts that are able to stabilize or bifurcate the plane of immanence. It is through the emergent relationality of this conceptual crafting that thinkability, and thus the threshold of unthinkability, is actualized. Put another way, concepts always emerge in relation to both an internal logic as well as a range of extant concepts that take part in ongoing processes of deterritorialization, which in turn define what is possible to think in the first place.

This attunement to "problematic epistemology" (DeLanda, 2002), or a form of thinking which consists in "making visible problems for which there exists no program, no plan" (Rajchman, 2001, p. 8), not only raises philosophical questions and stakes, but, importantly for Deleuze and Guattari, signals one of the most important contemporary political challenges of our time. As they assert in *What is Philosophy?,* one of the main functions of philosophy is to *resist the worst horrors of the present*, which as they see it, are exemplified by contemporary communication society and its dead ends of "commercial professional training" (Deleuze & Guattari, 1994, p. 12). For Deleuze and Guattari (1994), then, the question for philosophy is not how to produce *better* communications, but how to resist representational capture: "[w]e do not lack communication, on the contrary we have too much of it. We lack creation. We lack

resistance to the present" (p. 108). One of the pivotal questions within Deleuze and Guattari's problematizing philosophical method is thus how to free thought from the restricting representations and everyday opinions that have come to overdetermine concepts, thus disappearing potentials for unthought conceptual crafting. For Deleuze and Guattari, the way out of this communicative nightmare is through philosophy and the *pedagogy of the concept*, which involves understanding what concepts are, how they function in context and how to create them ecologically, ethically and aesthetically. This study of *Pedagogy at the End of the World* draws upon this approach to philosophy and, as such, is invested in the creation of concepts that work towards problematizing the apocalypse habits and end of the world representations that have come to condition potentials for thinking educational futurity. Where, as I have unfolded thus far, proclamations of and speculations on the end of the world raise a particularly *pedagogical* question, albeit one that is hard to think about, the task of investigating pedagogy at the end of the world involves experimenting with the deterritorializing function of *concepts,* which condition the contours, configurations and constellations for events, including the event of thinking, to come.

### 1.7 Project Preview

This study of *Pedagogy at the End of the World* emerges from today's unthinkable end of the world scenario and is oriented towards the creation of concepts that work to problematize and resituate questions of educational futurity. Where, as developed in the next chapter, the Industry of Education remains committed to the progressive acquisition of knowledge, and ultimately *thinkability*, a confrontation with pedagogical unthinkability is, well, unthinkable! How, then, might pedagogical thinking proceed when confronted with the unthinkable scenarios and unfathomable conditions raised by today's anthropo-scenic milieu and its extinction events? What does educational inquiry entail when it confronts its own thresholds of rationality, or the limits of thought and thus a thought of limits, which, given education's commitment to progressive thinkability are demonstrably unpopular? How might educational problem-posing approach questions and issues that resist thought itself? And further, what are the conditions, preclusions and exclusions that make something thinkable in the first place? With these questions in mind, this study endeavours towards navigating the pedagogical unthinkability

raised by today's end of the world scenario, not as a way of surmounting or domesticating the unthought, but instead, as a mode of resituating educational problem-posing in relation to an unknown and unknowable future. As such, this study aims to practice an approach to educational research that does not entail a rejection of the actual world and thus the real of impending ecocatastrophe, but instead opts for modes and styles of inquiry that might be capable of mutating and bifurcating pedagogical possibilities. Heeding the warnings of simply repeating in the image of redemptive humanity, this study is positioned as a speculative experiment that does not aim to imagine some Utopic *education after education*, but instead works to problematize educational futurity so as to fold the problematic of an unknown and unthinkable future into the interval of the present so as to speculate on alternative trajectories for conceptualizing pedagogy at the end of the world.

In broad terms, this study experiments with various lines of pedagogical thought so as to interrupt the concerted narrowing of educational possibility, and ultimately futurity, that has been fueled by the apocalypse habits and extinction events characteristic of today's end times. By probing the way in which contemporary educational un/thinkability is itself conditioned, this study is geared towards counter-actualizing both the narratives and methods that have come to overdetermine discussions of educational futurity. In more specific terms, the project proceeds through a series of chapters that work to further probe the problem of pedagogical un/thinkability as it is situated within today's (apparent) world-ending situation by honing in on three specific trajectories for educational futurity, which are not only examined in terms of critique, but also in terms of the speculative elaborations they might enable. Whereas this introductory chapter has endeavoured to set the broader scene and outline the significance of un/thinking pedagogical problematics for the end times, *Chapter Two: Problematizing The Given World of Education,* zooms in on the site of education more specifically, or what I call the Industry of Education, in order to examine the ways in which pedagogical possibility has been directed and delimited by contemporary education's industry standards. After spending some time touring the Industry of Education and the futures it projects, *Chapter Three: Crafting an Experimental Approach to Weird Study,* outlines an overview of the (non)methodological cues and gestures that inform the speculative studies that follow. In this chapter, the end times scenario explored thus far is further probed in terms of its weird and weirding effects so as to outline the speculative modes and

transversal styles that reinforce this project and its development of a weird pedagogy. Following the three introductory chapters, this project then offers three speculative studies of *Pedagogy at the End of the World*. Each of these studies is positioned as a site for experimenting with the limits of pedagogical un/thinkability so as to speculate, through concept creation, on alternative orientations to educational futurity.

In *Chapter Four: Sustaining the End of the World (Study No. 1),* the unthinkable pedagogical problematic explored is that of *sustainability* and its education given today's increasingly unsustainable state of affairs. In this chapter, I focus the investigation on contemporary proposals for education *for* and *as* sustainability, which most often work towards the production and maintenance of a given world wherein education is seen as a necessary technology for adapting to and mitigating, in so-called sustainable ways, the eco-catastrophic challenges that lie ahead. In order to challenge and mutate dominant educational discourses trained towards sustainability, this chapter puts the problem of sustainable futures in contact with the strange logic of a black hole and its computational imaging. Through this weird encounter, this speculative study approaches the question of pedagogical un/thinkability in terms of how scientific legibility and its apparent horizons of perceptibility are interpolated into broader epistemological, and ultimately cosmological, frames of reference that have the potential to resituate education and its futures.

Next, in *Chapter Five*: *End-of-the-World Energetics (Study No. 2),* today's unthinkable situation is approached from a different angle, this time focusing on growing calls for energy transition and the banking models on which dominant visions of *energy futures* rely. Taking aim at the transition grammars that have not only come to over-determine energy futurity, but the concept of transition itself, this chapter examines the Industry of Education in terms of its givenness to financial instrumentalization, which, I argue, has resulted in an energy emergency characterized by widespread anxiety and fatigue. In more specific terms, this study investigates educational research and practice focused on the inculcation of energy literacy and the derivative recalibrations such approaches necessitate. Key here is an exploration of the role speculation plays in the production of educational futures, which, as the example of speculative finance demonstrates, is not always emancipatory. By putting the concept of energy literacy, and ultimately energy transition, in contact with the strange logic of speculative finance as well as the

weirder dimensions of the energy concept, this chapter asks not how to better manage educational futurity given current crises, but how to un-manage it still.

In *Chapter Six: Working at the Edge of Extinction (Study No. 3),* the unthinkable pedagogical problematic explored is one that raises questions about life itself, specifically in relation to the Anthropocene and its extinction events. The educational site of study here is that of online learning, or *platform education*, which works to equate and conflate learning, labour and life in the name of particular educational futures. Here, the Industry of Education is examined in terms of its unquestioned orientation towards *working futures*, which are defined, above all else, by the assumption that education is forever given to the production of a workforce thus perpetuating particular modes of life and living. To explore this educational given, this study looks to the phenomenon of online learning and the working conditions it engenders and reproduces in an age of platform proliferations. In a move to counter-actualize the givenness of education to visions of livelihood always-already oriented to working futures, this section puts the question of pedagogy in an era of extinction in contact with the weird habits and strange productions of reality TV.

In each of these chapters, particular aspects of the Industry of Education and its unthinkable problematics are examined in terms of the educational givens at work and how such givens condition pedagogical problematization. Importantly, however, each of these speculative studies endeavours to move beyond just analysis and critique of the epistemic constraints and conceptual affordances that have come to condition educational futurity. By putting (apparent) educational givens into contact with a range of seemingly alien objects, theories and examples, each of the speculative studies that follow work to reframe and reorient both educational problems *and* solutions through speculative experimentation. It is from this experimentation that a weird pedagogy emerges, that is, an experimental (albeit always insufficient) pedagogical anti-model, a speculative programme for the unprogrammable that seeks to problematize pedagogical un/thinkability. In the final chapter of this project, *Chapter Seven: Germinating a Weird Pedagogy,* I provide a summative sketch of this approach to pedagogy with specific focus on how it responds to the end times problematics within which education is today situated. Through the speculative development of a weird pedagogy, this study of *Pedagogy at the End of the World* is not only framed as an experiment in pedagogical thought, but also aims to intervene

within educational theory and research — into the process of *study* itself — so as to counter today's apocalypse banality and those everyday end-of-world concepts that have come to limit pedagogical possibilities, both now and into the future.

# CHAPTER TWO: Problematizing The Given World of Education

## 2.1 The Problem of and for Pedagogy Today

### *2.1.1 What Do Concepts Do?*

Today's end of the world, which, as unfolded thus far rarely references any actual experience of ending, will not come like those monumental ends proffered by the apocalyptic habits that perpetually flicker across our screens and occupy discussions of our self-made extinction events. Instead, this is the way the world ends: not with a close encounter or zombie invasion, not with a global geo-storm or nuclear meltdown, not with a sudden break or fantastic bang, but rather, as a gradual demise wherein the world as we know it — the world as it is *given* — is transformed in ways that put at risk what, and on what basis, we are able to think in the first place. Against the dominant apocalypse habits that see the end of the world as yet another opportunity to redeem and relaunch humanity, both in spite of and because of today's anthropo-scenic situation, this study of *Pedagogy at the End of the World* probes at the ways in which end of the world thinking has come to define and delimit pedagogical approaches to grappling with the material and conceptual ends that might otherwise provoke important questions about education and its futures. As such, this project not only embarks upon a pedagogical encounter with the real, if unthinkable, situation of ecocatastrophe gripping the planet today, but also works to experiment with what makes education, and its reasons, thinkable in the first place.

A significant aim of this study is to actively investigate the role and status of *pedagogy* as it is situated amidst today's end times scenarios. As developed thus far, pedagogy in this study refers to a pedagogy of concepts, which I explore further here in relation to the question of *what concepts do*. Drawing on the philosophical method of Deleuze and Guattari, this project understands thought as that which emerges from the plane of immanence, or the deterritorialized Earth, through *concept creation.* Within this philosophical approach, concepts are not given in advance, but instead must be created (Deleuze & Guattari, 1994, p. 11). For Deleuze and Guattari, then, the task of philosophy is to consistently ask how concepts are produced, which necessitates experimenting with what concepts *do.* And what concepts do is *create problems*. As introduced in the previous chapter, for Deleuze and Guattari (1994) concepts are created as a function of problems. Here, the notion of a problem refers to the problematizing forces and intensities through which life — all life, not just that limited to the human — is generated. As

Colebrook (2002) summarizes, where "life poses problems," where "organisms, cells, machines and sound waves are all responses to the complication or 'problematizing' force of life," questions within philosophy are "extensions of the questioning power of life" (p. 1). One of the key points made by Deleuze and Guattari in their claims about concept creation, then, is that creation is not an act of variation that is *added on* to an otherwise stable and inert assemblage called life, but instead *all life is creation*: "we understand what something is not by looking to its unchanging form but by trying to discern its specific way of being different or creating, [that is] *its specific problem"* (Colebrook, 2002, p. 26).

The creation of concepts is, in this way, just one instance of the creative force of life, one that involves, on the one hand, the "laying out of a plane," or the construction of a plane of immanence so as to pragmatically "find one's bearings in thought" (Deleuze & Guattari, 1994, p. 37) and, on the other hand, the generation of encounters with that which exists against any sort of prior recognition or resemblance. Here, the plane of immanence refers to the presupposed field across which the distinction between apparent interiorities (i.e. the mind of the subject) and exteriorities (i.e. the world) are drawn (Colebrook, 2002, p. 74). Thought, which is not produced through conscious choices made by the subject but rather emerges as a *necessity* of conceptual problematization, is what produces connections with a perceived exterior, a world we can know and represent, and a perceived interior, a mind of the subject that can know and represent the world. But, importantly, this apparent relation between interior and exterior, between so-called inside and outside, relies on what remains hidden or presupposed. As Colebrook (2002) develops, "we do not begin as subjects who then have to know a world; there is experience and from this experience we form an image of ourselves as distinct subjects. Before 'the' subject of mind, then, there are what Deleuze refers to as 'larval subjects': a multiplicity of perceptions and contemplations not yet organized into a self" (Colebrook, 2002, p. 75). The "outside" of thought, then, does not refer to a world that exists beyond or outside of the subject, which can come to be known and represented, but instead refers to the plane of immanence, which is co-constituted by all the assumptions, presuppositions, distinctions and distributions that produce the conditions for thought. It is in this way that concept creation is future-oriented and it is in this way that concepts are based in necessity; that is, there is a future-oriented necessity to thinking for concepts are what give rise to unthought relations and thus the event of thought lies beyond the

autonomy of something like personal choice. Where thinking is a power of and for becoming, it is not something that "we" do; "thinking happens to us, from without" (Colebrook, 2002, p. 38). Returning back to the question of what concepts do, then, concept creation can be summarized as the immanent process wherein concepts are formed in relation to specific problems, in turn giving rise to new concepts that re-orient strata for thinking. This process is not just a representational or cognitive task, nor can it be predetermined in advance, but instead involves the emergent and material processes of deterritorialization through which life itself is constituted.

Thinking, in this way, is not merely a representational activity, but involves the productive, creative and material forces of *desire*. As Deleuze and Guattari develop throughout their philosophical project, desire is not fueled by lack, but is instead *productive*. Against psychoanalytic accounts of desire, which see it as that which emerges from lack, or desiring what we do not have, desire for Deleuze and Guattari begins from connections: "life strives to preserve and enhance itself and does so by connecting with other desires" (Colebrook, 2002, p. 91). It is thus through desiring-production that social worlds, including the world of education, are formed. When bodies connect with other bodies to form communities or societies, they do so through connections that enhance desiring-production, and thus "power is not the repression of desire but the expansion of desire (Colebrook, 2002, p. 91). Deleuze and Guattari's socio-political notion of desire therefore implies that if social meanings and ideologies are constituted in power relations and desiring-production, then it is necessary to look at social institutions, including educational ones, in terms of the networks of power enabled and limited through circuits of desire. This notion of desire and power works against the idea that social worlds are formed through ideology, or some repressive, externally imposed idea or common-sense opinion to which subjects must submit. Instead, for Deleuze and Guattari, social assemblages, including educational ones, organize desires — understood as those connections that enhance life — in order to produce *interests*, which are then coded, standardized and organized into forms of desire that can be recuperated by dominant organizations of power. In one description of the conversion of desiring-production into interest, Deleuze and Guattari (1983) give the example of a baby's mouth that connects to a breast so as to produce and enhance life and desire, in very literal ways. What they point to in this example is how the socially ordered image of this connection, for instance, the image of motherhood or the family, recapitulates the locally invested desire as a

general *interest.* The problem with this typical explanation of sociality is that it *begins* with interests, that is, it assumes "that we come in to the world with ready-made ideas of desires *for* some specific end" (Colebrook, 2002, p. 92). With this problem in mind, the task of Deleuze and Guattari's philosophical method is to explain how interests, such as those that undergird capitalism, humanism, philosophy, and as I develop in this chapter, education, are produced by the organization — the flows and blockages — of desire.

Following from this brief, and thus far from comprehensive, overview of Deleuze and Guattari's philosophical approach to the question of *what concepts do*, this study approaches pedagogy at the end of the world as a philosophical *problem* in the DeleuzoGuattarian sense, that is, as a materially invested organization of power and desire that which might make us think. As educational scholar Inna Semetsky (2009) explains, "[t]he making and remaking of concepts constitutes a creative process, which is irreducible to a static recognition, but demands an experiential and experimental encounter that would force us to think and learn, that is, to create a singular meaning for a particular experience (still un-thought-of and lacking sense)" (p. 444). As such, the problem of thinking takes on a *pedagogical* character, one that is focused on understanding what concepts are, how they function in context and how to create them so as to resist the everyday opinions and regimes of representation that conflate and subsume desiring-production in the name of pre-determined interests. This study orients towards this approach to concept creation so as to grapple with the problem *of* and *for* pedagogy as it is situated within today's end of the world scenario. Drawing on the problematizing method of Deleuze and Guattari, this pedagogical orientation insists that the world, and thus its end, is not something that exists "outside" of thinking, something that is "out there" waiting to be represented. Instead, the very thought of the end of the world emerges, like all life, as a creative and material process of deterritorialization wherein thought creates its own "worlds" (Colebrook, 2002, p. 26). What is important to note here, and taking cues from Deleuze and Guattari (1987), is the distinction between the (ends of) worlds we experience as our own — my world, my life — and the *cosmos*, which refers to a plane co-constituted by intersecting flows of anorganic life, all of which are fueled by difference. With this in mind, this study of *Pedagogy at the End of the World* insists that there is no single world and thus no singular end demarcating its existence, but instead the world "we" experience is but a slice of the chaosmatic and problematizing foldings that make up

life itself. Nevertheless, through processes of deterritorialization, particular foldings come to be articulated through specific worlds, for instance, through the world of education, and thus the world as it comes to be known, the world as it is *given*, provides an important site of struggle when it comes to problematizing pedagogy at the end of the (so-called) world. In what follows, I endeavour to navigate the world of education as it is situated in today's anthropo-scenic milieu so as to interrogate the way in which this world, and thus its end, has been actualized through the installation of particular *givens*.

### *2.1.2 Navigating Given Parameters*

In this chapter I wager that today's educational apparatus, or what I outline below as the Industry of Education, is not interested in a pedagogy of concepts, or that which might produce new directions for thinking. Instead, this industry is invested in the business of restricting thinking to orientations tethered to the maintenance and perpetuation of education's *givenness* to a positive future (for "us"), which is made possible through the promise of a redemptive *education after education*. While the reorganization of planetary realities ushered by unprecedented ecological, social, psychic, economic and political transformations might otherwise provoke pedagogical encounters that challenge long-held commitments within educational thought and practice, dominant approaches to education today struggle to hold the line, keeping outdated rhythms afloat, or worse, double-down on nostalgic visions and conservative fantasies that are as oppressive as they are untenable. This is evident in the way that education has responded to today's anthropo-scenic scenario, where the threats brought on by something like global climate change, but also global pandemics, are seen as *new opportunities* to reimagine and relaunch education so as to overcome today's most pressing problems. Following in conventional wisdom about the givenness of education to positive transformation, typical educational approaches to something like the problem of an uninhabitable planet are most often counteracted through the promise of *educating* people about the issues that affect them (Peim & Stock, 2021). Within this approach, the *problem* of the end of the world can and should be overcome through the *solution* of education, thus minimizing the way in which educational thinking and practice is itself implicated in how the world, and thus its end, is actualized. With this in mind, the problem of pedagogy at the end of the world is one that necessitates, first and

foremost, an interrogation of the concept of education itself. As I develop in this chapter, where education has become defined and delimited by a set of industry standards, which in turn reterritorializes pedagogy under the image of affirmative educational futurity, the otherwise problematic force of pedagogy, that is, its potential to produce problematizing encounters that might make us think, are dejected and/or obscured so as to maintain the conceptual orientations necessitated by education's industrial complex. By defining and directing pedagogy in terms of standardized forms and opinions, which in turn work to affirm and actualize today's apocalyptic but nevertheless redemptive reasons, rationalities and interests, educational futurity continues to be honed upon a particular set of *givens* that have limited pedagogical encounters with today's anthropo-scenic scenario while at the same time contributing to its disastrous trajectories.

The use of the *given* here is understood in two senses: first, as that which constrains thought, and second, and also somewhat counter-intuitively, as that which produces encounters with the problematizing, or creative, force of thought. In terms of its constraining functions, and drawing on Michel Foucault's (1970) notion of the *episteme*, the first sense of the given used here refers to the conditions of what is assumed *a priori,* which in turn affords and/or impedes particular orientations and navigations in and of the world. Here, the given operates as a strategic apparatus of historically and culturally situated assumptions that establish conditions of possibility for both the adjudication of knowledge (and therefore power) and the formation or prohibition of particular questions. Epistemic conditioning, in Foucault's understanding, not only works by legitimizing particular ways of thinking and being so as to maintain hierarchizations of knowledge and power, but does so by obscuring potentials for modes of thinking and being that might challenge given epistemic parameters. Importantly, this is not a dysfunction of the episteme, but is integral to its maintenance and perpetuation. As artist, writer and designer Patricia Reed (2019b) asserts, since "this episteme predetermines what is (perceived as) given, it is also largely insensible to entities operating within it (both by individuals and systems), meaning that its internal mechanisms of discursive prohibition are largely obscure" (p. 3). In this way, the sense of the given signaled by Foucault's episteme is concerned with both the legitimization of knowledge as well as with the field of conditions that enable and shape knowledge in a specific way; as that which determines the very rules for, and thus domestication of, the formation of concepts, theories and objects of study (Reed, 2019b). Read through Deleuze

and Guattari's language, the first sense of the given developed here is that which constrains concept creation through the redistribution of what is considered important or necessary, in turn shaping the conditions that enable thinking in the first place. Where, as Deleuze and Guattari develop, any identification of a problem carries with it a "(re)distribution of the important and the unimportant, the interesting and the uninteresting, the possible and the impossible, the alluring and the repugnant," the problematizing process of concept creation is already an evaluation: "it is the selection of a form of life that affirms itself within the given" (Zourabichvili, 2012, p. 9). In this way, and as Reed (2019a) contends, the "'domesticity' implied by the episteme is not the construction of a fixed enclosure, but is the foundational space subtending the construction of certain structures of knowledge, determining what is possible and impossible to think, what is relevant and irrelevant to question" (para. 2). It is through this domestication, and thus the determination of the im/possibility of thinking, that the first sense of the given referenced here constrains orientations for conceptual creation.

The second sense of the given to which this study refers both extends from and undermines this first sense of the given so as to highlight the way in which the given also produces the conditions that enable strata for thinking. In their own work, Deleuze and Guattari understand the given not as a constraint that limits concept creation, but instead in relation to the *virtual* processes of deterritorialization through which concepts are created. For Deleuze and Guattari, reality, or the Real, is created through the deterritorializing movements between actual and virtual worlds. Within this formulation, an actual thing is always produced from virtual possibilities through which the plane of immanence is constituted. As such, the virtual is, at the same time, strictly *indeterminate*, lacking all form of fixity and identity; a regime of *reciprocal* determination, wherein structure emerges through immanent relations between forces; and, *particular*, that is, completely determined, or *given*, with respect to the singularities pertaining to each virtual relation. Where, as Colebrook (2002) articulates it, our "real" world is always actual-virtual, "it is not just that the actual world is the effect of virtual potential, [but also] each actual thing maintains its own virtual power" (p. 98). In this way, it is the virtual realm of potential, which is always real, that produces conditions for actualization. But, the tricky thing here is that we only realize virtual potentialities after they have been actualized. As such, virtual potentialities cannot be thought as a whole that can be reduced to universal necessity, but instead

can only be grasped, albeit involuntarily, through something like deduction every time one's habitual relationship with the world is troubled, or problematized.

For Deleuze and Guattari, then, the only thing *given* to human perceptual and sensorial, or empirical, experience is immanence itself. That is, what is given is virtual potentiality, which cannot be known in advance of its actualization. In contrast to a notion of the given that constrains thought, then, Deleuze's notion of the given articulates the way in which deterritorializations are not only partitioned into an actual and a virtual side, but also into the side of "the world as such" and the side of "its" concrete entities, or what Guattari calls "consistencies" (Berressem, 2018, p. 132). As Guattari (2013) puts it, albeit somewhat opaquely, "[t]here is the Given, thus there is the Giving, but neither the one nor the other should be considered as subjected to compartmentalized domains of consistency" (p. 58-59). In other words, the Given and the Giving denote the two complementary planes of the chaotic and the chaosmatic, or the virtual and the actual, aspects of the world and thus the creation of consistencies (Berressem, 2018, p. 133). Where immanence is generative (Giving), characterized by forms of chaos that cannot be compartmentalized in advance (the Given), immanence isn't immanent to anything, but is instead rendered perceptible through the singular becoming of its own contingent actualization. Far from constraining thought through epistemic conditioning, this notion of the given offers a weird account of thinking as that which always emerges through difference, as that which is absolutely different from thought but which nonetheless gives itself to thought. Here, the notion of the given does not just reference the limits and constraints of thinking, but points to the way in which anorganic life forces itself on thought, forcing itself to be thought, albeit in ways that are not reducible to communicable concepts and everyday opinions.

### *2.1.3 The Problem of Pedagogical Resistance*

In this study, I bring both Foucault's and Deleuze's concepts of the given together in order to explore and experiment with the problem of *pedagogical resistance* today. While various endings unfold all around, education, as an industry, is now characterized by a non-confrontation with contemporary planetary realities. Where the potentially upending realities ushered by something like anthropogenic climate change or the dismal future of jobs or even a

global pandemic might otherwise be read as pressing impetus to challenge some of education's long-held, albeit outdated, philosophies and practices, the Industry of Education forgoes such an encounter in the name of *business as (un)usual.*[10] This non-confrontation with the challenges of encroaching global crises is, however, not just the product of denial or a will for ignorance, but instead symptomatic of education's *givenness* to particular interests, commitments and investments. As I have endeavoured to establish above, this givenness is what both enables and constrains approaches to thinking the problem of pedagogy, and thus provides an important conceptual framework for investigating pedagogy at the end of the world. In addition to interrogating the apocalypse habits and commonsense concepts that have limited ways of thinking prospects for educational futurity, this study is invested in the pressing question of *pedagogical resistance*. As such, I am not just interested in interrogating or critiquing the way in which educational thought and practice has become limited by given organizations of power. Instead, this project is deeply committed to asking, earnestly, how to grapple with today's unthinkable scenario without falling back on the unquestioned promise of a redemptive education after education, which, I wager, involves understanding the given world of education in terms of its immanent connections and contingent actualizations.

It is through problematizing the given world of education that we might experiment with yet unthought modes of pedagogical resistance. This approach to resistance takes cues from Deleuze and Guattari's philosophical developments, which were themselves active responses to a host of problems from diverse areas beyond philosophy, including "the problem of capitalism and how we can think revolution; the problem of 'man 'and how we can think evolution; [and] the problem of thought and how we can think creation" (Colebrook, 2002, p. 8). This study of *Pedagogy at the End of the World* offers an experimental response to similar problems: the problem of education's economization and potentials for resistance to it; the problem of the human and its education; and the problem of thinking itself, which I have argued, is a pedagogical one. Situated within the problematic milieu of the (so-called) end of the world, Deleuze and Guattari's philosophical method provides both a powerful conceptual framework

[10] Throughout this research, I use the turn of phrase "business as (un)usual" to refer to the way in which the primacy of economic imperatives are able to persist and proliferate through ongoing modulation and innovations. This unusual continuation is further illustrated through various examples that appear in the speculative studies that make up Chapters 4, 5 and 6.

and a way of *doing* philosophy, one that I draw upon to intervene in the space of educational research, which is itself involved in education's givenness to particular futures. Given the end times scenario in which education is today situated, this study starts from the assertion that educational inquiry must develop a very different register of pedagogical problem-posing. That is, in order to counter-actualize the givens that have constrained pedagogical encounters, I assert that educational research must generate questions, methodologies and approaches wherein the given world of education is navigated in terms of the problematizing force of pedagogy, which in turn orients the very questions we are able to ask. It is through this approach to educational inquiry, and thus the problem of and for pedagogy today, that new modes and styles of pedagogical resistance might be experimentally deployed.

This chapter endeavours to more fully sketch out this assertion by taking a tour of what I call the Industry of Education. In what follows, I further outline the industry standards that have come to define and delimit the problem of pedagogical resistance today. As outlined in the next section, these industry standards are characterized by an *economizing logic, progressive paradigms* and the unquestioned pedagogical orientation towards *becoming-forever-human*, all of which contribute to the givenness of education's orientation to particular futures. In what follows, these industry standards are explored in relation to three orientations that now direct and delimit pedagogical possibilities, namely education's orientation to *sustainable futures*, *energy futures* and *working futures*. The future-oriented projections introduced here set the scene for the later chapters that make up this study, each of which take on a different trajectory of educational futurity so as to speculatively experiment with how such futures, and their perceived givens, might be resituated, negated and mutated when put in contact with the weirder dimensions of today's end times scenario. Following the overview of education's industry standards and the futures such standardizations work to affirm, this chapter concludes by linking the problems of educational transformation and educational futurity back to the problem of pedagogical resistance, particularly as it plays out in the field of educational research.

### 2.2 Industry Standards and the Problem of Educational Transformation

The concerted delimitation and reduction of the problematizing forces of pedagogy is exemplified across dominant educational domains and practices today, or what I refer to in this

project as the *Industry of Education.* The Industry of Education is the name I give to the systematized organization of education, including both sites for the production of educational theory (i.e. educational philosophy, educational research, education graduate studies) and educational practices (i.e. schools, universities, curriculum and policy development). This systemized organization is not just co-constituted by domains of institutionalized educational theory and practice, but also extends and connects to a range of broader social, economic, political and ecological organizations that contribute to the Industry of Education's given reasons and rationalities. Where, through industry standardization, education has become a "master concept" that enables faith in a given world that promises redemption through educational transformation, the logic of educational theory and practice has become tethered to an ameliorative understanding of education that now reaches far beyond specific sites of schooling and concrete educational institutions into social life more generally (Peim & Stock, 2021). By situating this experimental encounter with *Pedagogy at the End of the World* within this dispersive and interdisciplinary site of educational organization, my aim is to interrogate and resituate questions of pedagogical possibility, and thus educational futurity, in relation to the broader end times scenarios making themselves known across the globe today.

### *2.2.1 Economizing Pedagogical Goods and Services*

Situating this project within the Industry of Education not only draws attention to the way in which education is interpolated within broader organizations, but also highlights the way in which pedagogy has become *economized* through specific industry standards and rationales. In its most basic sense, the use of industry here, references the ways in which education has become infiltrated by neoliberal imperatives, or what cultural theorist Mark Fisher (2009) calls a standardized "business ontology" (p. 17) that subsumes the problematizing force of pedagogy under market pressures and financial logic. Not unlike Deleuze's (1995b) own worries about the ways that we are "turning education into a business" (p. 182) through, for instance, "continual training" (p. 175) and forms of "continuous assessment" (p. 182), Fisher (2009) highlights the way in which "business" has been introduced into education at every level. For both thinkers, the economizing trends that increasingly define educational thinking and practices signal "the widespread progressive introduction of a new system of domination" (Deleuze, 1995, p. 182).

Within this standardized takeover, the very conceptualization of what is called education has itself become equated with the production of "goods and services" that can be recuperated within broader economic organizations.

Examples of this economization abound. In response to the pressing environmental and social challenges today, education has become tied to the promise of a "better" tomorrow, where a better tomorrow is almost always defined in economic terms. Faced with the pressing issue of ecological degradation, for instance, education is framed as an integral system for producing the goods and services necessary to overcome the problem of planetary conditions that are becoming increasingly unsustainable. Within this frame, the problems raised by climate change, which extend far beyond just ecological issues, are met with educational solutions oriented towards inculcating the knowledge and skills necessary for students to enact individual adaptations, such as adapting to "green" jobs or engineering more sustainable models of development. This same logic of economization plays out in dominant educational responses to the question of energy futurity, which is now met with calls to develop more "literate" educational subjects, that is, ones capable of navigating the energy emergencies on the horizon through careful accounting and efficiencies training. In yet another example, the Industry of Education's economizing imperatives have come to define educational responses to today's crises of work. Here, education (cl)aims to solve the problems of increased unemployment and a lack of "good" jobs by educating people in the knowledge, skills and attitudes demanded by the shifts in labour that now characterize the contemporary economy and its workforce. Taken together, where the *problem* of sustainable futures, energy futures and working futures are framed in terms of an economizing logic, the *solution* is one that involves developing individual, educated citizens that can adapt, through education, to today's, but also tomorrow's, purported economic demands. Through the production, distribution and consumption of educational goods and services, end-users (a.k.a. students) are told that through education they will be able to take part in individual and collective opportunities for betterment and thus a prosperous future. It is this economizing logic, I argue, that now impacts encounters with the problematizing forces of pedagogy, thus contributing to the way in which education, and the futures it projects, is positioned in relation to today's unthinkable end times scenario.

*2.2.2 Progressive Paradigms*

A foundational tenet of this economizing orientation to education is the promise of progressive transformation. The Industry of Education, in both its more conservative and liberal instantiations, is founded on a progressive paradigm wherein learning is understood as the accumulation of knowledge that is undeniably correlated to events of transformation. Within this progressive paradigm, transformation is not only given to educational practices, but the transformation envisioned is most often oriented towards something "better." Based on the fantasy of moving, in a linear fashion, from "uncivilized" conditions to "civilized" society, the progressive educational imaginary is founded on the idea that knowledge is not only power, but that it is essential to the advancement of society and its peoples. As such, progressive understandings of education, and the developmental model on which they rely, position learning as the accumulation of knowledge with the assumption that such accumulation will lead to a "higher" or "improved" or "better" stage in the rubric called humanity. Within this progressive framework, it is simply given that the human condition is itself a product of ongoing, purposeful improvement, which is made possible by advancements in, for instance, technology, social organization and, of course, educational reform.

This progressive paradigm is evident, for instance, within global policy organizations, such as the Organization for Economic Co-operation and Development (OECD), which defines education as "organized and sustained communication designed to bring about learning" (Education, n.d.). According to the OECD, "communication" within this definition involves the transfer of information, "organized" means planned with established aims involving a central agency and/or teachers, and "sustained" references a notion of learning that happens over time and is structured with some form of continuity (OECD Glossary of Statistical Terms, March 4, 2003). Within this definition, learning is always tied to some form of transformation, or as the OECD puts it, as "any change in behaviour, information, knowledge, understanding, attitudes, skills, or capabilities which can be retained and cannot be ascribed to physical growth or to the development of inherited behaviour patterns" (OECD Glossary of Statistical Terms, March 4, 2003). As a global institution committed to "better policies for better lives" the OECD's work on education stems from this definition, focusing on helping both nations and individuals to "identify and develop the knowledge and skills that drive better jobs and better lives, generate

prosperity and promote social inclusion" (Education, n.d.). Within this framework, then, education involves the transfer of information through a centrally managed institution that directs pedagogical possibility, which is always-already constituted in terms of transformation towards something better: "*better policies, better jobs, better lives"* (Education, n.d.).

Taking hold as early as the late nineteenth century, education's progressivist orientation has mutated from a Deweyan emphasis on experiential learning into what has been hailed today as "21st-century learning," a pedagogical disposition tethered to the claim that education must prepare learners for the evolving economic conditions of the 21st century. Within this paradigm, progressive education's short-hand mantra — "learn by doing" — has been extended to the "real world" (of work) and thus the contemporary progressive educational project has shifted towards the imperative of developing "a broad portfolio" of skills that are demanded by current socio-economic organizations. Updated for the "knowledge economy" or "digital economy" or "information economy" or "attention economy" or "learning economy" or "creative economy," — take your pick — educational progressivism today has replaced the old metaphors of "foundations" or "bedrocks" on which to build or construct future learnings, for that of the "hill," a metaphor that positions learning as a process of endless advancement, perpetual growth, and ultimately, unfettered progress (Bereiter, 2002). Within this progressive paradigm, students are positioned as life-long learners trained to adapt to the pressing challenges that lie ahead with a positive attitude and hopeful postures. As the recently updated Ministerial Order on Learning in my home province of Alberta puts it, the aim of education is to develop "life-long learners who will cultivate the virtues of wisdom, courage, self-control, justice, charity, and hope" through both knowledge development and character development, both of which aim to build "resilience and good judgement in a rapidly-changing world" (Alberta Education, 2020). Here, the aim is to produce subjects who are able to adapt to the many changes in society and the economy with an attitude of *optimism* and *hope for the future* through the belief that there is *no limit* to what knowledge may be gleaned, what skills may be accumulated, and what may be achieved. Where the progressive logic of the Industry of Education invariably calls for expansion, growth and progress, the very notion of education is not only driven by the affirmation of an inherently human potential to accumulate more and more and more knowledge in and of the world, but also

the optimistic mantra that no matter the pressing challenges that may lie ahead, tomorrow *will* be better than today.

### *2.2.3 Becoming-Forever-Human*

Key to this projection of a positive future is a vision of a redeemable humanity, one that bolsters the Industry of Education and its economizing and progressive project of producing an education after education. Where education is conceived as a "humanist project par excellence; often connected to a general idea of education as something inherently 'good', that can somehow make us become better human beings" (Pedersen, 2016), it remains wedded to a compulsory becoming-human that directs and subsumes pedagogical life under the rubric of an ideal human subject. As educational theorists Robin Usher and Richard Edwards (1994) write:

> [t]he very rationale of the educational process and the role of the educator is founded on the humanist idea of a certain kind of subject who has the inherent potential to become self-motivated and self-directing, a rational subject capable of exercising individual agency. The task of education has therefore been understood as one of 'bringing out,' of helping to realize this potential, so that subjects become fully autonomous and capable of exercising their individual and intentional agency (p. 24).

Trained through the Industry of Education, this model educational subject is characterized by autonomy, self-control, and discrete and representable identities that necessitate the development of a stable and rational "I." Further, this ideal educational subject is defined in terms of bounded individualism and an unquestioned posture of human exceptionalism, which assumes that humanity as a species is not only categorically different than those non-human bodies with whom we share the planet, but also capable of controlling and transforming the world in concordance with all-too-human will and desires. Further yet, this model subject is one that is forever given to advancement and amelioration through, for instance, processes of life-long learning, and thus pedagogical becomings that endlessly select for only those becomings that can be correlated with the ideal subjective forms demanded by education's industry standards.

In the example of its progressive imperatives, for instance, the Industry of Education not only subsumes pedagogical life under linear orders of time, but also pre-positions learners as self-governed citizens that are able to transform both themselves and the world through personal

responsibility, individual competition and self-reflection. In turn, the singular, albeit multiplicitous, nature of subjective enunciation and thus unheard-of processes of individuation that might otherwise go under the name of learning, are repressed, occluded, and ultimately, disappeared in the name of those subjective formations that are required by the status quo. As educational theorists Nick Peim and Nicholas Stock (2021) stress, "[m]uch of this ingrained, unthinking thought is implicitly predicated on the idea that 'things can only get better," and that the essence of education, separated out from its fallen apparatuses, must be the central feature of a humanism that sees its future as boundless without ever subjecting that essential idea to examination" (p. 7). Where educational becomings are endlessly directed towards the progressive imperatives of becoming-forever-human, in turn disappearing the otherwise co-constituted and entangled character of subjective heterogenesis, educational futurity is forever tied to the reproduction of a standardized subjective form that can be recuperated into dominant socio-politico-economic organizations.

## 2.3 Good Pedagogy and The Problem of Educational Futurity

### *2.3.1 Trending Transformations*

Through its industry standardization, which involves an economizing logic underscored by a progressive paradigm oriented towards becoming-forever human, the very notion of pedagogy is converted and subsumed into everyday, commonsense concepts that can be represented (through policy), disseminated through standardized forms (such as curricula), and assessed for its effectiveness (using industry standards as the benchmark). With this industrious logic in mind, the education at the heart of the Industry of Education is not only given to an inherently better future, but *the future is also forever given to education.* As futurist Alvin Toffler (1974) asserted in his canonical book *Learning for Tomorrow*, "[a]ll education springs from images of the future and all education creates images of the future [and thus all education] is a preparation for the future" (cover). Toffler's foundational educational assertions point to how education is given to a sense of futurity that supports its very rationale. In this "relentlessly future-orientated world of education" (Kidd, 2015, p. 123), the future is a commonplace concept that now orients the entire 21st century educational project.

Education's unquestioned orientation towards the future, and specifically a "better future," is now cited by industry executives as being more urgent than ever before. According to the OECD's 2019 report on "Trends Shaping Education," for instance, the unprecedented "global mega-trends" that are purportedly shaping the future — namely, changes in complexity and speed given the digital transformation of the economy — have catalyzed the need to reinvent and reimagine education so as to meet the demands of a precarious future (p. 13). In recognition of the changing nature of change today, the OECD, like many educational organizations, has asserted that education plays a key role in navigating the unprecedented transformations taking place around the globe. As the OECD (2019b) reports, given today's "shifting global gravities," education must continue its mission of supporting individuals to develop as "persons, citizens and professionals," while remaining relevant to today's transformed and transforming world (p. 9). For the OECD, just some of the transformative trends shaping education include issues of security in a risky world and the problem of how to live longer and better given shifting environmental and social realities. The OECD asserts that education plays an important role in influencing these global trends by, for instance, providing skills and competencies to uplift the most disadvantaged while combating increasing polarization and empowering people to take charge of their civic responsibility through democratic practices. As the report puts it, "[a]ccess to learning and knowledge not only opens doors to individual and collective opportunities, it has the potential to reshape the future of our global world" (p. 13). At the same time, by projecting educational futures through the trends of accelerated globalization, shifts in democracy and citizenship, new security risks, and the "wicked problems" faced by ageing and modern cultures, the future is directed in relation to particular "mega-trends" that are positioned as the very "horizon," as the OECD puts it, for informing educational decision-making (p. 11). The OECD's mega-trend analysis and the educational responses that follow from it are just one example of the ways in which the future has been positioned as a *problem*, one that can be overcome through the *solution* of education.

In line with the OECD's call to transform education for a transforming world, a wide array of research and commentary on educational futurity now asserts that "today's schools are not adequately preparing young people for the increasingly complex, uncertain and fast-changing world of the future and that the need for change is now urgent" (Gilbert, 2016, p. 191). As Jane

Gilbert (2016) outlines, a two-part story underpins these educational analyses and approaches. The first part focuses on how "mega-trends," such as those identified by the OECD (i.e. digital revolution, globalization, new "networked" forms of knowledge, demographic and economic changes, and the "wicked problems" of the twenty-first century), are driving a "paradigm shift" in education. In the second part of the story, "schools are portrayed as having failed to respond to these trends, as being inert, outdated, obsolete and no longer 'fit for purpose'" (Gilbert, 2016, p. 191). And so, in response to this perceived failure, this two-part story ends with a call to action, an imperative to "reform" or even "revolutionize" education so it can better address the problem of the future. Such reformist demands not only play an integral role in the ongoing defunding and privatization of public education based on claims of its inadequacy, but also correlate pedagogical interests with a "future wanting to emerge," (Friesen & Jardine, 2009, p. 7), one defined by the assertion that "times are changing" and thus education must respond accordingly.

Where prospects for educational futurity are locked into this "future wanting to emerge," educational futurity is honed upon the limited purview of the past-present and the epistemic conditions of education's apparent givenness. This givenness to a positive, not to mention inherently educated, future not only relies on particular assumptions about what education is and what education is for, but also necessitates a linear construction of time that in turn conditions pedagogical possibility both now and into the future. Progress reports, both at the individual and institutional level, for example, (cl)aim to highlight achievements that can then be tied to future opportunities and potentials, while lesson plans, timetables and academic calendars progress in a linear and largely unquestioned manner via chronological coherence and Euclidean forms.[11] Through the illusion of straight-forward, predictable and limitless progress and thus the uncomplicated correlation between past, present and future, the progressive visions that reinforce the Industry of Education proceed in a manner largely indistinguishable from the continuation of present moods and protocols. As educational theorist Deborah Kidd (2015) puts it, "we perpetuate our present by planning our future based on a model of now" (p. 113). As such,

[11] As Davis and Sumara (2000) assert, "the images and metaphors that have guided and that continue to guide curriculum theory, planning and development, tend to be organized by a particular 'geometry', namely Euclidean. Despite the now long-standing post-modern critiques of modernist epistemological beliefs incorporated into formal education for the last few centuries, there have been relatively few challenges to the classical Euclidean forms used to organize curriculum and to structure schools" (p. 823).

temporality itself is conditioned by "a belief that progress is ongoing, moment by moment; that it can be measured and adjusted incrementally to secure the distant trajectory in a series of steps" (Kidd, 2015, p. 109). Or, as educational thinkers Alexandra Lakind and Chessa Adsit-Morris (2018) write:

> Time and space are fixed as we teach children to become the adults we want them to be: to marry and reproduce, to attain careers and enlightenment, acquire behaviours, write thank-you cards, recycle, perform chivalry. We educate for a better tomorrow. We do it for the children, for those who will supersede us, overshadowing them with what we want them to be. Toward this end, 'teaching' is captured by time: The present becomes a mirage of a fantasized past and dream of a future by sentimentalizing stasis (p. 36).

Where the Industry of Education maintains this progressive line of time, the present constantly exerts its pressure on the future, pulsing with hopes and dreams (but also fears and anxieties), all of which are produced and maintained based on the narrowed and narrowing purview of what has been determined as "good," "necessary," or "realistic" based on education's economic, progressive and humanist parameters.

### *2.3.2 Thinking Against Education After Education*

This study of *Pedagogy at the End of the World* aims to counter the commonsense projection of an *education after education* by putting questions of educational futurity in contact with the *weird* forces and intensities raised by today's unthinkable planetary realities. As such, this study endeavours to think *against* those industry standards that perpetually remit to affirmative and redemptive images of educational futurity, which, I assert, have fallen drastically out-of-synch with today's pressing environmental, social and psychic breakdowns (Guattari, 2000). While ecological catastrophes continue to multiply, alongside the degradation of the very fabric of social solidarity and the erosion of subjective potentials via the powerful, if illusory, consensus that "there is no alternative" to the current state of affairs, the Industry of Education has yet to fully confront the bleak realization that the planet is undergoing uncertain and catastrophic transformations that are leading us to deprive even our own species of an ecological niche. As Peim and Stock (2021) assert, "almost all educational philosophy writes in a conditional tense that is predicated on there being a neverending future" (p. 7). As such,

education more broadly "is always being purported as the apparatus that will allow us to reach a utopic future. It is the tool that will offer us light and wrench us from the darkness" (Stock, 2021, p. 151). And yet, as educational theorist Jason Wallin (2017) contends, "it is today clear that the image of the future posited in education has fallen out of synch with the outside or inhuman thought of ecocatastrophe, or rather, the condition of our being perceived from the inhuman vantage (geological, volcanological, cosmological, etc.) of a planet destined to go on without us" (p. 1100). With this out-of-synchness in mind, educational thought has become caught by what it is unable to think, demonstrating a limit-case for pedagogical inquiry.

At the same time that educational futurity has become restricted to an imagined time-to-come that reproduces those educational postures considered essentially "good" or unquestionably "necessary" in the past-present, it also remains beholden to the axiomatic assumption that education will forever be devoted to the propagation and preservation of a particular formation of human rationality, even, or perhaps especially, in light of potentially world-ending conditions. As Peim and Stock (2021) proclaim, "[t]he endlessly deferred but endlessly desired and believed-in end – of a redeemed education delivering on self-fulfillment, equality and 'the life worth living' – is of course, as far away as ever, and yet the discourse must prevail, rendering the present deficiencies, abundantly recorded and explained, tolerable, acceptable, necessary, even" (p. 8). Through a non-confrontation with today's end times scenario, the otherwise problematizing force of pedagogy is subsumed under progressive orders of time, restricting it to an exceptionally exceptional human subject and correlating it to a world that is always-already given to a positive future for "us." In turn, what counts as education in the first instance is defined and delimited by industry standards, thus directing the kinds of questions we might pose when grappling with the problem of pedagogy at the end of the world.

While the Industry of Education might be interrogated in terms of its rational lineages and progressive imperatives, it is much too reductive to simply name and blame something like "rationalism" for education's givenness to a decidedly redemptive sense of futurity. As philosopher Reza Negarestani (2014) asserts, the fundamental misstep of the "humanist human" construction, is not due to its so-called rational lineages and the emphasis on exceptional human capacities to reason the world, but that such a construction *stops short* in reasoning or rationalizing its own unexceptional position within the world. Once again, and as Colebrook

(Colebrook, 2018a) outlines, where the human has been defined and delimited by existential threats, by the threat of its potential non-being, human rationality and the "thinking" that unfolds from it is defined both as a unique human capacity to grasp the infinite while also gesturing to the finite capacities of the human to reason beyond its own rational parameters. By stopping short in reasoning its own prosaic position within the world, the human and its education are repositioned and reaffirmed as unquestionably salvageable. And so, while the Industry of Education might be interrogated in terms of its givenness to progressive thinkability and all-too-human perceptory inculcations, it must also be examined in terms of how it furnishes the conditions to reaffirm the (educated, rational) human as an ingenious species that is able to manipulate and transform the world so as to ensure its own progressive futurity.

In the example of educational research, for instance, inquiry is not only subtended by progressive orders, "evidence-based" practices and the fetishization of empirical data, but also the imperative to "save" humanity, and thus its education, so that an education after education will emerge. Not unlike broader apocalypse habits circulating today, even *after* the end of the world, the promise of a "new" education and a "good" future (for us) persists via the assertion that "there must be a future and it must be human (and by human, we mean 'mine,' ours, and not some other unimaginable life or non-life)" (Cohen & Colebrook, 2016, p. 17). Situated at this end of the world, the given world of education is revealed as being fundamentally oriented to its own salvation. In a strange and somewhat paradoxical double-movement, threats of environmental breakdown are, at the same time, denied and downplayed, while also providing the breeding ground for a "new" education to emerge, one that is more "diverse," "relevant," "sustainable" and, ultimately, redemptive. As part of the broader project wherein anthropos forever exceeds itself by vanquishing its own potential non-being (Colebrook, 2020b), the Industry of Education subsumes the problematizing force of life under those conditions that would make education's redemption undeniable. The givenness of education to an affirmative and affirmed human future not only conditions the Industry of Education's reasons and rationalities, but also orients the pedagogical questions that might be posed within its parameters.

### *2.3.3 Counter-actualizing Futures as Usual*

While the rhetoric of education's orientation to the future has become commonplace, the future presumed by this aim is one largely indistinguishable from the continuation of present social, political and economic orders. As Gilbert (2016) notes, while the two-part story of future-oriented educational reform outlined above is as pervasive as it is familiar, "it has not produced a revolution in educational thinking" (p. 192). Instead, the problem of the future has become a productive fulcrum to affirm and proliferate the Industry of Education's projection of an education after education, in turn obscuring the pedagogical questions that might otherwise be raised by an unknown and unknowable future. In this project, I focus on three specific instances of this narrowing of educational futurity so as to examine the ways in which pedagogical possibility has become constrained and obstructed through particular givens. Once again, the sense of the given referenced here not only signals the way in which pedagogy has become constrained by, for instance, education's industry standards, but also seeks to "articulate and enable the contingencies of the given, armed only with the certainty that what is, is always incomplete" (Reed, 2014). In more specific terms, and as further unfolded in the speculative investigations that make up this study of *Pedagogy at the End of the World*, I look at educational futurity in terms of its projections of *sustainable futures, energy futures* and *working futures*. Each of these trajectories of educational futurity, I wager, takes part in today's broader apocalyptic scenario and its unthinkable pedagogical problematics. Situated within the given world of education today, these future trajectories are not just analyzed and critiqued, but probed in terms of their problematizing force, that is, in terms of their potential to develop concepts capable of bifurcating and mutating the problem of pedagogy at and for the end of the world.

The first instance of educational futurity explored is that of *sustainable futurity,* which has become a dominant orientation within the Industry of Education today. Within this future-oriented approach to education, and as outlined in *Chapter Four: Sustaining the End of the World (Study No. 1),* sustainability is examined in terms of education *for* sustainability and education *as* sustainability, both of which contribute to the promise of an education after education. By positioning education as the territory for bringing about more sustainable practices, the problem of sustainable futures is most often approached in terms of how to manage the current unsustainability of planetary conditions while nevertheless *sustaining* continued economic growth and development. Through this orientation to sustainable futures, education is

positioned as a necessary technology for *overcoming unsustainability* and thus within this line of educational futurity, the problem of the future is one that can and should be solved through more, and more sustainable, educational practices and protocols. Contra to this orientation, I experiment with the possibility of resituating sustainability, and its education, in terms of the alien encounters that open up when the cosmological assumptions that typify approaches to sustainability are problematized.

The second instance of educational futurity investigated in this study is that of *energy futurity* and the future-oriented energetic investments through which education, and its subjects, have become organized. As developed in *Chapter Five: Energetic Investments at the End of the World (Study No. 2),* the Industry of Education's commitment to the projection of an education after education not only requires an economizing logic and progressive orientation, as demonstrated by education's sustainable proposals, but also involves the creation of educational subjects that will invest, in speculative ways, in particular affective, or energetic, organizations and habitualizations. In this line of educational futurity, the pedagogical implications of energy futurity are not just examined in terms of calls for more "just" energy transitions or political divestments in the energy sectors that continue to ravage the planet, but are probed in terms of energy transition as it relates to processes of desiring-production. Through this shift in focus, this speculative study of energy futurity aims to counter-actualize the emergency exhaustions that now characterize education's energy futures.

The third, and final, instance of educational futurity probed in this study of *Pedagogy at the End of the World* is that of *working futurity*, or the line of educational futurity wherein education is forever tied to the production of a workforce. This is explored in *Chapter Six: Working at the Edge of Extinction (Study No. 3),* which examines the ways in which the promise of "full employment" and "good" jobs for all has become central to the Industry of Education's standardization. Whether through sustainable proposals for a "greener" workforce or through energetic investments in "energy literate" workers, the promise of positive working futures for all has become paramount in the monopolization of educational realities. This projection of working futures is a taken-for-granted assumption that now defines education, including its reasons, rationalities and futures. In turn, what counts as "good" pedagogy has been reduced and conflated with the production of lifelong learners, or better, lifelong workers, who are positioned

as agents capable of overcoming current crises of work through innovations in educational training. Within this line of futurity, the problem of the future is presented, once again, as that which necessitates educational intervention. Aimed at counter-actualizing the unquestioned promise of working futures, particularly in an age of extinction, I position the future of work as an important site to re-work theories of pedagogical resistance so as to mutate the standardized forms of life that keep education, and its futures, working.

## 2.4 Educational Research and the Problem of Pedagogical Resistance

### *2.4.1 Methodocentrism and the Inculcation of Perception*

One of the main sites through which education's industry standards are actualized is within education's research and development branch, also known as the academic discipline of *educational research*. As educational theorists Nathan Snaza and John Weaver (2015) write, where educational research has come to mean "randomized, large-scale quantitative studies of specific pedagogical and curricular interventions, educational studies have become tedious, instrumental, and boring" (p. 7). Within these standardized and standardizing research orientations, educational inquiry is most often founded on regimes of accountability, reliability and validity, all of which proceed from the assumption that with enough "evidence" or "data" and the careful analysis of research "findings" proposals for pedagogical transformation are both possible and desirable. Such approaches follow in the Industry of Education's economizing logic by correlating "good" research to processes of careful accounting and calculated interventions that can be measured, controlled and analyzed so as to bring about educational transformation. By prioritizing consistency over contingency, standardization over difference and thus the reduction of complexity in favour of tidy causal determinations and straight-forward correlations, this economizing mode of educational research presumes the world is accessible to rational investigation and thus human-directed, future-oriented, progressive transformation.

Through this economizing mode, standard approaches to educational research are founded on a progressive paradigm that orients inquiry towards the amelioration or betterment of educational thinking and practices. Within this paradigm, researchers (cl)aim to capture and transmit a view of things "in their totality," in turn providing unhindered access to a world of "best practice" (Roy, 2004, p. 299). In this given world, it is assumed that these (best) practices

can and should be streamlined, standardized and circulated (for others to implement), hinting at an "ideal realm of forms of which the institution is but a shadow" (Blake, Smith & Standish, 2000, p. 10). Through economic and progressive standardizations, many approaches to educational research therefore align with the Industry of Education's orientation towards becoming-forever-human by assuming the human in some form or another at the centre of its investigations. These standardizing tendencies are now commonplace within both quantitative and qualitative approaches to educational research, which presume a knowing human researcher that is capable of objectively observing and thus knowing their "object" of study. As Snaza and Weaver (2015) write:

> [t]raditional educational research methods assume a subject/object relationship in the world. The 'researcher' is the subject who enters into the 'world' or object in order to understand and give meaning to the world. This subject-object hierarchy instinctively and presumptively alienates the researcher from the world, and as a result from reality, and demotes the world to an object to be analyzed, probed, prodded, tested, manipulated, and silenced (p. 8).

Through this subject-object separation, educational research, and thus its researchers, take on an authorial role, redoubling the imperatives of a standardized (and omnipotent) humanism.

The economizing logic, progressive imperatives and human-centred orientations that have come to characterize standard approaches to educational research all contribute to, but are also further affirmed by, an unquestioned commitment to *methodocentrism*, which in turn directs and delimits educational inquiry and the problems it poses. Methodocentrism, as Weaver and Snaza (2016) define it, is "the belief that particular, pre-formed methods can guarantee the validity of an intellectual investigation into the world by factoring out the vicissitudes of the researcher's entanglement with the world" (p. 1056). Founded on over-determined understandings of causality and reductive visions of subject-object relationships, "methodocentrism relegates most humans, other sentient beings, and non-sentient objects to a subordinate position in which the role of these beings in their own reality and other realities is removed from the researchers' work" (Snaza & Weaver, 2015, p. 9). This relegation is best evidenced by the increasingly dominant role of "data" within both quantitative and qualitative educational inquiry. On the one hand, in quantitative research, the discrete divisions between

subject and object or researcher and object of study "has created a fantasyland in which databases and correlational numbers have served as substitutes for realities" (Snaza & Weaver, 2015, p. 9). Here, researchers dissimulate behind data while proclaiming access to a world where data "speaks" for itself. In qualitative research, on the other hand, the subject-object invention has led to an apologetic posture wherein the researcher must "mourn his or her inability to capture an uncertain, confusing, complex, and always shifting reality" (Snaza & Weaver, 2015, p. 9). Exemplified through the increasing prominence of data points and practices and the methodocentric programmes on which they rely, educational research remains faithful to the development and reproduction of methods that can and should be standardized, which is seen as an assurance of the validity of method itself.

Another example of educational research's methodocentric orientations can be found in the domain of educational graduate studies, where educational researchers-in-training learn to see, think, talk, and exist in the academy in certain ways. As Weaver and Snaza (2016) describe, "the correct protocols of asking questions are being inscribed into the minds and bodies of graduate students, disciplining them to instinctively act in acceptable ways when conducting future research, even when their theoretico-political commitments should lead them astray" (p. 1057). For instance, the very categories that have been invented and standardized in order to structure something like a doctoral dissertation project (i.e. research problem, research questions, literature review, methods of data collection, data analysis, and representation) not only work towards tiresome recapitulations, but also "assume depth in which the human is superior to and separate from the material" (Lather & St. Pierre, 2013, p. 630). In this example, the very way that graduate students are "trained" to do educational research, including in my own experience, assumes that there is a beginning, an origin to the research, a middle, the investigation itself, and ultimately, an end, what is often considered the "findings," "results," and/or "recommendations." Through this methodocentric training, perception is disciplined through the inculcation of particular modes of sense-making and temporal orientations, and thus as researchers-in-training we learn to adopt a repertoire of strategies that direct educational problem-posing in pre-determined ways, while obscuring the potentially strange, uncertain and unpredictable quality of research insights that might otherwise be encountered.

Both the examples of data-driven research and educational graduate studies demonstrate how educational research, at least in its standard and standardizing forms, has itself become tethered to industry standards that produce the conditions through which trajectories of pedagogical problem-posing are actualized, or not. In recognition of this conditioning, educational research and its methods have come under scrutiny, with some suggesting that it may be the case that qualitative educational research, at least as it's currently practiced, is in fact no longer possible. As educational theorists Patti Lather and Elizabeth St. Pierre (2013) establish:

> [i]f we cease to privilege knowing over being; if we refuse positivist and phenomenological assumptions about the nature of lived experience and the world; if we give up representational and binary logics; if we see language, the human, and the material not as separate entities mixed together but as completely imbricated 'on the surface' – if we do all that and the 'more' it will open up – will qualitative inquiry as we know it be possible? Perhaps not (p. 630).

In response to the im/possibilities of conducting educational inquiry today, Lather and St. Pierre (2013) propose that educational research must itself be positioned as a site of struggle, one that ultimately divests from logical positivism and the representational logics that undergird the field. Such divestments, however, raise all sorts of risky questions and troubling tensions for educational inquiry. For example, where educational research is no longer able to labour under the "auspices of common sense wielded by responsibly autonomous human subjects (a.k.a. well-trained qualitative researchers)" it raises difficult questions about subjectivity as much as perception (Maclure, 2013, p. 660). Importantly, recognizing educational research, and thus its methods, as a site of struggle does not mean that method itself is "bad" or something that must be avoided. Indeed, it is not so much the practice of particular methods that is the issue, but rather how such practices become dissimulated, normalized and standardized, in turn conditioning the kinds of questions that might be asked. As Stengers (1997) writes, what the notion of method *dissimulates* is "the fact that all measurements are not of equal merit, that they do not all create meaning, that not all methodical interrogation commits the one who carries it out, or makes him or her run risks that will allow him or her to interest others in it, to articulate and proliferate other risky interrogations" (p. 88). The key point I draw out here in order to develop the (non)methodological experiments that make up this study is how methods, in their

very formation, must necessarily obscure and dissimulate particular aspects of any given problematic so as to focus or direct inquiry. As such, no matter their claims of validity, reliability and reproducibility, even the most "sound" methodological practices cannot make guarantees in advance, nor can they claim to represent the world as it is given. With this in mind, method is an integral and inseparable aspect of research that must itself be made vulnerable to problematization.

### *2.4.2 From Substantial Rethinkings to Ahuman Creativity*

In response to the standardizing practices and methodocentric protocols that have come to characterize many methods and approaches to educational inquiry, some contemporary educational thinkers have moved to challenge and experiment with the parameters and possibilities for doing educational research today. These proposals not only seek to interrogate educational research's epistemic frameworks, but also draw attention to how today's unthinkable situation requires the mutation and redirection of education's unquestioned imperative for transformation. Contrary to the taken-for-granted images of transformation projected by institutions like the OECD or Alberta Education, who seemingly advocate for education's "adapting" to the precarious future through more of the same (but with a smile), critical interrogations of educational research do not take educational transformation as a given, but instead position it as a site of pedagogical struggle.

In response to the introduction of the Anthropocene designation, for instance, a growing number of educational scholars now assert, albeit in different ways, that the encroaching challenge of ecological transformation characteristic of existence today requires the radical refusal of education's economic, progressive and humanist paradigms. As Lakind & Adsit-Morris (2018) profess, "[t]he Anthropocene, as a theoretical concept and as a representation of material urgencies, calls into question our most fundamental, 'most cherished' structures: nature, time, reproduction, child" (p. 31). Science educator and educational theorist Jane Gilbert (2016) likewise asserts that contemporary educational domains today are ill-conceived and ill-equipped to deal with the urgent, if illusive, concept of the Anthropocene and thus what is required is a "*substantial rethinking* [of education] — of its content, its purposes and its relationships" (my italics, p.188). For these thinkers, rethinking education and its research given the Anthropocene

involves, first and foremost, a recognition that any attempt at "substantial rethinking" is incredibly challenging due to the way "that conceptual categories that structure our thinking are themselves part of the problem" (p. 188). Indeed, as Reed (2019a) notes, "[a]lthough one can tinker with the arrangement of things within a given episteme and a degree of surface change can be experienced, paradigmatic transformation happens at the level of the site from which the construction of thought is primarily referenced" (p. 2). Put another way, possibilities for transformation are themselves conditioned by what has been deemed possible and impossible to think, and thus any sort of call for "substantial rethinking" is itself conditioned by particular conceptual frameworks that both enable and limit strata for thinking.

Gilbert (2016) argues that the transition into the Anthropocene could be the "crisis to end all crises" (p. 188) and thus the catalyst needed to provoke real educational change. In a similar vein, educational theorist jan jagodzinski (2018) asserts that "[t]he Anthropocene marks a shift in kind rather than degree; a recognition that tipping thresholds have been surpassed, placing us into a stark realization of what anthropogenic activity can actually 'do'" (p. 17). In these takes, the Anthropocene does more than just create a conceptual shock, instead indexing a confrontation with the horrific thought of an impersonal planet in which human life and vitality no longer figure as privileged modes of being. As educational thinker Stephen Heimans (2018) puts it, just as the Anthropocene forces educational thought into entanglements of life and living, it also forces thought into disconnection and death (p. 9). What these educational thinkers draw attention to is how the contradictions and complexities of the planetary entanglements and radical disconnection signaled by the Anthropocene require both the refutation of long-held epistemic predeterminations as well as a speculative encounter with that which might force us to think. As Wallin (2017) puts it, "the project of education and what it might mean to educate requires dilation upon a broader calculus of realities and speculative futures out-of sync with an image of reality always-already given to thought" (p. 1108). For these thinkers, any substantial rethinking of education today must therefore come to terms with the conditions of a planet out-of-synch with the presumptions of educational research, which requires putting the canonical foundations of the field in contact with a variety of speculative, or non-given, scenarios through which education and its futures might be reassessed (Wallin, 2017).

Sensitive to such calls for speculative reassessments, various methodological and conceptual experimentations within educational research and practice are currently taking place.[12] In response to educational research's anthropocentric inheritances, for instance, a range of post-humanist responses have emerged so as to challenge the Industry of Education's "human exceptionalism and the foundational role of 'humanity' as it has been constructed in modernity" (Bayne, 2018). While post-humanist educational orientations and approaches vary widely in their specifics, what they have in common is their use of "post-humanist reconceptualizations of human/animal/machine/thing relations to diagnose how humanism ignores, obscures, and disavows the real relations among beings and things that make up the stuff of the world" (Snaza & Weaver, 2015, p. 1). While such orientations endeavour towards rejecting the distinct, albeit illusory, boundaries that have come to define the human and, by extension, the non-human, they are not immune to the apocalypse habits that contribute to the projection of a redemptive future beyond or after the human, which tends towards the reproduction, not abolition, of anthropocentric will and desires. As MacCormack (2020) explains, the post- of the posthuman works, on the one hand, to reaffirm a reified human subject through transhumanist imaginings and/or nihilist fantasies of human perpetuation, and on the other hand, picks up a "vitalistic turn which attempts to reinvigorate a positive end to anthropocentrism" (p.11). As such, and especially after the declaration of the small-a anthropocene, the posthuman as a concept to think with "seems to have exhausted itself" (MacCormack, 2020, p. 11). Against the posthuman, MacCormack instead offers the term *ahuman* as a concept that works to think of "ways beyond and ways out, not for ourselves, but for the world" (p. 2). The ahuman does not offer any sort of template, not does it take for granted what counts as transformation. Instead, the ahuman "celebrates and demands imagination and creativity in an increasingly impossible world" (p. 11). While this study of *Pedagogy at the End of the World* takes seriously the various calls and interventions that have been offered by posthuman educational scholarship, it opts for an ahuman mode of inquiry so as to experiment with alternate modes of study that involve making education — its reasons and futures — "vulnerable, available, accountable and careful in different ways" (MacCormack, 2020 p. ix).

[12] See Pedersen (2013; 2015), Biesta (1998; 2011), Snaza and Weaver (2015), Knox (2016), Taylor and Hughes (2016) and Lather and St. Pierre (2013)

By practicing an ahuman approach to study, one that aims to dismantle the dominance of all-too-human modes of thinking through weird trajectories of concept creation, I am not only interested in practicing a "substantial rethinking" of education and its given parameters, but also committed to experimenting, in a creative manner, with ways of *doing* research in an increasingly impossible world. Where calls to reimagine, reinvent and rethink education — be it through the concept of the Anthropocene or through posthuman methods — have become increasingly commonplace, it is necessary to probe the way in which such calls are themselves implicated in the projection of a redemptive education after education. The task for rethinking education, then, must be made to encounter the problematizing forces of deterritorialization through which the very concept of the future is created. Understood in terms of deterritorialization, or those dynamic and creative processes through which thinking orients and configures itself, the concept of the future, and thus its rethinking, offers a site to investigate educational movements and bodies as contractions and stabilizations of the problematizing forces of life, which are always more complex and differentiated than the strata for thinking that emerge. Where, as Colebrook (2020b) asserts, the future always involves more difference than the stable forms that emerge through its conceptual creation, then a future that is not tethered to humanity's self-preserving line of redemption requires a dramatic reversal in order to generate new strata for thinking. Calls for relaunching and rethinking educational futurity, that is, calls for a further deterritorialization of the future, must therefore come to terms with the way in which the future is, indeed, already deterritorialized (Colebrook, 2020). Further, any call for a "substantial rethinking" of education must address, but also destroy, the human privilege that continues to wreak havoc on the planet by experimenting with a range of "small tactics, of minor radicalisations" that aim to dismantle the dominance of the human by no longer "argue[ing] like a human" (MacCormack 2020, p. 2). Oriented towards such tasks, this project does not aim to overcome the (dominantly perceived) problem of the future so as to project an education after education, but instead experiments with ahuman modes of resituating and renegotiating pedagogical inquiry in relation to the dynamic movements of deterritorialization that characterize today's unthinkable scenarios.

### *2.4.3 Encounters with the Outside*

Where the Industry of Education labours under the assumption that it will forever be tethered to the preservation of an all-too-human futurity, educational problem-posing has become overdetermined by redemptive narratives that can be recuperated under futures as usual. By asking, again and again and again, the instrumentalized question "what works?" without bothering to ask the far more important ethico-political question, "works for what?" (Snaza & Weaver, 2015, p. 7) the very parameters of what constitutes education, and thus its research, have become restricted by that which education is unable to think. Further, where standard forms of educational research today privilege methodocentric research models founded in reductive subject-object divisions and deterministic understandings of relationality, educational research must be committed to the creation of concepts. As St. Pierre (2004) declares, "[w]e are in desperate need of new concepts, Deleuzian or otherwise, in this new educational environment that privileges a single positivist research model with its transcendent rationality and objectivity and accompanying concepts such as randomization, replicability, generalizability, bias, and so forth" (p. 286). With this in mind, pedagogical resistance will not emerge through theory and practices that promise to reform, revolutionize, reinvent or redeem education. Such calls, on the contrary, might actually work to restrict pedagogical possibilities by projecting an education after education that divests educational inquiry of its problematizing potential. As such, the question for education and its research today must experiment with putting pedagogical thought in contact with that which it has yet been unable to think, that is, with its perceived *outside*, so as to put pressure on the limits of what is currently conceived un/thinkable within given educational parameters.

Here, the "outside" does not imply the existence of a discrete exterior or an ideal transcendent category that might be attained through, for instance, educational reform and revolution. Instead, and following Deleuze (1998), the "outside" refers to the processual folding and unfolding, or deterritorialization, of inside forces that nevertheless constitute a perceived outside. As Deleuze (1998) describes, "[t]he outside is not a fixed limit but a moving matter animated by peristaltic movements, folds and foldings that together make up an inside: they are not something other than the outside, but precisely the inside 'of' the outside" (p. 96). Nevertheless, the outside is still a fact for Deleuze. That is, the concept of the outside references the way that even the most given of epistemic constraints are prone to leakages, how, even in the

most calcified of power relations "everything flees" (Deleuze & Parnet, 1987, p. 135) and, ultimately, how the creation of concepts themselves, including pedagogical ones, confirms the extraordinary powers of the unthought. Where the outside does not refer to yet another representational category but instead signals "the fact that we are not yet thinking" (Deleuze, 1989, p. 167), encounters with a perceived "outside" involves unthought processes of concept creation.

The problem raised by Deleuze's notion of the "outside," then, is not one of existence, but rather one of expression: "one cannot write sufficiently in the name of an outside" because it "has no image, no signification, no subjectivity" (Deleuze & Guattari, 1987, p. 23). As Deleuze and Guattari propose, a literal "exposition of concepts is the only guarantee of an *encounter* with a body of thought" (Zourabichvili, 2012, p. 140). As such, casting a line to the outside necessitates encounters with thought that is effectuated by what might appear, at first, as strange, weird, even irrational; "the movement of concepts must be placed into contact with something beyond words and phrases whose sense cannot be foreseen or comprehended beforehand, which [then] transforms the encounter with thought into a necessary rather than merely a logical association of ideas" (Zourabichvili, 2012, p. 27). Where thinking is not something that can be defined once and for all, but instead emerges as "a power of becoming […] transformed by what is not thinking's own — the outside or the unthought," (Colebrook, 2002, p. 38) there is a strange necessity to thinking. Thinking, in this way, is always "heterogeneous' (Deleuze and Guattari, 1994, p. 199); thinking not only involves processes of becoming (genesis) but a becoming other (hetero) by casting a line to a perceived outside (chaos) (Colebrook, 2002). This is not to say that thinking is itself chaotic, but rather that it would be nothing more than opinion if it did not allow an element of chaos, of virtual potentiality, to enter in and transform and mobilize thinking (Deleuze and Guattari, 1994, p. 204).

Returning back to the site of educational research and the problem of pedagogical resistance, the task of casting a line to the "outside" does not involve the fine-tuning or amelioration of pre-determined concepts and methods, but instead involves active experimentation with weird, ahuman modes of expression that necessitate concept creation and thus a different relation to the "outside." It is through such experimental encounters that the problems of educational transformation and educational futurity might be substantially rethought

as important, even necessary, sites for developing pedagogical resistance today. In response to the industry standards that now characterize the problem of educational transformation, encounters with the "outside" push back against the claims that education is fundamentally ameliorative, productive and positive, in favour of an understanding of transformation oriented to the creation of new strata for thinking. In response to what counts as "good" pedagogy, which has come to define and delimit the problem of educational futurity, encounters with the "outside" provide a site to negotiate, beyond good and evil, the movements of deterritorialization through which the future, and its actualization, comes about. And, in response to contemporary educational research and the problem of pedagogical resistance, encounters with the "outside" work toward problematizing pedagogical un/thinkability by asking how to develop ahuman modes and weird styles of doing educational research that necessitate unthought modes of expression. Taken together, and to conclude this contextualization of the given world of education, this study of *Pedagogy at the End of the World* endeavours towards creating encounters with education's perceived "outside" so as to generate weird lines of educational inquiry and unthought pedagogical trajectories through which educational futurity might be speculated otherwise.

## CHAPTER THREE: Crafting an Experimental Approach to Weird Study

Thus far in this study, I have endeavoured to set the scene for this investigation of *Pedagogy at the End of the World* as it relates to both today's broader end times scenarios and the more specific site of the given world of education. Through this contextualization, I have drawn attention to the difficult question of pedagogical resistance today. Once again, where education's industry standards have come to define and delimit the problem of educational transformation, where reductive notions of "good" pedagogy predetermine trajectories for pedagogical becomings, where educational research itself remains beholden to methodocentric postures that inculcate perception and thus possibilities for inquiry, the problem of pedagogical resistance today necessitates experimental approaches aimed at creating encounters with the "outside" of educational thought. Such encounters not only require contact with concepts that might provoke new strata for thinking, but also, following Deleuze, necessitate strange modes of expression and concept creation so as to probe the way in which education's "insides" and "outsides" have been conceived in the first place. As such, pedagogical resistance involves both an interrogation of the epistemic constraints that have come to overdetermine education — its reasons, research and thus its futures — as well as active and ongoing experiments in concept creation that might propel events of thinking towards unthought pedagogical becomings.

This study endeavours towards such experimentation by putting educational thought in contact with the *weirder* dimensions of todays' unthinkable end times scenario. Oscillating between two different, albeit intertwined, registers of inquiry, this project works towards the creation of weird lines of pedagogical becoming aimed at counter-actualizing projections of educational futures as usual. In the first instance, and in response to the unthinkable situation raised by the Anthropocene and its extinction events, this study *crafts a weird pedagogy*, one oriented to the weird and weirding dimensions of today's end of the world situation and is aimed at navigating the edges of what is perceived thinkable, and thus unthinkable, in the first place. In the second instance, and in a concomitant move, this study aims to *experiment with modes and styles of doing educational research* by developing a series of speculative studies aimed at resituating pedagogical thought within those domains and dimensions wherein we can no longer overdetermine the world, and thus its ends, in terms of all-too-human, redemptive narratives.

In this chapter, I return to the end times scenario outlined in the introduction of this study, this time articulating it in terms of its weird dimensions and weirding effects. Working against the imperative to overcome and domesticate these weird encounters, I instead propose an approach to doing educational research that involves both *speculative modes* and *transversal styles* of study. It is this approach, what I call *weird study,* that orients the research that unfolds in the following chapters. Before delving into the three specific sites of educational futurity that make up this investigation — i.e. the sites of sustainable futurity, energy futurity and working futurity — this chapter outlines my approach to weird study in more detail. In what follows, I refract today's (so-called) apocalyptic situation through the lens of *global weirding* in order to iterate and extend my assertions about today's unthinkable context. I then develop some theoretical background on *the concept of the weird*, so as to further experiment with the relationship between weird thinking and the pedagogical force of concepts. I then conclude this chapter by outlining the ways in which this project proceeds as a *weird study*, focusing specifically on the speculative modes and transversal styles that orient my investigations of *Pedagogy at the End of the World*.

### 3.1 Pedagogy in a Time of Global Weirding

Today's end of the world scenario is not only characterized by an unprecedented convergence of ecological, social and psychic crises, but also a range of *weird events and phenomena* that frustrate those frames of reference and modes of thinking to which we have become accustomed. While, for instance, reports on global warming accumulate like the CO2 in the atmosphere, concerns over melting glacier ice are but the tip of the iceberg, so to speak, with new worries about things like giant cavities taking shape under shifting ice sheets now on scientists' radar. Researchers in Antarctica, for example, have discovered an enormous void under the Thwaites Glacier in West Antarctica, a hole "big enough to fit two-thirds of Manhattan" reports NBC, careful to relate the problem to human scales (Chow, 2019). The discovery of this void has led to a major new research initiative, which will "use robots and ocean weather stations, as well as more than a dozen seals fitted with sensors designed to collect data about glacial ice and the surrounding water" (Chow, 2019). Today's extreme weather seasons have not only triggered record-breaking wind speeds and unprecedented flooding, but

have led to strange interspecies encounters where, in the example of 2018's Hurricane Florence, for instance, groups of dolphins were observed frolicking in the flooded streets of Wilmington, North Carolina. The strange and unexpected consequences of today's ecological crises are concomitant with a range of weird social and cultural phenomena, such as the resurgence of "Medieval diseases" like typhus in California, which has hit houseless populations especially hard (Gorman, 2019). Today's bizarre situation is epitomized in headlines such as "A Border Patrol Agent Started a 47,000-Acre Wildfire with a Gender Reveal Party" (Schwartz, 2018), which brings together the heteronormative ritual of the "gender reveal," with oedipal one-up-mans-ship, gun violence, wildfires and border policing. Indeed, and in a strange turn of events, today's wildfires have not only been exacerbated by rising temperatures and ongoing deforestation, but have been further fueled by *several* instances of these gender reveal explosions, including recent examples here in Alberta where exploding disc targets have sparked at least three Alberta wildfires in 2021 alone (Snowdon, 2021). With sensor-wearing seals working with robots to track the large holes forming under ice, dolphins swimming the streets, medieval diseases making a comeback, and wildfires resulting not only from a warming world, but also a mélange of fucked-up cultural practices, it appears that the taciturn language of "global warming" might be more accurately described as *global weirding*.

Popularized by the writing of *New York Times* columnist Thomas Friedman[13], the term "global weirding" briefly rose to prominence as a suggested alternative to both global warming and climate change, neither of which adequately capture the situation but instead produce a kind of "tactical denialism" against it (Canavan & Hageman, 2016). As Gerry Canavan and Andrew Hageman (2016) outline in their introduction to the 2016 *Paradoxa* special issue on "Global Weirding," while the term global warming most often focuses on empirical measurement of the temperature alone it does not adequately represent the strange feedback loops and weird phenomena that are otherwise characteristic of a changing climate. Or, as Friedman (2010) put it, "I prefer the term 'global weirding' because that is what actually happens as global temperatures rise and the climate changes. The weather gets weird." While discourses oriented to global warming tend to focus on, for instance, increases in average air and ocean temperatures, they

[13] Thomas Friedman of The New York Times is often credited with coining the term, although he is quick to point out Hunter Lovins, co-founder of the Rocky Mountain Institute, as its originator.

obscure weirder and often far more catastrophic phenomena, such as the release of methane from a thawing arctic, a.k.a. "the methane dragon,"[14] which is predicted to result in temperatures much, much higher than the already unfeasible 2-degree target that has been proposed by international organizations to avoid climate disaster. With examples like the methane dragon in mind, global weirding, as a concept, short-circuits the denialist wordplay of climate change discourse by focusing instead on "the unpredictable disruptions that have been caused and will continue to be caused by the coming years of anthropogenic global warming" (Canavan & Haegman, 2016). In short, global weirding offers a more adequate concept for describing the weird nature of climate chaos and its resulting effects across ecological, social and psychic registers.

While the term global weirding might seem like the most appropriate description for today's unthinkable situation, it never really took hold. This is perhaps because, as Canavan and Hageman (2016) write, the "weird seems fun, quirky, almost cute and gothically cuddly, and relatively innocuous, and in that way woefully inadequate to the scale of a crisis that threatens." But this is just one way to understand the weird. As opposed to just denoting something a bit odd or strange, the weird might otherwise be understood as a particular kind of perturbation, "a sensation of wrongness," wherein a phenomenon, such as ecocatastrophe, is so strange that it makes us feel as though it should not exist, or at least not exist *here* (Fisher, 2016). Yet, if it is here, if things are indeed weirder than we can imagine, then the conceptual schema and cognitive apparatuses we have up until now used to make sense of the world are shown to be deficient. That is, it is not so much that the weird thing is out of place or wrong, but rather "it is our conceptions that must be inadequate" (Fisher, 2016, p. 15). As exemplified through just a select few instances above, climatic breakdown is weird in the sense that it warps and resists attempts to be normalized, or managed, by existing narratives and institutions. The news of giant underwater voids and sensor-sporting seals, for instance, not only points to the incomprehensible state of ocean life today, but highlights the ways in which scientific research relies on a range of inhuman and non-human relations that, in turn, impact modes of vision and the limits of scientific legibility. Meanwhile, the so-called "natural disasters" that have devastated and

[14] There is more energy stored in the arctic methane than there is in coal in the world. If the process of the release of the methane currently frozen in the soil and ocean beds of the arctic spins out of control, global temperature is projected to raise well past the 2 degree target, reaching closer to an 8 degree rise.

disrupted both human and non-human coastal communities around the globe, have made it clear that the nature/culture divides that have structured ecological thought for centuries are counterfactual; that there is "no hard-and-fast divide between natural and social; rather they are seamlessly swept together in counterclockwise rotations" (Tuana, 2007, p. 192). These weird ecological phenomena are intimately tied to various weird social phenomena, which are now spreading across the globe like wildfire, further highlighting the strange nature of today's ethical and political problematics defined as they are by both a range of conservative norms *and* dynamic expressions of sociality that evade and frustrate typical analyses.

What global weirding points to, then, is how we are now living in "post-normal times" and, as such, we can no longer depend on the climatological, political, economic and social patterns that up until now have more or less reliably structured our behaviours and actions (Canavan & Hageman, 2016). The sense of the weird signaled by global weirding therefore cracks open a space "for experimenting with radical new ways of representing massive and mind-bending things like global warming, geological time, the Anthropocene, the life and afterlife of infrastructures, and so on" (Canavan & Hageman, 2016). In this way, and referencing Deleuze's provocations on the necessity of thinking, the weird at the heart of global weirding necessitates encounters with a perceived "outside," where the outside is not given as a transcendent elsewhere, but as an *event* that forces thought into crisis. With this in mind, the term global weirding might not have caught on because it is actually much harder to enact "tactical denialism" against it. If today's situation is exposed not as an anomaly to overcome or repair, but rather a weird perturbation that frustrates taken-for-granted conceptions of life, balance, finitude, and human agency, then taking global weirding seriously means we would have to face up to long-held conceptual commitments and deep desires, such as those that undergird education.

### 3.2 Weird Times Call for Weird Thinking

Whether adopted or not, the term global weirding remains provocative, forceful even, due the way it necessitates encounters with the weird affects, percepts and concepts that characterize today's planetary scenarios. Such encounters are pedagogical in the sense that they both frustrate common sense perceptions, while also provoking highly singular "lines of flight" that necessitate unthought concept creation. Situating this investigation within today's milieu of global weirding,

this study endeavours to create such pedagogical encounters through the experimental crafting of *weird thinking*. Taking cues from Deleuze and Guattari, weird thinking references the event of thought itself, which, as they assert, is not something "we" do, but instead something that happens to us, from without (Colebrook, 2002, p, 38). Where, as Deleuze insists, thinking unfolds from encounters with what is not thinking's own, there is a necessity to thinking, one that nevertheless lies beyond individual agency or personal choice. It is in this way that thinking is weird, or at least weirder than how thinking is typically thought. Weird thinking involves strange modes of concept creation that opt for negation, destruction, subtraction and un-becoming so as to release the indiscernable and undifferentiated potentials for thinking that have become overcoded through commonsense perceptions and everyday opinions. Weird thinking, then, offers another way to articulate the problematizing force of thought or what has been outlined in the previous chapters as a pedagogy of concepts. In this understanding of pedagogy, the event of thinking involves, first, an encounter with that which is strange, or the elaboration of an "outside" to thought, and second, the experimental expression of conceptual creation, which is not simply added on to thinking, but is necessitated by the strata for thinking made possible by casting a line to a perceived "outside." Weird thinking is thus pedagogical in the sense that it involves encounters with that which creates *possibilities for thinking*, not by adding something new to fields of thinking but by rendering present conditions and thus terms of un/thinkability incoherent.

### *3.2.1 Weird Outsides-Folding-In*

Drawing on, but also taking off from, Deleuze's pedagogy of the concept, this project positions weird thinking as a conceptual orientation that involves the *in-folding of perceived outside forces and intensities*, which, in turn, create new strata for thinking. The in-folding function of the weird used here takes cues from Mark Fisher's (2016) concept of the weird, which is developed in relation to affects and modes: "modes of film and fiction, modes of perception, ultimately, you might say, even modes of being" (p. 9). For Fisher, the concept of the weird is closely related to the concept of the eerie, both of which share a preoccupation with the strange. As Fisher outlines, we find these affects and modes alluring not just because we "enjoy what scares us," but instead due to a "fascination for the outside, for that which lies beyond

standard perception, cognition and experience" (p. 8). Fisher's understanding of the weird is not unlike Eugene Thacker's (2010) use of the weird, where he asserts that indescribability is the reason why life is fundamentally *weird*: "[t]he threat is not the monster, or that which threatens existing categories of knowledge. Rather, it is the 'nameless thing,' or that which presents itself as a horizon for thought" (p. 23). In both of these conceptual developments, the weird is that which presents an encounter with the unthought, or the "outside" of thought, which necessarily evades description, thus exposing the insufficiency of representational categories and existing cognitive maps.

In Fisher's account, the weird is "constituted by a presence – the presence of that which does not belong," and as such "brings to the familiar something which ordinarily lies beyond it, and which cannot be reconciled with the 'homely'" (p. 10-11). With this in mind, the concept of the weird can be aligned with the concept of the uncanny, but also distinguished from it when it comes to thinking about "insides" and "outsides." As Fisher (2016) asserts, the *unheimlich* (or Freud's *uncanny)* is often equated with the weird and the eerie, with Freud himself treating the terms as interchangeable (p. 9). But this equation, Fisher argues, has meant that the idea of the uncanny has crowded out and subsumed the two other modes. Fisher goes on to distinguish the uncanny from the weird and the eerie based on their relative treatment of *the strange.* Whereas Freud's *unheimlich* is about the "unhomely," the strange within the familiar, the strangely familiar, the familiar as strange and thus a "compulsion towards a certain kind of critique, which operates by always processing the outside through the gaps and impasses of the inside," the weird and the eerie make the opposite move (Fisher, 2016, p. 10). As Fisher (2016) puts it, "they allow us to see the inside from the perspective of the outside" (p. 10). Unlike the uncanny, wherein a familiar thing or event is what unsettles and discomforts, the weird is the thing or event that arrives from the "outside," in turn creating an encounter with the limits of (human) thinking. In this way, the concept of the weird is dislocated from the concept of the uncanny in the way that it dilates perception beyond individual psychological experience, pointing instead to what Thacker (2011) might call the "horror" of philosophy and the enigmatic thought of that which cannot be grasped by (human) thinking (p. 8). In short, the weird is not simply that which is strange (in the familiar), but instead offers another way of articulating those powers and

intensities that lie beyond a bounded individual self, but nevertheless make up who we think we are, revealing, once again, how "there is no inside except as a folding of the outside" (p. 11-12).

### *3.2.2 Weird Speculations*

Through an articulation of un/thinkability as it relates to processes of outsides-folding-in, the weird offers a conceptual apparatus for grappling with, but also problematizing, the strange end times scenarios within which this investigation is situated. Where, for Fisher (2016), the weird is linked to the "metaphysical scandal of capital [which] brings us the broader question of agency of the immaterial and inanimate," it exposes "the agency of minerals and landscape and the way 'we' 'ourselves' are caught up in the rhythms, pulsions and patternings of non-human forces" (p. 11). Indeed, capitalism, the dominant organizing system of our time, is itself very weird. As Jason Moore (2016) contends, capitalism's "law" of value — how and what it prioritizes in the web of life — has always been a law of "cheap nature," and, as such is absurd, for nature is never cheap. The weird and dynamic process of putting nature to work on the cheap has nevertheless been the basis for modernity's accomplishments (Moore, 2016, p. 11), giving rise to a range of strange economic events and phenomena that are nevertheless deemed the most "rational" or "realistic" way of ordering life both now and into the future. This economic weirding is evidenced by the collapse of entire industries and the subsequent financial crises that have now resulted in an intensified precariousness for the middle and lower classes, which has not catalyzed calls to refuse and revise economic systems, but instead has provided the means to produce stranger and stranger speculations that ultimately maintain capitalism's absurd contradictions. This economic weirding is also evident within the Industry of Education, which, as investigated in the following chapters, now takes part in a wide range of strange practices and protocols that nevertheless *make sense* to the economizing logic, progressive paradigms, and humanist orientations that define education and its transformative futures.

The concept of the weird, which references both the in-folded presence of outside forces and intensities as well as the absurdist metaphysical scandal of capital, therefore draws attention to the *speculative* character of the weird as a concept to think with. The speculative potentials of the weird, and thus weird thinking, are exemplified within what has been called the "New Weird," a genre of fiction and its related modes of literary analysis that involves speculative

experiments in world-building. The New Weird arrives from the tradition of the Lovecraftian "Old Weird," which, as thinkers like Graham Harman and Eugene Thacker explore, "deals with the wonder and horror at the fringes of human consciousness" (Wilk, 2018, p.1). Drawing on the Lovecraftian tradition[15] of portraying that which exists beyond the explainable, even thinkable, the New Weird brings together the ineffability, transience, noetic qualities, and mysticism of the Old Weird with contemporary knowledge and scenarios, many of which now point to an existential threat on the species level (Wilk, 2018).

As Jeff VanderMeer and Ann VanderMeer (2012) outline in their introduction to the anthology *The New Weird*, this genre and its analytical probes are "a type of urban, secondary-world fiction that subverts the romanticized ideas about place found in traditional fantasy, largely by choosing *realistic, complex real-world models as the jumping-off point* for the creation of settings that may combine elements of both science fiction and fantasy" (my italics). A prime literary example of such jumping-off points can be found in Jeff VanderMeer's own weird tale, the *Southern Reach* trilogy (*Annihilation, Authority, Acceptance,* 2014), which presents an unnerving world in which the apparent fixity of the laws of nature no longer seem to hold. In this example, the weird provides a mode of expression aimed at grappling with contemporary ecological annihilation via speculative means that are able to extrapolate from, while also extending, the frameworks that ground understandings of the human, the body and life itself. As VanderMeer (2016) writes, as extreme weather events continue to spin out of control and the resolute "fixed laws of nature" seem to become increasingly un-fixed and un-fixable, weird fiction becomes a way to render sensible, that is, to create a greater and more visceral understanding of the ecological situation as it is "felt in and under the skin, as well as in the subconscious." By contextualizing current geological, climatological and cosmological scenarios in terms of their weird dimensions, theoretical orientations that fall under the banner of the New Weird work to counteract typical approaches to today's anthropo-scenic scenario through radical reframings and incompossible accounts of life and existence in a weird and weirding world. It is this speculative character of the weird that I draw upon and deploy in this weird study of *Pedagogy at the End of the World*.

[15] It should be noted, that this "Lovecraftian tradition" is also inflected by Lovecraft's misanthropic xenophobia and thus the work of Lovecraft itself requires its own critique.

*3.2.3 Weird Affinities*

In addition to experimenting with the speculative potential for weird outsides-folding-in, the weird thinking operative in this study overlaps, and thus shares affinities with, some of the weirder theoretical interventions that have been offered within the domain of queer theory. In her thesis project on *Weird Modernisms*, Ali Sperling (2017) points out some of the affinities between the weird and queer theory, highlighting how in addition to the way in which weird and queer are used somewhat interchangeably in colloquial terms, there is also a sonic resonance between the two words: "[w]hen a text is 'queered,' the weird is already a part of the way the word sounds, and is paralleled in the shape of the mouth when both words are spoken" (p. 17-18). This affinity, according to Sperling, is also felt in the historical development of these concepts, specifically in the way that they share the reclamation of representations once used as pejorative as a source of pride and even disruption. Indeed, and not unlike the weird, concepts such as "queer time" and "queer space"[16] have been proffered as subversive theoretical interruptions capable of frustrating overdetermined institutions and relations, particularly in terms of the family, heterosexuality and reproduction (Halberstam, 2005). In this way, the historical development of the queer and the weird as conceptual apparatuses share an affinity for exposing the inadequacy of existing frameworks and monolithic ideals. Within these histories, however, is also where distinctions between weird thinking and queer theory might be drawn. While the weird is often attached to literary or philosophical lineages, the concept of queerness emerged as a sign of deviation or difference within institutional and social domains, particularly in theories of sexual and gender difference. While this research acknowledges the affinities between the queer and the weird, it purposefully orients around the latter, which, I wager, provides potentials for rethinking pedagogy in light of today's unthinkable milieu.

As unfolded above, the weird provides one mode of navigating the edge of un/thinkability and thus holds the capacity to bring about asignifying ruptures, mutant existential

[16] As Halberstam (2005) summarizes, "'[q]ueer time' is a term for those specific models of temporality that emerge within postmodernism once one leaves the temporal frames of bourgeois reproduction and family, longevity, risk/safety, and inheritance [whereas] '[q]ueer space' refers to the place-making practices within postmodernism in which queer people engage and it also describes the new understandings of space enabled by the production of queer counterpublics" (p. 6).

variations and yet unthought forms of pedagogical becoming. While aligning with queer theory and its interrogations of dominant relationships, identities and habits, the weird offers more than just a critical orientation by way of its speculative dimensions. Transposed to this study of *Pedagogy at the End of the World*, the concept of the weird conjures questions about how pedagogy itself might enable and sustain encounters with the unfathomable, yet very real, forces and intensities that co-constitute the world and our relations within it. In contrast to typical approaches to queer pedagogy,[17] then, the pedagogical task of weird thinking is not just aimed at subverting normative organizations in favour of weird alternatives, but instead, the task is to bring about in-foldings of alien, mutant and/or "outside" forces so as to render sensible a weirdness that is capable of annihilating those modes of thinking, sensing and being that have produced the pedagogical foreclosures we are living out today. The question raised by weird thinking, in this way, asks not only how to produce pedagogical encounters that queer, pervert or subvert dominant modes and methods, but instead, how to endure such encounters through unthought collectivities and strange pedagogical becomings. As Eileen Joy (2013) suggests, the active process of making things that are weird (in this case, education itself) *even more weird* is "an ethical act, one invested in maximizing the sensual and other richness of the world's expressivity" (my italics, p. 28). Drawing on this assertion, weird thinking can be understood as an orientation to thinking that attends to the "world's expressivity," while simultaneously mutating the concepts of both world and expression beyond their ordinary, commonsense representations.

### 3.3 On Weird Study: Speculative Modes, Transversal Styles

Oriented towards weird thinking, this research is invested in crafting an experimental approach to studying the problem of *Pedagogy at the End of the World*, or what I call *weird study*. This approach centres on an understanding of study, or a way of *doing* educational research, that is oriented towards weird pedagogical encounters and thus the event of thinking, which in turn necessitates the speculative deployment of new modes of expression. The use of study here is purposeful and refers to a very specific understanding of what it means to do

[17] See, for instance, William Pinar (1998) and Deborah Britzman (1995).

research within the given world of education today. As contemporary thinkers of the university and its management Stefano Harney and Fred Moten (2013) propose, study is, quite simply, the practice of getting together with others to think, co-determining desires for learning without a specific objective, output, or end point determined in advance. While this orientation might seem commonplace or even fundamental to academic practices, Harney and Moten (2013) argue that such modes of study are, in fact, antithetical to (and almost impossible within) the contemporary neoliberal university, characterized as it is by various forms of ac(credit)ation, debt, instrumentalization, completion and professionalization. And yet, as they suggest, somehow study goes on; despite the various pressures of ongoing certification, bureaucratic domination, and dwindling job prospects, the desire to study continues, particularly in those spaces and among those subjects that are not recognized, not legitimized by the university, or what Harney and Moten (2013) call the "undercommons." Harney and Moten (2010) therefore ask how study might be repositioned as "a different kind of speculation, a speculation called 'study,' a debt speculation, a speculative mutuality" (para. 16). Put another way, these thinkers ask how research might be redeployed as a speculative practice that entails the "creation of conditions for encountering the operative transversality of difference at the heart of all practice" (Manning, 2016, p. 41). This research endeavours to practice this approach to study, which necessitates both *speculative modes* and *transversal styles* of doing research. It is through such modes and styles that study itself is made weird, thus leading to a very different register of pedagogical problem-posing than those typically at work within the standard and standardizing approaches to educational research circulating today.

First and foremost, an experimental approach to weird study cannot be known in advance of specific sites of pedagogical encounter and, as such, it takes on a *speculative mode*. Weird study is, in this way, not positioned as a critical approach aimed at uncovering the given axioms that have come to direct and delimit educational futurity, but is instead positioned as a *fictional* orientation to the problem of pedagogy at the end of the world. Taking cues from Deleuze's (1994) assertion that a text in philosophy "should be in part ... a kind of science fiction" (p. xx), weird study offers speculative probes that operate "at the frontiers of our knowledge, at the border which separates our knowledge from our ignorance and transforms the one into the other" (p. xxi). Through this speculative mode, weird study does not aim to predict or lay claim to the

future, but instead, "it unpredicts the future; it seeks out what is unpredictable, or what is counterfinal" (Shaviro, 2018). Taking on this mode, and offered up to be read as "a kind of science fiction," this study is neither forward-looking nor utopian. Rather, this study provides a speculative account of educational futurity that aims to fold the problematic of an unknown future into the interval of the present so as to create transversal lines and alternative pedagogical becomings in the here and now (Flaxman, 2012, p. 20). As such, the fictional character of this research is not so much adopted in terms of narrative strategies and futuristic plot-lines, but instead operates as a theoretical practice that aims to dilate perception though strange vantage points and weird timelines that ultimately frustrate commonsense regimes of representation, rendering epistemology itself incoherent and thus in need of new means of expression.

Is it in this way that this study takes on a fictional character in the sense that Deleuze discusses. As he writes in *Negotiations* (1995b): "[p]hilosophy is like a novel: you have to ask 'What's going to happen?,' 'What's happened?' Except the characters are concepts, and the setting, the scenes, are space-times. One's always trying to bring something to life, to free life from where it's trapped, to trace lines of flight" (p. 140–141). This weird study of pedagogy at the end of the world enacts this fictional approach by taking on a speculative mode. Speculation as it is practiced in the following chapters is positioned as a verb, or what Patricia Reed (2014) describes as the enactment of a processual and iterative "ethics of non-presentness" that in turn provides the conditions for generative iteration over deadly repetition. Written as a kind of fiction, this study commits to this speculative practice despite the call to will the same. Through this speculative mode, the speculator, or in the case of this study, the researcher, recognizes that while the given functions by limiting what can and cannot be thought in the first place, it is never complete. To speculate is therefore to attend to convention and suspect that which is given, but also to recognize and experiment with the untotalizable potentials, or givenness of thought in the DeleuzoGuattarian sense, by projecting thinking into strange domains and weird dimensions wherein the world, including the world of education, can no longer be quantified and economized in terms of measurable, repeatable and readily re-cognizable facts and information. Speculation, in this way, requires re-tuning inquiry toward a practice of incipient thought, or conceptual crafting, one that involves the alienation from familiar frameworks and the

purposeful rethinking of concepts so as to re-situate and re-orient what is deemed un/thinkable in the first place.

Positioned as a speculative mode, weird study therefore necessitates a *transversal style* of doing educational research so as to create encounters with the perceived "outside" of educational thought. As Guattari (2000) asserted now decades ago, given the breakdown of the three ecologies, we must learn to think *transversally,* that is, we must learn to draw connections between heterogeneous bodies, be it material or conceptual, in order to liberate desiring flows and subjective potentials from overdetermined identifications and repressive forms of institutional organization (p. 43). Transversality is a significant aspect of Guattari and Deleuze's approach to doing philosophy more generally. As philosopher Brian Massumi (1987) notes, Deleuze and Guattari themselves were always happy to "steal from other disciplines with glee" but also "more than happy to return the favour" (p. xv). What transversality enables, what makes it exciting as a way of doing philosophy, is how it makes different conceptual assemblages possible, ones that hold the potential to make available the "nonthought within thought" (Deleuze & Guattari, 1994, p. 59). Drawing on Deleuze and Guattari's calls for and practices of transversality*,* weird study involves the purposeful mixing of heterogeneous and partial signs and territories as well as divergent, even alien, disciplinary examples that might disarticulate organizational forms so as to produce anomalous, and often temporary, connections that have the potential to create their own signifiers and systems of value. A transversal style is one that places emphasis on ongoing differentiation and resingularization, and is therefore inextricably linked with the activation of mutant existential territories, with processual creativity, with the affirmation of the unthought, with that which has yet to be thought, yet to be seen, yet to be felt. The generation of such processual openings, or, in Guattari's terms, these "transversalist bridges" (Arnott, 2001), are, in my mind, one strategy for constructing lines of flight leading away from congealed and overdetermined organizations, towards counter-actualizations and the opening up of fields of the possible. The ethical and political importance of a transversal style is thereby revealed in the way in which it attunes to ecologies of the virtual, thus providing a site to potentially shift modes and methods of problematization away from solutionist approaches and redemptive narratives, towards unthought pedagogical possibilities.

In more specific terms, each of the speculative studies developed in the following three chapters take up this transversal style by bringing today's unthinkable pedagogical problematics in contact with examples and theories drawn from the (apparent) "outside" of educational research and practice. In Chapter Four, which probes education and the problem of *sustainable futures*, the concept of sustainability is put in contact with the strange event of a black hole and its computational imaging. Bringing together educational literature on sustainability and planetary stewardship with concepts from diverse fields ranging from astrophysics to computational theory to philosophical pessimism, this speculative study of sustaining the end of the world practices a transversal style of weird study as a way to upend salvation narratives and navigate horizonless futures. In Chapter Five, or the speculative study of energetic investments at the end of the world, the problem of *energy futures* is put in contact with the ir/rational apparatuses of speculative finance and the bizarrely affirmative logic of energy transition. This encounter is unfolded through transversal connections between educational research on the financialization of education as it is situated within the energy-climate-education nexus and some of the more mind-bending theories offered by contemporary physics in relation to the energy concept. In Chapter Six, which probes education in relation to working at the edge of extinction, the problem of *working futures* is put in contact with the weird phenomena of reality TV and a series of strange theoretical propositions for rethinking today's extinction events. This final transversal encounter is refracted through theories of life, living and survival that respond to the mutated and mutating forces of capitalism in both an era of platform proliferation and amidst ongoing extinction events.

Through alien encounters with cosmic darkness and algorithmic sense-making apparatuses, weird contact with speculative derivatives and subtractive strategies, and unfathomable confrontations with reality programming and the strange survival conditions it enables, each of the following studies of educational futurity propose alternative, albeit always speculative, always incomplete, pedagogical trajectories that work to fold the problematic of an unknown future into the interval of the present. Through this experimental conceptual crafting, each study therefore works towards the creation of mutant existential territories, transversal lines and alternative pedagogical becomings that might be capable of resisting the horrors of the present and its apocalypse banality. Oriented towards conceptual crafting via weird study, this

project does not aim to provide further evidence of educational challenges and thus interventions, nor does it (cl)aim to provide better solutions to today's pressing societal, and by extension educational, concerns. Instead, this study of *Pedagogy at the End of the World* is committed to the occasion of modes of inquiry and the crafting of weird conceptual encounters that might problematize that which is given within the Industry of Education so as to refuse and recast educational futurity in yet unthought ways.

# CHAPTER FOUR: Sustaining the End of the World (Study No. 1)

## 4.1 Seeing the Unseeable, Thinking the Unthinkable

### *4.1.1 A Precious Discovery*

On April 10, 2019, the team at the Event Horizon Telescope (EHT) project released an unprecedented image of a supermassive black hole at the centre of galaxy Messier 87. The image, which shows a dark disc outlined by swirling hot gas circling the black hole's event horizon, exhibits a 55 million year old cosmic event in the Virgo galaxy cluster — a void of stellar mass measuring some 6.5 billion times that of Earth's sun. After almost a decade of work and the collaboration of an international team of scientists, a network of radio telescopes and the creation of a powerful algorithm capable of correlating and calibrating huge amounts of data while sifting through "noise," the image produced by the EHT has been offered as unprecedented "visual evidence" of what has, until now, been invisible, evidence of the event horizon of a black hole (Drake, 2019). As EHT Director and astrophysicist Shep Doelman put it when introducing the image, "[w]e are delighted to be able to report to you today that we have seen what we

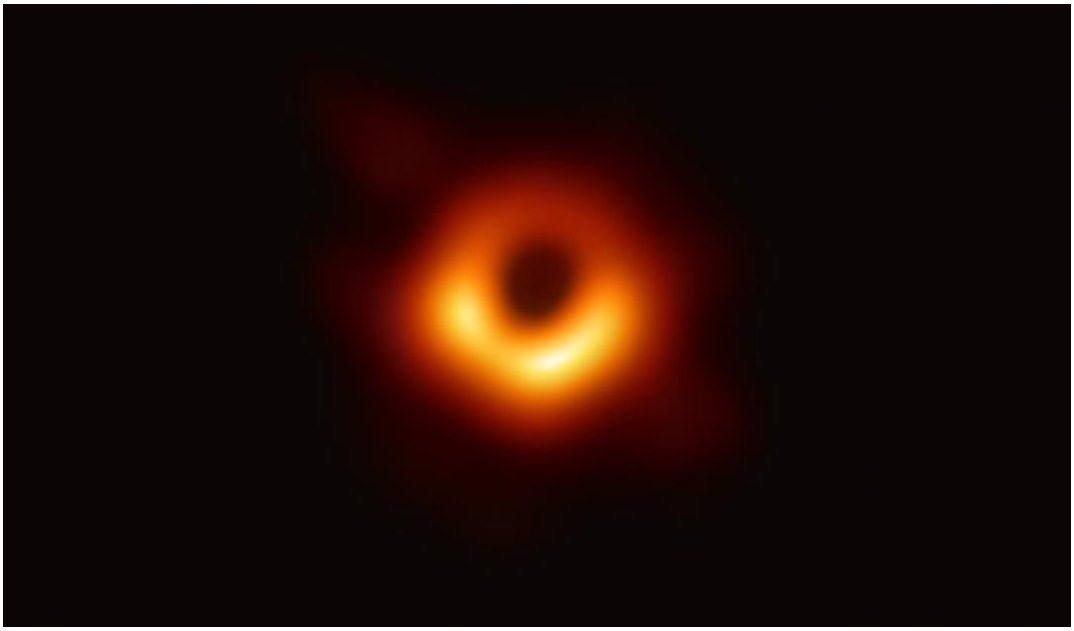

*Figure 1:* Radio image of the black hole located in Messier 87, EHT Collaboration (2019).

thought was unseeable. We have seen and taken a picture of a black hole" (cited in Chappell, 2019).

While the news of this extraordinary image was but a blip on newsfeeds at the time, its significance has reverberated throughout scientific communities where the picture has been hailed as a "precious" techno-scientific discovery that affirms some of the most important theories subtending the field of astrophysics (Chappell, 2019). For instance, Einstein's theory of general relativity and its related calculations were used to predict the size and shape of the black hole's event horizon, which was then confirmed with the image, resulting in a renewed confidence in the physics that is said to drive the large-scale structure of the universe (Chappell, 2019). While there have been extensive simulations created in order to speculate on how the laws of physics might extend to the outer limits of deep space, black holes have never been directly observed, and thus have not, until this image, been empirically "proven." With this in mind, the 2019 image has been deemed *precious* because, as Heino Falcke, chair of the EHT Science Council put it, "this one is finally *real*" (my italics, cited in Chappell, 2019).

### *4.1.2 Ingenious Operations*

In addition to being hailed as a "precious discovery" by scientific communities, the black hole image has also been deemed significant based on the technical *ingenuity* required to visually represent such a distant and compact cosmic event. In order to reach into the depths of space-time, the globally dispersed EHT team needed to create an extremely large and powerful telescope, one at least 10,000 kilometres in diameter or almost as big as planet Earth (Hardesty, 2016). Due to the material impossibility of such an endeavour, the team responded by developing the Event Horizon Telescope, a computational telescope, which, combined with a powerful algorithm, is capable of resolving structure on the scale of a black hole's event horizon. The EHT is dispersed across the globe, consisting of a series of radio telescopes that are linked together through atomic clocks and a supercomputer. Helmed by an international group of researchers, the computational telescope works by "freezing light," not unlike a time-lapse image, in order to collect thousands of terabytes of data, which are then combined and processed in a lab in Massachusetts. Key to this data collection are radio waves, which are able to "pierce through galactic dust" thus allowing for scientists to "*see* into the centre of our galaxy," a perspective that

visual wavelengths can never provide (my italics, Hardesty, 2016). Through the technique of Very Long Baseline Interferometry (VLBI), the EHT forms a virtual Earth-sized radio dish that is able to provide a uniquely high image resolution. As astronomer Maciek Wielgus has put it, "[w]ith the incredible angular resolution of the EHT we could observe a billiard game being played on the Moon and not lose track of the score!" ("Wobbling Shadow of the M87* Black Hole," 2020).

The data collection process required for such incredible imaging, however, is painstaking as each signal received by the telescopes must be synchronized wave by wave. Further, the data collected through this process must be managed, interpreted and analyzed, which has led to the development of a powerful machine-learning algorithm that has been used to stitch together the image from otherwise sparse and noisy data. The name given to this Bayesian algorithm, one that provides an important algebraic solution for the extraction and deconvolution of information from otherwise noisy radio signals, is CHIRP or Continuous High-resolution Image Reconstruction using Patch priors. As the lead engineer and computer scientist behind the development of CHIRP, Katie Bouman (2016), explains it, to understand the EHT and its algorithmic operations we can imagine that the Earth is itself a telescope, one that looks like a giant spinning disco ball where each mirror collects light that is combined together to take a picture. While the EHT only has a small set of mirrors to work with, the Earth's rotation allows the computational telescope to collect a range of data that can be then used to create a picture. But there needs to be a way to fill in the gaps. This is where CHIRP comes in. As the Earth, or disco ball, rotates, the radio telescopes, or mirrors, are able to observe different parts of the image, gathering new measurements that can then be fed into the algorithm; "[l]ike a time-lapse exposure, this slowly builds up an image of even a very dim source [allowing the] Earth's rotation to, in effect, fill in the empty spaces in the array to produce a more complete picture" (NSF cited in Chappell, 2019).

In addition to the international collaboration and painstaking data collection processes involved in the EHT, then, it is the creation of this powerful machine-learning algorithm that has been recognized as a "very significant" part of the EHT project (Marrone cited in Chappell, 2019). CHIRP and its related research has been able to overcome the gaps within the data through "careful modelling of the sensing process [as well as] cutting-edge derivation of a prior-

image model," both of which have already been deemed as important advancements for future researchers to test new imaging methods (Yoav Schechner cited in Hardesty, 2016). In this way, the unprecedented imaging of the black hole at the centre of galaxy Messier 87 is not only significant, *precious* even, due to the scientific theories it affirms, but also for its *ingenious* technical operations and the new trajectories of research such innovations have opened up.

### *4.1.3 Cosmological Affirmations*

Beyond offering new confidence in fundamental scientific theories and demonstrating what is possible through well-funded and technologically innovative international scientific collaboration, the 2019 black hole image has also been celebrated for the *cosmological assumptions* it seemingly affirms. Cosmology here refers to the amalgam of ontological, epistemological, temporal and cosmogenic elements that orient studies of the cosmos, that is, studies of its origin, constitution, evolution and eventual fate (Allan, 2018). By providing a navigational apparatus for conceptualizing the fundamental units of matter and the nature and direction of time, cosmological assumptions not only determine those sanctioned "modes and procedures" that produce viable "knowledge of the universe," but also subtend understandings of the role and place of humanity within it (Reed, 2019d, p. 28).

Upon the release of the black hole image, particular cosmological assumptions about humanity's role and trajectory in the universe, and thus its epistemic modes and procedures, were a central focus in discussions of the image's significance. As *Guardian* writer Ellie May O'Hagan (2019) suggested, for example, the unprecedented picture offers a "beacon of hope," a "ray of light" in these dark times, due to its affirmation of a humanity that is not only destined to explore the farthest reaches of the universe, but one that is able to capture, through imaging, its deepest mysteries. As O'Hagan (2019) put it:

> On our own turquoise speck in the cosmos, we're living through ecological breakdown, the rise of authoritarianism and the appallingly unequal distribution of resources. We're devoting a lot of time and energy to destroying our home and to hurting one another. It can be hard not to feel like the human race has become trapped in its own event horizon, and we're inevitably and inexorably being pulled towards the darkness. The grainy

> image those scientists released on Wednesday reminds us of something different (para. 2).

Counter to the melanoheliophobic narratives that often circle around discussions of black holes (for example, at the press conference where the image was introduced the black hole was described as "[t]he gates of hell, the end of space and time") O'Hagan highlights a more optimistic narrative, one wherein this scientific and technological feat is a testament to the ingenuity, curiosity and resourcefulness of the human species. For O'Hagan, the black hole image offers a "mirror for us all – the intelligent life forms huddled together on our tiny planet – to hold up and remember a better side of ourselves" (para. 3). What this mirror reflects, O'Hagan asserts, is an important reminder of what humans can achieve if we put our minds, and technology, to it. That is, if we can image a black hole, then we are more than capable of building systems that are adequate to providing a good life for human beings both now and into the future.

In O'Hagan's narration, then, the black hole image is not only celebrated for its techno-scientific implications, but also for the *optimistic narratives* of human progress and futurity it seemingly affirms. In this way, this unprecedented evidence of a black hole, a physical point in space-time that, many would argue, marks a threshold of human legibility, is not seen as a limit point but instead indexes humanity's capacity to continuously *overcome its own boundaries* so as to see itself anew. Through its optimistic narration, the black hole image is sucked into the gravity of those broader apocalypse habits circulating today and, as such, the end of the world signaled by this distant cosmic event is not an end at all, but a new site for human exploration, extraction and expression. The black hole image indexes the prospect of an ultimately *hopeful* future, that is, if humanity is able to take hold of technological apparatuses and scientific innovation so as to manage and redirect planetary futures. Through this optimistic narration, humanity is, once again, positioned as that which is ultimately redeemable, this time through scientific advancement, and thus the future is one that is characterized by light, not darkness.

With these cosmological affirmations in mind, the recent, and unprecedented, imaging of a black hole raises weird questions about scientific objectivity and cosmological orientations, questions that provide a strange site for grappling with today's unthinkable pedagogical problematics. By bringing the black hole and its imaging in contact with the challenge of

sustainability and its education, this chapter probes the given world of education in terms of the problem of *sustainable futures*. In what follows, I further set the (cosmic) scene for this speculative study in order to ask how pedagogy might be *resituated* given today's (apparent) end of the world horizons. Following this cosmic contextualization, I further probe the horizons of black hole physics and cosmic imaging in relation to the *affirmative relaunching of post-anthropocene futurity*. The weird encounters developed throughout the chapter are then extended and mutated in order to outline a series of *speculative counter-emanations* aimed at sustaining alien encounters, enduring becoming-imperceptible and upending salvation, all of which, I wager, work to *resituate sustainability and its education today*.

## 4.2 Education and the Problem of Sustainable Futures

### *4.2.1 Overcoming Unsustainability*

The bright future linked to the precious discovery of a black hole, one made possible by cosmological assumptions about humanity's ingenious capacities and technical prowess, is also projected by the Industry of Education today. Where standard forms of educational research and practice operate through economizing protocols and progressive paradigms, which in turn correlate educational transformation to the unquestioned aim of becoming-forever-human, they are invested in upholding and affirming a particular set of cosmological assumptions that in turn impact the way in which educational futurity is directed and delimited. Put another way, through its industry givens, which not only inform educational practice but also educational research, the Industry of Education is dedicated to *sustaining* the cosmological assumptions that bolster its given reasons and rationale so as to project a vision of education after education, one that is capable of *overcoming the pressing issues of unsustainability* gripping the planet today.

The affirmation of education's cosmological assumptions is exemplified within the Industry of Education's *sustainable* propositions and paradigms. In recognition of the pressing challenges raised by the "global mega-trends" (OECD, 2019b) altering education and its future-orientations in the 21st century, various educational proposals have been made to address today's crises of unsustainability. In response to the Anthropocene designation, for instance, education has been nominated as a key site to develop more sustainable approaches to ways of living amidst anthropogenic climate change and its related social, political and mental crises.

As Professor of Science and Sustainability Education Kai Niebert (2019) asserts, if the Anthropocene is to become an epoch of sustainability, we must be able to develop knowledge and strategies to transform societies towards more sustainable futures, which "requires groundbreaking changes in our mindsets, lifestyles, attitudes and the way we imagine industry and economy" (p. 1). Such changes, many argue, will be made possible through education.

Given the Anthropocene moment, education is often nominated as one of the most "powerful tools for transformation, in order to make the Anthropocene long-lasting, equitable, and worth living" (Leinfelder, 2013, p. 10). Here, the conceptual framework introduced by the Anthropocene provides a basis for relaunching education towards "envisioning a sustainable human presence on Earth in which humans would no longer be 'invaders' but rather participants in shaping the natural environment" (Leinfelder, 2013, p. 9). By positioning education as a site for envisioning more sustainable futures, the Anthropocene is not seen as a "'crisis to end all crises,' the catalyst needed to provoke real change" in educational domains (Gilbert, 2016, p. 188), but is instead positioned as an opportunity to reform, revolutionize and responsibilize education towards more sustainable practices. Where education is deemed an integral site to bring about groundbreaking changes that nevertheless sustain education's progressive paradigms, sustainability manifests within educational domains in two interrelated ways: first as education *for* sustainability and second as education *as* sustainability.

## Education *For* Sustainability

Within approaches to education *for* sustainability, sustainability is understood in relation to imperatives for developing the necessary skills, knowledge and attitudes that students need in order to take part in more sustainable futures. In this approach, sustainability is positioned as the desired outcome of learning and correlated to broader accounts of sustainability where the problem of unsustainability can and will be overcome through individual lifestyle changes, more effective environmental management strategies and technological interventions. Education *for* sustainability manifests through curriculum initiatives and instructional programs that position sustainability as content to be learned, something that can be transmitted within educational domains (i.e. schools) and taken up by educational subjects (i.e. students). Where sustainability is taught as content to be learned, the problem of sustainability is one founded in questions of

understanding and awareness. The assumption here is that teaching sustainability will help determine a positive and helpful future, but to do so "people require a much better *understanding* of (and a closer engagement with) sustainability issues" (my italics, Huckle & Sterling, 1997, p. 26). Education for sustainability often involves both an environmental and democratic approach to the problem of overcoming unsustainability. In terms of the environmental side of things, education is "the vehicle for actively promoting positive attitudes and patterns of behaviour" that can be correlated to broader sustainable goals (Bonnett, 2002, p. 10). And, in terms of the democratic side of things, educational domains are positioned as important sites for "encouraging ongoing pupil exploration and engagement with environmental issues in which the promptings of their own rationality are followed" (Bonnett, 2002, p. 10). Taken together, and as Foster (2001) notes, sustainability here is conceived "as a condition or establishable trend towards the operational realisation of which the whole process — education for sustainability — is susceptible of being directed" (p. 156). What this approach to sustainability draws attention to, then, is how education *for* sustainability affirms the Industry of Education's commitment to progressive thinkability and approaches to pedagogy founded in the communication of information and the accumulation of pre-formed ideas.

Education *As* Sustainability

Alongside and interwoven with education *for* sustainability is an orientation that presents education itself as a key technology for overcoming more general problems of unsustainability, or what I call here education *as* sustainability. Within this orientation to sustainability, education is itself positioned as an integral technology for managing, mitigating and ameliorating present ecological issues so as to lead to a prosperous future. A key example of this orientation can be seen in policy-oriented approaches to educational sustainability such as those that have been developed under the name of Education for Sustainable Development (ESD). Playing a key part in the United Nations' Decade of Education for Sustainable Development (DESD), an initiative that took place from 2005-2014, ESD aimed to shift both the content and purpose of education towards practices and approaches that foster the values of "sustainable development" ("UN Decade of Sustainability," n.d.). By marrying the notion of *sustainability* to that of *development*, the focus of this initiative was to create policies that could be enacted through incremental and

managerial approaches so as to "meet the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 8). The decade, which has now come and gone, was followed by the UN Global Action Program on Education for Sustainable Development, which continued in the line of positioning education as an integral sustainable technology. In both of these initiatives, several educational concepts, as well as thousands of projects to implement sustainability into educational programs, were developed to "transform society by reorienting education and helping people develop knowledge, skills, values and behaviours needed for sustainable development" (UN, 2016). With these examples in mind, ESD has proceeded through the assumption that "the rapidly transforming conditions of planetary life well established in climate science research might be reversed by revisioning schools and curricula as a fulcrum for the transformation of mental, social and planetary ecologies" (Wallin, 2020, p. 3). In this approach to sustainability, which is always-already tied to the promise of ongoing development, education is positioned as the territory for overcoming the unsustainable conditions that characterize life and living today while *at the same time* ameliorating and continuing progressive paradigms and continued economic growth (Ontong & Le Grange, 2018).

Education *as* sustainability is thus committed to ongoing *development*, that is, the development of a new, more sustainable, education, *and* progressive economic development, both of which are seen as complementary goals. But, as researcher of sustainability and biodiversity Helen Kopnina (2014) asserts, this promise of sustainable development presents particular ethical paradoxes and empirical dilemmas: "[d]iscourse on sustainable development singles out economic development, which might have created the current ecological problems in the first place, as part of the solution" (p. 78). In this way, the very concept of sustainable development is "contradictory, imprecisely defined, and socially and culturally contested" (Kopnina, 2014, p. 79). However, the contradictions of sustainable development, such as those that underscore education as sustainability, are not seen as problems, but as acceptable and even desirable "as transformative debates on sustainability are then made possible" (Jickling and Wals, 2008). That is, education as sustainability, or more accurately sustainable development, offers "something *everyone* can subscribe to, from enlightened captains of modern industry to subsistence farmers: the former concerned to create the conditions for sustained economic

growth, the latter concerned to survive into the future and perhaps better their material lot there" (Bonnett, 2002, p. 11). What education as sustainability highlights is the way in which particular concepts, such as sustainable development, are reduced to everyday opinions that adhere to models of representation that assume a present, thinkable world that can and should be re-presented through concepts aimed at communicating and garnering agreement. As exemplified through the far-reaching uptake of sustainable development, and taking into account its glaring contradictions, the problem raised is how this everyday concept reduces difference and complexity and homogenizes desire, which in turn produces a general "subject" that can be honed upon predetermined models and trajectories for becoming. Education as sustainability provides just one site for investigating this conceptual over-coding and the pedagogical becomings it enables, or not.

### *4.2.2 Sustaining Cosmological Orders*

Both education *for* sustainability and education *as* sustainability contribute to the broader promise of *overcoming unsustainability,* specifically through educational interventions. Sustainability here is not just a commitment to realizing more sustainable futures for life on the planet, but involves *sustaining the cosmological orders* that have come to define and determine the limits of education — its reasons, its practices and its futures. In this way, sustainability has become an everyday concept, one that makes it so that we *do not have to think.* Put differently, sustainability has become a *cosmological order word,* that is, following Deleuze and Guattari, sustainability has become a representational device for ordering understandings of the role and place of humanity within the cosmos. For Deleuze and Guattari (1987), order words are not simple commands, but are instead those commonsense terms and everyday opinions that compel obedience and "tell people what to think" (Conley, 2005, p. 193). As Adrian Parr (2009) develops in her book *Highjacking Sustainability*, where sustainability has become a buzzword, an empty signifier that is nevertheless evocative of a "good thing," it has become "a political attitude of the multitude" (p. 4) that works to mask economic business-as-usual by subordinating everything under the imperative of a worldwide market and, as she explores, the power of police and military machines.

Operating as a cosmological order word, the otherwise problematizing force of the concept of sustainability, that is, the potential pedagogy of this concept, is reterritorialized by particular cosmological assumptions, which in turn affirm specific interpretations of educational realities. As thinker of environmental education Noel Gough (2014) develops, the very notion of something like environmental education, a domain that is especially invested in education for and as sustainability, "owes its very existence to a particular interpretation of reality" (p. 18). Gough, who is also critical of dominant approaches to education for/as sustainability, examines critically the ways in which perceptions of environmental problems and issues are themselves "conditioned by our position in space and time," resulting in "selected fictions" on which interpretations of reality are based (p. 18). As Gough (2014) asserts, it is these selected fictions that constitute the "unsustainable fictions" on which environmental education is founded. Drawing on Gough, as well as broader critiques of sustainability, I am interested in focusing on how sustainability, as a "selected fiction," *sustains* particular cosmological orders, which in turn contributes to the unthinkable pedagogical problematics of this study. Specifically, I assert that the narratives through which sustainable futurity takes hold — manifest through both education *for* sustainability and education *as* sustainability — are necessary for maintaining and reproducing the economizing logic, progressive paradigms and all-too-human investments that undergird education's industry standards today.

## Economizing Sustainability

First, sustainability for/as education is subtended by an *economizing logic*, which in turn requires narratives of "detached instrumentalism" (Gough, 2014, p. 21) so as to affirm its central tenets. Evidenced by sustainability's unquestioned tethering to notions of development, the narrative construction here depicts the earth as an object of instrumental value that can be managed, measured and manipulated through responsible accounting protocols. This is exemplified through curriculum founded on systems theory, which "segment[s] the face of nature" and objectifies environmental qualities by giving them names (e.g., "solar energy", "biogeochemical cycles," "erosion"), measuring them where possible, and classifying them as "inputs," "processes" or "outputs" (Gough, 2014, p. 22). As Gough (2014) highlights, this theory encourages us to think of environments as systems of "artificially isolated objects" and thus the

problem raised by systems theory approaches to curriculum "is that we no longer seem to be aware of the artifice: we talk and write as though names, categories and numbers represent and signify the world 'as it is'" (p. 22).

Within this narrative construction, which has come to define interpretations of educational reality, sustainable capacities can and should be known and communicated through "key indicators" (Foster, 2001). This is expressed, for example, through language about the total carrying capacities of the planet's natural systems (i.e. Earth overshoot days) but also through more specialized economistic versions (i.e. carbon budgets) that "employ the concept of critical natural capital, which is also crucial to rights-based notions of intergenerational equity" (Foster, 2001, p. 157). These economic expressions assume "consensus around the notion of there being some overall level of something which we can establish, changes in which we can at least hope to measure, and which we can then endeavour to keep constant through specific human actions and refrainings" (Foster, 2001, p. 157). Sustainability for/as education takes up similar economic expressions and narrative constructions of detached instrumentalism by positioning sustainability as a management issue. Positioned as such, the problem of overcoming unsustainability can be solved by gathering enough information, or data, about planetary carrying capacities and critical nature capital so as to model and project appropriate mitigations. The cosmological assumptions at work here, then, are that with enough information about the planet, we humans will be able to calculate the best way forward. But, as Foster (2001) notes, "[w]hat we are constantly liable to forget in the press of our techno-managerial preoccupations is that indicators do not read themselves nor do they simply *register* whether particular forms of development are 'sustainable' or not" (p. 157). Instead, decisions about sustainability, including educational ones, involve the construction of narratives and processes of cosmological ordering, through economics, for example, which in turn bring forth specific interpretations of sustainable realities.

## Progressive Sustainability

In addition to upholding the Industry of Education's economizing logic, sustainability for/as education commits to a *progressive paradigm* wherein sustainability is narrated as that which can and should be brought about through educational practices oriented to towards a "better" future that depends on "the intelligence and goodwill with which humanity comes to

terms what the harsh new reality it is creating" (Curren & Metzger, 2019, p. 1). As Curren and Metzger (2019) write, "sustainability requires a long-term systemic, and collective perspective and standard of judgement that is only possible through a profound reorientation of education" (p. 3). For these thinkers, there are four key ideas that inform this "profound reorientation" to educational sustainability: first, education should involve the cultivation of "good practical judgment" in order to "equip students to live well" (p. 3); second, sustainability demands an "integrated, multi-disciplinary, systems-focused approach" (p. 3); third, sustainability must be informed by an ethics of "mutual respect and taking care to avoid harming others" (p. 3); and fourth, all of these elements should come together in "collaborative, civic, project and problem-focused learning" (p. 3). Within this approach to sustainability, it is assumed that broader civilizational progress can be brought about through the development of *responsible individuals* who can make good judgements informed by (the detached instrumentalism enabled by) systems thinking and predetermined principles of sustainability ethics, all of which can and should orient learning towards progressive societal development.

Within this progressive view, education is positioned as a leading institution for changing how we live by, for instance, developing individuals who will adapt to models of progressive transformation such as "green" citizenship (Curren & Metzger, 2019). Such approaches to citizenship see the task of education as producing responsible individuals who will cultivate good practical judgment based in intellectual, ethical and civic virtues oriented towards more sustainable beliefs and action in the world. As such this narrative of education for/as sustainability follows in the "discourse of responsibility" (Purdy, 2015) that characterizes broader Anthropocene narratives that assert that today's geopolitical and environmental threats must be met with "a blend of urgent language and concepts (or pseudo-concepts): responsibility, the fate of man" (para. 13). This sense of responsibility is often placed onto future generations, onto young students, for instance, who are positioned as both inheritors and saviours of an increasingly uninhabitable planet (Lakind & Adsit-Morris, 2018). Underlining this discourse of responsibility, which seeps across time, into the future, is the assumption of individual agents who can transform themselves and the world towards progressive betterment. As Niebert (2019) asserts, "[m]any – often politically driven – documents on education for sustainability argue that a transition towards a sustainable future needs a change at the level of the individuals 'attitudes

and perceptions to enable behaviour that is in line with sustainable development" (p. 1). This orientation to transforming individuals who nevertheless transform the world is exemplified in the OECD's (2019b) report on "Trends Shaping Education" and its projection of a future education capable of "open[ing] doors to individual and collective opportunities, [that have] the potential to reshape the future of our global world" (p. 13). With these examples in mind, the cosmological orders that are affirmed through education for/as sustainability sustain the promise of societal betterment and collective progress, which is nevertheless tied to shifts in the actions and beliefs of individuals.

Becoming-Forever-Sustainable

Taking off from the economizing logic and progressive imperatives that condition the cosmological ordering of sustainability for/as education, is the now commonplace narrative of planetary stewardship, which repeats in the Industry of Education's image of *becoming-forever-human*. As Africa Taylor (2016) notes, sustainability is often tied to metaphors of stewardship, which "inadvertently rehearse the entrenched sense of human exceptionalism" that continues to affirm the mistaken belief that "we" (in the developed world) can "'improve' upon nature and exploit the earth's resources with impunity" (p. 1453). Approaches to sustainability that synch with this narrative of human superiority and exceptionalism operate from the premise that humans have the (exceptional) capacity to not only damage their environment, but to also manage, protect, and save a distinctly exterior (i.e. non-social, non-cultural) environment. As Taylor (2016) outlines, "influenced by twentieth century wilderness protection discourses, humanist notions of environmental stewardship reinforce an understanding that pure nature exists 'out there' far beyond human settlement," that there is "a 'natural order' to the division between urban cultures and wild natural places that must be maintained" (p. 1453). Calls for better environmental stewardship have been among the common responses to the Anthropocene, "whether this be via more effective environmental management strategies, the implementation of new forms of environmental damage mitigation, new technological interventions to save nature, or redoubled effort to cordon off and protect nature" (Taylor, p. 1453). Paramount to this narrative of stewardship is the continuous division between so-called nature and culture, as well as the affirmation of a responsible, self-regulating and autonomous subject capable of mitigating

planetary damage through (further) anthropocentric interventions. More than repeating in discourses of responsibility, sustainability founded in stewardship narratives affirms the positive and perpetual projection of a redeemed and redeeming human. The cosmological assumption sustained here, then, is one that centres human life as an incontestable force capable of controlling and directing planetary realities so as to bring about more sustainable futures.

Unsustainable Orders

Taken together, sustainability is a cosmological order word that not only conditions relations between human and non-human bodies, or relations between humans and economic activity, but, importantly for this study, conditions and constrains the pedagogical force of conceptual creation. As Gough (2014) writes:

> [m]odern Western science has provided many solutions to technical problems of human survival - we have abundant technical knowledge ('know-how') of the ways in which we can sustain a functional and adaptive relationship with the earth. But the stories which tell us how to survive rarely address questions of *why we should survive* - they seem to lack the conceptual systems and signifiers from which we might be able to construct meanings, purposes and values for survival (my italics, p. 22).

In the example of education for/as sustainability, the technical problem of human survival is raised once again, bringing with it a range of stories that do not question the deeper cosmological questions that might be raised by an increasingly unsustainable planetary situation. And so, while narratives of detached instrumentalization, stories of civilizational progress made possible through intelligence and goodwill and tales of planetary stewardship work to sustain the Industry of Education's given cosmological orders, such narratives are themselves becoming increasingly unsustainable. The reliability of economizing logic, calculated balance sheets, and systems thinking, for instance, is now frustrated by a wide range of weird ecological, social and political events that elude even the most careful modelizations and nuanced economic projections. Meanwhile, large-scale studies consistently find that "neither students' attitudes nor their behaviour and associated values are significantly affected by school programs for sustainability" (Niebert, 2019, p. 1), raising questions about the role education actually plays in catalyzing both individual and collective transformation. Further, where today's anthropo-scenic times not only

signal an indexical relation of the planet to all-too-human regimes of control and manipulation, but also, somewhat paradoxically, the unfathomable autonomy and wayward causalities of the planet itself, the vision of responsible human agency that underscores narratives of planetary stewardship are highly dubitable. With these material and conceptual upheavals in mind, the very concept of sustainability offers an important site of struggle when it comes to investigating pedagogy at the end of the world.

### *4.2.3 Sustainable Struggles*

The increasingly unsustainable narratives that reinforce education for/as sustainability have led to several critiques of and interventions into the concept of sustainability within educational theory and practice. With the Decade of Education for Sustainable Development now well over, numerous educational scholars have asserted that despite its well-intended curriculum proposals and policy-driven interventions, education's purportedly sustainable agenda has failed to significantly address the environmental crises that are now growing in number and intensity around the globe (Gadotti, 2008; Kopnina, 2014; Ontong & Le Grange, 2018; Wallin, forthcoming). As Gadotti (2008) asserts, "education, as we see it today, is more a part of sustainable development's (SD) problem than a part of its solution because it reinforces the principles and values of an unsustainable lifestyle and economy" (p. 22). Gadotti (2008) proposes that without social mobilization against current economic models, education for sustainable development (ESD) will not reach its goals. Niebert (2019) raises similar concerns, asserting that:

> people with a high level of environmental awareness do not necessarily have a good personal ecological balance sheet. People from poorer backgrounds, on the other hand, who have under-average positive attitudes towards nature, pollute the environment the least. Both environmental impact and pro-environmental attitudes increase steadily with rising income (p. 2).

With Gadotti's and Niebert's assertions front and centre, the promise of education for/as sustainability must not only confront the realization that the inculcation of pro-environmental attitudes are counterbalanced by effects of income disparity, but must face the fact that shifts in

attitudes and consciousness are not necessarily what make a difference when it comes to the actualization of sustainability.

Such realizations bring forth the question of what, then, should be the aim of education oriented toward sustainable futures? For Gadotti (2008), "[i]t is not enough to introduce the theme of sustainability without rethinking other school subjects under a different logic, a communicative and emancipatory one" (p. 22). Gadotti's intervention in education for/as sustainability is thus one that suggests that education must invest in the transformation of economies from ones based on the free market and profit to ones that circulate wealth with a logic of cooperation, what he calls "solidarity economies" (p. 23). Niebert (2019), on the other hand, proposes that education for/as sustainability should not be centred on bringing about individual change, but economic and political change: "[i]t is not the individual abandonment of CFC-containing deodorants, not the individual change of your electricity provider from nuclear to green energy and not our individual decision to buy an electric car instead of a fossil car, that drives the world into a green state. It is hard political and economic decisions that make a difference" (p. 3). In both Gadotti's and Niebert's critical approach to sustainability, then, sustainability is repositioned as an important political task for education today.

This orientation towards sustainable politics and policy-driven transformation, however, is also one of the central tenets that drive critical approaches to education and the problem of sustainable futures. Educational theorists Krystle Ontong and Lesley Le Grange (2018), for instance, discuss how education for sustainable development (ESD) has largely failed due to its policy-focused orientation, which relies on specific semantic, ethical and epistemological claims that predetermine what, exactly, is being sustained within ESD's imperatives. Policy-driven approaches to sustainability, such as those proposed by ESD, are *semantic* in that it is possible for a society to simply interpret the term in ways that are congenial to it, *ethical* in that sustainability involves varying assumptions about the rights and duties of humankind to the rest of nature, and they are *epistemological* based on how they affirm and/or obscure ways of thinking about the high degrees of complexity that characterize natural and social systems amidst increasingly unsustainable planetary transformations (Bonnett, 2002; Ontong & Le Grange, 2018). With this in mind, thinkers like Ontong and Le Grange (2018) suggest that sustainability should not be approached as a problem for policy at all, but instead approached as "a frame of

mind," one that fosters an idea wherein "our underlying relationship with nature defines both ourselves, as well as our relationship with the world as a whole" (p. 3).

Through their critical reorientation, Ontong and Le Grange (2008) highlight how ESD's policies not only work to "marry two highly desired yet contested goals, that of development and conservation," but do so through the reinforcement of an anthropocentric stance wherein nature is only valuable, and thus worth sustaining, if and when it serves human ends (p. 2). Researcher of sustainability and environmental education, Helen Kopnina (2014), also outlines the limits of ESD's anthropocentric agenda, asserting that while many scholars have decried a lack of emphasis on the social and economic aspects of sustainability, it is actually the environment that has become dismissed and downplayed in mainstream sustainability discourses. While, as she notes, ESD has purposefully moved towards the inclusion of more social and economic aspects of sustainability, it has done so at the expense, so to speak, of the pressing environmental realities that characterize today's unsustainable trajectories. Through this shift, one that places "People, Profit and Planet" in an equivalent relation, Kopnina argues that ESD may, in fact, be counter-productive to developing a truly sustainable education, that is, one that is prepared to address the anthropogenic causes of today's most disastrous environmental problems.

Kopnina (2014) argues that educational research committed to sustainability must therefore readdress the logical and empirical dilemmas that are raised by the "contradictory, imprecisely defined, and socially and culturally contested," not to mention oxymoronic, term "sustainable development" (p. 79). This is not unlike educational philosopher Jason Wallin's (2020) critical intervention into sustainability, where he asserts that while ESD may now be challenged in terms of its definitions and praxis, it nevertheless remains beholden to specific conceptual commitments "by which the image of a sustainable future is constrained" (p. 3). Where education and its sustainable projections presume that our present ecocatastrophic trajectories can be averted through increased and/or ameliorated "educational productivity" (Wallin, 2020, p. 3), the cosmological assumptions that subtend the Industry of Education's givenness of progressive amelioration are tethered to the promise of becoming-forever-human and thus a good future for "us".

In each of the critical approaches to education for/as sustainability outlined here, what is called for is *a reorientation of the concept of sustainability*, which entails asking what, exactly, is

being sustained when we talk about sustainability within educational domains? Do we mean something broadly definable in terms of human activities impacting on the [so-called] carrying capacities of the Earth's natural systems, in which case, as Foster (2001) develops, "a well-functioning higher education is actually a precondition for this concept's having any practical coherence or purchase[?]" (p. 156). Or, do we begin to interrogate and redeploy the concept towards something more experiential, speculative and transversal, where the very concept of sustainability becomes an important site of pedagogical resistance? It is through this latter question that I orient this investigation of sustainability as it relates to pedagogy at the end of the world. As such, I position sustainability (and its education) as a site where we might pose the unthinkable pedagogical question of how to *resituate* education, and thus its futures, in relation to today's increasingly unsustainable situation.

### *4.2.3 Enabling Pedagogical Resituation*

As thinker of multi-species muddles and chthonic relations Donna Haraway (1988) proposes in her now canonical feminist text "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," "feminists have to insist on a better account of the world" (p. 579). Within her exploration of situated knowledges, Haraway situates this call for a "better account" of reality in relation to the question of *objectivity*. As she outlines, while it may be the case the "Science" has been "used and abused" to further colonize bodies and knowledge, this does not mean that scientific objectivity should be simply thrown out. Instead, we need to ask what we are talking about when we talk about objectivity. Taking off from these questions of objectivity, Haraway develops a "feminist objectivity" one that is always "about limited location and situated knowledge, not about transcendence and splitting of subject and object [and as such] allows us to become answerable for what we learn how to see" (p. 583). Where, as she writes, there is no such thing as an unmediated perspective, but instead only "highly specific visual possibilities, each with a wonderfully detailed, active, partial way of organizing worlds" (p. 584), objectivity, and specifically a feminist objectivity, involves the embodied practice of understanding "how visual systems work, technically, socially, and psychically" (p. 583). This is what Haraway means when she asserts that that feminists must create "successor science projects" that offer a "better account" of the world "in order to live in it

well and in critical, reflexive relation to our own as well as others' practices of domination and the unequal parts of privilege and oppression that make up all positions" (p. 579). As such, successor science projects involve approaching objectivity in terms of its limited locations, partial perspectives and situated knowledges.

Referencing Haraway's calls to situate knowledge, and specifically her call for the creation of "better accounts of reality," artist, designer and writer Patricia Reed (2018) asserts that given the complex planetary situation characteristic of life today, any call for situating knowledge must not only interrogate (cl)aims of objectivity, but must involve a necessarily *hypothetical* dimension. As Reed (2018) offers in a talk titled "Horizonless Futures," "if knowledge is to forge pathways beyond the stagnation of what is, beyond the tyranny of existing perspectives towards what could be otherwise" (32:77) it must be *resituated* in terms of its speculative potentials. Reed draws from, but also speculates beyond, Haraway's understanding of situated knowledges in order to offer a series of extrapolations that support the assertion that any proposal for a "better account of reality" has to include a hypothetical dimension. Through these extrapolations, Reed (2018) asserts that the situatedness of all thought always contains the possibility of overflowing its situation and thus "situated knowledge is not just an analysis of how knowledge is built, through which institutional mechanisms it becomes legitimized, nor merely what we newly know from it" (32:28). Situated knowledge also involves "emphasis on constructions of narrations stemming out of it" (32:40) and thus emphasis and attention must be put on how we learn to *exist in* situated knowledge.

Reed points to the current situatedness of anthropogenic climate change to make this point, asserting that *knowing about* something like ecological degradation is very different than *existing in* that knowledge. As Reed (2019d) insists, we should always be wary of assuming that accumulating more information and scientific consensus about something like climate change is enough to spur epistemic experimentation and cosmological shifts on its own. As she (2019d) outlines:

> [w]hile necessary as a point of departure, sheer informational transmission of this scientific evidence, without a broader, meaningful narration of how such facts intersect with the philosophical, social, and political, leaves us flailing in a cognitively dissonant

> space of simply *knowing that*, without *existing in* the ramifications of that knowing (my italics, p. 30).

For Reed, there is an important distinction to be made between merely acquiring new knowledge about the world and existing in that knowledge, which, she notes "entails working out *how* one navigates the world anew with this knowledge, as well as its instrumentalization" (Reed, 2019d, p. 28). Important within Reed's extension of Haraway's concept of situated knowledge, then, is the assertion that "positioning" oneself, and thus one's thinking, does not just mean correlating knowledge to one's immediate experience and/or location: "[s]ituatedness does not denote a fixity of place, materially or cognitively" (Reed, 2019a, p. 8). Far from being a process of fixing things in place, situatedness is instead "an ongoing continuum of positioning and interaction, where the excessive possibility of a given site is rendered intelligible via interaction, creating an affordance for repositioning in excess of a given site" (Reed, 2019a, p. 9).

Throughout her artistic and philosophical practice, Reed herself consistently works towards such processes of situated study by posing questions from the perspective of a *resituated human*, that is, one that finds itself amidst complex planetary conditions characterized by profound interconnectivity, anthropogenic climate change and transformed relations between humans and technology. Undergirding Reed's practice is a concerted focus on (re)situating questions of and for the future within the scope of cosmological transformation today so as to ask what direction and provisional diagrams ought to be conceived and practiced so as to orient and shape future trajectories. As she discusses, the current planetary situation brings with it "questions of a cosmological magnitude where our existing conceptual structures that serve as the driving force behind our organizational geopolitics are dramatically, even violently, out of synch with the complexity of our reality" (SFU's Vancity Office of Community Engagement, 2018, 6:31). Reed points to the more conservative side of this conceptual out-of-synchness, for example, those that tell us that the systems that delivered us into catastrophe will be the same ones to save us from our own demise, as well as examples from the other, more "progressive," side, which usually tell us that we have "lost our humanity," a posture that not only glosses over many of the atrocities enacted by "humanity" throughout history, but assumes that there is some essential humanity yet to be found.

In both cases, Reed underscores how political responses to today's unthinkable situation are driven by "anachronistic ideas for a 'making great again' that never was" (SFU's Vancity Office of Community Engagement, 2018, 5:51). This is also the case for the Industry of Education's sustainable proposals, which project a future where humanity is able to overcome its current unsustainable trajectories by directing transformation, including educational transformation, towards sustainable practices that presume an education after education, or an education that can be "made great again." Imperatives for sustainability not only contribute to the Industry of Education's given parameters and uphold its industry standards, but constrain and orient potentials for thinking about how to move towards some sort of desired otherworld. Important to note here, however, is how something like sustainability, and the futures it assumes, is not forever tied to one determinate future. As Reed herself is careful to articulate, while it may seem that conceptual categories and their epistemic givens have led to a cancelled future, this apocalyptic mode of thinking "inadvertently strengthens the perception that our condition is immutable, treating it as if it's not subject to change and as if our destiny in bound to what currently is" (SFU's Vancity Office of Community Engagement, 2018, 7:19). Highlighting the inherent "plasticity of our condition," Reed asserts that proclamations and diagnoses about the end of the future, and thus the end of the world, will not get us anywhere. As such, Reed provides an important reminder that while it may sometimes feel like current navigation systems are set in stone, things "could be and frankly ought to be otherwise" (SFU's Vancity Office of Community Engagement, 2018).

In this way, Reed echoes O'Hagan's claim that while things look pretty grim here on planet Earth, humanity can and should direct things otherwise. However, whereas O'Hagan appeals to the cosmological givenness of an ingenious humanity and its ultimately hopeful future, Reed instead asserts that what is required today is a speculative reorientation, one that is able to "denaturalize the givenness of a certain worldpicture, our position, and the understanding of our agencies within it" (Reed, 2019d, p. 28). Resituating something like education for/as sustainability in relation to today's end times is, in this way, not just about *knowing more* or even *knowing differently*, but instead, the "cosmological stakes lie in making claims on the construction of social, political, and ethical narrations to ramify the meanings we ought to extrapolate from them, influencing a cosmological milieu we need for their just deployment"

(Reed, 2019d, p. 29). It is through the transformative activity of thinking itself, of creating concepts and producing alien encounters with the problematizing force of pedagogy, that we might be resituated. As Reed puts it, through the mutual formation between thought and its (apparent) object, "the situatedness of all thought (located within a particular cosmological milieu) always contains the possibility of overflowing its situation" (Reed, 2019d, p. 30). It is through this spillage that alien milieus and yet unthought pedagogical becomings might open up.

In what follows, I endeavour towards the creation of such unthought pedagogical trajectories by bringing the black hole image produced by EHT in contact with the question of pedagogical resituation, and specifically, with some of the conceptual categories and narrative contingencies that have come to characterize the (Good) Anthropocene and its visions for education for/as sustainability. Drawing on Reed's speculative proposals for enabling resituation, this study experiments with what it might mean for educational thought to *exist in* an encounter with a black hole. This is a weird encounter, one that involves the "folding, unfolding, [and] refolding" (Deleuze, 1988, p. 137) of conceptual outsides-in so as to "free the art of seeing from its subordination to prior concept or discourse" (Rajchman, 2001, p. 129). In this way, my approach is a response to Haraway's call to develop "successor science projects" aimed at pedagogical resituation. Within such a project, science takes on a provocative function, one that involves "extending the original plane by giving it new curves, until a doubt arises" (Deleuze & Guattari, 1994, p. 57), a doubt that undoes the old plane "blow by blow" (Deleuze & Guattari, 1994, p. 76) and carries us "across our thresholds, toward a destination which is unknown, not foreseeable, not preexistent" (Deleuze & Parnet, 1987, p. 125). Positioned as a successor science project, this weird study not only involves grappling with the difficult task of interrogating cosmological presumptions and their pedagogical ramifications, but importantly, involves experiments with putting educational thought in contact with what it is currently unable to think — in contact with the (apparent) horizons of thinking itself — so as to put pressure on the conceptual categories that delimit thinking in the first place.

## 4.3 Cosmic Imaging and the Affirmative Relaunching of Post-Anthropocene Futurity

### *4.3.1 Black Hole Elucidation*

A black hole is typically described as what remains after a star is unable to resist gravity and collapses inwards. This process, sometimes called the "death" of a star, is more accurately the result of what happens when high-mass stars use up their fuel at a pace that creates a supernova explosion, resulting in an altered gravitational state. As a more common naming of what had been previously called Totally Gravitationally Collapsed Objects, the name "black hole" references both light and gravity: black holes are considered "black" because they are a place in space where gravity pulls so much that light cannot get out, and they are considered "holes" because the dense inner region of a black hole, known as its singularity, permanently warps space-time thus creating a "hole" in the fabric of the universe. As such, a black hole does not have a surface, but is instead defined by a special boundary called an event horizon. The pedagogical example often used to simulate this strange cosmic boundary is the one where an astronaut shines a flashlight on either side of the black hole's event horizon. If the flashlight is outside of the event horizon, then the light rays are able to escape the pull of gravity and thus can be seen from a distance. If the flashlight is at or inside of the event horizon, however, the light cannot escape the gravitational pull produced by the collapsed star and thus any light emitted is trapped inside of the black hole. Put briefly, it is this threshold between (human) visibility and invisibility that seems to define the event horizon of a black hole.

This common pedagogical example, however, it is not wholly accurate. It is not exactly the case that light gets "trapped" upon encountering a black hole, but rather that it is *unobservable* from the vantage of the astronaut at the centre of this pedagogical narration. This pedagogical example demonstrates the difficulty of grappling with the weird and weirding logic of black holes. Indeed, in my own studies of black holes, which included an online, open-access astrophysics 101 course[18], I not only learned about the exciting, albeit strange, physics of these mysterious astrological events, but also experienced first-hand how black holes pose challenges to pedagogical representation. As the instructor highlights at the very onset of the course, with reference to representations of black holes within popular cinematic representations, the first step for encountering these astrological events is to dispel the key myths and narrative contingencies that make it hard to grasp black hole physics. Referencing Disney's 1979 space-opera, *The Black*

[18] As part of my weird study of black holes I took a MOOC offered by the University of Alberta titled *Astro 101: Black Holes*, which uses the theme of black holes to introduce the basic ideas of astronomy, relativity, and quantum physics.

*Hole,* as well as Christopher Nolan's 2000 apocalyptic drama *Interstellar*, the course instructor tells us that while these cinematic depictions may have popularized the idea of a black hole, they have also contributed to a range of misunderstandings about the nature of light, space and gravity that must be *unlearned*. As articulated from the very start of the course, then, in order to really wrap one's head around black holes and the warped logic underlying their theorization, a very different set of concepts to understand both space and time must be developed.

As the course continues, the representational and pedagogical challenges of black holes and their scientific legibility are pointed out regularly. In the module titled "Getting on the same wavelength," for instance, the basic physics of light, or electromagnetic radiation, is introduced through the analogy of sound, which is presented as a more intelligible way to think through operations of light. Here, sound, and specifically the physics of soundwaves, is used as a more comprehensible, more intuitive way to teach about the nature of light — its wavelengths, its frequencies and its propagation of speed — thus pointing to a limit case for pedagogical elucidation, one that is addressed through analogy. In the module titled "The life and death of a star," the black hole's representational challenges are underscored once again when the instructor openly "confesses a lie of omission" that the module has been spinning all along. Here, the instructor admits that the way in which star formation has been taught so far, that is, as a single cloud that exists in isolation, is not actually *realistic* due to the way in which molecular clouds fragment as they contract into smaller cloud cores forming one or more stars in the process. Through this admission, we not only learn about the complexity of molecular cloud formation, but also how pedagogical examples of something like black hole physics themselves require particular narrative exclusions and omissions so as to make this physical phenomenon thinkable within the context of, for instance, an online course. In the module titled "The structure of spacetime," the representational dilemmas of black hole physics are exemplified once again by the strange metaphors and analogies used to explain the special relativity and equivalence principles of spacetime theory. In order to explain the weird ways in which black holes mutate spacetime, this module employs examples ranging from fishing off of a cliff to that of holey

Swiss cheese.[19] In each of these examples, black holes, in their very nature, are not only presented as that which bends space and time beyond commonsense frameworks of understanding, but also as that which challenges familiar approaches to pedagogical illumination.

*4.3.2 Apparent Horizons*

In addition to thwarting educational elucidation, these pedagogical, or perhaps non-pedagogical, examples shine light on one of the most interesting, if vexing, epistemological debates surrounding black holes more generally. The above pedagogical examples demonstrate how black holes exist, by definition, beyond the representational schema of humans and thus how the very definition of black holes is subtended by a series of *speculative gambits and hypotheses*. Physicists, for example, remain largely undecided as to whether the prediction of black holes and their singularities, supported as they are by fundamental theories about the "laws" of physics and the structure of the universe, actually exist (or existed at some point), or if it is the case that current knowledge and theories of the cosmos are simply insufficient to describe what happens at such extremely dense points in spacetime (Curiel, 2019).

Within this speculative orientation, the very concept of the event horizon — that special boundary beyond which events cannot affect a human observer — is still up for debate, catalyzing difficult questions about, for instance, the nature of photon spheres, black hole thermodynamics, Hawking radiation and information-loss paradoxes. Theoretical physicist and cosmologist, Stephen Hawking (2014), suggested for instance that the very idea of an event horizon should be replaced with what he called "apparent horizons," an assertion founded on the claim that quantum effects around a black hole cause space-time to fluctuate too wildly for a sharp boundary surface to exist. In contrast to an event horizon, which refers almost exclusively to the possibility of an *absolute* horizon, that is, one defined teleologically in terms of an asymptotically flat spacetime, an apparent horizon is instead dependent on the "slicing"[20] of

[19] In a module titled "Fishing in Spacetime" the weird structure of spacetime is introduced using the hypothetical example of how sound would be experienced by a fish swimming up a stream that runs over a cliff. This module also employs the analogy of Swiss cheese to explain "Swiss cheese models of cosmology" wherein spacetimes are conceived as locally inhomogenous but nevertheless appear globally isotropic in order to satisfy, for instance, the Einstein equation of special relativity.

[20] The notion of "slicing" here refers to the domain of numerical relativity, one of the branches of general relativity that uses numerical methods, algorithms and supercomputers to solve and analyze problems related to black holes, gravitational waves, neutron stars and other phenomena governed by Einstein's theory of general relativity.

spacetime. Put another way, unlike an event horizon, which relies on an *absolute horizon* — one that is very geometrical and requires the full history (all the way into the future) of spacetime in order to be known — the very location and even existence of an apparent horizon instead depends on the way that spacetime is itself *divided into space and time*. Put yet another way, which is often necessary when grappling with astrophysical concepts (at least for me), apparent horizons are not invariant and immutable properties of spacetime that can be known in advance, but are instead local and observer-dependent — the boundary at *this* instant — whereas an event horizon is the boundary of a black hole for light in the future, where the future is defined teleologically by the laws of physics.

What is important to note here is not how this distinction between event and apparent horizons works to *deny* the existence of black holes and their singularities, but rather, how the definitions and narrative contingencies of scientific phenomena are interpolated within a set of broader cosmological presumptions. As Reed (2019d) advocates, "despite the import of scientific development as a catalyst for novel understandings of the world, it's not until these developments become interpolated into a cosmological order that they begin to influence general purposefulness within it" (p. 28). Here, Reed draws attention to how scientific discovery and the techno-scientific knowledge that emanates from such "discoveries" requires narrative contextualization in order to operationalize new knowledge, both socially and politically. In the case of a black hole and its unprecedented imaging, then, Reed might say that the importance of this discovery lies not only in what it can tell us about ourselves and our place in the universe, but also in how such narrations are purposefully extended into particular domains so as to affirm (or negate) cosmological presumptions. This is not to say that there are no particular facts or regularities within the material world, that everything can be reduced to social constructions and cultural tropes, but rather, that the apparent "laws" and definitions that chase these regularities are always contingent. Once again, in Haraway's words "[t]here is no unmediated photograph or passive camera obscura in scientific accounts of bodies and machines" and thus what scientific objectivity provides is highly specific, albeit always partial, visual possibilities and ways of organizing worlds (p. 584).

In the case of black holes, for example, the very definition of a black hole varies radically, often in conflicting ways, based on the disciplinary background and cosmological

milieus from which such definitions emerge (Curiel, 2019, p. 27). As professor of mathematical philosophy, Erik Curiel (2019) suggests, this uncertainty around black hole definitions is not so much about the lack of a single, canonical answer but rather that "there are too many good possible answers to the question, not all consistent with each other" (p. 27). For Curiel, then, the multitude of black hole definitions is an important virtue of research related to black holes, not something to be resolved or unified. What matters instead is how such definitions are purposefully interpolated into scientific practice across domains and for different theoretical, observational and foundational contexts (Curiel, 2019, p. 33-34). Transposed to the speculative site of this study, the apparent horizons of black holes and their possible interpolations bring forth the crucial realization that "emergent cosmological meanings do not constitute the totality of all possible logical meanings attached to a particular development or discovery" (Reed, 2019d, p. 29). As such, there is always potential for the generation of *alternative* speculations and narrative emanations. Returning to the example of the black hole image created by EHT and its computational apparatuses, the following sections experiment with this assertion by tracking the narrative contingencies circling the "precious" 2019 image as well as the counter-narratives that emerge when this scientific discovery is interpolated through its inhuman operations and dark(er) cosmic dimensions.

### *4.3.3 Good Anthropocene Vibes*

#### A Message to Humanity

Upon its release, the black hole image produced by the Event Horizon Telescope team was quickly placed into the lineage of those other iconic environmental photographs — for example, *Earthrise* (1968), *The Blue Marble* (1972), *The Pale Blue Dot* (1990) — that have "both captured the public imagination and offered scientists insight into how the universe works" (Reuell, 2019). As EHT science council member Dan Marrone noted at the time of the image's release, "photos can change the way we think about ourselves and our place in the universe." To support this claim, Marrone likened the black hole image to *Earthrise*, a photo taken by Apollo 8 astronaut Bill Anders in December of 1968 (cited in Wall, 2019). *Earthrise* is often cited as both an inspirational and aspirational image, widely credited for helping to spur the contemporary environmental movement and for influencing scientific and ecological theories, such as Lovelock

and Margulis' Gaia Hypothesis.[21] Captured during the first manned mission to the moon, *Earthrise* shows a small and delicate Earth rising over a rugged grey lunar surface, "a magnificent spot of colour in the vast blackness of space" (Anders, 2018). Upon encountering the wondrous view during lunar orbit, part of which was broadcasted live into homes across America on Dec. 24, 1968, Apollo 8's mission astronauts expressed feelings of humility, gratitude and admiration as they described the unprecedented sight. As Command Module Pilot Jim Lovell put it, for instance, "the vast loneliness is awe-inspiring and it makes you realize just what you have back there on Earth" (cited in Williams, n.d.).

*Figure 2: Earthrise*, NASA (1968).

[21] The Gaia Hypothesis proposes that the Earth and its organisms form a synergistic complex system that self-regulates so as to maintain and propagate the conditions for life. By providing a view of this complex system as a whole from the vantage of space, *Earthrise* has been attributed to influencing this hypothesis.

As adventure photographer Galen Rowell has asserted, *Earthrise* is often considered "the most influential environmental photograph ever taken" due to the way in which it has inspired contemplation about our fragile existence and our place in the cosmos (cited in Coulter, 2009). Since its release, *Earthrise* has not only continued to rank high on lists of era-defining images, but has also become a common representational stand-in for environmental protection and planetary stewardship more generally. Showing up on NASA-endorsed stamps and influential magazines such as *Life* and *Time*, as well as in countercultural texts ranging from Stewart Brand's *Whole Earth Catalogue* to Joni Mitchell's 1976 song "Refuge of the Roads," this view of Earth from a distance has been called a "message for humanity," a message of both our cosmic insignificance and the precious nature of this planet we call Home. It is to this lineage that Marrone was perhaps referring, one wherein the black hole image not only provides evidence of an unprecedented encounter with the mysteries of the cosmos, but, more importantly, acts as a catalyst for bringing about broader social, cultural and cosmological shifts.

Resituated over five decades after its publication, however, it is now clear that while *Earthrise* has become a common trope within environmental communications, the notion that this image has been an impetus for more care-ful planetary stewardship is today dubitable, particularly given the increasingly disastrous state of the planet. As crises converge and proliferate across the globe, it appears that *Earthrise's* "message for humanity" remains unread. Resituated within the cosmological milieu of the Anthropocene, *Earthrise* no longer tells a story of cosmic humility and planetary protection, but instead spins a tale of anthropic omnipotence, one narrated from a God-like perspective, a "view from nowhere" as Haraway (1988) might have it, that unifies vision across time and space from but a single (all-too-human) perspective. Returning to the Apollo 8 Christmas Eve broadcast, it is perhaps important to note that after sharing pictures of the Earth and Moon as seen from lunar orbit, the live broadcast (the most watched TV program at the time) ended with the crew taking turns reading from the book of Genesis (Williams, n.d.). Refracted through this God-like view, with its fantasies of both dominion and salvation, the Earth in *Earthrise* is transformed from a precious "blue dot" in need of protection to a mutable object over which "we" can exert control and domination, extracting and exploiting for anthropocentric ends. Not unlike the image itself, which was edited so as to exaggerate the Earth's presence (NASA flipped the photo and cropped it in order to make the

Earth a bigger focal point[22]), from the vantage of the Anthropocene, *Earthrise's* "message to humanity" is manipulated to satisfy anthropocentric will and desires. From this vantage, *Earthrise* no longer reads as a symbol of environmental stewardship, but instead as a stand-in for assumptions about human control, manipulation, and ultimately, mastery over planetary life. The case may be made that the 2019 black hole image follows in the lineage of *Earthrise* based on how it too tells a story of human mastery, cosmic frontierism and an understanding of progress defined by "the recursively institutionalized, neoclassical economic ideal that 'human progress [is equal to] the unleashing of scientific and technological progress itself'" (Reed, 2019, p. 29). Indeed, these narrative contingencies were among the mainstream takes that circulated upon the image's release. As O'Hagan (2019) put it in her optimistic report, for instance, "[a]s far as we know, we are alone in the infinite darkness – yet we have not succumbed to despair of this terrible possibility. Instead, we have looked out into the darkness, transfixed by its mystery. The universe is spellbinding and miraculous, *but so are human beings*" (my italics). Like *Earthrise* before it, the narrative contingencies emanating from the black hole image tell a story of an ingenious human species, one that is discrete and separate from the cosmos, but nevertheless able to image, and ultimately control, its deep mysteries.

Welcome to the Good Anthropocene

It is this characterization of humanity, situated as it is within a broader set of cosmological presumptions, through which the Anthropocene itself is often narrated, particularly in its "Good" iterations. The idea of the "Good Anthropocene" originated with Erle Ellis, a landscape ecologist and senior fellow at *The Breakthrough Institute*, who champions what he calls "postnatural environmentalism" and the assertion that we should "forget Mother Nature" and recognize that "this is a world of our making" (Ellis, 2009; 2011). According to Ellis, if we first "stop trying to save the planet," then we can embrace the Anthropocene and our new role in it as "the creators, engineers, and permanent global stewards of a *sustainable* human nature" (my italics, Ellis, 2011). In many ways, Ellis' Good Anthropocene is just a more explicit articulation of how the Anthropocene has been narrated more generally, that is, as the expansion and extension of yet another epic story where humanity — *anthropos* — is capable of manipulating

[22] See Moran, 2018.

and transforming planetary trajectories. The Good Anthropocene's mantra is "if 'we' discover ourselves to be an agent of destruction, then 'we' must re-form, re-group and live on" (p. 9). Whereas the introduction of the Anthropocene, might otherwise be positioned as a conceptual "shock" or (geo)political point of bifurcation, the Good Anthropocene is "one in which humans can be proud of their achievements rather than lose too much sleep over the side effects" (Ellis cited in Zylinska, 2018, p. 16-17). Propositions for a Good Anthropocene are one of the most worrying responses to this epochal proclamation (Hamilton, 2014) as they not only affirm that humans have exerted destructive power over the planet, but they celebrate this power as an intrinsic and desirable aspect of human being.

These Good Anthropocene vibes are exemplified within the Industry of Education today, particularly within its sustainable projects and proposals. Policy initiatives within the domain of ESD, for instance, play a major role in the broader Good Anthropocene initiative by relaunching education as a necessary and uniquely situated *technology* to bring about educational transformation, and ultimately, societal betterment. Within this fantasy of a Good Anthropocene, humans are positioned as geological agents that must "take this agency upon themselves and direct it better than it has thus far been directed" (Snaza, 2018, p. 339). As geological agents, humans are championed as heroic figures that have not only altered the stratigraphic record, but are now capable of overcoming constraints through technological innovation and the accumulation of new knowledge. Transposed to educational domains, this narrative orients learning toward progressive ends, where even something like the unfathomable, albeit more and more pressing, issue of finite planetary carrying capacity is seen as a problem of accounting that can and will be solved through humans and their education. As such, visions of education for and as sustainability tethered to a positive future for "us" not only downplay and deny the current reality of anthropogenic climate change, but provide the breeding ground for the emergence of an education after education wherein our current planetary predicament is simply an aberration in need of rehabilitation and re-engineering. Within this redemptive narrative, it is simply assumed that education will forever be founded on the project of (human) sustainability and an ultimately positive, or "Good," future for "us." In turn, potentials for conceiving educational futurity from the unfathomable perspective of, for instance, extinguishment and ecocatastrophic

abolition are disappeared and occluded in the name of the Good Anthropocene's imperative to sustain current modes of living, no matter the cost.

### *4.3.4 Dark Resituations*

Viewed through the rose-coloured filters of the Good Anthropocene, the image of the black hole is positioned as "evidence" of a humanity that is not only capable of imaging the Earth from a distance, but of controlling and transforming its geology, climate and future trajectories. However, if I have learned anything from black holes thus far, it is that they must be approached with caution so as to avoid the gravity of the myths and misrepresentations that would obscure their otherwise thought-expanding horizons. As such, and referring back to Reed's (2019d) assertions about cosmological situatedness, the meaning and comprehensive significance of scientific developments, including the unprecedented imaging of a black hole, are not as matter-of-fact as the concrete discovery itself (p. 29). Indeed, there are a range of situated perspectives, partial accounts of reality and thus selected fictions that emanate from this stellar object, albeit ones that have been necessarily obfuscated so as to affirm and reproduce dominant cosmological orders and epistemic givens.

While the more optimistic readings of the unprecedented black hole image might elicit a much-needed sense of hope for these anthropo-scenic times, a light at the end of this tunnel we call the present, so to speak, it does so by ignoring the unfathomable cosmic darkness from which this image emerges, or, put another way, what the image necessarily *obscures*. After all, the image produced by the EHT does not technically show visual evidence of a black hole, for as we saw (or perhaps didn't see), black holes are, by definition, completely dark, incredibly dense objects from which even light cannot escape. Instead, the image shows a shadow, a boundary of perceptibility that manifests in darkness, forever exceeding human representational schema. This sense of darkness has been expressed through the designation of the black hole itself by researchers in Hawaii, who bestowed the name *Pōwehi* on the cosmic event, a Hawaiian word that comes from the Kumulipo, an 18th century creation chant, and means "the adorned fathomless dark creation" or "embellished dark source of unending creation" (Mele, 2019). In contrast to images of human curiosity and wonder, of enlightenment and insight, here, the black

hole image instead signals an event horizon for human perceptibility, and ultimately, thinkability.

This limit is evidenced through the creation of the EHT image itself, which not only required an international team of human scientists, but, perhaps more importantly, necessitated a complex meshwork of inhuman and non-human sense-making assemblages to image this imperceptible boundary event. As outlined in the previous sections and in more detail in the following section, in order to capture the black hole image, the EHT project needed to create an incredibly large telescope capable of reaching galaxy Messier 87 as well as a powerful machine-learning algorithm that could stitch together the collected data while also calculating for hidden delays in astronomical signal processing. While the working parts of this inhuman assemblage are too extensive to detail here, a starting list includes: 8 radio telescopes, a series of atomic clocks (a.k.a. hydrogen masers), thousands of terabytes of data, highly specialized supercomputers, three different algorithmic imaging methods, multiple server farms and attendant energy sources, 13 stakeholder institutions and over 60 affiliated institutions. And, if we were to unravel each of these elements, the list would, of course, grow exponentially, revealing a complex network of partial objects and machinic flows that challenge the very impulse to create a comprehensive bulleted list.

By interpolating the black hole image through its inhuman technical apparatuses, the narrative contingencies that support the cosmological presumption that this scientific feat reflects an inherently human ingenuity is made vulnerable. Further, the promise of scientific legibility and the futures it projects are revealed in terms of their limits. Taking this into account, the 2019 image of the black hole may, once again, follow in the footsteps of *Earthrise* as an iconic environmental image — a "message to humanity" from these anthropo-scenic times — albeit one that pushes back against Good Anthropocene impulses and desires. In contradistinction to fantasies of anthropic omnipotence and planetary control, the black hole image, in both its form and content, instead affirm a cosmological milieu characterized by rhythms and patternings of inhuman cosmic forces far beyond our perception, let alone control. In this counter-narrative, the human species is thus resituated as but a partial component in a dynamic network of connections that resist God-like, totalizing views, tidy causal determinations and affirmative mantras. In this way, the black hole image's dark dimensions and inhuman contingencies point to an important, if

unfathomable, paradox in terms of the "evidence" provided by this scientific discovery. That is, at the same time that the image provides "visual evidence" of a cosmic event that affirms fundamental scientific assumptions about the universe, it simultaneously provides "proof" of an actual limit case for testing such theoretical hypotheses based on its resistance to (human) representation. It is through this resistance to representation, this resistance to thinkability itself, that the black hole image appears as what Deleuze and Guattari call a "problematic object," that is, "one that exceeds our representative capacities, but for the same reason provokes the exercise of all of our powers, creating a relay between sense, memory, imagination and thought" (McMahon, 2011, p. 49). It is through this resistance that the black hole image provides a site wherein educational futurity, and specifically the projection of sustainable futures, might be resituated.

### 4.4 Deploying Speculative Counter-Emanations

In the case of this speculative study of *Pedagogy at the End of the World*, the black hole and its cosmic imaging provide one site for problematizing the industry standards that have come to define education and the problem of sustainable futures. By experimenting with the educational givens that have come to constrain pedagogical thought, which as Reed (2014) reminds us are always non-totalizable, the aim here is not just to gather more knowledge about black holes and their imaging, but to speculate on what it might mean for educational sustainability to *exist in* an encounter with that knowledge. As explored in this section, when put in contact with the weird logic of black holes and their imaging, the cosmological assumptions subtending education for/as sustainability today are made vulnerable, incoherent and thus in need of alternative expressions and unthought concept creation. Where dominant orientations to sustainability within educational domains project a future wherein we can *overcome unsustainability* through individual approaches to planetary stewardship and the progressive accumulation of more and more knowledge, the black hole image presents an encounter with an unthinkable cosmos that presents a range of weird limits when it comes to questions of human agency and intelligibility. Further, where education for/as sustainability envisages both learning and educational futurity with the human forever at the centre, the black hole image draws attention to the inhuman assemblages and imperceptible operations that increasingly characterize

today's unthinkable situation. Where education has become invested in overcoming unsustainability, which nevertheless involves sustaining cosmological orders that are increasingly out-of-synch with planetary realities, it projects an overtly affirmative, unquestioningly optimistic vision of a good future for "us." The black hole and its imaging, however, conjures something quite different, invoking a cosmic pessimism that exposes the failure of human thinking to adequately account for its own limits and inadequacies. In what follows, I further develop these counter-narrations in relation to education and the problem of sustainable futures.

### *4.4.1 Thwarting Laplacean Dreams*

Educational Productivity For "Us"

Pivotal to dominant discourses of education for/as sustainability today is the givenness of pedagogy to transmissions that can be correlated to the imperatives for *educational productivity* so as to bring about sustainable and ultimately positive futures for "us." In UNESCO's vision of education for sustainable development, for instance, the very purpose of ESD is to "transform society" by "empower[ing] learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society" ("What is Education for Sustainable Development?," n.d.). According to this definition, sustainability can and should be taught so that empowered and lifelong learners can accumulate information about "climate change, biodiversity, disaster risk reduction (DRR), and sustainable consumption and production (SCP)" ("What is Education for Sustainable Development?," n.d.). These learning outcomes are framed (in equal terms) as necessary for orienting education towards sustainable futures. Through the purposeful design of pedagogy and learning environments, UNESCO's vision for ESD asserts that learners of any age can be empowered to transform themselves and the society in which they live, for instance towards "greener economies," by learning how to be active and responsible global citizens through job training and the adoption of sustainable lifestyles ("What is Education for Sustainable Development?," n.d.).

Within this example, which has far-reaching impact on education's industry standards more generally, the question of sustainability is approached as a topic for study, something for students to acquire knowledge *about*, placing learners at a distance from the problematizing

questions that might be otherwise raised by today's unsustainable situation. As just one example of education for sustainability, learning here is always-already correlated with the quest for progressive thinkability and educational transformation is conceptualized in terms of its productive potentials given broader societal demands, namely economic ones. As such, and as Wallin (2020) writes, "ESD presumes that the present course of climatological change and planetary exploitation can be averted through educational productivity" (p. 3). In this approach, the narrative of sustainability is correlated to industry standards that continuously reproduce the unexamined correlation between "human cognitive labour" and "the recuperation of planetary systems and conditions that suit best the continuation of life 'as we know it'" (Wallin, 2020, p. 3). Within this narrative, then, sustainability entails endlessly ameliorating and expanding (educational) productivity, rather than challenging something like continued economic growth and the disastrous trajectories it promises. What this approach to education for sustainability sustains, then, is but the present organization of social, political and economic powers and the ends of the world such powers necessitate. Under the auspices of education for sustainability, educational futurity is always-already determined through *straight-forward causal relations* wherein a projected future and the ends it foretells come to over-determine possibilities in the present.

Laplacean Dreams

This dream of causality and pre-determined destinations not only undergirds the Industry of Education's sustainable projects, but subtends dominant conceptualizations of education and its research more generally. As educational theorists John Weaver and Nathan Snaza (2016) assert, a "Laplacean dream," one wherein reality can be ordered around the "the certainty of facts, the predictability of the future, the stability of isolated phenomenon, the universalization of mathematical thinking [and] the necessity of hypothetical/deductive thinking" (p. 1055), has come to direct the very practice of educational research. The Laplacean dream might otherwise go under the name of *causal determinism*, or the theory that all physical events in the universe are determined completely by previously existing causes and thus every event is necessitated by antecedent events and is conditioned by the "the laws of nature" (Weaver & Snaza, 2016, p. 1055). The pedagogical example used to explain causal determinism goes something like this: if

some omnipotent being, say, a demon, could account for the precise location and momentum of all matter in the universe, both the past and future state of this mattering could be predetermined in a causal way through the formulas and calculations provided by the laws of physics. As such, causal determinism hypothesizes that if we could gather enough data alongside the power and capacities required to sort through and manage that information, we would be able to account for all of time. Thinking back to the distinction between event and apparent horizons, it is partly through the narrative contingencies of causal determinism that the very existence of absolute horizons, wherein the future is defined teleologically, is supported. Within this narrative of the cosmos, the future is not inherently unknown, but rather, its unknowability is the result of *inadequate information*.

This vision of the cosmos is fictionalized in Alex Garland's (2020) science-fiction miniseries *Devs,* which presents a speculative account of what might happen if Laplace's demon were to be actualized by harnessing the power of big data and quantum computing. Within this science fiction scenario, which nevertheless extrapolates its hypotheses from our current reality and its technical innovations, the theory of causal determinism is pushed to its limits so as to explore the speculative ramifications of a predetermined cosmos. Without giving too much away, by harnessing the extensive power of data and building a machine-learning algorithm that can sort through and mathematically assemble that data into images of past, present and future, the characters in *Devs* are forced to encounter a cosmic situation that reorients questions of history, destiny and agency. As one of the Devs programmers recites at the beginning of the seventh episode of the series:

> We may regard the present state of the universe as the effect of its past and the cause of its future. An intellect, which at any given moment knew all of the forces that animate nature and the mutual positions of the beings that compose it, if this intellect were vast enough to submit the data to analysis, could condense into a single formula the movement of the greatest bodies of the universe and that of the lightest atom; for such an intellect nothing could be uncertain and the future, just like the past, would be present before its eyes.

While this citation is unattributed within the episode, it comes from French scholar and scientist Pierre-Simon Laplace himself. A central figure within the science fiction scenario portrayed by

*Devs*, then, is this figure of "intellect," one that is able to manage and interpret the universe so as to project a predetermined future. Drawing upon Laplace's theory of causal determinism, *Devs* places a quantum computer in the place of this powerful "intellect," and, as such, within this fictionalization, the future is no longer the domain of the unknown and unthinkable and thus the characters are presented with the prospect that the future isn't what *has* to happen, it's simply what *will* happen.

Science fiction scenarios aside, the Laplacean dream of causal determinism supports broader cosmological assumptions throughout scientific and educational domains alike. Indeed, it is, in part, the Laplacean dream that foregrounds postures of anthropic omnipotence and thus the possibility of seeing the Earth from a distance, seeing it as a known "object" over which an all-knowing transcendent "subject" (called humanity) is able to capture, manipulate and control its realities. Likewise, it is, in part, the Laplacean dream that provides the foundation for education for/as sustainability to proceed from the assumption that through the accumulation of knowledge about specific topics and the adoption of "intelligence and goodwill" (Curren & Metzger, 2019, p. 1), educational transformation can be directed towards a future determined in advance. This deterministic dream not only prioritizes consistency over contingency, standardized and standardizing techniques, and a posture of anthropocentrism that erases phenomena that cannot be accounted for in deterministic ways, but also positions the future as something that can be predicted and controlled, so long as we have adequate information and the correct calculations. As such, it is also the Laplacean dream that correlates questions of sustainability with the cosmological presumption that "we" humans will be able to overcome the unsustainability of the present world order through careful accounting, strategic risk-management and mitigation strategies that nevertheless sustain present political, social and economic orders.

## Weird Limits

Counter to the Laplacean Dream of causal determinism, the black hole image provides an unsettling reminder of how the conceptual categories to which we have become accustomed — be it illusions of well-intentioned geologic agency or fantasies of a redeemed and redeeming educational future — are narratively contingent and thus vulnerable to alternative speculations.

At the same time that the black hole image provides "visual evidence" of a cosmic event that affirms fundamental cosmological presumptions about the universe, it simultaneously provides evidence of an actual *limit case* for testing such hypotheses. As such, no matter how complex the technological mediations and interpretations, no matter how nuanced the theorizations of, for instance, quantum states and apparent horizons might be, it cannot be determined once and for all whether black holes do, in fact, conform to the "laws" of physics. After all, and to paraphrase Steven Hawking (2008), if an object were to enter the event horizon of a black hole, we wouldn't be able to predict the future of that object because there is no telling what occurs at the event horizon. As Hawking (2008) quips: "[i]t could emit a working television set, or a leather bound volume of the complete works of Shakespeare, though the chance of such exotic emissions is very low. It is much more likely to be thermal radiation, like the glow from red hot metal" (para. 14). What is significant here is that if causal determinism, and thus the very "laws" of science, do not hold in this instance then there is always the possibility they might not hold in other situations. As Hawking (2008) puts it:

> [t]here could be virtual black holes that appear as fluctuations out of the vacuum, absorb one set of particles, emit another, and disappear into the vacuum again. Even worse, if determinism breaks down, we can't be sure of our past history either. The history books and our memories could just be illusions. It is the past that tells us who we are. Without it, we lose our identity (para. 14).

With Hawking's words in mind, the black hole image not only provides "evidence" of a limit case for scientific intelligibility, but conjures a weird encounter with an unthinkable thought, an encounter with an unfathomable event wherein the cosmos can no longer be captured through technologically-mediated representations, but instead appears as a plane, or "planomenon" of intersecting flows of life, all fuelled by difference (Deleuze & Guattari, 1987).

This encounter with an undetermined and undifferentiated cosmos affirms very different cosmological assumptions than those offered by education for/as sustainability and its (Good) post-Anthropocene projections. Opposed to affirming the human as a pivotal figure through which life unfolds, the cosmological affirmations raised by an unthinkable cosmos point to a world of "virtual multiplicity, not of things and agents, but connections and contractions, events and responses" (Colebrook, 2002, p. 87). Within this cosmological orientation, it is not the case

that there are beings who then contemplate and represent the world, but rather, cosmic contemplations are "passive and impersonal" before being actualized as the creation of distinct human bodies and organisms (Colebrook, 2002, p. 87). What this encounter reveals, then, is both the limits of human intelligibility as well as how the commonsense categories, delineations, and correlations through which we make sense of the world on a more daily basis are perhaps much, much stranger than we like to think. It is in this way that black holes and their imaging are weird, which is not just to say that they are odd or out of place, but rather that they present an encounter with an outside of thought that necessarily evades description, thus exposing the insufficiency of commonsense categories and everyday concepts (Fisher, 2016). Or, as theoretical physicist often attributed to popularizing the term "black hole," John Wheeler (1998), puts it, "[the black hole] teaches us that space can be crumpled like a piece of paper into an infinitesimal dot, that time can be extinguished like a blown-out flame, and that the laws of physics that we regard as 'sacred,' as immutable, are anything but" (p. 298). By thwarting the Laplacean dream of isolated phenomena, objective stability and the universalization of mathematical calculation, the black hole image provides an encounter with the perplexing thought that "[n]othing can be said, here and now, to be impossible or to be closed down or determined once and for all […] the only impossibility is the determination in advance that certain events would be impossible" (Colebrook, 2016, p. 103).

### *4.4.2 Navigating Imperceptibility*

#### Empowering Human Visions

In addition to assuming the straight-forward correlation between educational pasts, presents and futures, the Industry of Education's sustainable orientations most often proceed from the cosmological presumption of a specific agentic figure at the centre of its proposals and initiatives, namely the *responsible, autonomous and empowered human*. A fundamental assertion within UNESCO's definition of ESD, for example, is that in order to work towards societal transformation, people must be empowered throughout their lives to take on active roles, both locally and globally, "to face and resolve global challenges and ultimately become proactive contributors to creating a more just, more peaceful, tolerant, inclusive, secure and sustainable world" ("What is Education for Sustainable Development?," n.d.). Within this definition,

education is positioned as the site to develop such empowerment through, for instance, the inculcation of "sustainable" individual lifestyles and job training in "sustainable" industries. Aligned with the broader Good Anthropocene initiative, the empowered human, or lifelong learner, at the centre of ESD is positioned as an agent of change, and pedagogy is oriented towards teaching young humans "how to behave better, more responsibly, more sustainably" (Snaza, 2018, p. 340).

Read through an encounter with the black hole and its inhuman imaging processes, however, the givenness of education to and for all-too-human transformation is thrown into doubt. As highlighted already, one of the greatest challenges, but also most significant developments in imaging the black hole was the creation of a machine-learning algorithm that could account for hidden delays while preserving continuity in order to produce a "reliable" image of the cosmic event. While the use of radio waves allowed scientists to collect data beyond the visual spectrum, it also presented a key challenge for the EHT researchers based on the way in which the Earth's atmosphere can slow down radio waves, leading to exaggerated differences in astronomical signalling that throw off calculations on which the interferometric imaging method depends. In order to account for these hidden delays, the project's lead computer scientist, Katie Bouman, applied an algebraic solution to the problem, which, in a nutshell, multiplies measurements from three telescopes which then triangulates away noise generated by the interference of Earth's atmosphere.

With this atmospheric noise cancellation at work, the next challenge the EHT team had to address was how to work with the scattered and sparse data produced by the computational telescope so as to assemble an image that matched the data while also meeting expectations for what the image *should* look like. This is where Bouman's machine learning algorithm, or CHIRP, came in. In her TedTalk "How to take a picture of a black hole," Bouman (2016) offers a user-friendly overview of how the algorithm works, including the aforementioned example of disco balls and time-lapse photography. In addition to these analogies, which help to describe the telescope network and data collection process, Bouman also describes, through analogy, how the image was created algorithmically. Her description goes something like this: since, through its disco reflections, the data collected by EHT can be combined to create infinite images, it is necessary to create a method for determining "good" images from "bad," or unreasonable, ones.

How? First, Bouman explains, images need to be ranked based on how likely they are to be the black hole image where likeliness refers to determinations based on "prior knowledge" of black holes and their properties. As Bouman puts it, some "images look more like what we think of as images than others. And so, my role in helping to take the first image of a black hole is to design algorithms that find the most reasonable image that also fits the telescope measurements." Here, Bouman uses the analogy of a forensic sketch artist to explain how CHIRP pieces together a picture using previous knowledge. Whereas a sketch artist references prior knowledge of face structure, CHIRP draws upon data simulations of black hole physics, which are then used to "train" the machine learning algorithm to "look" for specific images while ignoring others.

However, while black hole simulations can offer a starting place for algorithmic training, they cannot be taken as the sole baseline for algorithmic predeterminations due to the way in which particular theoretical and mathematical calculations are "baked into" them, restricting options for other imaging possibilities to emerge. As Bouman puts it, the question of training data poses a real conundrum for selecting "reasonable" images because we have never actually *seen* a black hole before. As such, the algorithm had to be "taught" how to tell the difference between certain images without telling them too much about what images look like or imposing one type of image's features too much. To do so, Bouman developed a computational method that could impose the features of different kinds of images onto the data so as to see how the type of image assumed is able to affect reconstructions. Referencing the sketch artist analogy once again, Bouman explains that this process is "a little bit like giving the same description to three different sketch artists from all around the world. If they all produce a very similar-looking face, then we can start to become confident that they're not imposing their own cultural biases on the drawings." To further validate the process of algorithmic imaging and prevent predetermined biases, the algorithm is also trained to reconstruct many different kinds of source images so as to build confidence in the computational processing method more generally. As Bouman emphasizes, appealing to her TedX audience, the algorithm works by "piecing together little pieces of everyday photographs, like you'd take with your own personal camera. So an image of a black hole we've never seen before may eventually be created by piecing together pictures we see all the time of people, buildings, trees, cats and dogs." The vision made possible by the computational imaging of the black hole thus signals, at the same time, the limits of human

vision as well as the potential to *extend and empower* it via technological apparatuses and machine learning.

Computational Turns

In more technical terms, the process through which the black hole was imaged is called *computational imaging*. In contrast to traditional imaging, computational imaging systems involve a tight integration of sensing systems (such as telescopes) and computational apparatuses (such as CHIRP) in order to form images of interest. The EHT example of computation processing is but one of many that makes up today's "computational turn." As philosopher and thinker of digital culture Luciana Parisi (2018) explains, "[i]n the twenty- first century, the epistemological dominance of computing has not only reduced knowledge to information but information itself has come to coincide with large chunks of highly complex data that learning algorithms correlate and continuously model" (p. 88). For thinkers like Parisi, the computational turn has been made possible by the ongoing discretization of information, which not only involves the break-down of information into segments, or "good" data that can be more easily classified and interpreted, but also new modes and technologies of information processing capable of processing data according to particular programming logic. As such, and as Parisi notes, the turn to computation today is not only characterized by the development of artificial networks and machine learning methods, but the emergence of automated systems of knowledge. As Parisi (2018) writes, "the task of breaking down has been superseded by the *function of elaboration* for which automated machines learn from data by establishing inferential relations between facial images and names, or voice frequency and patterns" (p. 88). The computational operations of the EHT, for example, not only involves sensing and recording data points, but sorting and selecting for data based on inferential relations through which machines learn to distinguish "good" images from "noise."

This computational approach to knowledge is not only evident within scientific domains such as astrophysics, but also plays a key role in broader social organizations. As Parisi outlines, the computational turn has impacted systems of governance and sovereignty through the wide-scale adoptions of predictive apparatuses that operate through the forward- looking evaluation of data. Parisi (2018) gives the examples of "the computational stratification of population within

the fractal matrix of data, metadata, big data, software programs, algorithmic processing" all of which establish a code of conduct, or regimes of intelligibility that are ultimately run by machines (p. 90). Parisi is just one voice among many who have pointed to the more and more prominent role that computation, and its data practices, play in society today. Patricia Clough (2007), for instance, picks up on Deleuze's articulation of control societies, asserting that control is now a biopolitical force that "works at the molecular level of bodies, at the informational substrate of matter" (p. 19). As Clough (2007) writes, "[i]nstitutions like the school, the labor union, the hospital, and the prison function as switch points for circulating bodies, along with information and capital, through channels, not with the aim of arrival, but with the aim of keeping the flows moving at different speeds" (p. 25). This mode of control is made possible through computational stratification and data protocols whose distribution is modulated by thresholds where data packets are generated, monitored, collected and computed. Indeed, and as explored in Chapter Six through the example of platform education, the Industry of Education has become a powerful data market in its own right, offering yet another example of today's computational turns.

Imperceptible Operations

While the above summary of interferometric data collection, algorithmic reconstructions, and computational turns only begins to describe the complex operations behind the creation of the black hole image, it nevertheless demonstrates the way in which this computational image is made possible by, at the same time, the externalization of human conceptual apparatuses as well as an assemblage of *inhuman organizations* aimed at filling in the "gaps" left by limited human perceptory capacities. As the black hole image demonstrates, while algorithmic processing makes the image of the black hole possible it does so through operations that remain *imperceptible* to humans. Despite its user-friendly disco ball metaphors and sketch artist analogies, the computational processing behind the EHT and its unprecedented image draw attention to those forces and intensities that operate at levels imperceptible to humans. While algorithms, especially those that structure everyday activities, appear, by design, to operate at "user-friendly" levels of human perception, "the levels of abstraction, the functionalities of the code, the relations of the code and hardware and human somatic, and the temporalities of

computation and internet transmission do not appear, do not engage nor operate at friendly or at any conscious level of human perception" (Bianco, 2018, p. 26). For users of algorithms, and certainly for the EHT scientists, the artefactuality of algorithmic processing is itself known, but the materiality, functionalities and modalities of algorithms remain "black-boxed." As such, the knowledge CHIRP provides is a kind of "black-box knowledge" wherein knowing is demonstrated by effects without comprehension of the process through which such effects are brought about. As such, the demonstrated effects of algorithms only ever account for a small intersection of designed affects.

Beyond pointing to a merely technological limit of the specific apparatus employed, what the black-boxing of algorithmic processing highlights is the way in which the actual world that we perceive, be it through computational imaging or human sensorial apparatuses, is always composed of virtual tendencies which are themselves not available, as a whole, to human comprehension. As Deleuze develops, perception, in its actual forms, always takes up what it can from a far more complex flow of pure difference. For instance, and as Colebrook (2002) explains, "there are possibilities for seeing which are virtual (flows of light), and such possibilities may or may not be actualized (or seen by an eye)" (p. 126). What this example demonstrates is that there is always more than what we see in/as the actual world; there are also all the potential worlds that we *might* see. On the one hand, human perception, including that made possible through computational imaging, reduces difference: "the human eye perceives only what interests it. We take the intense, complex and differing flows of life and perceive a world of extended material objects" (Colebrook, 2002, p. 127). On the other hand, human perception can also be expanded in order to maximize difference by, for instance, "anticipating a future, recalling a past, and allowing the actual perception to be opened to the virtual" (Colebrook, 2002, p. 127). It is through these movements of contraction and expansion that we *become perceivable and extended bodies,* or situated perceivers. By contracting and connecting to the complex flow of life, "we reduce the chaos of perceptions that we receive into an extended object, and can become 'subjects' who observe this object" (Colebrook, 2002, p. 128). This vision of subjectivity is quite different than the agental figure that is most often projected through education for/as sustainability. In contra-distinction to a responsible, autonomous and "empowered" human subject, the computational imaging of this black hole draws attention to the

way in which subjectivity involves ongoing processes of deterritorialization, that is, events of becoming where partial objects and flows of life are detached from their original territory, thus thwarting the fantasy of a self-making and self-controlling human subject.

### *4.4.3 Philosophical Failure as Cosmological Resituation*

Pessimistic Provocations

Where education for/as sustainability projects "good" educational futures made possible through empowered, lifelong, and individually-driven pedagogical transformations, the black hole image forces an encounter with an unknown and unknowable future that cannot be (causally) determined in advance. Further, where education for/as sustainability places the human at the centre of its cosmological navigations, the black hole and its algorithmic imaging point to the complex, albeit imperceptible, inhuman assemblages that subtend even the most "precious" human techno-scientific discoveries. With these counter-narratives in mind, the black hole image not only resituates questions of and for educational futurity, but raises questions about the nature of thinkability itself. This is not to say that the cosmos or the Earth is "such an abstract hyperobject that its imperceptibility prevents us from acting towards its endurance" (MacCormack, 2020, p. 181), but instead what the black hole image highlights, albeit through darkness, is the horrific thought of the darkened formlessness of the "planomenon" that slumbers beyond the threshold of human perception and will (Thacker, 2015; Deleuze & Guattari, 1987, p. 63). Where the black hole image brings forth an inhuman orientation to both the cosmos and the human's place within it, it therefore necessitates a speculative confrontation with the limits of all-too-human points of view and thus a confrontation with that which "we" are unable to think.

As pessimist philosopher and philosopher of pessimism, Eugene Thacker (2018), writes, while scientists have long-noted the ephemeral and arbitrary appearance of life on earth, this realization of humanity's cosmic insignificance has not led to humility of thought. Instead, this cosmic realization has led to a range of anthropocentric "coping techniques" wherein "'the human' eclipses the world, even the entire universe, [which is] all there for our interstellar gaze, self-centred address, and prophetic inquiries" (p. 56). For Thacker, this is evidenced through the "overview effect," like that produced by the "life-changing experience" of astronauts capable of viewing the Earth from a distance in images like *Earthrise*. This anthropocentric coping

technique is also a driving force within what is often called "critical distance" in theoretical domains, which "achieve a literal incarnation of the overview effect in philosophy" wherein the further we can distance ourselves from the world, "the closer the world becomes, and the closer it becomes, the easier it is to engineer the miracle of self control" (Thacker, 2018, p. 75-76).

Against such delusions of control and distance, Thacker (2018) puts forward an alternative account of our cosmic insignificance, what he calls a "cosmic pessimism." Drawing on the lineage of philosophical pessimism, but also through his own aphoristic experimentations, Thacker offers an anatomy of pessimism that draws an important distinction between moral pessimism and metaphysical pessimism. Whereas moral pessimism points to a subjective form of pessimism (i.e. it's better to have not been born because life is futility), metaphysical pessimism takes a more objective stance (i.e. this is simply the worst possible world). The problem for moral pessimism, then, is the world-for-us while the problem for metaphysical pessimism is the world-in-itself. For Thacker, this anatomy points to the need for yet another kind of pessimism, one that is neither for-us nor in-itself, but is instead, a pessimism of the world-without-us, or a cosmic pessimism. As Thacker (2018) outlines it, cosmic pessimism is:

> a pessimism that is first and last a pessimism about cosmos, about the necessity and possibility of order. The contours of cosmic pessimism are a drastic scaling-up or scaling-down of the human point of view, the inhuman orientation of deep space and deep time, and all of this shadowed by an impasse, a primordial insignificance, the impossibility of ever adequately accounting for one's relationship to thought — all that remains of pessimism is the desiderata of affects — agonistic, impassive, defiant, reclusive, filled with sorries and flailing at the architectonic chess match called philosophy, a flailing that pessimism tries to raise to the level of an art form (though what usually results is slapstick) (p. 11).

Laughable Ultimatums

Thacker's (2018) pessimistic proposals are made possible through a series of *ultimatums*, which, as he alleges, work to push philosophical thought to ultimately *laughable* conclusions (p. 32). As Thacker (2018) notes, with equal parts gaiety and gravity, even statements about philosophy's laughable fl/ailings are themselves made possible by the ultimatum of "a purely

phantasmic form of logic that pessimism covets, as one does with objects that make up a shrine — or as one covets a really good joke" (p. 32). With this in mind, Thacker asserts that "the only philosophy worth pursuing is the one that poses questions without answers. Anything less is hubris" (p. 39). This assertion, however, "can never be proven - by definition" (p. 39), raising a paradox for the problem of philosophy. As Thacker puts it, where "traditionally, paradox is understood to be a problem for philosophy" in pessimistic orientations to philosophy "paradox is (paradoxically) a foundation. Pessimism is the philosophy that demonstrates that all philosophy is destined to fail (its first and final proof)" (p. 44).

Positioned as a problematic object, that is, one that forces us to think, the black hole image conjures this sense of cosmic pessimism, in turn introducing humility into thought. Resituated in terms of its pessimistic projections, the black hole image exposes the fl/ailing of human thinking, which, according to Thacker, is a bad joke. In this way, the black hole image, like pessimism, is not a "helpful" pedagogical model in the sense that it does not offer a way to prescribe sustainable goals and trajectories. Indeed, resituated through its pessimistic dimensions, the black hole image "makes things worse" and as such "raises the stakes of the discussion, scaling things up beyond the self-interested level of human beings living in a world, beyond our wants and desires, beyond our individual or collective self-importance" (Thacker, 2018, p. 4). Against Good Anthropocene vibes, the black hole image therefore brings forth a strange cosmological orientation: "the most adequate, the least helpful" (Thacker, 2018, p. 4). The black hole image provides a site to ask unfathomable, if laughable, pedagogical and philosophical questions, questions such as what would be left after an (educational) philosophy without the human at its centre? Thacker responds that "[a]ll that remains would be something strange and impersonal, pointing to the horizon of our ability to understand both ourselves and the world into which we are thrown" (p. 82). Posing this same question in the context of education and the problem of sustainable futures, a similar response is elicited. Faced with the question of what is left of education without a redeemed and redeeming human at the centre, the black hole image provides a pessimistic response, one that undermines the "innumerable, self-aggrandizing postures that constitute the human being" (p. 3). It is in this way that the black hole and its computational imaging provide a weird site wherein the problematizing forces of life, and thus the pedagogy of concepts, can no longer be predetermined in terms of, for instance, more

sustainable means and ends, but instead point to the (apparent) horizon for unthought pedagogical becomings.

## 4.5 Resituating Sustainability and its Education

### *4.5.1 Sustaining Alien Encounters*

By encountering the weird logic of black holes and their imaging, the givenness of the Industry of Education's sustainable fantasies and trajectories, which are themselves always hypothetical, are put to the test. The counter-intuitive logic of the black hole image, characterized as it is by weird limits, imperceptible operations and pessimistic provocations, *re-situates the question of sustainability*, and as I develop below, the unthinkable problematic of educational futurity today. Through this resituation, however, it is not the case that the Good Anthropocene and its dreams of a positive future for "us" simply disappear. Instead, these good vibes are exposed for what they really are: collective confabulations that are *contingent* on the selection of particular fictions and narrative interpolations, which despite their very real material effects, are not given in advance nor given to a predetermined future. As Reed (2019d) proposes, "situated thought may always stem from a partial position embedded within a particular (cosmological) milieu, but neither that position nor that milieu is fixed absolutely; it is subject to the forces of thought's speculative mobility to permeate the given and render its subtending mythical grounds temporary" (p. 30). From this re-situated position, the pedagogical task is not how to better explain or theorize or shed light on or manage this knowledge of collective confabulation, but how to *exist in* this knowledge, that is, how to navigate the *alien milieus* that are opened up when the situatedness of thought exceeds the commonsense categories and delineations that have come to organize cosmological orders. Re-situated in this way, the event of the (Good) Anthropocene presents an encounter with philosophical humility, not grandiosity.

Faced with the unthinkable, albeit speculative, emanations circling the black hole and its computational imaging, the question is how to *sustain* encounters with the force of thought such speculations bring forth, including the failures, risks and uncertainties that come with them. Returning to the unthinkable problematic central to this study, the pedagogical task for sustainability is mutated from one founded on detached instrumentalism, discourses of responsibility and narratives of planetary stewardship, to one that experiments with *existing in* an

encounter with unthought educational postures and pedagogical becomings. Sustainability, in this sense, is oriented away from a progressive solution that nevertheless imposes more of the same, towards an orientation that works to *sustain* an encounter with the alien milieus that open up when thought is resituated, "milieus that are both bristling with the possibilities and fraught with the risks and uncertainties that come with it" (Reed, 2019d, p. 30). This is a very different notion of sustainability than that which is most often proffered by (Good) Anthropocene narratives and their advocates. In this weird counter-narrative of sustainability the goal is not to maintain and perpetuate current cosmological orders, but to sustain the active practice of confronting and re-working the pain and pleasure, the urgency and exhaustion, the deep discomfort and existential uncertainty that comes with existing in knowing, or rather, existing in *not* knowing.

With this re-situated notion of sustainability in mind, the black hole image offers a site wherein the promise of a "new," more sustainable education after education, is dislodged and made vulnerable to revision and, perhaps, reorientation. Resituated through the black hole image, educational futurity is no longer oriented towards sustaining (the end of) the world for "us," but is instead committed to sustaining encounters with the problematizing force of pedagogical problem-posing. As Reed (2019d) concludes in her own investigation of enabling resituation, while it is "indispensable to map the diagnostic terrain we find ourselves in, including the cosmological predispositions that have legitimized these processes, […] it is equally crucial to *speculate* on the locations, means and alternative narrations to make the current, entirely destructive path we are on an object of history" (my italics, p. 34). Taking cues from Reed, the 2019 black hole image is not offered up here as a new framework or metaphor for education and its sustainable practices, but instead provides just one experimental site (we might also look to financial derivatives or reality TV, as we shall see) for navigating mutant existential territories and thus speculating on education and its futures otherwise. To conclude this speculative study, I experiment with such mutations by proposing a counter-narrative for sustainability and its education today, one that is speculatively dubbed *black hole sustainability.*

### *4.5.2 Black Hole Sustainability, or a Weird Pedagogy of Endurance*

Ethical Sustainability

*Black hole sustainability* is, first and foremost, a concept that redirects pedagogical becomings away from the promise of becoming-forever-human towards unthought trajectories of *becoming-imperceptible*. Working against the imperative that education can and should be forever oriented towards a good future for "us," *black hole sustainability* instead involves sustaining an encounter with the self-annihilating potentials, but also the overdetermining tendencies and micro-fascist traps, that exist in any process of pedagogical becoming. As philosopher and feminist theoretician Rosi Braidotti (2006) writes, drawing on Deleuze and Guattari, the complex nature of planetary transformation today requires that the concept of change itself must be handled with care. This claim leads Braidotti to develop what she calls *ethical sustainability,* a concept that accounts for the problematizing force of change and the questions of *endurance* that might be raised when grappling with the ethics of transformation.

For Braidotti (2006), ethical sustainability involves a rethinking of what has come to constitute "the knowing subject," and thus, as she puts it, a truly sustainable, or "nomadic," ethico-political project "focuses on becomings as pragmatic philosophy that stresses the need to act, to experiment with different modes of constituting subjectivity and different ways of inhabiting our corporeality" (p. 1). Here, Braidotti draws on a Spinozist understanding of ethics, which troubles the idea of organized, predetermined bodies or subjects defined by identifiable traits and characteristics by proposing an understanding of ethics as a faithfulness to one's *potentia*, or the pre-individual and impersonal desire to *become* through interconnections to a cosmic "outside." Central to this concept of ethics, and key to Braidotti's (2006) concept of ethical sustainability, is the notion of endurance, where endurance is not framed in terms of persisting through predetermined adaptations to change, but instead involves the "temporal, lasting in time, but also spatial, space of the body as an enfleshed field of actualization of passions or forces" (p. 2). This notion of endurance positions the sustainable subject as but a slice of life that "endures through sets of discontinuous variations, while remaining extraordinarily faithful to itself" (Braidotti, 2006, p. 4). The reference to faith here is not meant to index a transcendent identity, a faithfulness to some essential "I," but rather indexes a future-oriented mode of subjective formation predicated on "mutual sets of inter-dependence and inter-connections, that is to say, sets of relations and encounters" (Braidotti, 2006, p. 4). Drawing on conceptions of subjectivity proposed by Deleuze and Guattari more generally, this "multi-layered

subjectivity" is one that is both *sustainable*, in that it lasts in time and space, and *ethical*, in that it suggests ways of being and acting that necessitate a radical decentering of anthropocentric and unitary visions of the subject through its own continuous and immanent becomings.

Braidotti's concept of ethical sustainability is one that gestures to the limits and thresholds through which particular subjective organizations are able to endure, or not. The ethics that underscore this formulation of sustainability are very different than the sustainable ethics typically offered within educational domains, which tend to marry ethical behaviour to principles of mutual respect and planetary stewardship (Curren & Metzger, 2019). While Braidotti's concept of ethical sustainability may come to bear on such principles, the focus of this ethical orientation is less about respectful civic duty and moralistic calls for better planetary stewardship and more about constantly reworking, in affirmative ways, the radical decentring of subjectivity that occurs through encounters in and with the world. This, it might be argued, is an ahuman form of ethical sustainability, one that privileges openings for expression and connection, albeit in ways that must account for how such capacities also necessitate diminishment and destruction through, for instance, processes of de-subjectification (MacCormack, 2020). With this in mind, and as a way of tempering the overtly affirmative account of ethical sustainability offered by Braidotti, the sense of ethical sustainability developed here points to the way in which ethical decisions and behaviours cannot be reduced to a binary system of joy and pain, nor can they be defined as "good" or "bad," but instead refers to the limit of how much a subject can take when it comes to encounters with their own de/territorializations, dis/organizations and dis/assemblies. Sustainability, in this sense, asks how to de-centre stagnant subjective formations given the complex compound through which subjectivity itself is constituted, while also recognizing how "lines of flight" are not inherently emancipatory. Oriented by the question of endurance, this notion of sustainability does not refer to a pre-determined category to which subjective becoming can and should be oriented, but instead asks how to sustain an encounter with the deterritorializing processes of becoming, and ultimately, processes of *becoming-imperceptible*.

## Enduring Becoming-Imperceptible

As Deleuze and Guattari (1987) assert, all processes of becoming aim at becoming-imperceptible, which for these thinkers, references the point of fusion — the singularity of chaosmatic folding — between the self and the cosmos wherein relations share the intensive capacity to enter into further relations that have yet to be determined, and as such, engender and fulfil new perceptive potentials and problematizing intensities. Where becoming-imperceptible marks the point of fusion between self and cosmos, it points to a "living nexus of multiple inter-connections that empower not the self, but the collective, not identity, but affirmative subjectivity, not consciousness, but affirmative inter-connections" (Braidotti, 2006, p. 25). By perceiving the force and power of life through which "we" nevertheless come into being, becoming-imperceptible signals the way we become *with* life, affirming its creative power while refusing the reactions *against* life that have developed from a position of illusory human judgement (Colebrook, 2002, p. 129). The appeal to affirmation here must not be treated as merely a "positive" quality of becoming, for to do so would suggest that becoming is identifiable and expressible in advance of its events, for instance, in ways that can be deemed "good" for "us." Instead, the affirmative power of becoming referenced here is that which also requires negation and destruction, for instance, the death of the ego, the death of social identity, the death of labels: "[y]ou have to die to the self in order to enter qualitatively finer processes of becoming" (Braidotti, 2006, p. 26). Through the deterritorializing movements of becoming-imperceptible, the subject becomes ensconced within processes of deconstitution, thus necessitating the need to re-assemble along the creative space of the plane of consistency. As such, becoming-imperceptible transforms notions of agency and freedom. As Colebrook (2002) explains, becoming-imperceptible is what challenges the perceived images of thought and predetermined points of view from which we judge and order life (p. 129). Operating as a molecular form of perception, becoming-imperceptible is invested in creating lines of flight that are freed from the human organism's interested and organizing perception, in turn gesturing to a particular sense of freedom: "not the freedom of a human self who can be disengaged from the force of life, but a freedom gained by no longer seeing ourselves as a point of view detached from life" (Colebrook, 2002, p. 129). As such, processes of becoming-imperceptible free life from the limited figure of the human, in turn creating potentials for unthought events of becoming.

As Deleuze and Guattari (1987) insist, the plane of creative potential that orients becomings, including becoming-imperceptible, is also the plane of death and destruction and thus becomings, or lines of flight, are not inherently life-affirming nor are they fundamentally liberatory. In *A Thousand Plateaus*, Deleuze and Guattari (1987) develop the concept of becoming-imperceptible and its deathly traps through their own take on black holes, which for them offer one instance of the deterritorializing, not to mention ambivalent, processes of becoming-imperceptible. For Deleuze and Guattari, the black hole is a concept used to articulate one unwanted, but necessary, outcome for a failed line of flight. Black holes are understood as those micro-fascist traps that exist across the plane of consistency, threatening both acts of transcendence and self-destruction. As Deleuze and Guattari assert, the constitutive flows of desire are prone to circulating exclusively around particular objects, ideas, self-images and narrative contingencies, which in turn overcode desire through the gravity of black holes, from which it cannot escape. Referred to by Deleuze and Guattari as the "black hole phenomenon," this form of micro-fascism sees one passing thresholds of deterritorialisation too quickly, without taking sufficient precautions; one constructs a black hole, "with a self-assurance about his own case, his role and his mission" (Deleuze & Parnet, 2006, p. 104). Put brief, the black hole for Deleuze and Guattari is one possible outcome of an ill-conceived attempt at deterritorialization caused by a threshold crossed too quickly or through an encounter with an intensity that becomes simply too much to bear.

What Deleuze and Guattari's take on the "black hole phenomenon" highlights, and key for the concept of *black hole sustainability* developed here, is how subjective transformation and its deterritorializing forces of becoming-imperceptible is prone to both violent overdetermination and annihilating tendencies. There is a fascism at work in the very dynamics of our being which must be constantly warded against in processes of becoming. Or, as Deleuze and Guattari (1987) put it in their own enigmatic description of black holes:

> [a] multitude of black holes may very well not become centralised, and act instead as viruses adapting to the most varied situations, sinking voids in molecular perceptions and semiotics. Interactions without resonance. Instead of the great paranoid fear, we are trapped in a thousand little monomanias, self evident truths, and clarities that gush from every black hole and no longer form a system, but are only the rumble and buzz,

> blinding lights giving any and everybody a mission of self-appointed judge, dispenser of justice, policeman, neighbourhood SS man (p. 251-252).

Where, as they write, the smooth spaces produced through deterritorialization are not in themselves liberatory, where we must "[n]ever believe that a smooth space will suffice to save us," the struggle for becoming-imperceptible signals how "life reconstitutes its stakes, confronts new obstacles, invents new paces, switches adversaries" (Deleuze & Guattari, 1987, p. 500). Deleuze and Guattari's assertions here point to the broader dangers and imperatives to which they draw attention throughout *A Thousand Plateaus*, that is, the dangers that come with creative schizophrenization and the imperative to construct abstract machines that take themselves as projects of and for radical self-abolition.

## Black Hole Sustainability

Drawing on Deleuze and Guattari's cautionary approach to the uncertainties raised by black holes, alongside the concept of ethical sustainability, *black hole sustainability* is not offered as a metaphor or model for redirecting educational sustainability, but instead operates as a practice of enduring the deterritorializing processes involved in both concept creation and pedagogical becomings. As Taylor (2017) writes, "[f]or those of us who have been thoroughly acculturated by humanism's exceptionalist premises, it takes considerable effort to resist the temptation to default back to the comforting belief that we can always find another 'solution 'to the problems that we have created" (p. 1450). It is this mode of resistance, one that not only involves changing habits and frames of mind, but requires *enduring-becoming-imperceptible*, that *black hole sustainability* takes on. Where, as Deleuze and Guattari develop, concepts are not "discovered" but are instead the result of catastrophe, the result of thought being forced into crisis, "true thought is rare, painful, and usually forced on us by the brutality of an event so terrible that it cannot be resolved without the difficulty of thought" (Culp, 2016, p. 10). With this in mind, *black hole sustainability* is hard work: it requires us to continually interrogate what it means to be human, to radically rethink our agency in the world and redirect energies toward unthought collective practices that require divesting from detached instrumentalism, discourses of responsibility and (Good) anthropocentric projections that overdetermine life and death on a damaged planet. In this way, *black hole sustainability* does not aim to dictate alternative topics

and practices for bringing about sustainable futures nor does it (cl)aim to provide a more adequate framework for educational curriculum and policy. Instead, *black hole sustainability* involves the purposeful decentering of all-too-human visions of education and its futures as well as ongoing attunement to and experimentation with the way in which such visions are made possible in the first place. Wary of the way in which its own (apparent) horizons are installed through particular deterritorializing processes and representational traps, *black hole sustainability* is oriented towards unthought processes of becoming-imperceptible and the pedagogical risks and uncertainties such processes bring with them. As such, *black hole sustainability* necessitates the purposeful untethering of pedagogical problematization from its givenness to an inherently positive future for "us" and thus a refusal to sustain the (end of the) world as it is given.

### *4.5.3 Upending Salvation*

By resituating pedagogical becomings in terms of the potentials for, but also the dangers of, becoming-imperceptible, in turn raising unthought pedagogical questions of endurance and ethical sustainability, *black hole sustainability* throws progressive thinkability and the postures of human omnipotence and control that undergird it into doubt. Within *black hole sustainability*, the concept of sustainability can no longer be simply conflated with processes of risk management and technological mitigation directed towards the production of calculated and causally-determined sustainable futures. Aimed at providing a "better account" of today's anthropo-scenic reality, albeit one that is necessarily hypothetical, *black hole sustainability* is instead oriented towards creating pedagogical encounters with the impossible thought that education, in its current industry formation, is perhaps *not worth saving.*

As Nathan Snaza (2018) contends, counter to the all-too-human management strategies and detached instrumentalism that pervades concepts like sustainability in education today, "the Earth is not 'ours' to save" (p. 339). Similarly, as Cohen and Colebrook (2016) put it, "the planet does not need to be saved; it existed before organic life, and will go on to exist for some time (probably) well after humans and well after organisms" (p. 7). Nevertheless, attempts to register the Anthropocene and its educational implications most often put forth the imperative that human action must be mobilized to confront issues like global climate change, for instance

through education for/as sustainability, in turn reaffirming the notion that humanity, and its education, are fundamentally salvageable. As Snaza (2018) writes, in response to the Anthropocene and the framing of humanity as a forceful geological agent, "the vast majority of ecological thought ends up calling for humans to take this agency upon themselves and direct it better than it has thus far been directed" (p. 339). Central to these calls is the imperative for a radical redirecting of human actions and institutional changes so as to avert the world-ending scenarios on the horizon. For Snaza, like many other commentators on the Anthropocene and its cosmological presumptions, this geological label reaffirms, at the geological level, "a humanism that always sought to install Man as the measure of all things (by violence when necessary… and it is always necessary)" (p. 339). Once again, the thought that "we" humans are not only capable of representing geological transformation, through, for instance, stratigraphic methods, but able to control its directions highlights how scenarios wherein humans are *not* at the centre of change are simply unthinkable. As such, it is now taken for granted that education and its reasons will forever be directed towards the ongoing perpetuation and thus the positive development of an education after education.

*Black hole sustainability* emerges from this situation of educational givenness, but instead of affirming such orientations for pedagogical thinking, it draws attention to the *darker dimensions* of today's Anthropocene situation and the dreams of human agency and control these dark dimensions upend. As educational theorist David Cole (2017) contends, there is a singularity, a black hole, or "black sun," at the heart of the Anthropocene. This black sun is, for Cole, "the ultimate, dark expression of the human drives," which has produced its own event horizon, namely the sixth mass extinction. For Cole, then, the black hole at the heart of the Anthropocene not only threatens those cosmological assumptions that make up who and where we think we are, but reveals that our role and place in the cosmos both now and into the future has much darker dimensions than we can even begin to imagine. This darkness, Cole writes, is more than just the result of a loss of faith in humanity and its endeavours, also showing us "how meaning has started to bend, twist and inverse, as the immense forces contained by the singularity begin to bite" (2019). In this way, the black sun at the heart of the Anthropocene exposes how the reasons and rationale through which education for/as sustainability has been

created are integrally aligned with that which has caused the singularity in the first place and will therefore only ever mitigate against limited effects of the this black hole's gravitational pull.

Resituated within the Anthropocene's dark dimensions and unthinkable trajectories, *black hole sustainability* does not aim to produce educational solutions that can better calculate and manage the crises on the horizon so as to overcome today's unsustainable situation. Working against such calculated solutions, *black hole sustainability* resists the progressive impulse to tether pedagogical life to the affirmative production of an education after education by exercising pedagogical modes and methods aimed at *letting go* of the desire to manage the future. As Snaza (2018) advocates, given the Anthropocene's agential framing of humanity, which works to reaffirm the disastrous postures that got us here in the first place, "we have to *let go* of our desire to plan, to act in ways that conform to a priori rules or maxims, to act only in the (false) certainty that our actions are just because they are oriented toward some good which we cherish" (my italics, p. 352). Where "[w]e lack even the most rudimentary theory of 'giving up'" (Thacker, 2018, p. 51), and further, where attempts to dilate and decentre the human remain largely incapable of embracing "the grace in not knowing and in leaving be" (MacCormack, 2020, p.13), black hole sustainability aims to enact pedagogical processes based in letting go, giving up and leaving be. As such, *black hole sustainability* is a weird pedagogical orientation that requires both a radical refusal of the Earth as human dominion as well as an investigation of how an all-too-human "we," and thus "ours," fails to acknowledge the differential (i.e. racialized, gendered, classed) experience of human beings (Snaza, 2018, p. 341). By upending imperatives for salvation at the end of the world, which, again, most often refer to but a segment of life deemed worthy of saving, *black hole sustainability* works against so-called sustainable solutions and the imperative to save or redeem education by resituating sustainability in relation to an ahuman future that cannot be predicted, let alone controlled, in advance.

### *4.5.4 Navigating Horizonless Futures*

Working against affirmative visions of post-anthropocene futurity and the progressive fantasies of becoming-forever-human on which they rely, *black hole sustainability* is committed to navigating "horizonless futures." As Reed (2019c) develops, the notion of the horizon has become a commonplace conceptual apparatus for envisioning thresholds of (human) thinkability

and its future trajectories. As she points out, the "horizon" has "become an automated term of choice, usually referring to a sense of expansiveness, or a way to loosely gesture to an unknown, becoming, futural phenomenon" (p. 7). In the OECD (2019b) report on "Trends Shaping the Future," for instance, the horizon is used throughout the report as a way to discuss the "mega trends" that should orient educational visions for the future. As a representational trope that mimics the linear perspective of human optics, the horizon not only points to human sensory-perceptory limits, but also indexes vantage points tied to individual, static perspectives that obfuscate the complex realities that lie beyond our immediate optical reach. As Reed (2019c) writes:

> [s]patially and geometrically speaking, it's worth highlighting that the classical perspective [undergirding the concept of the horizon] coincided with the concept of the monohumanist human—the genre of human centrality where reality is conceived as optimizable in its own, familiar image, and 'knowing' is often reduced to picturing the world as a resource for human projects (p. 7).

Important to note here, especially in terms of this speculative study of a black hole and its imaging, is how the figure of the horizon not only conditions conceptual orientations, but how the concept of the horizon is *externalized* through material and technological assemblages. As Reed articulates it, geometrical concepts such as that subtending the concept of the horizon create a feedback loop in that it both demands and allows for the spatialization of time, which then gets exteriorized through technical means informing the way we understand causal relations (SFU's Vancity Office of Community Engagement, 2018). In the case of the black hole image created by the Event Horizon Telescope, for instance, the "precious discovery" at the centre of galaxy Messier 87 creates a feedback loop that both demands and affirms fundamental assumptions about the nature of spacetime and scientific legibility, assumptions which are then externalized through the creation of the computational telescope and algorithmic operations that make the "discovery" possible in the first place. The conceptual and ultimately cosmological assumptions on which the very creation of the black hole image relies are therefore rendered material, and thus *real*, through its technical manifestation.

The example of the black hole image therefore shows how concepts *come to matter quite literally*, that is, how through technological externalization conceptual development is a "matter

of practice" that participates in broader cosmological constructions and the shaping of commonsense conceptual categories. As Reed (2019c) puts it, referencing the oft-quoted aphorism "the map is not the territory," while the "map, be it a story, a drawing, a diagram, a model, or a mathematical projection, may be distinct from the territory or system to which it refers, [it nevertheless] informs the way [the territory] is conceived, rendered accessible, and imagined as a navigable entity" (p. 2). In the example of the black hole image, then, it is not the case that this image is a "fake" or that it is a "false" representation, but rather, the truth it portrays is one that is contingent upon the navigational coordinates and conceptual conditions that engender its very creation.

With such (apparent) horizons in mind, *black hole sustainability* is committed to interrogating those conceptual apparatuses that orient thought and thus current parameters for un/thinkability, which, as outlined above is not just a conceptual practice but *a material one*. It is through this interrogation of current thresholds of un/thinkability that pedagogy might act in forceful ways to resist educational futures that are delimited by purported horizons of educational thinkability. As Isabelle Stengers (2010) writes:

> [i]f learning to think is learning to resist a future that presents itself as obvious, plausible, and normal, we cannot do so either by evoking an abstract future, from which everything subject to our disapproval has been swept aside, or by referring to a distant cause that we could and should imagine to be free of any compromise. To resist a likely future in the present is to gamble that the present still provides substance for resistance, that it is populated by practices that remain vital, even if none of them has escaped the generalized parasitism that implicates them all (p. 10).

Resituated in terms of its paradoxical representational dilemmas, planetary-scale networks of computation and a dark and darkening anthropo-scenic future, the concept of sustainability central to *black hole sustainability* insists on a "better account of reality" wherein pedagogical life is alienated from its given conceptual horizons and the modes of agency such horizons project. Through this alienation, one that refuses the event horizons of predetermined possibility and the likely futures such horizons bring about, *black hole sustainability* demands both a rethinking of pedagogical agency and educational transformation.

Where typical approaches to sustainability and its education project a horizon wherein education is relaunched by sustaining its own givens and the perceived ends such givens furnish, *black hole sustainability* proceeds from the problematizing assertion that such horizons are simply an "inadequate correlation to reality" (Reed, 2019c, p. 7). As Reed (2019c) notes, while the horizon provides a short-hand label for the threshold of (human) thought, it has now come to stand in as an unquestioned "representational artefact for the monohumanist human world" in turn limiting the way in which the future unfolds (Reed, 2019c, p. 7). Reed therefore calls for an update to those (geometric, monohumanist) concepts that have come to overdetermine, in nevertheless very material ways, future trajectories and the subsequent navigational apparatuses that might emerge from such updates. *Black hole sustainability* takes on Reed's call for conceptual revision by approaching the apparent horizons of pedagogical un/thinkability, such as those imposed by education's sustainable imperatives, in terms of their potential for resituating education, both its reasons and futures. As such, *black hole sustainability* necessitates pedagogies that orient towards enduring encounters with the unthinkable and horizonless futures that lie ahead.

# CHAPTER FIVE: Energetic Investments at the End of the World (Study No. 2)

## 5.1 Interrupting the Future, Normalizing the Now

### *5.1.1 Circuit Breakers*

On March 9, 2020, also known as Black Monday, the Dow Jones Industrial Average futures market dropped by 1300 points, which, alongside drastically falling oil prices, triggered a number of *circuit breakers* on the U.S. stock exchange. These financial regulatory instruments, put in place to curb panicked selling, caused the futures market to suspend trading for fifteen minutes to allow investors and other market-makers to, well, take stock of the current situation. These stoppages were the stock market's response to COVID-19, which, two days later, would be announced as a global pandemic by the World Health Organization (WHO). Prior to the WHO designation, the novel coronavirus was already infecting economic flows around the world, bringing about panic buying/selling, skewing supply distributions and leading global banks and reserves to cut rates and offer unprecedented support to investors and markets. As early as February 20, 2020, for instance, stock markets worldwide were already closing mostly down, leading to big banks such as Bank Indonesia to drastically cut its overnight rates while the Central Bank of Brazil announced future cuts to its reserve requirements (Ayres, 2020; Hyerczyk, 2020). Meanwhile, reduction in travel and the interruption of key manufacturing activities, as well as an oil price war between Russia and Saudi Arabia, significantly impacted demand for oil, causing its price to fall drastically (Schneider & Domonoske, 2020). These drops and falls led to the 2020 stock market crash, what has now been called the Coronavirus Crash, which saw the Dow Jones Industrial Average end its 11-year bull market run, marking the fastest fall in global stock markets in financial history.

This unprecedented crash and the circuit breakers it triggered were concomitant with and followed by a range of other slow-downs, stoppages and interruptions. As travel bans were issued around the world, nations shut their borders and global air traffic came to a stand still. Curfews, quarantines, and various stay-at-home orders were announced, while businesses shuttered their doors and school closures were implemented. To the horror of the masses (at least on some areas of Twitter), even professional sports came to a quick stop when the NBA suspended its season after Utah Jazz centre Rudy Gobert tested positive for the virus. As Andreas Philippopoulos-Mihalopoulos (2020), thinker of spatial justice and "lawscapes," wrote in the

early days of the pandemic, "Covid is the disease of stoppage, of 'social distancing', of 'self-isolating' (all these new terms that will no doubt find their way in the Oxford Dictionary very soon), of no-handshakes-no-hugs, no flights, no passing through" (para. 3). Indeed, for a minute there, it seemed like time itself had stopped, or perhaps mutated in ways that interrupted its regular flows and habitual orientations. Those pressing events that had been of utmost concern just days earlier, from the 45th American President's impeachment trial to Australia's Black Summer of raging bushfires, became distant memories, or perhaps belonged to some other timeline. Time zones seemed to mutate too. No longer oriented around Greenwich Mean Time but Corona Mean Time, Italy was not 8 hours ahead of us here in Alberta, but two weeks ahead. Districts yet to be affected by the virus were in the "past," while crisis zones were in the "future," highlighting not only how the pandemic was mutating markers of time, but also how it was unfolding in dramatically different ways around the globe. As Philippopoulos-Mihalopoulos (2020) put it, "[a]t the time of writing, Italy is currently in a phenomenal lock-down stoppage, whereas the UK government is still mulling over the possibility of taking any sort of measure (and the US carries on with business as usual, which means of course the business of closing the border – again)" (para. 4).

In recognition of the unprecedented economic shutdowns, the closing of borders (again) and the other circuit breaking mechanisms that rolled out at the start of the pandemic, this perceived time of stoppage was positioned by some as a necessary, even welcome, interruption to business as usual. As queer thinker and feminist killjoy, Sarah Ahmed (2020) wrote in a blog post titled "Complaint and Survival" in March of 2020, "sometimes we have to stop what we are doing to feel the true impact of something, to let our bodies experience that impact, the fury of an escalating injustice, a structure as well as an event; a history, an unfinished history" (para. 13). In a similar vein, for Indian author Arundhati Roy (2020), the pandemic was positioned as a "portal," "a gateway between one world and the next," that has "made the mighty kneel and brought the world to a halt like nothing else could" (para. 47). Or, as thinker of queer arts of failure, Jack Halberstam, wrote for Bully Bloggers in March of 2020, "[w]ith the economy in free-fall, the government in retreat, institutions in lock-down, we might want to ask about what comes after the whole system falls to its knees" (para. 7). In these early responses, the stoppages underway were positioned in terms of their political possibilities and their potential to *speculate*

*otherwise* on future trajectories. Not unlike market circuit breakers, which are put into place by stock exchange organizations as a way to *make time* — time for information to flow between market-makers and time for institutional traders to assess their positions and decisions — for some, the early days of the pandemic *made time* for an encounter with a possible otherworld.

### *5.1.2 Negative Reverberations*

Whereas the unprecedented circuit breakers brought on by the pandemic were seen by some as a much-needed interruption to the status quo, the stock market's response was less optimistic, at least at first. In the days and weeks following the WHO announcement, the stock market continued to experience a series of drops and falls alongside growing investor concerns and negative market sentiments due to the economic fallout from the coronavirus outbreak. The aforementioned Black Monday was followed by Black Thursday, just three days later, and then Black Monday II (the sequel) just one week later, which saw Dow futures tumbling more than 1000 points once again alongside Standard & Poor's 500 futures, triggering yet another set of circuit breakers. By the end of that day, the Cboe Volatility Index closed at 82.69, the highest ever closing for the index, which measures the stock market's expectation of volatility. What had been initially deemed "The Great Lockdown," a name given to describe the then-current moment of pandemic lockdowns and travel restrictions, became known as "The Great Shutdown," highlighting how ongoing shutdowns of economic activity created an enormous negative growth shock, in turn causing unprecedented and deeply-felt recessions almost everywhere.

The reverberations of this negative growth shock were exemplified by the price of oil, which, following the Coronavirus Crash, turned negative for the first time on record. On April 20, 2020 the price of West Texas Intermediate crude dropped by almost 300%, trading at around negative $37 per barrel. The historic drop quickly sent shockwaves through the U.S. financial market, with the Dow plunging once again, further denting negative market sentiments and dampening the overall global economic outlook. Important to note here, is how this unprecedented price drop was not just a result of the pandemic and its stoppages, but signalled a *crisis of overproduction* brought on by years of the oil industry obsessively overproducing a product that was shrinking in both value and demand. As Antonia Juhasz, an oil and energy reporter, put it in an interview with *Democracy Now,* "the pandemic has taken essentially every

weakness that already existed in the oil industry and then made each of them much, much worse, leaving the oil industry in a situation where it is right now, where I would argue it is at its weakest since its inception" (Goodman, 2020). One result of this crisis of overproduction, amplified as it was through the pandemic stoppages and slow downs, was the literal halt of the movement of oil. As supply remained steady while demand struck record-breaking lows, the contemporary infrastructural formula shifted from one of circulation to one of storage as typically overtaxed pipelines suddenly started operating under capacity and oil futures traders hunted for extra space to store their crude (Ambrose, 2020a; Ambrose, 2020b).

Beyond pointing to less-than-optimistic market sentiments, the drastic fall in the price of oil and the infrastructural shifts it brought about provides a key example of how the perceived stoppages brought on by the pandemic were actually nothing of the sort. While the price of oil dropped to negative numbers and the movement of oil seemed to come to a standstill, oil producers continued to pump near record-levels of crude into the global market overwhelming storage facilities and forcing oil producers to actually pay buyers to take the barrels they could not store (Ambrose, 2020a). While supply chains stopped (for some) producing grocery store shortages and situations of food scarcity, farmers were forced to dump milk, smash eggs and destroy tens of millions of pounds of fresh food that they could no longer sell (Yaffe-Bellany & Corkery, 2020). While borders were closed and flight tickets were cancelled, thousands of gallons of fuel were burned as "ghost flights" filled the skies in order to keep their flight spots (Sillers, 2020). While some people went into isolation, working from home while tweeting their best bread recipes, others continued to offer "essential" services such as delivering Amazon packages and takeout (Dzieza, 2020). While small businesses shuttered their doors, many never to be opened again, companies such as Clorox, Netflix, Regeneron Pharmaceuticals and, of course, Amazon reported record profits for the 2020 fiscal year. While the pandemic's industrial stoppages and shifts in commuter traffic patterns showed what might be possible through global efforts to reduce something like CO2 emissions, fossil fuel companies received record bailouts and emissions have surged back to pre-pandemic levels around the globe.

While the novel coronavirus stoppages seemed to *make time,* time to examine our intimate and entangled relations and thus the very real crisis of care at hand (The Care Collective, 2020), they have now, over a year after the initial WHO announcement, been

revealed as yet another *opportunity* for strategic financial speculations. This speculative opportunity not only provides another way to manage the future, but also works to bolster and affirm the delirious logic of contemporary capitalism and its endless drive for new frontiers of expansion. In short, while, for a moment, the pandemic seemed to produce a circuit breaking event, an interruption into the current state of affairs, a pause for thought, this apparent moment of stoppage has been exposed, in hindsight, as just the continuation, and in some cases acceleration, of business as (un)usual.

### *5.1.3 Speculative Recoveries*

Hindsight is, as they say, 20/20. Situated now (at the time of writing these words), almost eighteen months since the initial Coronavirus Crash, what was identified as the most devastating financial crash since the Wall Street Crash of 1929 turned out to be actually quite short-lived. Or as Reuters reported in the summer of 2020: "[w]ell, that was quick!" (Ahmed & Randewich, 2020). The pandemic-induced bear market lasted just 33 days, marking the shortest bear market in history with the average bear market run (there have been 20) coming in around 302 days (Ahmed & Randewich, 2020). While the economic repercussions of COVID-19 are still being felt across the globe with GDP yet to return to pre-recession levels and people struggling in ways that extend far beyond financial woes, the stock market "recovery," all told, took just 150 days (Armstrong, 2020). While chief central bankers, such as Canada's Tiff Macklem, have asserted that COVID-19 will "scar" both domestic and world economies for years to come (Pittis, 2020), the stock market has largely returned to "healthy" operations even as people around the world continue to be drastically impacted by the virus and the insufficient political and economic responses it has garnered.

Indeed, as early as April 2020, the S&P went up 301 points (or 12%), marking its best performance in 46 years (Schwarz, 2020). Further, while the Dow Jones Industrial Average has had its ups and downs since the crash due to fears of second and third and fourth waves, by November 2020 it closed above its previous high from earlier in the year, marking a "complete recovery" since its bear market losses (DeCambre, 2020). As Bloomberg reported one year after the "COVID freefall," markets hailed a "happy anniversary" thanks to the development of coronavirus vaccines alongside "growing legions of first time investors, who suddenly had

plenty of time to get into the market using free trading apps on their phones" (Cohoe, 2021). With stocks gaining 79% from their lows one year earlier and markets being led by sectors that had been previously deemed unlikely leaders (i.e. energy and industrials), the market has not only "recovered" but has transformed in ways that have yet to be seen (Domm, 2021). This transformation is perhaps best exemplified through growing investments in special-purpose acquisition companies, or SPACs, which are "companies with no operations that are formed strictly to raise capital through an initial public offering (IPO) for the purposes of acquiring an existing company" (Young, 2020). Also known as "blank check companies," SPACS offer a way for eager investors to pour money into the market before they even know what the investment is for. In 2020, SPACs raised $83.4 billion US dollars, more than six times the year prior, and in the first three months of 2021 that level of investment was already surpassed (Choe, 2021). These risky investments, along with the record amounts of margin debt used to finance them, have led strategists to report that the market is now subject to a "much more volatile economy than it has been used to" (Domm, 2021).

The return to a "healthy," albeit volatile, stock market, which is often referenced by state leaders as an index of the "health" of a society more generally, however, has not meant economic recovery for all. As Canadian business analyst Peter Armstrong (2020) points out, it's important to remember that the stock market is *not the economy*: "[s]tocks are meant to reflect the *future value* of a given company's stock, not the state of Main Street today" (my italics). In this way, and as cultural theorist Aimee Bahng (2018) writes, although in principle "the future exists as absolute uncertainty," through economic practices such as those used in today's stock market exchange "financial instruments work precisely toward actualizing the future in order to monetize and profit from it." With equity markets reflecting bets on what will happen in the future, what is predicted to happen within financial futures nevertheless impacts what is going on now. Or, as philosopher and media theorist Steven Shaviro (2019) puts it, even when its pricing mechanisms are entirely arbitrary, such as in the example of SPACs above, "their very existence works to bind the future to the present" (p. 6). In the case of the Coronavirus Crash, then, the stock market's "recovery" is less the reflection of the economy, which might be otherwise characterized by major shifts in material productions and essential work, and more a reflection of the stock market's visions of the future and its underlying assets.

In this way, the stock market's "recovery" is a reflection of sentiments about the future, where the future for market speculators is always-already tethered to potentials for post-tax corporate profitability. In the case of the most recent crash, for example, the quick recovery reflects investor's bets on the future, which in this case were not only fuelled by the risky promises of blank cheque equity investments, but also innovations in "qualitative easing," otherwise known as loosened financial regulations that put a lot of "cheap money" up for grabs. Further, in addition to an injection of new investors, the stock market has largely recovered from the most recent crash because the biggest financial players were not impacted. Where companies like Netflix and Cisco and Microsoft have come out of the crash largely unscathed, in turn driving stock market gains, the speedy stock market recovery was made possible by these major player's anticipation about the financial regulatory measures and stimulus packages on the horizon. As Philip Petursson, chief investment strategist and head of capital markets research at Manulife Investment Management, reported, "[a]s of the end of July [2020], global central banks had cut interest rates 164 times in 147 days and committed $8.5 trillion US in stimulus" (cited in Armstrong, 2020). As Petursson put it at the time, even with the unprecedented bailouts of the 2008 crisis in mind, the world has never seen fiscal and monetary support like it has in the wake of the Coronavirus Crash.

Far from denting market sentiments, the response to the 2020 stock market crash has actually made many corporations more powerful than before. In Canada, for instance, reports are gathering about how the richest have become $53 billion dollars wealthier since the pandemic (Tencer, 2020) alongside growing analyses of how corporate entities have used and abused wage subsidies and pandemic aid packages (Montpetit, Nakonechny & Hétu, 2020). As numerous scholars, but also financial analysts, have asserted, the economic impacts of the pandemic have hit certain and industries and communities much harder than others, leading to projections of K-Shaped recoveries (Kost, 2021) where some parts of the population will recover, and even benefit, from the pandemic recessions, while other parts will dive deeper into poverty, in turn exacerbating the economic disparities that pre-existed the most recent crash. With these examples in mind, it is now clear that the pandemic stoppages have not interrupted the future, but have instead, *normalized the now*, characterized as it is by economic disparity, jobless recoveries and a financializing logic that places economic "health" as the utmost priority, no matter the

cost. With this in mind, the stock market's recovery has not been brought on by shifts in economic supply and demand, but has instead been made possible by processes of *speculation*, which manifest through innovative financial mechanisms and strange instrumentalizations, in turn impacting both future projections as well as perceptions of possibility in the here and now.

Transposed to this study of *Pedagogy at the End of the World*, the circuit breaking stoppages and negative reverberations brought on by the coronavirus global pandemic, alongside the various "recoveries" they have necessitated, provide another site of struggle when it comes to the question of educational futurity as it is situated amidst today's unthinkable end times scenario. While the previous chapter examined the given world of education in terms of its *sustainable* industry standards, this chapter focuses on the problem of education's *energetic investments* and the financial instrumentalization such investments entail. Positioning speculation as an important dimension of actualizing possibilities for pedagogical resistance, this chapter proceeds by returning to the financial logic and instruments that have enabled the most recent stock market recovery, this time linking speculative financialization to education and the problem of energy futurity. Key to this second speculative study, then, is not only an interrogation of education's commitment to particular *energy futures*, but also the role and import of speculation for pedagogical problem-posing today. In what follows, I probe the Industry of Education's investments in particular energy futures by interrogating the ways in which education's financial instrumentalizations have mutated from earlier understandings of the "banking model" of education (i.e. for Friere). By bringing together educational questions with the weird and weirding logic of speculative finance, I wager that pedagogy today has been subsumed under a range of troubling investments that must themselves be troubled so as to interrupt futures as usual. These troubling investments are then further interrogated in relation to the problem of energy futures by focusing on the way in which energy transition discourses have been (speculatively) instrumentalized through particular transition grammars and energy literacies. By examining the ways in which pedagogy is directed so as to affirm and sustain the Industry of Education's financializing logic, thus impacting what is deemed "realistic" or "possible" both now and into the future, this study seeks to problematize both the energetic investments that have come to characterize educational futures as well as the strategy of speculation itself.

## 5.2 Education and the Problem of Energy Futures

### *5.2.1 Strategic Reality Management*

The Industry of Education has responded to the pandemic situation through its own stoppages, as well as its own proposals for recovery. In my own neck of the woods, here on Treaty 6 Territory in the Canadian Province called Alberta, for instance, the announcement of the public health crisis surrounding Covid-19 was met with the physical closure of schools and universities. Taking up various online learning and "remote delivery" schemes (which are explored in more depth in the next chapter), schools remained closed for the remainder of the 2020 academic year in an effort to "bend the curve" and keep case numbers down. As the summer months of 2020 passed, and after the initial shock of the new pandemic reality waned, the provincial government followed in the footsteps of the stock market by offering its own "recovery" plans, including plans for school re-entry for fall 2020. Within these plans and proposals the health crisis was not framed as a crisis of care, one that had exposed the devastating levels of inequity and the central role of interdependency that makes up the social fabric of the province, but was instead positioned, above all else, as an economic hurdle. As the Alberta Government website put it, in response to the "unprecedented economic crisis due to the COVID-19 pandemic, global recession and world oil price collapse," the government has put forth a recovery plan that "takes bold action to create jobs that get people back to work, build infrastructure and diversify our economy" ("Alberta's Recovery Plan," n.d.). The main thrust of this recovery plan was to build on Alberta's "economic strengths," referring to Alberta's (dying) oil and gas industry, in order to offer "a plan for today that provides hope for the future" ("Alberta's Recovery Plan," n.d.). In short, the reality of the pandemic situation, one characterized by rising death tolls, mental health crises and devastating economic circumstances, was downplayed and denied in favour of a bold action plan oriented towards the promise of economic recovery.

In order to implement this optimistic recovery plan, the province provided a relaunch strategy, including a school re-entry plan, which was initially presented as three scenarios that could exist if and when schools reopened for the 2020/2021 academic year. While the details of these re-entry plans are worth their own analysis, what is most important for the staging of this

speculative study, is how the implementation of the chosen school re-entry plan was made possible by very specific appeals to "reality" and thus particular modes of strategic reality management. This strategic reality management was perhaps best exemplified by the contradicting desires of parents, students and teachers, on the one hand, and government officials and their recovery delirium, on the other hand. Upon the announcement of the selected school re-entry plan, one that envisioned a new normal where student and teachers returned to classroom-business-as-usual (but with PPE and social distancing protocols), parents, teachers, students and educational researchers alike raised numerous concerns about the inadequate resources, staffing needs and outbreak protocols put forward in the plan. Recognizing that a return to school was going ahead despite growing case numbers both globally and locally, various educational advocacy groups made specific demands that would better ensure the safety of teachers and students as they worked, and breathed, together into the school year.[23]

While some of the strategies were adopted (in part), the most essential demands given the way in which COVID-19 spreads, such as reducing class sizes, were denied based on appeals to the financial "reality" of the current situation. As Alberta Premier Jason Kenney put it in August 2020 in response to questions about how $260 million in federal money would be used to support students and teachers: "[t]he proposals to reduce class sizes in half are actually proposals to keep the schools shut. We appreciate the additional federal funding, but there is no world in which you could reduce class sizes in half and reopen the schools for the current school year ... It's simply *fictitious*. It has *nothing to do with reality*" (my italics, "COVID-19 in schools inevitable, reducing class sizes unrealistic, Alberta premier says," 2020). Kenney's assertion that cutting class sizes is *simply unrealistic* was not only made possible due to the inflated and inaccurate estimates of this proposed safety measure, but was also bolstered by the unquestioned reference to the economic "reality" in which we find ourselves here in Alberta. Within this reality, funding schools so that they can ensure safety during a global pandemic is *unrealistic*, but investing teacher's pension plans (to the tune of $50 billion) in an investment portfolio that props up a

[23] The Coalition for Safer School Relaunch Across Alberta, for instance, outlined a series of urgent strategies necessary for ensuring a safe and equitable relaunch for both students and education workers across the province. Among the strategies offered by the Coalition, were calls to provide adequate equipment and resources, address transportation needs, develop transparent testing and outbreak protocols, cancel standardized tests and implement variable class caps to ensure physical distancing within schools ("Coalition for Safer School Relaunch Across Alberta," 2020).

dwindling oil and gas industry is not. Within this reality, 26,000 educational assistants, bus drivers, substitute teachers and other K-12 support staff can be laid off one day under the guise of pandemic-induced austerity measures, as was the case in Alberta in March of 2020, while the next day the government can inject billions of dollars into pipelines and provincial government equity energy investments based on the unquestioned claim that pipelines create jobs, in this case, about 6,800 of them. Within this reality, the value of teachers' and students' safety and mental well-being is outweighed by the value of "getting people back to work." In short, while teachers, parents and students raised concerns about the reality of working, and assumably learning, together during a pandemic, the message from state officials was aimed at strategically managing what is deemed realistic in the first place.

### *5.2.2 Recovery Delirium*

While it might seem *irrational* to invest billions of dollars into a dying industry or to lay off some of the most essential workers during an educational crisis or to put 35 kids together in a small room during a pandemic that is spread through aerosol contagion, Kenney's appeal to reality in the example above is actually a very *rational* response within the logic of contemporary capitalism. As Deleuze and Guattari discuss in a conversation featured in Guattari's (2009) *Chaosophy*, capitalism proceeds through a very special kind of *delirium*: "underneath all reason lies delirium, drift. Everything is rational in capitalism, except capital or capitalism itself" (p. 36). Deleuze and Guattari site the example of the stock market as one such "rational" apparatus: "one can understand it, study it, the capitalists know how to use it, and yet it is completely delirious, it's mad. It is in this sense that we say: the rational is always the rationality of an irrational" (p. 36). This is evidenced by the most recent stock market recovery, which does not mark any sort of economic "health," but instead indexes the particular ir/rationality of the speculative mechanisms, be it "qualitative easing" or "blank cheque companies," through which the system functions.

With this special kind of delirium in mind, when Kenney says that reducing class sizes is "simply fictitious" and that it has "nothing to do with reality," it is not enough to simply expose this as an irrational lie or conscious obfuscation of the "reality" of the situation. As Deleuze and Guattari (1983) write, the delirium within capitalism is not a "conscious delirium" but is instead

a "true consciousness of a false movement, a true perception of an apparent objective movement" (p. 10). In the educational recovery example above, Kenney's appeal to the "reality" of the situation is a "true perception" of the financial systems that impact current economic "realities." In response to the question of what is "rational" within this reality, then, it is "the *interests* being defined in the framework of this society -- the way people pursue those interests, their realisation" (Guattari, 2009, p. 36) which, in the case of Alberta involves investments in the perceived "economic strengths" that have been naturalized as a key framework for envisioning the province's past, present and future, namely: oil and gas.

As Deleuze and Guattari discuss, while such interests are defined by societal and systemic frameworks, "down below, there are desires, investments of desire that cannot be confused with the investments of interest, and on which interests depend in their determination and distribution: an enormous flux, all kinds of libidinal-unconscious flows that make up the delirium of this society" (Guattari, 2009, p. 36). With this in mind, the recovery plans put forward in the example here are not only aimed at managing something like "unprecedented economic crises," but more importantly, these plans work to manage the reality of *desiring-production.* As Deleuze and Guattari (1983) write, desire is both autonomous and productive in its own right and thus it both defies social determination while also shaping, in material ways, social organizations. It is important to emphasize here that for Deleuze and Guattari the material character of desire signifies that which resists social meanings and ideology, as opposed to the Marxist notion that desire belongs to ideology or the Freudian notion that desire is always unproductive (Deleuze & Guattari, 1983). Desire, as a material force, runs in a *flow* that is continuous and is always *becoming* in relation to the connections and blockages through which life comes to be organized. Desire, in this way, does not comprise any sort of lack, but instead "it is an assemblage of heterogeneous elements; it is a process, not a fixed structure; it is affect, as opposed to feeling; it is event, as opposed to thing or person" (Zembylas, 2007, p. 337). Within this understanding of desire, for power to take hold it must work to orient and direct desire so as to create the social assemblages and *interests* necessary for its creation and perpetuation. By reterritorializing and recuperating locally invested desires as general interests that can be standardized and organized, dominant powers are able to manage the reality of a given situation so that bodies continue to work, exploitations continue to expand and capitalism is able to create

and then recuperate more and more outsides, even through its own stoppages and interruptions. Within this situation of *recovery delirium*, the crises being managed are not just the pandemic and its attendant public health emergencies, but the crises inherent to capitalism and its rationally irrational models and operations.

### *5.2.3 Banking (on) Education*

By recognizing capitalism's very special delirium and the reality management it necessitates, a difficult pedagogical problem emerges. Where capitalism's delirium points to how reality is managed through the manipulation of desiring-investments, it is not enough to simply expose or uncover the ir/rationality of the system through, for instance, critical pedagogical approaches. Indeed, as Deleuze and Guattari (1995) discuss, within capitalism "nothing is secret, at least in principle and according to the code […] And yet nothing is admissible" (Guattari, 2009, p. 37). Here, Deleuze and Guattari highlight how the delirium of capitalism works "in the open" while nevertheless warding against an articulation of how desire and reason are already "abnormally" redistributed in capitalism (Guattari, 2009, p. 35). In the examples of recovery delirium above, then, claims about whether proposals are "realistic" or not are not simple matters of ideology, but instead involve the material organization of desire and power, which in turn limits what is deemed realistic, even possible, in the first place.

The organization of desire and power within domains of schooling has been at the forefront of educational debate for decades now. Concerns about the neoliberal hegemony of the Industry of Education, for instance, have been raised by numerous scholars who critique, albeit in differing ways, how education's economic organization works to stifle and negate efforts to enact effective pedagogy while simultaneously reproducing systemic inequities, dehumanization and instrumentalization of students, teachers and researchers alike. One such critique can be found in Pablo Friere's (2005) now-canonized work *Pedagogy of the Oppressed*, which describes education as "fundamentally narrative (in) character," where the narrative is one that is analogous to a *banking model* (p. 71-72). According to Friere, within the educational narrative of the banking model, the teacher is positioned as an active subject that "issues communiqués and makes deposits" that the student, as passive object, can "patiently receive, memorize, and repeat" (p. 72). Key to the Friere's articulation of the banking model is a transmission mode of

education, one wherein students are positioned as "adaptable, manageable beings" whose main purpose is to "store the deposits entrusted to them" and "accept the passive role imposed on them" (p. 73). By taking on this work, students 'capacity for developing "critical consciousness," an aim that Friere asserts is the raison d'être of liberal education, is thwarted. That is, the more that students accept their passive role in the banking model, the more they tend to adapt to the reality presented to them rather than try to change it. As Friere writes, "[t]he capability of banking education to minimize and annul the students'creative power and to stimulate their credulity serves the interest of the oppressors, who care neither to have the world revealed nor to see it transformed" (p. 73). By producing subjects that can be led to adapt to any given situation, say, for instance, a global pandemic, domination and ongoing oppression is made possible. Or as Friere puts it, "[e]ducation as the exercise of domination stimulates the credulity of students, with the ideological intent (often not perceived by educators) of indoctrinating them to adapt to the world of oppression" (p. 78). As Friere asserts, however, this "world of oppression" can and should be confronted and overcome; this is the work of a pedagogy of the oppressed. As Friere asserts, the aim of education is to expose the contradictions inherent within the banking model, characterized as it is by its delusions of discrete deposits and straight-forward transmissions, so as to transform both education and its subjects. The pedagogical revelation of contradictions, according to Friere, can "lead formerly passive students to turn against their domestication and the attempt to domesticate reality" towards the perception of reality as "*a process*, undergoing constant transformation" (p. 75). For Friere, this process is otherwise called *conscientizacao* or conscientization: the process of learning to perceive social, political, and economic contradictions so as to take action against the oppressive elements of reality.

This process is not only key to emancipatory educational practices, but, importantly within Friere's thought, is key to "becoming more fully human" (p. 71). As he writes, "any education that is committed to liberation must reject the banking concept in its entirety, adopting instead a concept of women and men as conscious beings, and consciousness as consciousness intent upon the world" (p. 79). As Friere asserts, this means abandoning educational goals oriented towards "deposit-making" and replacing them with the "posing of the problems of human beings in their relations with the world" (p. 79). Through this "problem-posing" approach, education is repositioned as a site for the "constant unveiling of reality" (p. 81).

Whereas banking education proceeds by "mythicizing reality" thus directing the ways in which human beings exist in the world, Friere's problem-posing education is focused on "demythologizing" through dialogic unveilings and critical thinking (p. 83), which in turn can lead to liberating trajectories of human actualization. At the same time that Friere's problem-posing approaches redirect the aims and goals of education, so too do they reposition students and teachers. Whereas banking education views students as domesticated objects, problem-posing education makes them critical thinkers capable of reflection and action upon reality. Problem-posing education, in this way, responds to what Friere sees as the "vocation" of human being, which for him is founded on the claim that human being is most "authentic" when it is "engaged in inquiry and creative transformation" (p. 84). As Friere sums it up, "banking theory and practice, as immobilizing and fixating forces, fail to acknowledge men and women as historical beings; problem-posing theory and practice take the people's historicity as their starting point" (p. 84). For Friere, then, the banking model of education affirms a view of the world as static and unchangeable and thus students are supposed to fit into it as it is. Problem-posing education, on the other hand, affirms that human beings, especially when they are engaged in creative transformation, can and should transform the world, and that this is, in fact, the very vocation of human being.

While Friere's banking model analogy provides one way to understand the manner by which the world "'enters into' the student" (p. 78) thus influencing both the production of (human) subjectivity and perceptions of reality, its mode of critique is founded on the assumption that if ideology is exposed it can be overcome. Transposed to today's unthinkable situation, and specifically with the delirious, albeit material, operations of financial capitalism in mind, problem-posing approaches that aim towards ideological demystification are exposed in terms of their limits. As Jason Wallin (2012) points out, "while the banking concept continues to be a productive tool with which to detect deliberate forms of social repression, it does not yet approach the way that banking itself is cut from an irrationality carried throughout its forms of social actualization" (p. 240). Where state leaders push forward more pipelines, privatization and austerity measures through appeals to "being realistic," which, again, are not outright lies so much as they are reflections of current economic "realities," both students and teachers are positioned as necessary circuits within today's financial operations and the realties they

necessitate. This is not to say that the Industry of Education has moved away from banking practices and financial logics, but rather, this is a recognition of the strange ir/rationality that now undergirds contemporary banking and its institutions, including its educational ones. As Wallin (2012) puts it, "the traditional analogy that schooling functions as a mechanism of accumulation and containment has been superseded by one of perpetual circulation in which the student is more fully integrated into the circuitry of semio-capital exchange" (p. 234). Where, for Friere, the pedagogical problem of the banking model is the way in which it indoctrinates students into a world of oppression, the pedagogical solution is to teach students how to perceive contradictions so as to overcome oppressive realities through active conscientization. Updated with today's financial operations in mind, the banking model is still relevant, albeit in ways that have been deformed and mutated. Situated within the contemporary economic "reality," the pedagogical problem raised by today's banking models is the way in which they function through *energetic investments,* which are not ideological, but instead operate "in the open" through the deterritorializing movements inherent within contemporary capitalism and its speculative financializations.

### *5.2.4 Troubling Energetic Investments*

The use of *investment* here is purposeful, and refers not only to education's banking models and financial instrumentalization, but also an understanding of investment as it relates to the production of affective assemblages and circuits of desiring-production. Where, drawing on Deleuze and Guattari, life is freed from its organicist and foundational models, instead signalling continuous flows, but also stoppages, then it must be rethought in terms of the ways in which *certain* life comes into being through its affective, or energetic, investments (Colebrook, 2002). Life, in this sense, is co-constituted by a dynamic swarm of interactions and encounters from which distinct lives, including the life of human subjects, are formed. In short, and as Colebrook (2002) summarizes, a body makes certain affective connections, or investments, which, in turn create what it is to be a subject, to be a human (p. 61). Investment, in this formulation, refers to that which *produces* an assemblage of bodies, which is always a material affair.

This understanding of investment is exemplified in contemporary banking models, which are not so much invested in oppressive transmissions and deposit-making forms of subjectivity,

as Friere might have it, but are instead invested in the *management and direction of desire*. As cultural theorist Ian Buchanan (2008) writes, referencing the work of Deleuze and Guattari, "if one wants to understand how desire is induced, managed, and channeled into socially sanctioned avenues, then one needs to understand how banking works, for it is banks that orchestrate [the]… arrangement of filiation and alliance" (p. 108). For Deleuze and Guattari, money is a tool for initiating, modulating and multiplying the flows of desire and as such the money form not only "determines the ways ideologies, politics, and culture get expressed" but, importantly, "shapes the dispositions and desires of those who are beholden to money's built-in demands (i.e. profit, repayment etc)" (Tiessen, 2018, p. 140). As Deleuze (1995b) writes, "beyond the state, it's money that reels and money that communicates" (p. 152). The example of money demonstrates how, through investments of desiring production organizations are formed in quite literal ways — organizations of bodies, communities, societies — and thus it is investment that connects groups, not some underlying identity or ideology. Nevertheless, investments are reinterpreted through representational schema and read as signs that are taken to be given to some pre-existing reality (Colebrook, 2002, p. 108). It is through such interpretations that desiring investments are conflated with *interests*, which in turn obscures the troubling investments that capitalism necessitates.

Recognizing this interpretive process, this study is invested in examining today's banking models and the financial instrumentalizations they produce in terms of the troubling investments — the affective assemblages and circuits of desiring-production — that now condition education and its projection of energy futures. As cultural theorist, philosopher, teacher and K-punk blogger, Mark Fisher (2009) writes, any reclamation of political agency today must, above all, come to terms with "our insertion at the level of desire in the remorseless meat-grinder of Capital" (p. 15). As Fisher (2009) develops via the concept of "capitalist realism," where reality itself is characterized by the widespread belief that capitalism is not only the most "viable" economic system, but that "it is now impossible even to imagine a coherent alternative to it" (p. 2), strategies aimed at countering this realist impulse must account for the way that capitalism is both "a hyper-abstract impersonal structure *and* that it would be nothing without our co-operation" (my italics, p. 15). With this in mind, moral critiques of capitalism and ideological demystifications may emphasize its strategic modes of suffering and diagnose its exploitative

fictions, but such approaches also work to reinforce capitalist realism (p. 16). Fisher's assertion here is evidenced by the examples of recovery delirium outlined above, where the normalization of the newest crisis has produced a situation in which repealing or dismantling that which brought the (economic) emergency about, say, for instance, a dying oil and gas industry, is simply unimaginable.

Yet, far from signalling some overdetermined, static reality defined by ideological constraints, the examples of recovery delirium above demonstrate how the "reality" of capitalist realism is itself able to transform and mutate so as to permit ongoing capitalist deterritorializations and the creation of ever-more outsides. While Friere's banking model problematizes education and its oppressive operations in terms of the financial mechanisms that *limit* students' creative power, today's banking models and practices work towards the *unlimited* proliferation and perpetual circulation of energetic investments so as to constantly innovate the creation of new outsides. As Tiessen (2018) writes, where theorists sometimes "predict or at least pine for the end of today's rapacious form of capitalism, expecting it to collapse in on itself or self destruct" such projections merely work to obscure the way in which capitalism is able to consistently overcome its own thresholds and boundaries (p. 144). As evidenced by the ongoing recovery deliriums that make up today's pandemic responses, capital is "so dependent on its outsides that it is prepared to make considerable investments, for instance in prospecting and research, to ensure the constant reproduction of these outsides" (Mezzadra & Neilson, 2017, p. 190). A major aspect of these "considerable investments" is the investment of desire within current economic systems, which, in turn, works to affirm and reproduce its ir/rational parameters. As Fisher (2009) writes, "'[b]eing realistic' may once have meant coming to terms with a reality experienced as solid and immovable. Capitalist realism, however, entails subordinating oneself to a reality that is infinitely plastic, capable of reconfiguring itself at any moment" (p. 54). Given capitalism's plasticity, the task for pedagogical resistance is mutated from one aimed at uncovering and unveiling current power dynamics and oppressive structures towards the task of navigating the deterritorializing forces of capitalism and the speculative instrumentalization that undergird its necessary deliriums. As Wallin (2012) writes, a "focus on ideology alone does not address the way that desire is already invested in the organization of power" (p. 236). Thought in terms of the deterritorializing forces of capitalism, oppression and

domination can no longer be understood, let alone overcome, in terms of ideological revelation and critique. Instead, we need to examine the way in which banking models and practices, which now characterize educational domains, condition what is deemed realistic, even possible, in the first place.

### *5.2.5 Energy Emergencies*

With these troubling investments in mind, this speculative study takes off from the assertion that the Industry of Education is now experiencing a series of *energy emergencies.* Beyond signalling crises of overproduction or the need to transition away from "dirty" forms of energy, the energy emergencies referenced here take place *at the level of bodies*, including the bodies of teachers and students, where *affective energies* are directed, modulated and reinvested so as to affirm and reproduce the ideal subjective formations that support those appeals to "realism" required by education's industry standards. Drawing on Deleuze and Guattari, affective energies do not refer to emotional states and feelings, but instead name the material energies that circulate throughout *all life* processes, including pedagogical ones. Taking place at the affective level, the energy emergency central to this study is quite different than what is usually presented within discussions of energy futures. As unfolded in the following sections, the question of "energy futures" are not only a central concern for contemporary speculative finance, but also show up within broader discussions of environmental and social justice situated within today's anthropo-scenic scenario. *Energy transition*, for instance, has become a "mantra for the present," especially in its more typical, "easy to grasp" narrative that outlines how fossil fuels have contributed to rising CO2 levels and climate change, leading to the need to "transition" to the use of "cleaner" energy to ensure a better outcome for the planet (Simpson & Szeman, 2021, p. 77). The problem of energy futurity posed within typical discussion not only signals "the end of oil," but also the need to innovate technology and develop alternative, so-called "greener," energy sources so as to mitigate the eco-crises brought on by fossil fuel powered ways of life. My own study of energy futures is situated within this broader context, but zooms in on the way in which the Industry of Education affirms and reproduces specific energetic investments, which in turn impact educational futurity. As such, this investigation of energy futurity focuses on the

energetic investments that support today's recovery delirium and the dispersive atmosphere of *anxiety and fatigue* created in its wake.

In addition to highlighting the ir/rational sense of realism that that has come to undergird education and its reasons, the "new normal" brought on by the pandemic within educational spaces, such as schools, has produced a tiring situation characterized by widespread anxiety, which is nevertheless made "secret" through non-recognition. This fatiguing situation, which is felt by teachers, students, administrators and parents alike, has been communicated through numerous reports and surveys that attempt to express the major toll that pandemic normalcy has taken on educational subjects. After the first few weeks of the 2020 school re-entry in Alberta, for instance, the Alberta Teacher's Association released a survey to check in on how teachers and administrators were adapting to the new normal brought on by the pandemic situation. In addition to expressing that physical distancing was "never," "rarely" or "occasionally" observed in school spaces as well as concerns about the ineffectiveness of screening tools and communication strategies between schools and parents, the survey results highlighted that "ninety-four per cent [94%] of teachers and school leaders reported being fatigued by the end of the day, while ninety-five per cent [95%] reported high levels of stress and eighty-one per cent [81%] reported feelings of anxiety" (Dryden, 2020). Meanwhile, reports continue to roll out about the mental health pressures felt by students of all ages, who express feeling alone, overwhelmed, drained and burnt out by the new normalizations of pandemic schooling. While these examples highlight the situation in my own context, they echo the broader sentiments of all those educators who have not had voices in reopening plans, all those who have had to teach both online and in person while, in some cases, having to also educate their own children, all those who are working twice as hard while resources are reduced or removed, and all those who are expected to do everything virtually, or virtually everything, and to do it with a smile.

While reports of widespread burnout, stress and anxiety keep rolling in, both within the domain of education and across social life more generally, this taxing situation has not been treated as a catalyst for interrogating education, its practices and reasons. Instead, this anxious atmosphere has been *normalized* as a necessary adjustment or adaptation to our current reality. When, for instance, Alberta Premier Jason Kenney told teachers that capping class sizes was a fictitious proposal, he was also saying that teachers and students must adapt to the "new" reality

before "us," even when lives are at stake. As a result, the weariness and anxiety that come with teaching in a school during a global pandemic become "public secrets" that actually work to perpetuate such troubling conditions. As researcher of anxiety Adam Kingsmith (2016) writes, "[a]s long as the dominant affect of anxiety is a public secret, it remains effective, and strategies directed against its sources cannot emerge." While government officials continue to assure us, at least here in Alberta, that "we are in this together," the public secrets of anxiety and fatigue that are felt more broadly are normalized by reframing these problems, and thus their treatment, as an individual concern.

The ubiquitous atmosphere of anxiety, which is normalized and downloaded as an individual concern, is not new to the pandemic situation, but part of the broader affective milieu produced by contemporary capitalism and its ir/rational operations. As the Institute for Precarious Consciousness (2014) outlines in their article "We are all very anxious." "[t]oday's public secret is that everyone is anxious." Highlighting the way in which each phase of capitalism has a dominant reactive affect, which is induced by its dominant forms of power — i.e. in the modern era the dominant reactive affect was misery; in the Fordist period, boredom — the Institute for Precarious Consciousness asserts that the dominant reactive affect within today's capitalist milieu is now *anxiety*. Like the reactive affects before it, anxiety is not just a symptom of capitalism, but is an ontological state selected for by capitalism as a necessary driver in overcoming its own limits thus ensuring its perpetuation. As Kingsmith (2018) writes, "[a]s capitalism is always redefining its own limits, it constantly comes into crisis and recomposes and reterritorialises around new affects" (p. 3). This is not to say that anxiety is new under contemporary capitalism. What is new, however, is how "anxiety now subsumes the whole of the social and emotional field, rather than being concentrated in specific spaces such as sexuality" (Kingsmith, 2016). Due to this penetration into all areas of life, anxiety within capitalism has become "reactive and personalized" leading to a range of new (and old) *management strategies*. As Kingsmith (2016) puts it:

> from New Right discourses blaming the poor for poverty, to contemporary therapies which treat anxiety as a neurological imbalance or a dysfunctional thinking style, a hundred varieties of management discourse — time management, anger management, parental management, self-branding, and gamification — all offer anxious subjects an

> illusion of control in return for ever-greater conformity to the capitalist model of subjectivity.

Anxiety management strategies operate by "treating" anxiety through the promise of affirmative and individualized measures, which, for instance, tell people that anxiety can be overcome through positive thinking or better management of one's energy. Within such proposals for the strategic management of anxiety, the problem of anxiety is framed as a personal, psychological problem and the sources of anxiety are obscured, thus leaving the social and economic causes of today's energetic emergencies unaddressed. As a result, affective energies are reactively trapped within the forces of capital-induced anxiety, which in turn disempowers and dividuates populations by turning them against each other and themselves.

In my own teaching experiences, this is perhaps best exemplified by the way in which assessment is practiced, and normalized, within formal education institutions, such as universities. As a (precariously employed) undergraduate instructor in an education department, I have spent countless hours and seemingly endless energy on *performing* assessments which, in my mind, are largely antithetical to pedagogical processes. The fatiguing nature of assessment protocols, which are ultimately oriented around providing numerical data that can be recuperated within broader systems of accreditation, is not just due to the energy expenditures related to thoughtfully reading student work and offering feedback, which are actually necessary to supporting student learning. Instead, what makes these practices so tiring is the energy it entails to navigate the pressure "to mediate between the post-literate subjectivity of the late capitalist consumer and the demands of the disciplinary regime" (Fisher, 2009, p. 24-25). The performance of institutionalized assessment positions students and teachers in a customer-service provider relationship modelled after the relations that characterize late capitalism, while also requiring disciplinary measures that pit students and teachers against each other, but also against themselves. Whereas energy could be spent on a whole range of collective pedagogical tasks and inquiries, instead it becomes invested in those interests necessitated by education and its assessment protocols. It is this energetic expenditure that contributes to an overall sense of fatigue. Similarly, in the example of education's recovery delirium, the fatigue felt by so many is exacerbated to unsuspected limits, to the point that the unworkable atmosphere of burnout, stress and anxiety are no longer conceived as such. As part of a new sensorium under contemporary

capitalism, "fatigue arises as the preeminent *affective tonality*" (my italics, Abril, 2019). This affective tonality is exemplified through the Industry of Education, where teachers are not only drained and distressed due to the physical and emotional work that comes with teaching amidst a global pandemic, but due to the way that affective regimes and desiring-production is managed so as to restrict, block and redirect affective energies in ways that can be reinvested in the system. *This* is the energy emergency, one that raises difficult pedagogical questions about how to counter-act today's affective tonality, which drains and fatigues bodies, keeping them from collectively organizing while profiting off of various affirmationist doxa that continue to promote positive thinking and other standardized optimisms even, or perhaps especially, when things feel increasingly grim. Framed in this way, today's energy emergencies provide an important, albeit unthinkable, challenge for practicing pedagogical resistance.

As investigated in the next section, given the speculative financialization of education, including its *derivative innovations*, its *lifelong recalibrations, risky reforms* and its ongoing investment in the production of *spectacular frontiers*, what is needed now are not just better tactics for communicating the problem or confronting preemptive control or circumventing institutional misery. Instead, what is required are both short and long term strategies for disrupting habitual subordinations by combatting those affective management strategies that direct and diffuse educational energies. The question for pedagogical resistance is, in this way, less about building better awareness or deconstructions of dominant forms of power and oppression, but instead how to re-direct, or *transition*, pedagogical energies towards active, albeit speculative, configurations of sufficient power capable of interrupting the normalization of anxiety and exhaustion today. Considering the energetic emergencies unfolded here, I assert that *the problem of energy futures* thus involves conversations that extend far beyond how to transition to renewables or away from fossil fuels, towards grappling with today's energy emergencies in terms of energetic investments and reality management strategies. In the following sections, I further probe the problem of energy futurity, which is examined, first, in relation to *speculative finance and the derivative recalibration of uncertain futures* and, second, in terms of broader discussions of *energy transition*. By bringing the question of pedagogical resistance in contact with these two lines of energy futurity, I aim to trouble the energetic

investments that have come to define education's energy futures so as to create a very different trajectory for energetic speculation today.

## 5.3 Speculative Financialization & the Derivative Recalibration of Uncertain Futures

### *5.3.1 Energy Futures Trading*

Alongside the "recovery" of the stock market, by the end of 2020, the price of oil had also "recovered" with the price of WTI crude oil sitting around $48 per barrel as of December 24, 2020. This "end of year rally" for oil futures was not only attributed to the vaccine trajectories that have brightened market sentiments, but was made possible by a series of unprecedented stimulus packages designed to support financial markets, employers and households alike (Kimani, 2020). While economic analysts highlighted that oil prices would fail to reach the same price levels recorded before the coronavirus outbreak in 2020 (Ambrose, 2020c), oil companies have continued to invest in fossil fuel production with recent reports that the world's governments, in fact, plan to produce more than double the amount of coal, oil and gas by the year 2030 (Reuters, 2020). This over-productive zeal, which as outlined previously is what led to the dramatic drop of oil prices in the first place, is not only a result of Big Oil's relentless commitment to profit-making exploitations, but points to how the speculative financialization of oil plays an important role in both today's economic crises as well as its innovative solutions and, as such, is a central force for determining today's *energy futures*.

Energy futures, stocks and bonds, derivative financial contracts, hedge funds, fungible instruments, shorts and bubbles, abstractions and regulations, these are just some of the terms and concepts that circulate within the domain of what is called *speculative finance,* or *futures trading,* today. Speculative finance is broadly defined as "the act of conducting a financial transaction that has substantial risk of losing value but also holds the expectation of a significant gain or other major value" (Chen, 2020). Speculative finance first gained steam in the 1970s, and, as Johnson (2015) notes, "marked a profound turning point in the history of global finance and set the stage for its entwinement with the oil business in the following decades" (p. 198). While the financialization of oil is actually a somewhat recent phenomenon, it has nevertheless gained incredible momentum since its inception, with oil now the most actively traded commodity in the world (Johnson, 2015). Energy futures are just one example of the speculative

operations that now characterize contemporary economic practices and banking models. As Steven Shaviro (2019) writes, the reality of contemporary finance is that "all economic activity, no matter how physically real or productive, is refracted through, and largely governed by, the abstract calculative mechanisms of financial speculation [where] the object of such speculation is always the future, with its chances and its differences from the present" (p. 5). Speculative finance, in this way, is always implicated in the future, always invested in both the risks and potentials that the uncertain future holds. As Bahng (2018) explains, within speculative finance "economists apply mathematical algorithms to render their extrapolations more supple, accurate, and complex, [and thus] the market in financial derivatives—tethered notionally to its underlying assets—relies on an engine of speculation, extrapolation, and projection to render value out of the not yet" (p. 2). In addition to investing in the future, then, speculative finance is invested in specific banking models and practices that affirm its internal, albeit delirious logic, so as to consistently deterritorialize its own outsides and further securitize its investments in the future.

This delirious logic is exemplified in the domain of energy futures by the "paper barrel" or "paper crude," a financial product that does not refer to the actual delivery of oil in the future, but instead refers to the *price* of oil in the future, which itself has become a tradable commodity. As human geographer Leigh Johnson (2015) writes, "[s]ince the trading of paper barrels does not require the physical exchange of a commodity, prices fluctuate rapidly and can move independently of material changes in physical supply or demand" (p. 199). These future-oriented projections, in turn, have strong impacts on oil futures prices in the present, due to the way that they overreact to such forecasts through high mobility operations that are not afforded by markets in physical deliverables. Referencing the example of paper barrels, Johnson discusses how futures contracts have shifted away from their original formation, which required the "delivery" of some underlying commodity, towards a scene wherein the vast majority of futures contracts are now "settled by monetary transactions to cover the difference between the current spot price and the futures price" (Johnson, 2015, p. 198). Through financial mechanisms such as paper barrels, oil futures and their highly liquid, so to speak, trading platforms have led to "a temporal inversion in which futures prices typically '*lead*' spot prices, rather than vice versa" (Johnson, 2015, p. 199).

Returning back to the example of the most recent financial "recovery," the upsurge in the price of oil is not so much an indicator of changes in material circulations related to supply and demand, but instead reflects forecasts and perceptions about *future conditions* in the oil market, which remain largely positive. Again, and not unlike broader market sentiments, the upward trending price of oil reflects bets on the future of oil and its industries, which have already reaped the benefits of new financial stimulus apparatuses even as the demand for oil continues to dwindle. As the example of paper barrels shows, the financialization of oil, including its price "leads" and price recoveries, involves speculation, which not only projects particular (oil) futures, but also impacts current realities. It is this same mode of speculation, I argue, that now undergirds the Industry of Education and its own energetic investments in uncertain futures. This assertion is explored in more depth below through an examination of the derivative abstractions and risky reforms that now characterize the Industry of Education's management of uncertain futures.

### *5.3.2 Managing Uncertain Futures*

In addition to paper barrels, today's financial speculations now involve a wide array of tradable assets including real estate, fine art and pork bellies but also stocks, bonds, currency and other forms of *derivative contracts*. A derivative is one type of futures contract, a contract whose value is based on "something else," where the "something else" refers to a confusing array of "underlyings": "[t]he value of the derivative financial contract could depend on anything from the price of copper, to the price of a particular financial security (a bond or an equity), to the temperature, to a default on a payment, to the price of *another* derivative-contract (as in the case of an option on a futures-contract)" (Norfield, 2012, p. 105). Derivatives, then, are involved in the transmission of value from one source to something else. Within this transmission, "an attribute of [an] original expression [of value is] combined with like characteristics, a variable factor that can move in harmony or dissonance with others" (Martin, 2015, p. 51). Key to a derivative's transmission of value is therefore the process of *abstraction*. Where commodities have traditionally appeared as "unitary things," where "particular, concrete labors become abstract labor [and] particular commodities extruded from their factories all embody some quantity of that labor" their exchange value is determined by processes of abstraction (Wark,

2017, p. 4). Within this traditional understanding of commodity formation, abstraction relies on "a whole hidden world of production, where particular labors are themselves commodified and combined, where products are made and a surplus labor extracted" (Wark, 2017, p. 3). But, as Mackenzie Wark (2017) asks, what if such processes of abstraction "didn't stop at abstracting from the body of the worker, the object produced, and the individual subject as consumer?" (para. 4). What if, in addition to the abstraction of labour, commodities and consumers, there is now another form of abstraction wherein the component flows of commodification can be even further "subdivided, valued, combined and sold again and again in the form of a financial instrument?" (Wark, 2017, para. 5). It is this form of abstraction that is produced through the derivative and its speculative operations.

As Wark (2017) writes, "on top of the quantitative abstraction of the energetics of production is a quantitative abstraction of the *information* about all of the possible future states of that system. […] each of which can be separately priced and sold" (my italics, para. 5). What the derivative form highlights, then, is how financial markets are involved in *knowledge aggregation* in its purest form. Positioned as a purportedly self-regulating distributor of prices that combines knowledge from individuals, who are undoubtedly driven by their known preferences and self-interests, the market is the sum of all knowledge provided by individuals, which cannot be mastered because individuals are only ever privy to incomplete information. Here, the economy acts as a device for converting knowing into being, but as Wark notes, "one has to believe in it in order for it to deliver wealth" (para. 32). That is, where "[k]nowledge is not given to anyone as totality," where only the market can enact that perspective, today's financial logics and their derivative innovations are not just indicative of a world of "fictitious capital," but point to the way in which financial logics are integrated in all areas of life, from housing to health to education (Wark, 2017, para. 33). As Wark writes, "[e]ven daily life becomes financialized, and anyone with either money or debt works a second shift managing these assets and liabilities" (Wark, 2017, para. 43). This everyday financialization manifests in the Industry of Education, which is itself involved in modes of economic abstraction that conflate "good" pedagogy with the production of educational goods and services. Not unlike the abstractive functions of derivatives, which constitute a totality, an aggregate of all knowledge available at the time of their abstraction, the Industry of Education's economizing logic "perform[s] a

dispossession of self and ownership" (Martin, 2015, p. 78) by correlating pedagogical possibilities with economic demands, which can be calculated in advance as a perceived totality.

While there are many "underlyings" that influence the value of derivatives, what characterizes derivative contracts is the way in which they are always associated with the construction of *risk* as a tradable commodity. As Wark (2017) writes, "[d]erivatives increase opacity, amplify volatility and risk. They then treat the volatility they produce as a horizon for their own opportunity" (para. 43). In this way, and as Bahng (2018) puts it, "[d]erivatives function as insurance policies, working to hedge against the uncertainty of speculative futures" (p. 2). It is through derivative contracts that investors are able to hedge against the occurrence of unpredictable adverse events, while at the same time permitting speculative returns based on bets on the chances of the derivatives contract itself. The revaluing of risk is exemplified by the stock market's treatment of environmental crises, which do not signal developmental problems for capitalism but instead offer new frontiers for debt formation, the accumulation of finance capital and risky investments. As communication scholar Matt Tiessen (2018) writes, "there's a lot of money to be made from the Anthropocene." Tiessen (2018) discusses how "most of today's institutionalized barbarism and eco-destruction - a vast majority of life's most heinous crimes and catastrophes - were facilitated through bankers' use of computers, privately and digitally created money, credit checks, and crediting international bank accounts" (p. 137-138). Importantly, and as Tiessen notes, this is not just the fault of some greedy millionaires sitting around scheming on how to be more evil, but because the system of capitalism *requires* the creation of new outsides so as to reproduce its reasons and ir/rationalities. Where, as Tiessen puts it, "the banks benefit by creating money for both oil exploration and oil spill cleanup" (p. 140), environmental destruction and civilization collapse provide important sites for new, more intensive rounds of money production through debt-formations and the creation of credit. As Thiessen (2018) writes, 97% of the money in existence today takes the form of digitally-generated credit, that is, credit that has been created out of nothing by banks. This *ex nilhio* creation of money is nevertheless accounted for, in economic terms, through the concept of *debt,* where debt does not refer to any sort of borrowing, but instead to the *creation* of money. Where privately generated credit now undergirds the very structure of contemporary finance, economic

production today is more often than not defined as a "process of debt formation" (Tiessen, 2018, p. 136).

This revaluation of environmental risk also shows up in what Johnson (2015) calls "hurricane derivatives," the phenomena wherein weather derivatives are used to hedge risks to energy sectors, an innovation that was developed in response to the crisis of insurability brought on by the 2005-2008 hurricane seasons. As Johnson puts it, this crisis of insurability "motivated the development of — and growing reliance on — a number of new financial instruments and meteorological forecasts that rendered the region's weather risks into tradable instruments for hedging and speculation" (p. 196). In the example of hurricane derivatives, these financial instruments are involved in the creation of "spectacular investment frontiers" and thus the production of "value," which in these cases, is correlated to risk and volatility (Sullivan, 2012). As such, hurricane derivatives offer a conduit through which energy futures are both imagined and traded: it is this "contradiction of environmental precarity and financial resilience [that] both enables and requires a conceptual bracketing of intergenerational time, consonant with the oil industry's perpetual deferral of its end times and energy transition" (Johnson, 2015, p. 209). Put otherwise, where the banking sector is able to decide what is worthy of investment, in the form of debt-formation or revaluing volatility, it is also able to decide what our world looks like tomorrow. And so, while teachers are told that proposals for reducing class sizes are fictitious, that they are unrealistic or simply too expensive, money is literally being created out of nowhere to fuel more and more environmental destruction.

Derivatives trading, including the weird phenomenon of hurricane derivatives, has only grown since 2008, fulled by changes in government regulation and monetary policy combined with market-makers' ongoing attempts to boost declining profitability through ongoing financial *innovation*. As Norfield (20120 puts it, "financial innovation' was an easier way to make money than productive investment" (p. 129). However, while such innovations may have helped to postpone the crisis, they did so by "adding fuel to a speculative boom," ultimately making the crisis much worse (p. 129). With this in mind, analysts and policy makers have called for *reforms* to futures trading markets so as to guard against a repeat of the crash. As Norfield (2012) notes, these reforms, more often than not, "ignore the fundamental determinants of the financial crisis, assuming it to be a failure of regulation" (p. 103). That is, these reforms understand

financial crises as problems that can be approached through better regulation and accounting, thus ignoring the way in which financial innovation is itself an integral part of capitalist growth and financial expansion today. In response to its own crises, the Industry of Education has also developed a range of reforms aimed at revaluing risk and redressing crises, which, like their financial counterparts, have directed future trajectories while also conditioning current practices and their underlying rationalities. For instance, in response to the crises that have been identified by major educational bodies such as the OECD — crises such as shifting global economic power relations and complex technological and planetary transformations — educational futurity has been directed by calls to reform education so as to respond to the problem of an unknown future. Directed towards the production of an education after education, one oriented towards, for instance, more "sustainable" practices capable of sustaining a "good" future for "us," educational reforms often champion education's capacity to innovate its own purposes and protocols so as to overcome the problem of the future. Here, the Industry of Education produces its own derivative futures contract, in the form of educational policy and curriculum, whose value is based on the projection of a future defined by economic demands as determined in the here and now. The "underlying" here is educational futurity itself, which works as an insurance policy to manage the risk of an otherwise unknown and unknowable future. By betting on a particular educational future, one that remains tethered to education's industry standards, the Industry of Education's derivative innovations hedge against the occurrence of adverse future events while also garnering speculative returns that ultimately reinforce education's given parameters.

### *5.3.3 Lifelong Recalibrations*

The derivative abstractions and risky reforms through which the Industry of Education manages the problem of education's uncertain futures not only involve innovating education's content and processes, but, importantly, involves particular energetic investments on the part of educational subjects. The use of investment here, once again, refers to the ways in which affective assemblages and circuits of desiring-production produce bodies, and thus how *certain* life comes into being through its energetic investments. This process of energetic investment, which, in turn, moulds educational subjects so as to affirm and reproduce education's industry standards, is exemplified through the Industry of Education's demand for *lifelong learning*. As

the OECD outlines at the very onset of their report on "Trends Shaping Education" (2019b), the report's very aim is to explore the major "economic, policy, social and technological trends affecting the future of education, from early childhood through to *lifelong learning*" (my italics, p. 9). In this instance, lifelong learning is positioned in terms of "living longer, living better" and oriented around questions such as "[w]hat is the best way to promote a culture of learning throughout life?" and "how can [this culture of learning] be extended to not only be life*long*, but life*wide*, touching on all aspects of well-being more generally?" (p. 10). Similarly, in Education for Sustainable Development (ESD) discourses, lifelong learning is positioned as an integral part of "quality education" aimed at bringing about more sustainable futures (UNESCO). At the local level (for me), Alberta Education is also invested in the development of lifelong learners, or as they put it in the most recent Ministerial Order on Student Learning (2020), students will "become life-long learners, who will cultivate the virtues of wisdom, courage, self-control, justice, charity, and hope" (Alberta Education, 2020). Within these examples, lifelong learning is seen as a pedagogical "good" based on its impacts on both short and long term economic growth.

Within this educational orientation, which is now commonplace across the industry, students are positioned as self-controlling and self-directing agents oriented towards "limitless postponements" wherein "one is never finished with anything" (Deleuze, 1992, p. 5). Taking part in contemporary capitalism's dispersive modes of control (Deleuze, 1992), the ideal figure of the lifelong learner is no longer produced and delimited through techniques of discipline and punishment, but through continuous internal modulations and "self-deforming cast(s) that will continuously change from one moment to the other" (Deleuze, 1992, p. 4). As such, the project of lifelong learning correlates education with an economic modelization wherein learning most often means "permanent retraining, ongoing evaluative and performative registration aptly organized under the lauded pedagogical project of learning how to learn" (Wallin, 2012, p. 234). Within this model of subjectivity, the energetic investments of the student become passively linked to pursuits of individual choice and the promise of personal preference. As Wallin (2012) writes, "the contemporary [educational] institutional apparatus no longer works by inhibiting mobility but by establishing ways to continually register the movement of the subject through the course of her life" (p. 235). This change in definition, however, does not change control's terms of application; if anything the systems of control through which something like lifelong learning

operates are more ruthless than ever before (Braidotti, 2011, p. 25). As such, the shift to lifelong learning "is neither inherently liberatory nor counterposed to the banking complex as it has mutated in the age of integrated world capitalism" (Wallin, 2012, 234). Far from offering new modes of freedom, lifelong learning affirms a vision of education as the territory for new discourses of risk management and dispersive mechanisms of control.

Where Friere's banking model critiqued the way in which students are positioned as empty vessels or passive objects prone to indoctrination, what today's speculative banking model and its dispersive modes of control highlight is how educational subjects are far from inert, and instead highly *active* in lifelong recalibrations that work to affirm and reproduce the Industry of Education's financializing logic. Situated amidst the deterritorializing operations of capitalism, pedagogical resistance must therefore come to terms with the way in which the future of education is produced through specific energetic investments and subjective recalibrations, which work to create educational subjects that are *indebted* to the demands of lifelong learning. As sociologist Lisa Adkins (2018) writes, what characterizes finance today is not just speculation, but the creation, management and registration of *indebted subjects*. As she writes, the contemporary situation is one defined by both mass indebtedness and a financial system that now operates through debt accumulation strategies which have generated new sites for the creation of "surplus" for finance capital (Adkins, 2018). For Adkins, the changing nature of debt points to the way in which *recalibration* has become a central operation within debt formation today. Where today's "schedules of debt" are characterized by variable, flexible and adjustable "schedules of *repayment*," they not longer involve payment schedules that are based on regular payments in sequence. As Adkins puts it, "[r]epayment schedules may, for example, be sped up, slowed down, suspended, delayed, rescheduled, reset, restarted, reassembled, reorganized and even reversed" (p. 90). What is key here, especially with capitalism's derivative innovations in mind, is how this transformation of payment schedules have transformed debt itself, where debt has shifted from a process of repayment to "servicing debt" through ongoing, perhaps even *lifelong*, recalibration and repayment.

This recalibration echoes the same figuration through which lifelong learning comes about, where lifelong learners also take on the character of an "indebted subject." As Adkins (2018) writes, the "indebted subject" is bound to a speculative form of time that is nevertheless

undergirded by logics of capitalist accumulation, which manifest, for instance, through securitized debt. Where debt securitization "has opened out novel channels for the harvesting of profit for finance capital from income streams which mass indebtedness necessarily entails" (p. 81), the speculative subject bound to the time of securitized debt is not one without temporal orientation, without a present or future, but, quite to the contrary, one that "has *too much* time" (Adkins, 2018, p. 98). But, as Adkins is careful to note, "this is not too much of the steady time of the calendar, but of the eventful and nonchronological temporal frames which comprise the time of securitized debt" (Adkins, 2018, p. 98). This is also the case for the lifelong learner. That is, positioned as lifelong learners, students are similarly not without time, but instead beholden to the non-chronological, constantly transforming temporal frames of educational futurity and the spectacular frontiers through which such futurity is made possible. What this indebted subjectivity reveals, then, is how lifelong learning is neither liberatory nor is it positioned in contradistinction to contemporary banking models. Where capitalism operates through derivative innovations and the necessary expansion of its own outsides, it works as "a difference engine" that celebrates the power of innovation and diversity, so long as it can be essentialized and reattached to unitary identities and consolidated traditions (Braidotti, 2011, 171). Within this "difference engine," undergirded as it is by contemporary forms of control, lifelong learning is aimed at the production of constant recalibrations that can nevertheless be recuperated and normalized through appeals to (capitalist) realism and its delirious obfuscations. It is in this way that lifelong learning works to manage energetic investments by composing, assembling, organizing and *reinvesting* desiring-production in ways that can be recuperated by education's given demands.

### *5.3.4 Spectacular Frontiers*

Whereas in the time of debt payment probable futures unfold from the knowns of the present towards the termination of a debt, in the time of securitized debt and its perpetual repayments, profits are accumulated through the risks that come with adverse future events. Debt, in this way, operates as yet another derivative abstraction, one that appears as a detachable, measurable quantity but actually reveals a situation of mutual indebtedness. As Wark (2017) writes, where "[d]erivatives make future outcomes actionable in the present, appearing as a way

to regulate and control futures […] [d]ebt 'servicing 'becomes everyone's problem" (para. 45). Or, as Adkins (2018) puts it, where, in the time of securitized debt, "profits are yielded from unpredictable and contingent events, such as credit events and future events which have not yet arrived and even past events which have not yet taken place […] the time of debt is *speculative* in form" (my italics, p. 94). Within the speculative time of mass indebtedness, debt itself offers a new financial frontier, one made possible through derivative abstractions and the ongoing revaluation of risk. This financial frontier is not created by the so-called autonomy of the market, but instead requires energetic investments such as those made possible through the ongoing recalibration of indebted subjects. With this in mind, "far from emptying out futures, debt society demands subjects who must constantly adjust to recalibrations of pasts, presents and futures as well as to changes in the relations between and across these states" (Adkins, 2018, p. 98). Transposed to the Industry of Education, it is through the (re)production of indebted, lifelong learners, ones that are pre-positioned in relation to the speculative time of financial derivation and its risky reforms, that education projects its own *spectacular frontiers* for energetic investment.

As the various examples of recovery delirium outlined above have demonstrated, crises are not a problem for capitalism and its financial operations, but are instead fuel for the constant deterritorialization of its own outsides. Evidenced by the "resilience" of capital when faced with crises, be it economic or environmental, the "capitalist apparatus does not fear difference but, obversely, the cessation of difference itself" (Wallin, 2012, p. 239). As such, capitalism is invested in the creation of "spectacular frontiers" so as to open new spheres for investment, trade and speculation. As anthropologist Anna Tsing writes (2005), "the self-conscious making of a spectacle is a necessary aid to gathering investment funds" and is "a regular feature of the search for finance capital […] the more spectacular the conjuring, the more possible an investment frenzy" (p. 57). As the most recent round of "post"-pandemic bailouts show, for example, while financial crises might otherwise signal an encounter with expansionary limits or finite resources, the ongoing creation of money, or more accurately debt, has substantially reinforced both the resources and power of capitalist expansion. Whereas within finance such speculative frontiers work to open up new spheres for capital investment, within the Industry of Education, these

frontiers are created so as to manage and direct subjective investments and the energetic realities such investments require.

## 5.4 Probing the Speculative Limits of Energy Futurity

Where the Industry of Education positions students as lifelong learners invested in ongoing educational productivity, pedagogical becomings are oriented towards perpetual recalibrations that are nevertheless tethered to current economic demands. Further, where leaders within the Industry of Education, such as those here in Alberta, bank on education as a key operation in maintaining capitalism's very special delirium, energy and desire is reinvested in the spectacular, not to mention highly mutable, frontiers of capitalist realism. Through the (new) normalization of business as (un)usual, which in turn directs and delimits pedagogical becomings, the contradictions and crises through which capitalism functions can no longer be approached, as Friere might have it, as necessary catalysts for educational transformation. That is, through the formation of indebted subjects and derivative innovations, the contradictions that Friere highlights as catalysts for conscientization are not what spur action and change, but are instead integral to capitalist production and the subjective formations it requires. Where Friere's banking model draws attention to the way in which passive students are "domesticated" within a particular reality, today's banking model, characterized as it is by futures trading, securitized debt, derivative innovations, risky reforms, lifelong calibrations and perpetual repayments, instead draws attention to a weird educational scenario that requires modes of pedagogical resistance invested in negating, through speculative experimentation, those energy futures that have limited pedagogical possibilities both now and into the future. Projections of energy futurity, especially as they are developed and practiced within educational domains, provide one site for such speculative negation. In this section, I continue to probe the speculative limits of energy futurity by examining the way in which dominant energy transition discourses are enacted and reproduced through the Industry of Education. Focusing on the example of energy literacy and the petro-pedagogical realizations enabled by this educational initiative, this section aims to develop modes of speculation that are capable of reshaping possibility, in care-ful ways, amidst today's energy emergencies.

### *5.4.1 Energy Pathways and the Smoothing Grammars of Transition*

In addition to driving speculative investments, *energy futures* have become a common topic within broader environmental, political and social discussions of today's pressing convergence of crises. One of the ways in which energy futures are often discussed is through the language of *energy pathways*, where the future of energy is speculatively modelled based on various scenarios that attempt to predict what it will take to transition toward more "sustainable" forms of energy. The metaphor of the "pathway" has been deployed, for instance, by "Generation Energy," a 2017 initiative aimed at developing an "open and inclusive nation-wide dialogue with stakeholders, experts and individual Canadians to envision what a low-carbon energy future would look like for Canada over the course of a generation" (p. 2). Taking a purposefully generational view, the focus of this report is to create a "shared future" characterized by "the broad and deep shifts occurring in the world's climate and energy systems, and the imperative that Canada must act now to navigate the energy transition successfully" (Generation Energy Council, 2018, p. 2). Within the report, four "pathways" are proposed, all of which are aimed towards this vision of success. These pathways include wasting less energy, switching to clean power, using more renewable fuels and producing cleaner oil and gas (Generation Energy Council, 2018). Through the projection of these pathways, the key message offered by the report proclaims that: "[i]f we navigate these pathways successfully Canada can emerge a generation from now as a leader in this energy transition worldwide. Along the way, we will attract investment, create jobs, and ensure economic prosperity which will yield advantages for Canada on a global scale" (Generation Energy Council, 2018, p. 11). Within this report, the energy emergency is framed as something that can and will be overcome by shifting, or *transitioning*, energy sources and adopting better forms of regulation and management of energy production and consumption.

Within this example of energy futurity, the energy emergency is narrated in terms of the urgent need to "shift from dirty to clean energy" (Simpson & Szeman, 2021, p. 77), a narrative that is founded on the assertion that the dangerous levels of carbon dioxide that are building in the atmosphere must now be mitigated by transitioning away from fossil fuels towards other, greener, cleaner, more sustainable, energy sources. As such, the "Generation Energy" initiative takes part in broader calls for energy transition today, which now occupies thinkers, leaders and

activists from across scholarly domains and political orientations. As energy humanist Mark Simpson (2020) outlines:

> [a]cross all facets of contemporary life, from national, regional, and municipal governments to intergovernmental agencies and NGOs to financial indices and media to global energy corporations, energy transition provides the ubiquitous refrain deployed to imagine, to narrate, and to manage the passage from our fossil-fuelled present to some alternate energic futurity (p. 1).

Within this chorus of calls for energy transition, the *problem* of energy futurity is most often countered with the *solution* of energy transition, which is framed as a temperate, pragmatic and incremental approach to today's purported energy emergencies. As Simpson and Szeman (2021) write, the dominant language of transition contains many assumptions: first, transitional change is defined as orderly change thus offering "a measured, serene, reassuring response to the ragged urgencies of climate crisis;" and second, that transition can and will be brought about by establishing clear boundaries and limits for energy production and consumption without necessarily changing other habits and practices (p. 78). As Simpson and Szeman (2021) write, "[c]hange the type of energy we use, yes, but make sure to leave other potential alterations and alternatives unthinkable: managed, diminished, foreclosed, or stifled altogether" (p. 78). These assumptions underline the way that transition is often narrated in terms of its "autopoetic aura," wherein energy transition "promises quite magically to realize itself and thereby guarantee the happiest of happy outcomes" (Simpson & Szeman, 2021, p. 78). This magical thinking insists that while transition is now necessary, everything else, and especially capitalism, will stay the same.

In addition to insisting on an inherently positive trajectory for transition, the language and logic of energy transition draws attention to a central, albeit highly fictional, narrative at the heart of most transitional promises today, namely, "that there have been *other* energy transitions, that the time of energy is *always* about transition" (Simpson & Szeman, 2021, p. 80). As Christophe Bonneuil and Jean-Baptiste Fressoz suggest, a significant problem haunts the prospect of energy transition, that is, that it is absolutely and utterly fictional. As they outline, "the history of energy is not one of *transitions*, but rather of successive *additions* of new sources of primary energy" (my italics, Bonneuil and Fressoz 2017, 101). As Simpson (2020) notes,

where energy transition is most often conceived in terms of its additive tendencies it follows in the broader history of energy transition, one wherein "energy forms do not shift or change; instead they *accumulate*" (p. 2). Referencing a history of transition where coal supplemented wood, oil supplemented coal, diesel supplemented oil, nuclear supplemented diesel, and so on and so on, Simpson highlights that given energy transition's additive history, there exists "no historical template for leaving forms of energy behind" (Simpson, 2020, p. 2). In this way, the very notion of energy transition can be seen as its own form of strategic reality management, one that works to smooth the volatility that might otherwise be raised by the question of energy futurity. As Simpson (2020) writes, "[t]he appeal of transition, as a logic and a grammar through which to articulate such potentially seismic changes, comes from its ability to evoke the inextricable, combinatory givenness of temperance, pragmatism, and inevitability together" (p. 4). In this way, and as Simpson (2020) notes:

> [c]onceptually and affectively as well as procedurally, transition smooths the volatility, contingency, and risk that might otherwise attend any comprehensive shift in energy system—and thereby licenses the fantasy that a switch in prevailing energic forms will support not disrupt business as usual so as to sustain the existing economic, social, political, and cultural order in perpetuity (p. 1-2).

In short, the smoothing grammar of transition upholds an approach to transition that involves adding new forms of energy, as opposed to actually transforming, let alone divesting in, energy futures.

Narrated through the metaphor of "pathways" and a language of transition that assumes a measured, reassuring response to an increasingly devastating environmental situation, "Generation Energy" is just one example of the smoothing, and ultimately positive, transition grammar that has become commonplace within discussions of energy futurity today. As Simpson and Szeman (2021) articulate, energy transition offers a "scheme that status quo economic and political actors appear glad to take up as a way to save themselves from the worst of what is to come: ostensibly the ardors of climate catastrophe, but really the seismic shocks of stock market collapse, currency devaluation, resource redistribution, and the like" (p. 79). Taking part in broader (Good) Anthropocene fantasies wherein current planetary emergencies can be overcome through careful management, strategic mitigation and technological innovation, within this pitch

for energy transition, education is nominated as a key site for bringing about brighter energy futures. As the "Generation Energy" report details, education offers a key site for working towards the pathways proposed, specifically by providing the territory for training a future workforce who, through their individual action, can become "catalysts for change and champions of Canada's energy transition" (Generation Energy Council, 2018, p. 11). In this example, education is, once again, positioned as a critical transformative technology that offers opportunities for innovation and social betterment. This approach to energy transition not only redoubles in an image of affirmative, all-too-human ingenuity, but obscures the energetic emergencies and uneven distributions that inform the very questions that might be posed in relation to energy futurity and its education today.

*5.4.2 Energy Literacy, for the Win*

The s(m)oothing grammar of transition has become central to educational approaches to energy transition, such as those that place education within the "climate-energy-education nexus." As researcher of renewable transformation Jennie Stephens (2018) develops, the climate-energy-education nexus refers to the transdisciplinary space where academic researchers, professional scientists, policymakers, educators, and the general public come together to address real-world social, economic, educational, and environmental problems. Within this nexus, the energy emergency is defined in terms of how "educational priorities have not effectively evolved to prepare students for the rapidly changing energy-climate landscape" (Stephens, 2018, p. 1). As part of the broader crisis of the future to which educational reform —including its derivative abstractions and lifelong calibrations — consistently refer, the problem of energy transition here is correlated to the solution of education. As Stephens (2018) notes, "[a]dapting education to prepare society for inevitable but unpredictable changes at the energy-climate nexus is a critical aspect of the energy transition that offers huge opportunities for innovation, diversification, and engagement" (p. 1). Situated within the climate-energy-education nexus, energy transition is narrated as a process that will magically be brought about through a logic of temperance, pragmatism, and inevitability. Through this logic, energy transition discourses within the climate-energy-education nexus play an important role in the management of educational realities and the futures they project.

This management is exemplified within "energy literacy" discourses and initiatives, which make up a major part of education's energy transition strategies today. As The Alberta Council for Environmental Education (ACEE) defines it, energy literacy is "an *understanding* of the forms, properties, role and impacts of energy in the world and in our daily lives, accompanied by the ability to *apply* this understanding to answer questions and solve problems" (my italics, "Alberta Council for Environmental Education," 2020). According to this definition, an "energy literate" person is able to trace energy flows; account for energy uses, purposes and sources; assess the credibility of information about energy; communicate about energy in meaningful ways; and, finally, make informed decisions about the political, economic, social and personal aspects of energy ("Alberta Council for Environmental Education," 2020). Through understanding and application, that is, through tracing, accounting, assessing and communicating information *about* energy purposes and sources, energy literacy is involved in the repetition of everyday concepts through representational capture, which promises to bring about educational transformation. The pedagogy of energy literacy is thus one that must deject and occlude the otherwise problematizing forces of the energy concept in order to facilitate straight-forward transmissions about energy and its uses. In addition to operating through everyday concepts, energy literacy is most often tethered to the promise of affirmative, positive futures for "us." ACEE's energy literacy programmes and curricula, for instance, are founded on the belief that "educating today's youth to be tomorrow's environmental stewards is our best strategy to create a sustainable future" ("Alberta Council for Environmental Education," 2020). Oriented towards this better tomorrow, ACEE provides resources and programs that proceed from the assumption that if students learn about energy, and its transitions, a more sustainable future will be brought about. As the ACEE puts it in their Curriculum for a Sustainable Future (CSF) guidebook, "[n]ow more than ever, Alberta's over 700,000 K-12 students need to be prepared for their future – a future in which they will face many challenges as they strive for reliable and affordable energy, a healthy and diverse environment, and economic prosperity" ("Alberta Council for Environmental Education," 2020). Through the transmission of information about energy, which can and should be traced, represented and communicated, such approaches to energy literacy take part in the Industry of Education's broader goals for progressive thinkably, and ultimately transformation.

In the example of ACEE, the energy emergency is one that places environmental "health" and economic "health" in equivalency, and thus any solution to today's energy crisis must develop "win-win" solutions for the environment *and* the economy. As such, ACEE's approach to transition is not only aimed at providing more information and resources about energy and its uses, but is also aimed at "depolariz[ing] the energy conversation in Alberta" ("Alberta Council for Environmental Education," 2020). As the ACEE puts it, if students "are well-educated on [energy] topics, they will be able to create innovative solutions that are 'win, win' instead of 'either/or' for environment, society and economy." The language of "win-win" solutions comes up several times throughout the ACEE website, where ideas such as energy efficiency and conservation are positioned as important "win-win solutions" that will help students analyze energy costs while providing life skills that can prepare them for future job opportunities. In addition to this winning logic, the ACEE's approach to energy literacy skills also involves an additive dimension that proposes students must develop "yes, and…" thinking. As the ACEE puts it in response to the question "what should Alberta students learn about energy?": "*YES* Alberta's heritage and prosperity is based on our energy industry and *YES* there is a current need for these energy sources and *YES* Alberta can be an energy leader in the global energy transition to a low carbon economy providing both prosperity *and* a healthy environment" (my italics, "Alberta Council for Environmental Education," 2020). Within this framing of energy literacy, then, the reality presented is one wherein energy, which most often means fossil-fuelled energy, is *central* to life, even and perhaps especially amidst today's unprecedented climate emergencies.

Within the pedagogical example of energy literacy, the very notion of energy transition is founded on the assumption that today's energy emergencies will be overcome by learning about the primacy of energy, which can be represented and communicated in clear and comprehensive ways in order to develop solutions that benefit both the economy and the environment. The grammar of transition at work here is characterized by several key assumptions about educational transformation. First, this transition grammar is framed in terms of responsible and pragmatic *individualized action*. Within this logic of transition, solutions are most often proposed from the vantage of what is deemed most "realistic," where "realism" is tethered to the presumption that responsible individual humans who can make informed decisions will be able to change the world. Second, this transition grammar is characterized by *affirmative perceptions*

of the future and additive proposals for change. For instance, within the climate-energy-education nexus, education, particularly in its STEM formations, has been pitched as a major "opportunity" to build "students' future adaptive capacity and prepare students for a rapidly changing future in which climate-energy knowledge and experience will be increasingly valuable in the workforce" (Stephens, 2018, p. 4). Within the climate-energy-education nexus, energy transition involves adapting and innovating education, in affirmative ways, so as to prepare society, and its workers, for the energy futures that lie ahead. Third, through its givenness to individual action and its affirmative logic, the transition grammar undergirding energy literacy is one that is characterized in terms of its *productive capacities,* for instance, the capacity to produce a workforce. Within this grammar of transition, the energy pathways on offer today are treated as opportunities for productive sites for innovating solutions to today's pressing energy emergencies. Taken together, the characteristics that define energy literacy and its transition grammars work to smooth over the real sense of risk, volatility and anxiety that might otherwise characterize today's energy emergencies.

### *5.4.3 Petro-Pedagogical Realizations*

Where this study frames today's energy emergencies in terms of a widely felt but nevertheless denied and downplayed atmosphere of anxiety and fatigue, today's energy emergencies are characterized by a range of reality management strategies*,* which in turn shape conditions for possibility. As exemplified through the Industry of Education's weird speculative financialization, education's energy futures are characterized by a series of strange derivative abstractions and lifelong recalibrations aimed at reforming risk and volatility so as to expand and proliferate capitalism's spectacular frontiers. By treating crises, be it energy crises or crises of unsustainability, as opportunities for the (new) normalization of business as (un)usual, the Industry of Education's ongoing investment in those energy futures that would affirm its fundamental reasons and rationalities have produced a weird energetic emergency, one that is bolstered through initiatives such as energy literacy. Where, for instance, energy literacy takes on a s(m)oothing grammar founded on individualized, responsible notions of agency, affirmative projections of change and unquestioned imperatives for productivity, it contributes to the Industry of Education's troubling investments and reality management strategies. As such,

energy literacy is an important mechanism for maintaining education's broader industry standards. At the same time that the winning financial logic underpinning energy literacy reinforces education's economizing directions and demands, the affirmation of productive futurity further fuels education's progressive imagination and transformative imperatives. Further, by focusing on the development of "energy literate" people, that is, responsible, pragmatic and well-informed human subjects capable of transforming themselves and the world, energy literacy bolsters the Industry of Education's commitment to pedagogies married to the goal of becoming-forever-human. By honing pedagogy upon responsible individual action, affirmative and additive logics and the (re)productive framing of education as a necessary solution to overcome today's energy emergencies, energy literacy affirms particular educational realities while necessarily obscuring and dejecting the troubling energetic investments and emergency exhaustion that might otherwise be encountered as important sites of pedagogical struggle.

In an incisive analysis of fossil fuel interests and the obstruction of climate justice in public education, educational theorists Emily Eaton and Nick Day (2020) discuss one example of such energetic obfuscations, or what they call a "regime of obstruction," which involves the targeting of public education by fossil-fuelled powers as a key site for shaping petro-pedagogical subjects. As they write, many contemporary educational approaches, such as the energy literacy example highlighted above, work to "centre, legitimize, and entrench a set of beliefs relating to climate change, energy, and environmentalism that align with the interests of fossil fuel industry actors" (2020, p. 457). *Petro-pedagogy* is the name that Eaton and Day give to these pedagogical practices. Through pedagogical approaches such as energy literacy, petro-pedagogy affirms particular narratives about the source of energy and climate problems in turn directing and delimiting what is deemed possible to think when it comes to approaches to energy transition. Key to Eaton and Day's (2020) petro-pedagogical analysis is the assertion that "public education is a key site for securing and maintaining the hegemony of the oil and gas industry and obstructing transitions to low-carbon economies" (p. 458). This "regime of obstruction" involves the discursive power of fossil fuel corporations to shape norms and inculcate values through policy and curriculum created by the oil-backed, not-for-profit insertion into education, one wherein "corporate propaganda masquerad[es] as energy and environmental literacy programs"

(Eaton & Day, 2020, p. 460). This unwritten partnership between the fossil fuel industry and public education installs specific narratives and discursive framings of energy whereby fossil fuel extraction and consumption are equated, without question, with notions of freedom, scientific and technological innovation and environmental stewardship.

As Eaton and Day point out, however, "fossil fuel companies need not insert themselves directly into education through partnerships in order to circulate their hegemonic climate obstructionism" (Eaton & Day, 2020, p. 460). As Bissell (2014) outlines, referencing the Alberta educational context, teachers often express discomfort with discussing topics such as climate change due to the wider hegemonic discourses that tie the Alberta economy and individual prosperity to oil. Here, petro-pedagogy or "the pedagogical arm of the regime of obstruction," is not just about corporate investments and partnerships within education, but involves the *strategic management of possibility*. Through the oft-repeated and unquestioned assertion that "there is no alternative" to the current (petro)state of affairs, petro-pedagogy valourizes industry interests as necessary components of energy education while insisting upon the fact that individuals and their lifestyle choices are both the cause and potential solution to today's energy emergencies (Eaton & Day, 2020). This "no alternative" rhetoric is exemplified within the ACEE approach to energy literacy, which positions energy and its necessary transitions in terms of informed individual action directed towards win-win solutions for environmental sustainability *and* industry powers. In this example, energy literacy contributes to the petro-pedagogical realization of possibility by reinforcing the subjective moulds and energetic investments necessary for capitalism to continuously expand and mutate. By restricting what is deemed possible, or "realistic," when it comes to transition itself, the petro-pedagogical impulses of initiatives such as energy literacy not only fail to challenge the structural growth of fossil fuel consumption, but work to obscure and deject the very real energy emergencies that are taking place all around. However, and thinking back to the limits of Friere's banking model once again, what is being obstructed here is not just an ideological agenda in need of demythologizing and unveiling. Instead, what is obscured is the deterritorializing circuits of desiring-production and the affective assemblages through which pedagogical becomings emerge (or not). Put another way, it is the energetic investments through which educational subjects, including "energy literate" ones, are organized that are disappeared through non-recognition.

Where particular organizations of life always emerge from affective, or energetic, investments, it is investment that produces assemblages of bodies. As such, for power to take hold, it must work to direct and delimit energetic investments so as to create the social assemblages and detached interests necessary for its creation and perpetuation. In the example of energy literacy, just one (petro)pedagogical mechanism that works to affirm the speculative financialization of the Industry of Education today, locally invested desires, such as those that might otherwise signal an energy emergency, are reterritorialized by the smoothing grammars of energy transition and thus educational subjects become alienated from their own desire, which is instead directed towards general interests. This reterritorialization, however, is concomitant with ongoing deterritorialization, where subjects must recalibrate, in lifelong ways, so as to meet the demands brought on by ongoing educational reform tethered to the promise of an education after education. It is these processes of re/deterritorialization that point to the creative and problematizing force of life that must be obscured so as to maintain the energetic investments that keep the Industry of Education up and running. With these strange occlusions in mind, approaches to pedagogical resistance must not only work towards "lifting the veil" and exposing the oppressive nature of, for instance, petro-pedagogical submission, but must work to trouble the investments — affective investments, desiring investments, energetic investments — through which the Industry of Education and its futures are actualized.

### *5.4.3 Care-ful Speculation*

As I have endeavoured to unfold through both the examples of speculative finance and energy literacy, energy futures are today defined by a range of weird operations and strange fictions that are nevertheless naturalized as realistic, normal and necessary. Whereas energy futures trading points to the bizarre and irrational operations undergirding speculative finance, which have now seeped into many areas of everyday life and living, energy literacy highlights the strange ways in which transition itself has been continuously smoothed, and thus inhibited, through repetitions of the same. These weird and weirding phenomena demonstrate how today's energy emergencies raise question about how to navigate the ongoing movements and recapitulations through which capitalism continuously reproduces its territory. This is an especially challenging question based on the way in which these movements involve affective

investments that thwart representational analyses aimed at overcoming power through critical awareness. With this challenge in mind, the task for pedagogical resistance not only involves interrogating and critiquing current power structures and regimes of obstruction, but re-directing, or *transitioning*, pedagogical energies towards *speculative configurations* aimed at interrupting energy futures as usual.

Speculation, as a philosophical strategy for interrupting and countering what-already-is, has become a key interest for many thinkers that situate their work within today's environmental, social and political impasses. The burgeoning field of the "energy humanities,"[24] for instance, has been punctuated by rallying cries to create speculative energy imaginaries so as to imagine more just energy futures. In my own artistic and scholarly commitments to a collaborative project called *Speculative Energy Futures*,[25] for instance, I have gathered together with a range of thinkers and makers to "explore current research and imagine alternate futures specifically as it relates to feminist and decolonial energy transition" ("Speculative Energy Futures," 2021). One of the key questions that arises time and time again within these collaborations is how to push our thinking into truly speculative territories, how to imagine that which exists at the edge of imagination, and how to express such speculative experiments so as to collectivize our thinking. With these difficult tasks in mind, speculation is not something that is approached as a straight-forward affair, nor is it positioned as an inherently emancipatory practice. As today's speculative financial operations clearly demonstrate, speculation is not always liberatory nor can it claim guarantees to offering "lines of flight" away from calcified power formations and repressive organizations of desire. Where financial derivatives, for instance, work to produce the reality they predict, one defined by calculated risks and the imperative for infinite capital accumulation, speculation operates to divert energies into the "speculative casino" of finance in

[24] Recognizing the limited way in which energy transition has been framed in many mainstream political and environmental discourses, the field of the "energy humanities" has emerged. Within the energy humanities, the project of energy transition is not just framed as a technological, infrastructural or resource management problem, but, importantly, involves a range of socio-cultural dimensions of energy that constitute the impasses that have impeded and continue to impede energy transition. A key claim within the field is that "[t]ransitioning away from fossil fuels will necessitate a more thorough understanding of the social forces they have unleashed, and an understanding, too, of shifts in social practices that will be important for real and sustainable energy transition" (Szeman, et. al. p. 2).

[25] *Speculative Energy Futures* is a "collaborative, multi-year research-creation project that brings together artists, activists, scientists, engineers, policy makers, and social science and energy humanities researchers to investigate the challenges and potentials of energy transition through artistic means" ("Speculative Energy Futures," 2021).

the hopes of capital appreciation. While typical approaches to energy literacy suggest that learning *about* energy — its sources, its centrality to life, its individual uses — is the key to solving today's energy crisis, the financial operations inherent to energy futures today highlight the limit of such approaches. If oil futures and the derivative innovations through which they are actualized tell us anything, it is that the future of energy is tied to speculative ventures that are invested, above all, in the ongoing creation of new outsides for capitalist expansion. And so, where the future is increasingly becoming the new terrain of financial speculation, speculation itself must be approached as an integral site of pedagogical struggle.

While calls to reimagine education *beyond* or *after* what is currently deemed thinkable are increasingly necessary given the catastrophic conditions facing life today, the very appeal to an "outside" thought plays a role in the way in which education and its futures are imagined and, as such, must be made vulnerable to its own problematization. As Reed (2014) writes, philosophical speculation allows the development of an "experimental responsiveness to epistemic, ontological and systemic variation" (p. 578), and thus, speculative thinking might be summed up as a mode of experimenting with the givenness of realities that exist beyond and before our ability to think them. While modes of speculation might be rife with potentials for thinking *otherwise*, speculation in and of itself is not immune to the temporarility of "what is," a nowness that works to cloud over the very futurity of what *might* be. As Shaviro (2019) writes, "it is not easy to restore the rights of speculation. Just as any successful abstraction must pay the price of leaving certain details unaccounted for, so any speculative attempt to move beyond mere phenomena will find itself inevitably haunted by some sort of exception or remainder" (p. 2) With these speculative limits in mind, the pedagogical task of rethinking or relaunching or redirecting or reimagining educational futurity must attune to the way in which speculative proposals are themselves constituted by particular gaps and omissions, particular foldings of insides and outsides, particular obfuscations and occlusions, particular *cuts*, which in turn condition and orient what can and cannot be thought in the first place.

With this in mind, speculation is not a haphazard activity, but instead requires what Maria Puig de la Bellacasa (2011) calls an *ethos of care*. Puig de la Bellacasa offers a proposal for re-imagining research and ecological ethics in a world under crisis by framing the idea of care as a situated and committed form of *speculative sensitivity*. As she develops in her book *Matters of*

*Care (2017),* care entails a committed, speculative sensitivity to discovering less apparent traces and assembling "neglected things" that bring with them a range of other relations — of suffering, of exclusion — that are often invisibly but inescapably implicated in that which is determined as a matter of concern. Within Puig de la Bellacasa's concept of care, then, speculation is not only involved in producing new imaginaries but also involves engaging the material relations and flows of life that have been neglected, obstructed and disappeared in the name of dominant matters of concern. For Puig de la Bellacasa, an ethos of care therefore offers a proposition to both think *with* and a practice to think *through*. One of the key assertions that Puig de la Bellacasa makes in her proposal for enacting an ethos of care is that our ways of studying and representing matters of fact have world-making effects. As such, any study of the world involves the creation of *cuts* so as to make the world thinkable, representable, communicable. In this way, and as Puig de la Bellacasa (2011) writes, foregrounding speculative care reminds us that:

> in order to be liveable, a critical cut into a thing, a detachment of a part of the assemblage, involves a re-attachment. This means, on the one hand, that we become able to cut in a certain way because of our own attachments, because we care for some things more than others. And it means, on the other hand, that to produce a caring account, critical cuts shouldn't merely expose or produce conflict but should also foster caring relations (p. 97).

Central to this care-ful cutting is the role of speculation. An ethos of care is always speculative in that it involves "not only detecting what is there, what is given in the thing we are studying, but also to think about what is *not included* in it and about what this thing could become" (p. 96). Through speculation, which always involves care-ful cuts, an ethos of care is not so much a "fixed explanatory vision or a normative stance (moral or epistemological)" but is instead a "speculative commitment to think about how things would be different if they generated care" (p. 96). With this in mind, speculative practices of care cannot be standardized through, for instance, something like educational practice: "[c]are eschews easy categorization: a way of caring over here could kill over there" (p. 100). An ethos of care is not necessarily reassuring, nor are its speculative gambits always liberatory. An ethos of care is "more about a transformative ethos than an ethical application [and as such] we need to ask 'how to care' in each situation" (p. 100). Drawing on this approach to speculation, one that is undergirded by an

ethos of care, this study of energetic investments at the end of the world does not aim to provide yet another innovative instrument for managing uncertain futures, but instead experiments with possibilities for re-shaping possibility so as to unsettle and resingularize pedagogical responses to today's pressing energy emergencies.

## 5.5 Negating Energetic Speculation and its Education

### *5.5.1 Exhausting the Possible*

Where energy futurity today remains wedded to the promise of financial innovation and smooth transitions, it's speculative proposals have become tethered to energetic investments that can be recuperated within what has been deemed *possible* by dominant organizations of power and control. More than reproducing the delirious logic of capitalism, such commitments have produced an energy emergency wherein the widespread atmosphere of anxiety and the affective tonality of fatigue are exacerbated through non-confrontation. Evidenced by the current situation here in Alberta, where in the summer of 2021, COVID-19 was declared "over" thus leading to the announcement from government officials that "Alberta was open for summer,"[26] the tiring situation brought on by, in our case, the fourth wave of the pandemic, has been made worse, often in unforeseen ways, to the point that what is fatiguing or unworkable in this situation is no longer recognized as such. The Industry of Education takes part in this normalization of unworkable conditions by obscuring today's energy emergencies in the name of upholding and reproducing its industry standards, which work to strategically manage the reality of the situation, in turn conditioning what is deemed possible both now and into the future. Taken seriously, this conditioning of possibility raises difficult questions about the role and trajectory of pedagogical resistance as well as the speculative potentials for imagining educational futurity otherwise. As Fisher (2009) writes, resistance to today's widespread atmosphere of capitalist realism must work to "destroy the appearance of a 'natural order,' must reveal what is presented as necessary and inevitable to be a mere contingency, just as it must make what was previously deemed to be *impossible* seem attainable" (my italics, p. 17). After all, and as Fisher outlines, what is currently called "realistic" was itself once deemed "impossible," and conversely, "what

[26] At the time of writing these words, in the fall of 2021, Alberta is experiencing a disastrous fourth wave of the pandemic, which, as numerous experts have asserted, was made possible by the complete loosening of restrictions combined with the highly contagious Delta variant of the virus spreading through the population.

was once eminently possible is now deemed unrealistic" (p. 17). With this in mind, the question of energetic investments at the end of the world is one that involves probing the ways in which what is deemed realistic, or possible, is always contingent and thus vulnerable to alternative speculations.

For instance, by conceptualizing anxiety and fatigue as more than just sociological or individual psycho-physiological phenomena, the affective tonality that characterizes today's energy emergencies provides a weird site for speculating on the ways in which affective, political, and, importantly, educational investments might generate and reorient strata for thinking. If, following Deleuze and Guattari, we accept that affects have an inherently ambiguous character, then it is it is essential to consider not only what such energetic investments block or interrupt, but also what they allow, what they drive forward, what they *make possible.* This question of possibility is one that Deleuze explores throughout his philosophical project, including in one of the last texts he published titled "The Exhausted." In this essay dedicated to the literary works of Beckett, Deleuze (1995a) asserts that "[e]xhausted is a whole lot more than tired" (p. 3). Where, as Deleuze develops, tiredness signals that one has only exhausted the *realization* of possibility, exhaustion "exhausts all of the possible" (Deleuze, 1995a, p. 3). Put another way, when one is tired, they no longer prepare for possibility, whereas when one is exhausted, there is no possibility as such: "[t]he tired can no longer realize, but the exhausted can no longer possibilitate" (Deleuze, 1995, p. 3). Being tired, then, does not mean that possibility has been exhausted, but rather one becomes tired by continuously combining sets of variables that necessarily exclude possibilities through the standardized realization of what has been deemed possible in the first place. In the case of today's strategic reality management in a pandemic age, for instance, one gets tired of realizing all the possibilities, which are already prefigured by a range of new normalizations: teachers teach, get anxious and tired, go home and rest, teach again the next day, get anxious and tired again, perhaps in new ways, go home and rest, and repeat this pattern again and again so as to realize the possibilities set out before them without necessarily exhausting them. With this example in mind, "fatigue comes when we realize the possibles that inhabited us, choosing, obeying certain objectives and not others, carrying out certain projects, following clear preferences" (Pelbart, 2013, p. 38). That is, we get tired to the extent that we follow a predetermined path, in which the possible is presented as a

predefined field that we are *going to realize*, and not as something that is engendered *as it is realized*. Counter to the tired, which realizes the possible through the *exclusion* of possibilities, the exhausted seeks to *realize the impossible*, and as such does not exclude possibilities, but *includes* disjunctively. As Deleuze (1995a) writes, "you combine a set of variables of a situation, provided you renounce all order of preference and all organization of goal, all signification." (p. 3). Whereas one gets tired of realizing prefigured possibilities, the exhausted exhausts the possible: one "exhausts what *is not realised* in the possible. He has had done with the possible, beyond all tiredness […]" (Deleuze, 1995a, p. 3). It is in this way that the exhausted seeks to realize the impossible.

Deleuze's understanding of exhaustion offers a weird approach for navigating today's energy emergencies, one that undermines the financializing logic of lifelong recalibration and the unquestioned, not to mention affirmative, production of energy literate subjects. Counter to the tiring recapitulations proffered by the Industry of Education and its fantasies of energy transitions, this concept of exhaustion exhausts the possible, leaving no alternative but to *create*. As Peter Pal Pelbart (2015) writes, "[e]xhaustion corresponds to an emptying of all of the possibles catalogued and incorporated into the repertoire. With such emptying, one has no where to hold on: neither a utopia, nor an ideology, nor an anchor. And before this impossibility, one has no choice. *A possible must be invented*" (my italics, p. 17). The invention of the possible is, in this way, a speculative practice, one that requires an ethos of care that attends to those "points of deterritorialization" that are able to "bifurcate worlds and release incompossible and indiscernible elements that enter into new variations around the position of the actual" (Lambert, 1997, p. 141). The bifurcations, inconsistencies and contradictions made possible through this mode of speculation work towards exhaustion in the sense that they empty out predetermined possibilities through weird inclusions and transversal connections. In the final movement of this study, I endeavour to practice this exhausting mode of speculation so as to counter-actualize the tiresome energetic investments that now define and delimit education's energy futures. By developing a speculative pedagogical approach that I call *energy mediacy*, I work here to put education and the problem of energy futures in contact with the weirder dimensions of the energy concept so as to exhaust what is not realized through today's energy emergencies, that is,

to realize the impossible through strange inclusions that necessitate new strata for thinking pedagogy at the end of the world.

### *5.5.2 Energy Mediacy, or a Weird Pedagogy of Exhaustion*

*Energy mediacy* is a pedagogical, albeit always speculative, always care-ful, proposal for a weird pedagogy of exhaustion that signals the end of possibility and thus the realization of impossibility made possible when concepts no longer cohere. Where exhaustion, as Deleuze develops, indicates the actual finitude of the living present, of the body and the organism subjected to the contraction of instants, that which exhausts and that which is exhausted — the exhaustive and the exhausted — point to the threshold of forces that a being is able to support before it changes state, or *transitions*. It is in this way that the exhausted works to "abolish the real" (Deleuze, 1995a, p. 5), in turn necessitating the invention of new possibilities. Where, once again, tiredness realizes the possible through the exclusion of possibilities it has led to an abandonment of any possibility of transformation, of actual transition, because tiredness itself signals that there is nothing left to imagine. Exhaustion, on the other hand, indexes a critical moment wherein it is the impossible that leads to transition. Counter to the smoothing grammars of transition that undergird the Industry of Education, the speculative practice of *energy mediacy* understands transition in relation to such exhaustive potentials, that is, in relation to the realization of impossibility that might be actualized when the logic and language that binds something like energy futurity is detached and negated.

As such, energy mediacy does not see energy as content to be learned, through, for instance, literacy, but instead as a concept that *mediates* what is deemed possible, and thus impossible, in the first place. In contrast to the idea of literacy, which requires that energy be approached in terms of communicable terms and everyday opinions, mediacy indicates a "being-with" energy that is committed to grappling with the desiring investments, but also the exhausting possibilities, that increasingly define today's energy futures. The use of mediacy here is drawn, in part, from Stefan Herbrechter's (2018) critical interrogation of literacy as it relates to the question of posthumanist education. In his article *Posthumanism and the Ends of Education*, Herbrechter (2018) asserts that education's humanist fidelities have not only reproduced an ontological and ethical outlook on the world founded on human exceptionalism, but have also

relied on "certain fundamental (educational) 'techniques'" such as literacy (p. 4). Aimed at developing a critical posthumanist intervention into education's humanist legacies, Herbrechter (2018) asserts that education today can "no longer (at least not exclusively) be about the personal development of humans channelled by literacies" (p. 4). For Herbrechter, the very term "literacy" may no longer be appropriate due to the way that it always implies a bounded, self-reflective, all-too-human subject at the centre. Herbrechter offers "mediacy" as a more appropriate term for indicating the "being-with" through which human subjects are always formed, thus drawing attention to the inhuman, non-human and more-than-human relations through which humans have evolved and continue to do so.

Whereas Herbrechter focuses on the question of posthumanist education, I transpose the concept of mediacy to the site of energy futures in order to propose a speculative approach to probing education's energetic investments. Mediacy, as I deploy it, does not reference an idealism founded on the acknowledgement that there is a life or "real world" outside of our ideas, that our lived experience is *mediated* by ideas. Instead, and drawing on Deleuze's insistence against this understanding of mediation, the sense of mediacy used here affirms that "it is not the case that there is a life or being which is then mediated or ordered by ideas; [instead] life is lived directly and im*mediately*" (Colebrook, 2002, p. 80). With this in mind, the goal of *energy mediacy* is not to reveal or demythologize organizations of power, but to produce pedagogical encounters with the direct and immediate life of concepts, including the energy concept. Such mediation, I wager, is made possible through a pedagogy of exhaustion, one that necessitates a detachment from the everyday concepts that have reduced difference in the name of tiresome repetitions. It is through this concerted detachment — through exhaustion, subtraction and negation — that energy mediacy counter-actualizes the troubling investments that continue to define and perpetuate today's energy emergencies. Positioned as just one experiment in care-ful speculation, *energy mediacy* is not aimed at producing new energy imaginaries, but instead attends to that which has been necessarily neglected and obscured by the dominant logic and language of energy futurity. As such, this weird proposal for *energy mediacy* negates the smoothing grammar and commonsense metaphors that undergird projections of energy futurity while also responding, albeit speculatively, to the difficult problematics raised by the financialization of educational futurity and its obfuscating deliriums.

Metaphorical Exhaustion

Energy is a primal *metaphor* within Western thought, entwined with some of our most basic cultural self-images and commonsense representations. As historian and philosopher of economic thought Phillip Mirowski (1989) outlines in his fascinating account of the economics of social physics and the physics of nature's economics, the energy metaphor has not only dominated the domain of physics, but there is actually "no way of understanding economics and social theory in the twentieth century without first understanding 'energy' in some detail" (p. 11). In his book *More Heat than Light,* Mirowski (1989) gives the example of how the energy metaphor and its related laws and concepts continues to determine economic thought, particularly what is hailed as "scientific economics," or economics "squared with the method of physics." In his analysis, Mirowski not only traces the historical lines wherein energy was "simultaneously discovered" in physics and economics, but also the various ways in which the energy metaphor was ensconced as the pinnacle of nineteenth-century deterministic physics. In this historical analysis, Mirowski discusses how so often these histories position energy as a variable state characterized by persistence, equilibrium, invariance and independence from the passage of time. Put another way, central to the energy metaphors that have dominated both economic and scientific domains is an unquestioned fidelity to *laws of conservation* and their related assumptions about, for instance, equilibrium.

In basic terms, the law of conservation of energy states that energy can neither be created nor destroyed, only converted from one form of energy to another. As Mirowski (1989) outlines, the formula for laws of conservation go something like this:

> [i]f a physical system begins in a particular state and then returns to it, by whatever means and after however long, the system will possess the identical energy. […] Equivalence of this strong type is a two-way street: energy type A gets transformed into energy type B at a fixed rate, and this process can also be reversed at the same rate of transformation (p. 60).

Laws of conservation therefore presume a world defined by symmetry, equivalency and equilibrium, one that can be measured and accounted for in predetermined ways through, for instance, mathematical calculations. This understanding of the world and its energy

conservations has had impacts far beyond physics, bolstering economic theories including those that undergird speculative finance and its innovative mechanisms. As Mirowski (1989) develops, by understanding laws of conservation, and thus energy, in terms of mathematical identities that can be accounted and manipulated towards equilibrium, "conservation principles in nature gave way to seeing them more as contingencies, imposed by our accountants in order to keep confusion at bay" (p. 135). It is this contingent mode of accounting that supports dominant approaches to energy transition today by restricting the concept of transition itself to the constraints of linear relations that can be determined in advance, thus imposing "an extra independent restriction upon the vector field, while preserving the explanatory construct of extremal principles and conservation principles" (Mirowski, 1989, p. 227). Within such accounts of transition, which proceed, for example, through the smoothing grammar of energy "pathways," the energy concept is domesticated in ways that disappear the otherwise forceful pedagogical encounters that might be raised by its weirder dimensions.

As Mirowski details, the deterministic energy metaphors that continue to dominate both scientific and economic framings continue to hold strong, despite "the function and status of the conservation of energy (and, indeed, conservation principles in general) profoundly chang[ing] in the last century" (p. 59). With this in mind, and as Mirowski notes, the energy metaphor points to a "breathtakingly audacious misrepresentation of both the history of physics and the history of economics" (p. 12). By, for instance, acknowledging that something like money is itself always provisional, this "audacious misrepresentation" reveals how the "symmetries expressed by conservation principles were [and still are] contingent upon the purposes of the theory in which they were embedded" (p. 136). This brings forth the "devastating" realization that the entire concept of something like energy tied to conservation principles is just an "artifact of our language, something we project onto nature" (Mirowski, 1989, p. 137). Despite their misrepresentation, and even counterfactuality, energy metaphors that see energy in terms of reversibility, symmetry and conservation continue to pervade energetic discussions. Within energy literacy initiatives, for instance, energy is most often defined as a resource to be managed, measured and learned *about* so as to bring about more sustainable, but also more profitable, energy transitions. In this example, the energy metaphor works to strategically manage the reality of energetic investments, contributing to the broader obfuscations through which the

Industry of Education proceeds. Recognizing dominant energy metaphors as audacious misrepresentations that are nevertheless realized, or made "realistic," through tiring repetitions and affective normalizations, *energy mediacy* works towards exhausting the metaphorical contingencies that have limited affective investments, taking up energy and wearing us down.

Subtractive Strategies

As just one experiment in a weird pedagogy of exhaustion, *energy mediacy* is invested in *subtracting* from the metaphors that have come to think on behalf of education and its energy futures. This pedagogical orientation refers to an understanding of subtraction as the concerted elimination of the transcendent dimensions of metaphor so as to unleash the indetermination of a substantial multiplicity, or what Deleuze and Guattari (1987) articulate through the mathematical formula of n-1 (p. 6). Deleuze and Guattari use the formula of "n-1" frequently in the rhizome plateau of *A Thousand Plateaus* as a way to mathematically conceptualize lines of flight. The formula of "n-1," where we take "n" to be "the number of dimensions one already has available" and, through the art of subtraction, remove unitary traits and loosen the axiomatic bolts that have conferred a form of "commonsense" across dimensions (p. 6), describes the deterritorializing processes through which organizations are restructured by subtracting, or destroying, necessary determinates. What this formula points to is not only how representation is always contingent upon particular languages and grammars, not only how "words lie," but how representations are "burdened with calculations and significations, with intentions and personal memories, with old habits that cement them, that their surface, barely broken, heals over again" (Deleuze, 1995a, p. 22). This burden is exemplified by energy literacy programmes, which reduce both the concepts of "energy" and "transition" to everyday communications that can be recuperated within the Industry of Education's economizing logic.

With this representational burden in mind, which, I wager, constitutes a key aspect of today's situation of energy emergency, *energy mediacy* is aimed at experimenting with subtractive strategies that insist on the *negative* task of conceptual crafting, which destroys both the problems and solutions that have been installed by commonsense regimes of representation and ordinary language. "Destroy, destroy," Deleuze and Guattari (1983) advocate, for the task of schizoanalysis goes "by way of destruction — a whole scouring of the unconscious, a complete

cutterage" (p. 342; p. 371). As Buchanan (2008) articulates it, speaking of Deleuze and Guattari's schizoanalytical method more generally, "destruction is essentially a practical matter of undoing the complex set of illusions (i.e. territories in Deleuze and Guattari's terms) by means of which we give structure and purpose to our lives" (p. 117). But, importantly, this destructive process is not one of simply exposing or "working through" repressive apparatuses, as one does in psychoanalysis or critical approaches (like Friere's), "since this only destroys something the better to conserve it" (p. 117). Instead, this destructive process involves "destroying beliefs and representations, theatrical scenes" (p. 118-119) so as to better grapple with the processes of deterritorialization that mediate experiences and make up who we think we are.

Refracted through the subtractive formula of n-1, *energy mediacy* works to destroy the metaphors that have overdetermined "realistic" approaches to energy transition. This is especially important given the vexing problems of pedagogical resistance today, characterized as they are by a range of troubling investments made possible by speculative finance and its weird operations. Characterized by subtractive strategies, *energy mediacy* is not involved in the production of responsible individual subjects oriented towards positive transformation, but instead involves the destructive task of eliminating those metaphorical representations that constantly reterritorialize energy futures in relation to the image of productive, lifelong learners. By subtracting from the commonsense assumption of education's givenness to lifelong transformation, which is actually a repetition without difference, the subtractive strategies of *energy mediacy* undo the reterritorializing logic of "win-win" thinking by examining, and then destroying, the metaphors that make such winning solutions possible in the first place. By subtracting from energy metaphors that correlate possibilites for transition to economic health, *energy mediacy* exposes how "the real truth of the matter—the glaring, sober truth that resides in delirium—is that there is no such thing as relatively independent spheres or circuits" (Deleuze & Guattari, 1983, p. 4). With this in mind, and as just one experimental response to the troubling energetic investments that undergird the Industry of Education's delirious banking models, the goal of *energy mediacy* is not to further *manage* the reality of today and tomorrow's energy emergencies, but instead to articulate a very different order for thought, one wherein the very concept of energy is conceived as being "in-struggle" with and by its very (in)definition.

*5.5.3 Non-Productive Investments*

While dominant energy metaphors continue to hold strong, influencing physics and economics but also energy transition, there have been numerous scientific and theoretical developments that continue to frustrate such metaphors and the symmetrical conservations underlying them. As Mirowski (1989) notes, "[t]he great vulnerability of this portrait of a fully reversible world is that it is patently *counterfactual*" (p. 60). Physical processes cannot simply be reversed; people age, logs burn, friction occurs. And so, one way this irreversibility has been explained is through the metaphor of energy "loss," which counterfactually represents how energy is "lost" in processes of transformation. Because such an interpretation is itself prohibited by the law of the conservation of energy, which states that in a closed system all energy must be accounted for, one of the main problems that has been central to defining the energy concept — from the mid-nineteenth century until today — has been how to reconcile existing theories of energy conservation and loss with shifting understandings of heat and energy (Mirowski, 1989, p. 60). One example of this conceptual reconciliation can be seen through the concept of *entropy*, and its related concept of *negentropy,* both of which have been put forth in order to conceptualize the transformation-content of energetic processes.

In conceptualizations such as that offered by Rudolf Clausius as early as the 1850s, entropy offers a way to account for energy "loss" within the laws of classical thermodynamics by proposing, first, that the energy of the universe is a constant, and second, that the entropy of the universe increases to a maximum. Based on these claims, entropy is a thermodynamic *quality*, which is nevertheless expressed as a *quantity* that expresses how many different ways we can arrange elementary particles given ultimately the same properties on a large scale. The formalization of the entropy concept was rapidly embraced by nineteenth-century physicists because of the close resemblance to the already-existing formalism of mechanics inherent to the theory. As Max Pinsard (2020) outlines, the concept of entropy has been extensively discussed and debated because it is the basis for the laws of thermodynamics, which indicate that "without additional contribution coming from an external medium, the universe (and all things) tend irreversibly to return to equilibrium (i.e. death), having dissipated its *useful* energy" (my italics). But, and this is where things get weird: entropy's resemblance with and conformity to the laws of thermodynamics is deceptive. While dictionary definitions define entropy as "a measure of

thermal energy per unit temperature that is not available for *useful work*" (my italics, Afework et. al., 2018), entropy is actually not really a conserved quantity that can be measured in advance of its actualization. Instead, entropy conforms to an "as-if" conservation — a speculative postulate — which is only possible when all systems are imagined as reversible: "only in the fully reversible case can entropy be portrayed as a 'substance' that is maximized" (Mirowski, 1989, p. 61).

The speculative postulations subtending the entropy concept have necessitated a related concept, that of negentropy, which was introduced by Erwin Schrödinger as "negative entropy" in his 1944 popular-science book *What is Life?* For Schrödinger, negative entropy provided a response to the question of how living organisms avoid decline so as to maintain equilibrium. The concept of negative entropy provided a response to this question by formulating the ways in which living organisms gradually approach a state of maximum entropy (otherwise known as death) by feeding on negative entropy. Or, as Schrödinger puts it, where "life feeds on negative entropy," the only way to avoid the maximization of entropy is to continuously draw negative entropy from the environment. Negentropy therefore offers a way to explain energy consumption in relation to the irreversible nature of energetic processes by proposing a measure of order wherein consumptions of negentropy are equivalent to degradations of order. What the concept of negentropy assumes, then, is that the abstract property of "order" is what is valued and useful above all else, and thus negentropy provides a logical framework for measuring and developing efficiencies when it comes to the transformation-content of energetic processes. At the same time, however, general efficiencies cannot be determined based on negentropy alone because its absolute magnitude cannot be defined in advance. Not unlike the related concept of entropy, then, what the concept of negentropy points to is how the quantitative formulations used to calculate energetic processes are contingent upon the theories and language through which they are calculated.

With these beginning definitions of entropy and negentropy in mind, I find myself on the same page, so to speak, as Thomas Pynchon (1984), who writes about his own encounters with entropy in the introduction to *Slow Learner: "*I've been able to follow the OED definitions, and the way Isaac Asimov explains it, and even some of the math. But the qualities and quantities will not come together to form a unified notion in my head" (p. 14). The concept of (neg)entropy

is, in this way, a *weird* one in that it exhausts dominant languages and subtracts from insufficient metaphors, necessitating the creation of strange lines of thinking and unthought pedagogical encounters. Refracted through the weird concept of (neg)entropy, energy and its transitions are also mutated in weird ways. For instance, by reading energy futurity through the concept of (neg)entropy, the smoothing logic of energy transition and the fantasy of managing uncertain futures through, for instance, informed decision-making, are made to encounter the contingent, and even counterfactual, relations through which the concepts of energy and transition are made possible. This is an exhausting encounter in the sense that the pedagogy of these concepts exhausts the possible by relating "possibilia" (such as energy) to the words that designate them through inclusive disjunctions and combinatorial experiments (Deleuze, 1995a, p. 7). As Deleuze writes, "[t]o exhaust words, one must relate them to the Others who pronounce them — or rather, emit them, secrete them — following the flows that alternately intermingle and become distinct" (p. 7). In the case of (neg)entropy, *energy mediacy* works towards such exhausting encounters by enacting combinatorial experiments that subtract from and empty out predetermined possibilities by including, in disjunctive ways, the *non-productive* dimensions of the energy concept.

As Ilya Prigogine and Isabelle Stengers (1984) write in their book *Order out of Chaos*, "[t]he classical notion of entropy boils down to a distinction between 'useful' exchanges of energy and dissipated energy that is irreversibly wasted" (p. 62). In this take, the sense of productivity, and thus non-productivity, raised by entropy has less to do with "loss" and more to do with what is *unavailable* — specifically, the unavailability of a system's thermal energy for conversion into *mechanical work*. This "unavailability" indexes the "degree of disorder" or "randomness" in the system, and thus what is "negative" about entropy is, as Prigogine and Stengers write, how "it appears in the form of 'uncontrolled' changes that occur as soon as the system eludes control" (p. 120). In short, entropy names what we cannot order, cannot control, cannot manage. Attuning to this non-productive quality of energetic exchanges, the concept of energy transition is deformed and reframed in terms of available and unavailable energies, where availability is not correlated to financial instrumentalizations and predetermined futures but instead references that which eludes the system, or that which *does not work* within a system. *Energy mediacy* is invested in actualizing, through pedagogical encounters, the non-productive

potentials of the energy concept, where the "non" is positioned as a fulcrum for struggle against what has been deemed "productive" in the first place.

Where, once again, "[t]he history of energy is not one of transitions, but rather of successive additions of new sources of primary energy" (Bonneuil & Fressoz, 2017, 101), where there exists "no historical template for leaving forms of energy behind" (Simpson, 2020, p. 2), a non-productive approach to energy transition is one oriented to divestment. This approach not only aligns with the growing political calls for degrowth and active divestment from, for instance, pension plans that fund ongoing environmental destruction and fossil-fuelled ways of life, but, importantly, refers to the urgent need to *divest from those concepts*, including pedagogical ones, that condition subjective formations and social organizations. *Energy mediacy* is committed to this mode of divestment, where divestment is not just an appeal to use *less* energy but involves a pedagogy of exhaustion that aims to abolish the real. Given today's energy emergencies it has become apparent that what is needed is not less energy, but the *redirection or transition* of energy towards creating active configurations of sufficient power capable of providing "a reversal of perspective, a unifying break, a click, a moment in which it is realised that tactics must be immanent to thought" (Kingsmith, 2016). As Deleuze (1995a) writes, there is a big difference between the "we are tired" (tiredness) that capitalism forces us to wield and the "we are tired!" (exhaustion) as a cry for actualising the virtual, as experimentation with that which has yet to be thought. A weird pedagogy of exhaustion enacts the latter of these proclamations by subtracting from dominant energy metaphors so as to prioritize non-productive investments. Importantly, such prioritization is not a call for passivity and indifference, but instead requires pressing on, but toward nothing, for nothing.

### *5.5.4 Circuit Breaking Speculations*

Mutated through non-productive investments and subtractive strategies, the concept of energy takes on circuit breaking functions. This instance of circuit breakage is, however, quite different from the examples that opened this speculative study of energetic investments at the end of the world. Where, as Deleuze and Guattari write, conceptual crafting has been subsumed by "mere doxic hearsay" that works to "keep the ball rolling, without advancing even one inch"

(Boundas, 2006, p. 241), non-productive energetic speculations force an encounter with the problematizing force of thinking itself. As Deleuze (1995b) writes in *Negotiations*:

> Maybe speech and communication have been corrupted. They're thoroughly permeated by money – and not by accident but by their very Nature. We've got to hijack speech. Creating has always been something different from communicating. The key thing may be to create vacuoles of *noncommunication, circuit breakers,* so we can elude control. (my italics, p. 175).

*Energy mediacy,* characterized by subtractive strategies oriented towards non-productive investments, provides one experimentation in this noncommunicative process of concept creation. Within this approach, resistance to today's banking models is directed away from demythologizing the realties imposed by the powers that be and redirected towards speculative encounters with that which eludes systems of communication and control.

Oriented towards circuit breaking speculations, which always necessitate an ethos of care, *energy mediacy* is not invested in recovering and recalibrating pedagogical becomings towards affirmative and additive energy transitions, but is instead invested in pedagogical *un-becoming*, or the undoing of a subject. While Deleuze was, in many ways, against the very concept of discrete subjects, he did not deny subjectivity a place in philosophy. Subjects, for Deleuze (1995b), are only interesting, however, when they "cast a line to the outside — in short, when they stop being subjects (with a double emphasis on "being" and "subjects") (p. 99). Becoming, in this sense, has little to do with subjects developing into more of themselves, into more *actualized* humans, as Friere might have it, and is instead inflected by processes of un-becoming (Culp, 2016, p. 28). Pedagogical un-becoming necessitates, in the first instance, short-circuiting those assemblages that autoproduce contingencies for pedagogical becoming, and in the second instance, dissipating the connective tissues between the subject and its referents in pre-determined (but also consistently recalibrated) identities. In discord with educational instrumentalizations that install responsible, autonomous and "energy literate" identities, un-becoming mobilizes pedagogical encounters capable of dissolving the automatic correspondence of the subject to a name that would designate "the sum of [its] capacities" (Culp, 2016). *Energy mediacy,* which involves subtracting from energy metaphors and encountering the non-productive dimensions of energy, is what provokes pedagogical un-becoming, in turn founding

new conditions for pedagogical resistance against the present language and logic of energy futurity. Invested in pedagogical un-becomings, *energy mediacy* circumvents the habitual entreaty to continually produce an education after education in favour of circuit breaking pedagogical encounters that elude prediction and control.

Where today's energy emergency is characterized, at the same time, by an obsession with over-production as well as an affective tonality of fatigue, the circuit breaking logic of *energy mediacy* has an appetite for destruction. This appetite both necessitates and is made possible by very real instances of stopping. As Boundas (2006) writes, speaking of Deleuze and Guattari's circuit-breaking vacuoles of communication, while philosophy is aimed at rethinking concepts of the political, that is, by creating them outside of politics per se, "this requires time, momentary retreat, and a certain intransitivity towards all the fashionable sirens" (p. 241). Once again, circuit breakers are what *make time.* Unlike the circuit breakers used on the trading floor, however, making time here involves "mak[ing] the whole world stand still" (Culp, 2016) so as to short-circuit the smoothing grammars, primal metaphors and commonsense communications that delimit what is possible to think. With this circuit breaking pedagogy in play, the productivist and affirmative logic that permits education's speculative financialization is exhausted and destroyed, in turn short-circuiting the "here and now" to play out the scene differently (Culp, 2016). It is through this exhaustion of possibility that educational subjects might be able to detach from the world as it is given, from "what 'comforts us' within the illusion of fortitude (of self, of we, of the sense, of freedom, of the future)" (Pelbart, 2015, p. 46). And, it is through this exhaustion of possibility that pedagogical possibility, and thus educational futurity, might be speculatively reinvented.

# CHAPTER SIX: Working at the Edge of Extinction (Study No. 3)

## 6.1 Transmitting Reality, Surviving the Future

### *6.1.1 Survival Conditions*

On May 31, 2000, the reality competition television franchise *Survivor* entered the living rooms and life-flows of audiences across North America. Inspired by a Swedish television series titled *Expedition Robinson* that premiered three years earlier, this instant-hit was the result of (then fledgling) producer Mark Burnett's fantasy to whisk viewers to a deserted island where they would live vicariously through two "tribes" of competitors — 16 "average" Americans — as they worked together to survive the island conditions while also working against each other to determine, through elimination votes, who would be the "sole survivor" and thus the winner of one million dollars. Thinking the Swedish version too "cheesy and mean-spirited," Burnett retooled the *Expedition Robinson* concept so as to focus less on the survival of the elements and more on the human drama that plays out when people are put under both physical and mental pressure (Murray, 2016). As the show slogan highlights, beyond surviving food scarcity and stormy weather, the main imperative for the *Survivor* cast(aways) is to outwit, to outplay and, and ultimately, to outlast.

Upon its premier, *Survivor* became an immediate success, both in terms of ratings and profits. When the first season — *Survivor: Borneo* — ended in the summer of 2000, more than fifty million people were watching, making it the number two program of the year behind the Super Bowl. In addition to the advertising revenues that came along with these high ratings, the show offered a range of new marketing promises based on the diverse, but nevertheless "ordinary" — or *real* — people that made up its cast(aways). As *AV Club* writer Noel Murray (2016) highlights, when "the CBS marketing team first heard about the show, they salivated over the notion of a diverse cast drawn from all across the country, opening up promotional opportunities in every market and every demographic." Airing twice a year, *Survivor's* first twenty-three seasons consistently broke the top twenty most-watched shows, and while its ratings have declined over time, it is now considered one of the leaders of American reality television programming.

In addition to bringing in profits and keeping viewers glued to screens during prime-times across the continent, *Survivor* also marked a shift in the era of reality TV programming at the turn of the 21st century. Until this point, non-scripted television had been mostly imported from overseas as a cost-saving option for struggling cable channels in the U.S. *Survivor,* however*,* marked a shift in non-scripted productions, providing a prototype for what has now become a competitive mainstay for major TV players. As Murray (2016) notes, *Survivor* legitimized the genre by using higher production values, which worked to reframe some of the seedier elements of reality TV, such as ubiquitous surveillance and cut-throat competition, into "something plausibly meaningful." Indeed, when pitching the show to CBS, Burnett focused on how the American version would be different from its earlier Swedish iteration, specifically in terms of production, which he imagined akin to the high production value of his popular extreme sports competition show *Eco-Challenge.* More than that, though, Burnett wanted the show to focus on a specific part of the drama of survival, that is, the unpredictable *human drama* that plays out when people try to relate to one another (or not) when put under pressure. For Burnett, *Survivor* was not only pitched as a fantasy of escape, but was put forward as a potentially profound site to say something "meaningful" about the human condition (Murray, 2016). And say something about the human condition, it did! In addition to being illustrative of humanity's (apparent) capacity to outwit, outplay and outlast, *Survivor* is just one sign-post in the short history of the rise of reality TV, which has not only transformed programming ecologies and the economics of television, but has worked its way into various aspects of everyday life and daily practices.

### *6.1.2 Reality All Day, Everyday*

Reality television can be defined, in basic terms, as "unscripted shows with non-professional actors being observed by cameras in preconfigured environments" (Kavka, 2012, p. 5). Along with *Survivor*, early popular reality TV programmes included shows such as the isolationist social experiment *Big Brother,* the heteronormative match-making gameshow *The Bachelor* and family-friendly talent competitions such as *American Idol,* all of which, it should be noted, are still on air in one form or another today. This early reality TV definition, defined by non-actors placed into carefully designed situations, not only offered sites for creating exciting

human drama, but was recognized for its potential for high profit margins. From the start, network executives had dollar signs in their eyes when they realized that the lower production costs, the use of non-union "talent" and the lack of writers characteristic of the unscripted format drastically reduced expenses (Allan, 2018; Peterson, 2020). As one network executive put it, while "[reality shows] don't make the best press releases, […] they make some of the strongest, most thriving business" (Peterson, 2020). Due to these cost savings, reality TV profit margins, which come mostly through advertising revenue, can be as high as 40% (Writers Guild of America East, 2013), which, combined with new opportunities for integrated product placement, franchise licensing deals and merchandising opportunities make reality TV programming big business for television power-players.

As reality television programming has proliferated and mutated over the years, however, the simple definition offered above, one that speaks of non-professionals and preconfigured environments, has been made vulnerable by a range of reality texts that challenge such definitional parameters. Today's unscripted shows not only include a range of ever-wackier competitions and strange social experiments, but also an ever-growing variety of reality formats that elude earlier definitions of the genre. Reality competition shows in the last few years, for instance, have featured teams of "fugitives" running from highly-skilled investigators in shows like *Hunted* as well as hour-long programming wherein adult humans must work desperately to avoid touching the ground, as is the goal in Netflix's *Floor is Lava.* The competition strain of reality TV has expanded and extended, now featuring a range of shows that pit budding chefs and fashion designers, but also glass-blowers, sword-makers and flower-arrangers, against one another so as to determine the "top" or "master" individual in any given discipline. In some cases, these competitions take on dystopic undertones, going so far as to exhaust, and dare I say, torture, contestants as in the case of Channel 4's *Shattered,* where ten contestants were challenged with going without sleep for seven days while their actions were broadcasted for viewing pleasure.

In addition to its competitive modes, reality TV today also includes a range of docu-dramas, both of the celebrity and everyday variety, which have not only led to newly-branded digital channels, such as Bravo, but also the creation of a celebrity industry in its own right. While keeping up with the Kardashian family and checking in on the antagonistic relationships

between various groups of real (and really rich) housewives, reality docu-dramas today also follow hoarders, addicts, cheapskates, ghost hunters, polygamists, plastic surgeons, real estate agents, newly-weds, teen moms and various couples who have many, many children. The docu-drama form, or what is sometimes called "structured reality," differs from its competition cousins in that it is implied that the events shown on screen would still be taking place even if cameras were absent. In addition to providing views into special living environments such as *Temptation Islands* and *Big Brother* houses, these "structured realities" also feature courts of law (i.e. Judge Judy, The Peoples Court), investment scenarios and entrepreneurial ventures (i.e. *Restaurant Startup*, *Show Me the Monet*) and supernatural investigations (i.e. *Paranormal State, Ghost Hunters*). This "structured reality" programming is taken to its extreme through a range of shows, which have only proliferated in recent years, that follow the idiosyncrasies of very particular cultural groups and practices. In addition to family-operated duck dynasties and gold rushers, for instance, shows such as *Appalachian Outlaws, Moonshiners, American Guns, Wildwest Alaska, Ice Lake Rebels* and *Big Fish Texas* have come to stand in for the afternoon (or late-night, or early-morning, or really any time of day) soap opera genre.

In the realm of reality dating shows, *The Bachelor* and its ongoing spin-offs (including *The Bachelorette, Bachelor Pad, Bachelor in Paradise, Bachelor in Paradise: After Paradise, The Bachelor Winter Games, The Bachelor Presents: Listen to Your Heart* and *The Bachelor Summer Games)* are now accompanied by shows like *EX-treme Dating*, where blind dates are chaperoned by ex-lovers, *Chains of Love*, where four people volunteer to get chained to a member of the opposite sex for four days, and *90 Day Fiance*, where couples have 90 days to marry each other before their K-1 visa expires. Yet another genre that is common to reality TV today is the make-over or transformation show, which extends beyond tear-jerking "queer eye" transformations and extreme home makeovers, to include shows like *Help, I Wrecked My House!*, which "rescues" homeowners from majorly incomplete DIY renovation projects, and shows like *100% Hotter*, which makes its subjects watch videos of the public rating their "hotness" before making them over to look, well, "100% hotter."

Through this proliferation of sub-genres, as well as the ongoing mutation of forms, reality TV's big business has only grown over the years. Indeed, reality TV programming has been one of the biggest winners of pandemic television programming, not only due to its lower production

costs, but due to its ability to pivot its operations in order to meet shifting health protocols. As the BBC reported at the start of the pandemic in April of 2020, ratings for major US broadcast networks (such as ABC, NBC, Fox and CBS) had increased each week since early March of the same year, with reality TV show ratings especially showing major increases (Jones, 2020). These increases came alongside reports, from HBO for instance, of increased "binging" (defined by HBO as audiences watching at least three episodes of any one series in a day), which grew by 65% in the months following the onset of the pandemic. This increase in reality uptake has been attributed to the genre's ability to provide escape and fill in the gaps that were left by major television events, such as the 2020 Olympics. But more than that, media scholars such as Tanya Horeck have highlighted how reality TV's appeal in a pandemic age also stems from its "relatability" and "intimacy." "We're all trapped now," writes Horeck, going on to say that "[r]eality TV has an intimacy which makes it quite powerful at this time. The shows bring us up close to real people" (cited in Jones, 2020).

Reality TV's capacity to expand and grow in a pandemic age, both in terms of profits and reach, bring forth an important point about the genre's earlier definitions. That is, based on its constant mutations and pivoting capacities, the phenomenon of reality TV now exceeds earlier definitions based on the various ways that it bleeds through the screen into so many other areas of life and daily practice. As scholars and CNN reporters alike have pointed out, reality TV has grown as a political force in its own right (Schwarz, 2018). For instance, many have pointed to reality TV as being at least partially responsible for launching the political career of the 45th president of the United States. As James Poniewozik (2020), author of *Audience of One: Donald Trump, Television, and the Fracturing of America* outlines, Trump's political career was founded on giving TV audiences what they supposedly craved — spectacle, drama and outrage — all of which became hallmarks of Trump's disastrous time in the oval office. In addition to infecting political arenas, the competition aspect of many reality TV shows — be it *Dragon's Dens* or *Shark Tanks* or *Master Chefs* or *Ninja Warriors* — are now echoed in a range of situations, from job interviews and social media campaigns to carbon capture initiatives. In early 2021, for instance, Elon Musk announced a four-year global competition with a $100M prize to find a way to pull carbon from the atmosphere and oceans so as to mitigate the irreversible impacts of rising CO2 levels.

Of course, not to be forgotten when discussing the reality formatting that now filters our daily lives, social media and its algorithmic logic takes the staging of "non-professionals observed by cameras in preconfigured environments" to a whole new level. Not unlike reality TV, on social media "everyday" people are able to gather followers (and ad revenue) by sharing their own slice of reality. And, like reality TV, social media platforms have mutated and extended far beyond their original forms and purposes, to now include a wide range of platforms offering new forms of connection, demonstrating the potential for social media to constantly innovate so as to attract (and extract from) new audiences. From exercise programmes (Peleton) to money-sending apps (Venmo) to career networking platforms (LinkdIn), today's "social media platforms have penetrated deeply into the mechanics of everyday life, affecting people's informal interactions, as well as institutional structures and professional routines" (Van Dijck & Poell, 2013). Given the various platforms and protocols through which so many of us now communicate, express, consume and even *learn* — be it through Zoom lectures, Youtube tutorials or TikTok memes — it's looking more and more like we are all becoming-reality TV stars.

### *6.1.3 Innovating Realities*

While not everyone may be a fan of reality TV, its impact on political, social, cultural, and I argue, *educational*, practices are nevertheless far-reaching. As highlighted above, reality TV programming has been able to consistently *innovate* its content and forms so as to ensure success in terms of both profits and audience engagement. The ongoing proliferation and innovation of reality TV, in turn, demonstrates that reality programming today includes many exceptions to earlier categorizations, thus necessitating a more complex definition of the genre. With this in mind, reality TV has been explored and interrogated by media scholars in terms of its interpolations within broader social organizations, political milieus and economic practices. Within these analyses, the focus is not just on the *content* of reality TV, but, importantly, the *forms* of its production and consumption, which extend far beyond the screen.

Media theorist and author Misha Kavka (2012) asserts, for instance, analyses of reality TV should focus less on what reality TV presents on the screen, and more on "the internal features of reality TV texts with information about the critical discourses and cultural economies

in which they are embedded" (p. 5). As Kavka (2012) writes, in its relatively short history, reality television has not only transformed programming schedules, birthed new niche channels and influenced celebrity culture, but has, importantly, "turned viewers into savvy readers of – not to mention potential participants in – the mechanics of television production" (p. 2). In the example of *Survivor*, for instance, the "public" is not only brought into the island fantasy through the selection of the cast(aways), which, again, are explicitly presented as ordinary, average Joes, but are also key to live season finales, post-show auctions and the consumption of *Survivor* merchandise. Annette Hill (2014) also highlights the important role that audiences play in unscripted programming, asserting that the production, aesthetics and politics of reality TV are, in their very formation, intimately connected to "audiences and publics, consumers and producers, participants and users, fans and anti-fans, readers, listeners, viewers – all these people and their practices" (p. 7). For Hill, then, "it is not possible to understand reality TV unless it is connected to audiences" (p. 7). According to both Kavka and Hill, the success of reality TV has not only been made possible by its low-costs, high profit margins and capacity for adapting to shifting realties beyond the screen, but has been furthered based on the relations it engenders between producers, participants and audiences.

With this in mind, it can be argued that the rise of reality TV over the last twenty-or-so years has not been accidental. As Hill (2014) writes, reality TV's "successful and controversial mix of fact and fiction came at just the right moment when broadcasting shifted from a traditional model of *speaking to* its audience, to a niche commercial model of *interacting with* its audience" (my italics, p. 21). Positioned as television's response to the "interactive," or "affective," or "experience" economy, reality TV most often involves participation from audiences, publics or consumers, whether through "participating in shows as live crowds, in auditions, as contestants, as themselves, through voting, or making and sharing content for social media, and through gossiping, people watching and public debate" (Hill, 2014, p. 22). What is important to note here is how reality TV can be "successful" even when, or perhaps especially when, its content is terrible. This is highlighted in a 2018 survey conducted by *Morning Consult/The Hollywood Reporter,* which outlines statistics that show, at the same time, increasingly souring and unfavourable views of reality TV (especially among women) *and* ongoing increases in overall ratings (Shevenock, 2018). This love-hate relationship with reality

TV rings true for me and my own consumption, which is based less on whether a particular programme is "good" and more on my fascination with the strange logic and scenarios that producers think up in the quest to capture and re-present some version of "reality." In short, the success and ongoing proliferation of reality TV, which now includes a range of formats and content available all day, everyday is not only based on ratings and profits, but how reality TV, in its very formation, integrally involves the day-to-day practices of audiences as they are situated within broader economic operations and demands.

Writing back in the early days of unscripted television, media scholar Mark Andrejevic highlights such economic connections. Focusing his analysis on surveillance-based reality TV programmes such as MTV's *The Real World* and *Road Rules,* Andrejevic (2002) outlines how such programming emerged at a time when the economy was becoming increasingly reliant upon surveillance as a form of economic exploitation. Here, Andrejevic is referencing the early days of the "online economy," wherein the economy was becoming "increasingly reliant on the economic value of information gathered through sophisticated interactive communication technologies" (p. 252). Writing back in 2002, Andrejevic was interested in how this economic shift required more than just capital investment into new infrastructures of production and communication technologies in order to take off. As Andrejevic tells it, this shift also required the transformation of *ways of life* and *modes of existence* in accordance with the new forms of consumption and production that such an economy necessitated. Put another way, the development of the online economy and its sites of e-commerce necessitated the development of a "new person," one who "has the right kind of attitude toward the benefits of [for instance] online surveillance" (p. 259). Asserting that one of the key features of the "new" economy was its dependence on the "dedifferentiation of the spheres of consumption, production and leisure" (p. 259), Andrejevic highlights how this de-differentiation was (and still is) achieved, at least in part, "through techniques of surveillance that allow leisure time and consumption time to participate in the creation of surplus value through the generation of information commodities" (p. 259). And so, for the online economy to be successful, audiences-cum-consumers needed to be "trained" into a reality wherein individuality could be recovered, and thus marketed to, through practices of customization made possible though ubiquitous surveillance. Turning away from then-typical analyses of reality TV in terms of its voyeuristic qualities, Andrejevic's early

analyses of unscripted "real worlds" instead focus on the way in which "structured reality" programming "trains" viewers to take up particular subjective formations, ones that correspond to the implicit definitions of "reality" presented on screen and undergirded by economic demands.

The innovative subjective formations through which reality TV has proliferated are also hard at work within the Industry of Education, which involves its own internal features and economic interpolations. Like reality TV, the Industry of Education has had to consistently innovate both its forms and content not only to respond to broader socio-economic demands, but to *pre-produce* a reality that would ensure its redemptive narratives and thus the ongoing perpetuation of an education after education. In this study, the third and final in the speculative series offered here, I look to the rise and transformation of reality TV as one weird site to examine the *survival conditions* that contribute to today's apocalypse habits and end-of-the-world scenario. By bringing the strange world of reality TV into contact with the question of educational futurity, this study aims to explore the ways in which shifting educational realities connect to broader economic organizations, with specific focus on the Industry of Education's given imperative to produce a *workforce* for the future. In what follows, I continue to outline the short history of reality TV, honing in on the pedagogical connections and implications of this media phenomenon, particularly as it relates to (the end of) *working futures*. Drawing on contemporary political and economic theory, the study proceeds by outlining the contours of what I call here *platform education*, which is offered as one example of the shifting educational realities that define not only the (pandemic) present, but the future of education. By bringing the phenomenon of non-scripted television and its habituating tendencies in contact with the "reality training" programmes and protocols necessitated by platform education, I examine the ways in which *life has been transformed into learning, and learning into labour.* Following these analyses, I begin to re-work the strange transformations that characterize platform education today by experimenting with the ways in which dominant work ethics might be counteracted so as to rethink modes of existence in light of today's (de)extinction programming. Based on this re-working, the study then concludes with a series of speculative proposals that endeavour to mutate the educational givenness of sole survival and the unthinkable pedagogical problematic of *working at the edge of extinction.*

## 6.2 Education and the Problem of Working Futures

### *6.2.1 Reality Training*

Like reality TV, the Industry of Education rolled out its own response to the online economy and its shifting demands at the turn of the twenty-first century. The wide-reaching educational initiative called 21st Century Learning, for example, was explicitly presented as a response to shifting economic realities and industry demands. Through various global educational initiatives put forward by organizations such as the OECD, the World Bank and the World Economic forum, as well as more locally-oriented curriculum reforms and policy initiatives, "21st century learning" has become central to educational reform over the last two decades, with specific emphasis on those frameworks and skills that are aimed at promoting employment, innovation and economic growth (Robertson, 2005). 21st Century Learning is focused, above all, on developing the skills deemed necessary for students to participate as future citizens, or more accurately, future *workers*, *producers and consumers* in a rapidly changing, hyper-connected, globalized, digital society.

Also like reality TV, this paradigm shift was not accidental, but instead a result of contemporary education's unquestioned economic givens. Where, once again, the Industry of Education operates by economizing learning through specific industry standards, the notion of education is itself defined and delimited by the demands laid out by dominant economic orders. Important to note here, and as developed in the previous chapter through the example of education's energetic investments, is how such economizations are not the result of fixed measurements and strict determinations, but are instead constantly transformed, adapted and mutated in line with capitalism's necessity to consistently expand and innovate so as to overcome its own limits. Through a range of initiatives and reforms, be it energy literacy initiatives or sustainability projects, education is positioned as an innovating force that is able to transform individuals and thus the world so as to meet the needs of the unknown future, which is most often defined in economic terms. And so, like reality TV once again, the aim of the Industry of Education under this innovative and innovating rubric is to develop, or "train," subjective organizations, via the figure of the student, so as to produce the necessary skills, knowledge and attitudes to adapt to the "new" realities presented by shifting economic demands.

As such, these seemingly disparate sites of inquiry provide a weird overlap for examining the way in which pedagogical questions are intimately connected with processes of *subjective habituation*.

In the case of reality TV, especially when examined in terms of its "training" functions, processes of subjectification are central to its success and ongoing proliferation. It is in this way that reality TV takes on a distinctly pedagogical character. The pedagogical function of reality TV highlighted here, however, is different from that which is often articulated by scholars who advocate for using reality TV in the classroom. While, for instance, academics in the disciplines of political science and economics have discussed how reality TV shows like *Survivor* might serve as tools for introducing political lessons (Dreyer, 2011), macro-economic concepts (Karlan, 2017), cartel behaviour (Mixon, 2001) and prisoner's dilemmas (Salter, 2014), to name a few examples, the pedagogical function of reality TV referenced here is less about the *instructive* potentials of its content, and more about the *material practices* and *subjective organizations* it enables, delimits and habituates. In this way, the "training" function of reality TV is involved in both the training of subjects that are primed to conform to the demands of contemporary social and economic formations as well as the training of reality itself so as to pre-produce such subjective formations as necessarily "realistic" given dominant visions of structured reality.

This reality training is fundamental to the Industry of Education and its necessary standardizations. As Guattari (2009) writes in *Chaosophy*, what a teacher requires of their students, is not just that they engage with specific content or data, but that they take up particular modes of "semiotization," that is, "a certain style of semiotic moulding, a certain initiation to the given castes" (p. 279). Guattari's notion of semiotization here references "what happens with perception, with movement in space, with singing, dancing, mimicry, caressing, contact, everything that concerns the body" (p. 279). As such, while semiotization for Guattari is interpolated within dominant regimes of representation, including pedagogical ones, it cannot be understood by looking to representational organisms, significances and subjects alone. The concern Guattari raises through the concept of semiotization is how subjective formations are "reduced to the dominant language, the language of power which coordinates its syntactic regulation with speech production in its totality" (p. 279). In the example of the Industry of

Education, for instance, students are "trained" into particular semiotic moulds, not only through content delivery and the transmission of information, but through the dominant languages, structures and forms of schooling, or what has been outlined thus far as education's industry givens. Students learn, through ongoing habituation to economizing logics, progressive imperatives and humanist orientations, the skills and attitudes necessary to "fit in" to dominant castes, or industry givens, and as a result desire and subjectivity become conflated with what is in a student's best *interest*, in turn disappearing possibilities for alternative modes of semiotization. Through this standardizing process, education is always-already positioned as the industrious territory for the inculcation of the requisite duties, speeds, and repetitions, or those pedagogical becomings that have been determined "good," "necessary" or "realistic" in order to pre-produce social reality in line with dominant organizations of power. As Mark Fisher (2009) writes, "education, far from being in some ivory tower safely inured from the 'real world,' is the engine room of the reproduction of social reality, directly confronting the inconsistencies of the capitalist social field" (p. 26).Through its modulation and direction of subjective formations, education works to pre-produce a reality that can be recuperated within, or "trained" upon, the dominant social and economic organizations that undergird its operations so as to ensure its ongoing perpetuation.

### *6.2.2 Habitual Formations*

As outlined in the previous section, the success of reality TV has involved bringing audiences and their daily practices into the fold, again and again, highlighting the key role of *habit formation* in reality TV's impact, which extends far beyond viewing patterns. For Deleuze, (1991), the "problem of subjectivity," which he identifies as early as 1953 in his work on Hume, arises from the assertion that the self is not given, but instead formed through habits derived from an otherwise indeterminate and borderless world: "we are habits, nothing but habits" (Deleuze, 1991, p. x). Habit, otherwise thought of as the synthesis of bodily, desiring and unconscious connections with the world, works to unify and make meaning of experience, in turn developing a particular concept of the self. Subjectivity, for Deleuze and Guattari, is therefore not based on a pre-established code, but instead constructed through both the habitual and singular relations — the cuts, segments and orders — one forms with the world. In this way,

subjectivity works as a "strange 'fiction' difficult to dissipate since it is precisely the fiction of ourselves and our world" (Rajchman, 2001, p. 17). The fiction of a bounded, knowable self is nevertheless co-constituted by material processes. As Brian Massumi (2002) writes, following Deleuze and Guattari, habits "reside in the matter of the body, in the muscles, nerves, and skin where they operate autonomously" (p. 236–237). Of great import within the philosophical project of Deleuze and Guattari is therefore to examine how *habitual* responses to the problematizing forces of life and subsequent processes of subjectification, have come to haunt our culture, inspiring the segmentations, planifications, categorizations and hierarchies which cut up experience in particular ways (Deleuze & Parnet, 2002, p. 229).

The weird (real) worlds of reality TV offer just one site to explore this understanding of the habitual formation of subjectivity. As media scholar Catherine Chaput (2011) outlines, the connective energy of reality TV works by "habituat[ing] people into individuated forms of belonging patterned through a repeated movement between the television, telephone, and computer" (p. 10). By drawing on theories of affective value with labour theories of value, Chaput (2011) suggests that reality TV highlights how "everyday activities constitute political value through subject formation and economic value through productive labor, making them part and parcel of capital rather than its derivative" (p. 2). In a similar vein to Andrejevic, Chaput points out the ways in which reality TV "trains" audiences-cum-consumers to "seek life energies along the paths set before us," (p. 11) namely those ones that constitute themselves in harmony with the needs of late capitalism and its online economies. In her analysis, Chaput outlines the ways in which reality TV is bound up with shifts from mass culture toward mass customization and the normalization of a politics of surveillance, both of which allow viewers to construct themselves within what Foucault (2008) calls an "enterprise" society (p. 241). Within this vision of society, the "individual becomes his or her own most valuable commodity, one that must be constantly monitored, assessed, and updated" (Chaput, 2011, p. 7). From this point of view, the value of reality TV stems from its ability to constitute subjectivity and create individuals that are themselves positioned as "projects to be enhanced, updated, and redirected toward the increasingly digital spaces of social networking, shopping, entertainment, and education" (Chaput, 2011, p. 10). Not unlike Andrejevic, then, Chaput argues that the affective energies

through which reality TV circulates work to collectively constitute themselves in accordance to the needs of the economic demands of late capitalism.

Transposing both Andrejevic and Chaput's analyses of reality TV to the question of educational subject formation, reality training is not just a matter of indoctrinating students, through, for instance, curriculum content, but involves the pre-production of habitual paths and energies for subjective formation, which in turn limit the ways in which education frames and then actualizes life itself. Reality TV works on viewers not just through representations of, for instance, a "whole way of life" (Andrejevic, 2002) but through the concerted habituation of daily practices that come to constitute affective assemblages in the world. As such, reality TV is more than just an inculcating force that operates through images on a screen, instead invested in the training of *and* for reality, which in turn impacts perceptions of subjective possibilities, both now and into the future. Returning back to the question of pedagogy at the end of the world, what, then, are the connective energies and habituating potentials through which the Industry of Education operates today? What kinds of realities are pre-produced by such habituating forces and energies, and importantly, what educational futures are projected? Further, what might we learn by bringing these energies and potentials together with the strange world of reality TV and its own reality training protocols? One line to follow in order to explore such questions is one that points to the *future of work,* or what is unfolded here as (the end of) *working futures.*

### *6.2.3 The End of Working Futures*

One of the defining characteristics of contemporary educational reform is a concerted investment in the pre-production of educational futures that are always-already tied to the fantasy of "full employment" (Srnicek & Williams, 2015), or the dream of *working futures*. Indeed, the future of work is one of the key guideposts for the way in which the Industry of Education — its reasons and its futures — continues to be defined and delimited. In a 2019 report produced by the OECD called "Envisioning the Future of Education and Jobs: Trends, Data and Drawings," for example, the future of education is tied to "revolutions" in work brought on by today's global trends, which are seen as necessary catalysts for transforming education so as to "help our children develop the kinds of skills needed not only to weather, but to take advantage of this revolution" (p. 3). In more specific terms, the report asserts that preparing for the future will

entail “pairing the artificial intelligence of computers with the cognitive, social and emotional capabilities of humans, so that we educate first-class humans, not second-class robots” (p. 3). In this report, the future of education is honed upon the broader global “mega trends” identified by the OECD as impetus for educational reform more generally, including trends of globalization (“It’s a small world”), environmental security (“A change in the weather”), digitization (“Data makes the world go round”), the 4th industrial revolution (“New opportunities”), lifelong learning (“Learning to work, working to learn”) and collaboration and co-operation (“Working together to create new opportunities”) (OECD, 2019a). By projecting educational futurity in relation to these unquestioned trends, this report is one example of the now taken-for-granted claim that education is fundamentally tied to the future of work and thus the production of a workforce.

The customary assumption of putting an educated populace to work is not only prevalent within international policy reports and initiatives, but also key within 21st Century Learning paradigms and other dominant educational discourses, especially those concerned with the future of education. In projects and proposals of education for/as sustainability, for instance, sustainable education is often tied to furnishing the skills and information necessary to produce more sustainable training programmes and job opportunities. Likewise, in discussions of energy transition, the future of work looms large, as demonstrated by energy literacy initiatives aimed at developing a workforce prepared to transition infrastructures and economies towards “green” and/or “clean” energy futures. In these examples, learning is directed towards training subjects to take up the appropriate subjective forms so as to develop the knowledge, skills and attitudes necessary to participate in a more sustainable, energy efficient, working future.

This vision of futurity, one characterized by fantasies of full employment and more sustainable jobs for all is, however, increasingly at odds with the reality of today’s unthinkable situation. This out-of-synchness is not only due to the questionable status of education’s sustainable approaches and energy futures, but is due to the incredibly dismal outlook for the future of work. Alongside the extinction of various species, the world of work is undergoing its own series of extinction events. As the World Bank articulates it in a 2015 report, “of the additional one billion young people expected to enter the global labor market by 2026, only 40% are expected to acquire jobs that currently exist, presumably due in part to a reorganization of

global production and labor in relation to new technology and machine learning capabilities" (cited in Means, 2018, p. 328). With this in mind, the World Bank estimates that the global economy will have to "create 600 million jobs over the next 10 years, or more than 5 million a month, just to maintain current insufficient levels of youth employment" (Means, 2018, p. 328). The "job apocalypse" projected here, by an international banking forum, it's worth noting, refers to a much broader crisis of work that has been taking place since the 2008 financial crash, now accelerated by the unprecedented economic circumstances brought on by the most recent global health crisis and its "jobless recoveries" (Srnicek & Williams, 2015, p. 94). The facts and figures outlined here demonstrate how the future of work is far from optimistic, in turn raising questions about how to proceed when confronted with the end of working futures.

Political theorists Nick Srnicek and Alex Williams (2015) contend with such questions, asserting that increased processes and technologies of automation, expanding surplus populations (of a certain kind) and ongoing, albeit disastrous, austerity measures all heighten the need to rethink work and its interpolations within the broader crises of capitalism. In their exploration of post-capitalism and a world without work, Srnicek and Williams (2015) use "work" to refer to jobs, wage labour, or "the time and effort we sell to someone else in return for an income" (p. 85). For these thinkers, today's crisis of work has not only been brought on by the rise of precarious labour, characterized as it is by all sorts of bad working conditions (i.e. casual, un-guaranteed working hours, low/stagnant wages, decreasing job protections, widespread insecurity), but has also been brought about by the ongoing austerity measures since 2008 that have allowed employers to gain ever-more control over workers and working conditions. The controlling casualisation of work has been accompanied by a series of "jobless recoveries," which, as evidenced by the most recent pandemic-driven recovery plans, respond to economic crises through further cuts and austerity measures, in turn exacerbating the problems of precarity by making under- and un-employment the "new normal" of the labour force (Srnicek & Williams, 2015).

Despite the various crises of work *already* taking place all around, the Industry of Education proceeds through the assumption that education will provide future job opportunities and thus a prosperous future, both for individuals and society at large. In response to the crises of work on the horizon, the World Bank, for instance, continues to place an emphasis on learning

and skill upgrading as important solutions to this seemingly insurmountable problem. And so, faced with a crisis of work, one that has been compared to an apocalypse on more than one occasion, education is not only positioned as that which will produce the future workforce, but also as that which will *overcome the crisis of work* that increasingly defines the workforce itself. With this in mind, those crises that might otherwise conjure something like *the end of work*, at least as we have come to know it, do not signal an actual end, but instead provide a site for innovating labour practices and work ethics so as to pre-produce the reality of an undeniably working future. It is this orientation towards a working future, one defined by the fantasy of full employment despite the growing crises of work piling up today, that is further examined and counter-actualized in this speculative study of *working at the edge of extinction*. By continuing to investigate the shifting realities and training protocols of reality TV, the following sections endeavour to raise questions about the demands and promises of the "online" economy in relation to educational domains and practices today. Focusing on the wide-scale shifts to remote delivery and other forms of online learning that have been brought on by the pandemic, or what is developed in the next section as the transformed and transforming world of *platform education*, this speculative study proceeds by examining the ways in which *learning, labour* and *life* have become integrated and conflated so as to pre-produce a reality oriented towards working futures.

## 6.3 Platform Education and the Transformation of Life

### *6.3.1 Reality Pivots*

In early 2020, *Survivor* celebrated its twentieth year anniversary milestone with its fortieth season, *Winners at War,* which featured twenty returning winners from past *Survivor* seasons competing for an unprecedented 2 million dollar prize. In addition to doubling the prize money and introducing new twists to the game (i.e. for the first time a currency called the "fire token" was introduced, allowing players to purchase comfort items, food and other advantages), the season concluded with another first when the typically live finale was moved online due to the emerging public health crises brought on by COVID-19. Airing in May of 2020, this online finale saw contestants reuniting though the grainy images and glitching sounds of their personal computers. Jeff Probst, *Survivor's* steadfast host and executive producer,

led the teleconference reunion from his home garage where a makeshift set was brought in as the backdrop to chat with the final three contenders for sole survivor before announcing the ultimate winner. While Probst and others drew attention to the strange "situation," there was no explicit mention of public health crises, pandemics or coronaviruses. Instead, one after the other, the contestants highlighted their gratitude and honour for having been part of an extraordinary season.

*Survivor* was not the only show that had to deal with the shifting realities brought on by COVID-19 and its related restrictions. Reality TV main-stays, such as CBS's *The Amazing Race* and *The Bachelorette*, announced the halting of production on their latest seasons, while many of the reality TV shows already in post-production were completed using "a bare-bones" group of producers and editors to meet new public health, but also economic, realities. The fifth season of *Big Brother Canada* not only had to stop production early, but had to break the news of the shutdowns in Ontario to the contestants inside the house, who were, up until that point, only fed brief updates about the increasingly devastating global pandemic. This "reveal" was, of course, filmed, with host Arisa Cox sharing the "difficult news," which was met with clutched hands, tears and shaking heads. After assuring the cast that they should take comfort in the fact that they provided a much-needed distraction during the public health crisis, Cox concluded her disembodied announcement with the following: "I know when you live in the Big Bother house the game can become your entire world. But now we need to bring you back to the real world." While some productions were stopped altogether, other shows got creative in terms of their production so as to pivot their practices and protocols in line with shifting restrictions. While, for instance, the Kardashians pushed forward with filming due to their ability to self-film their close-knit family operation, *American Idol* contestants recorded auditions remotely and *Love Island* moved its islanders to the rooftop of a shutdown Las Vegas hotel. Meanwhile, other reality shows pivoted to alternative platforms, such as social media, to give fans a peek into the quarantine life of their favourite reality stars. Now, over a year since the official declaration of the pandemic, many reality TV productions have adapted to the new pandemic reality, either through "Pandemic Protection Bubbles," as in the case of the *Great British Bake-off*, or by introducing PPE and other health protocols into the mix, as demonstrated through the various iterations of the *Real Housewives* franchise.

While these stoppages, slow-downs and pivots impacted the lives and livelihoods of the cast and crew of unscripted productions, network executives have been less worried and less impacted. As *Variety* reported at the onset of the pandemic, reality TV-focused networks such as HGTV, TLC, Food Network and Bravo were confident that their unscripted TV stockpile would be able to outlast the pandemic, adding that their creative use of show marathons and self-taped production techniques would allow them to fare the months-long production shutdown relatively unscathed (Jones, 2020; Williams & Reynolds, 2020). Indeed, the isolationist, highly-surveilled environments of many reality TV productions are actually quite well-suited to take on the regulatory measures required amidst the current pandemic. Where, in many cases, casts must remain isolated from the pubic to avoid spoilers and productions are shot over condensed time periods, requiring intense work schedules from both cast and crew, several reality TV mainstays have been able to not only adapt to, but *thrive* within, the new situation.

At the same time that unscripted programming has been able to offer new binging opportunities while maintaining a steady feed of fresh reality content, it has also been able to advance production technologies in ways that are likely to stay long after the current pandemic situation. Many shows that were once filmed and produced in "real life," are now organizing around highly virtualized workflows, leading to a funnelling of capital expenditures away from physical assets towards various platform technologies (Williams & Reynolds, 2020). Such platforms include advancements in virtual collaboration tools where filming, editing and administration are increasingly hosted in the cloud. Meanwhile self-production techniques are becoming more and more common, allowing for reality stars to self-monetize in more direct ways. On the audience side of things, fan-controlled production technology is also advancing rapidly, hinting at a not-too-distant future where fans may be able to choose their favourite camera angles and interact in "real time" with reality stars, all of which would provide new avenues for monetization for studios and producers (Williams & Reynolds, 2020).

The pivots and advancements brought on by the reality of the pandemic have also shifted the working realities — the labour relations and conditions — of reality TV. Due to the lower budgets and the various ways in which unscripted TV is able to avoid union rules, reality TV productions have been able to develop protocols on the fly. Many productions are now back on schedule, albeit with smaller crews, shorter filming schedules and various quarantining, PPE,

social distancing and testing protocols. Not unlike the broader situation, while executives give orders from the comfort of their homes, cast and crew put their bodies on the line to bring us the comfort and distraction of our favourite realities. And so, where quarantining, testing protocols, PPE, social distancing, self-production techniques, smaller crews, shorter filming schedules and virtual collaboration have become the "new normal" for reality TV, most productions have been able to continue with business as usual. Or, better yet, and not unlike the broader "business as *un*usual" pandemic response,[27] many unscripted productions have been able to *innovate* practices towards new revenue-generating avenues and forms of reality content that have not only allowed network executives to maintain "healthy" bottom lines, but claim to bring viewers even closer to those being filmed, especially amidst times of social isolation.

### *6.3.2 Remote Deliveries, New Opportunities*

While unscripted programming had to pivot its production logistics so as to maintain the steady feed of reality programming to which viewers have become accustomed, so too did the Industry of Education have to shifts its protocols and practices so as to adapt to the new pandemic reality. At the same time that many K-12 schools were forced to reopen (despite worries from teachers, students and parents alike), there has been a concomitant movement towards various forms of online learning, virtual learning schemes and other forms of "remote delivery." After the WHO announcement of the pandemic in early spring of 2020, and almost overnight, many schools and education systems began to offer education remotely. At the University of Alberta, for instance, instructors were sent correspondences asserting that the first key action for responding to the pandemic announcement was to ensure that we were prepared to move all courses to remote delivery within 48 hours of notice. On March 16, 2020 the official email went out stating that for the remainder of the academic term, classes would be offered online. This announcement was accompanied by a letter from the President's Desk that reasoned that "[m]aking the transition from in-person classes to remote delivery will ensure that our students can complete the academic term and meet their academic goals." Not unlike the pivots

[27] Recent (2021) campaigns and webinars from Export Development Canada (EDC), for example, have used the slogan of "business as unusual" in order to pitch strategies for companies to "manage risk and stay the course during these challenging times."

made by reality TV programming, this shift to remote delivery was positioned as a way to advance and ensure learning goals amidst this extraordinary time.

The sudden shift to remote delivery and the use of online learning platforms was not only inflected by promises of academic completion and the continuation of business as usual (now online), but also brought forth a range of complications and challenges, ranging from frustrations about a lack of technological skills and resources to concerns about mental health and increased workloads. Teachers, for instance, found themselves faced with the challenge of not only teaching during a pandemic, but also doing so through a range of online platforms, bringing forth the demand to become "technology wizards, Zoom screen DJs, counsellors, cheerleaders and teachers all in one" (St. George et. al., 2021). Workloads increased overnight and stress levels shot through the roof as educators struggled to figure out new technological platforms while trying to maintain connections, both literally and figuratively, with students. Meanwhile, students, appearing as a series of squares and/or numbers on a screen, also had to navigate the pressure of learning content in order to (still!) pass exams, while grappling with the psychic difficulties and mental health challenges that are increasingly being cited as main characteristics of the current pandemic isolations. And, like the pandemic situation more generally, remote learning has hit marginalized and vulnerable students especially hard, leading to reports of falling grades and spikes in missing students who already struggled to engage in school settings.

While the hardships of remote delivery have been at the forefront of educational discourse since the start of the pandemic, with the passing of time and the formation of habits, both students and teachers are now adapting to the *new normals* of remote delivery, challenges and all. The anxiety, depression, burnout, isolation and disconnection felt by both teachers and students is, in turn, individualized and, in most cases, swept under the rug (or behind blacked-out screens), so as to maintain the givenness of education's current imperatives. This has further fuelled the energy emergencies that increasingly characterize the Industry of Education and its future speculations. While many pedagogues have argued that authentic online teaching and learning is just not possible in times of crisis and as such what might at best be achieved is "emergency remote teaching" (Hodges, et. al., 2020), the move to online learning has nevertheless been positioned as an *opportunity* to not only keep the Industry of Education running, but to reimagine educational practices and protocols into the future.

For instance, early on in the pandemic and amidst large-scale shifts to online learning, US Education Secretary Miguel Cardona presented the pandemic reality as an "opportunity to reimagine what schools will look like," providing a moment to "think about how to evolve schooling so the kids get the most out of it" (St. George, et. al. 2021). A growing number of scholars have also been grappling with questions of how the unprecedented pandemic situation might provide an opportunity to rethink and reimagine education. In their article "The changes we need: Education post COVID-19," Zhao and Watterston (2021), for instance, assert that the pandemic situation has created a "unique opportunity for educational changes that have been proposed before COVID-19 but were never fully realized" (p. 3). For Zhao and Watterston, the pandemic is positioned as a potential opportunity for change based on the way it reveals how education systems could, in fact, enact globally dispersed, not to mention rapid, transformation of practices and protocols. As they write, while "educators across the world demonstrated that they could collectively change en masse" and "most of the traditional regulations and exams that govern schools were also lifted or minimally implemented," we have now seen how education systems can, in fact, be completely rethought and reorganized (Yong & Waterson, 2021, p. 4).

At the same time that the move to online learning has been dubbed an opportunity for educational transformation, it has also been deemed an exciting opportunity for cost-saving measures and future-oriented financial investments. Online learning, also known as "web-based instruction, distributed learning, internet-based learning, cyber learning, virtual learning or net-based learning" is not new to education, and has for many years helped institutions lower costs and automate processes while promising customizable preferences and "open" access to learning (Le Grange, 2020, p. 5). Universities, for instance, have adopted and developed various online teaching and management schemes, from hybrid modes of content delivery, flipped classrooms and other forms of blended learning, to the use of digital learning management systems (LSMs), such as Blackboard and Moodle, which are employed to organize class content, manage assignments and regulate communications. This online integration, or what might otherwise be called the "platforming of education," has been championed in terms of how it benefits both users, who are able to access "integrated" and "customized" experiences, and developer/owners, who are able to adapt, build on and ultimately monetize user preferences.

Even before the introduction of the latest global pandemic, online learning systems have been seen as an opportunity for financial gain, evidenced by, for instance, Silicon Valley's vigorous support of the ed-tech marketplace, "particularly through networks of venture capital firms and entrepreneurs and business 'incubator 'and 'accelerator 'programmes that support start-up ed-tech companies to scale-up" (Williamson, 2017, p. 72). Framed in terms of the dominant refrains of technological disruption and solutionism characteristic of Silicon Valley mantras, part of the success of online learning has been enabled by its positioning as a product of venture capital and thus its promise for future financial pay-offs. With the onset of the pandemic, this product (and its platform tendencies) has become even more successful, with commentators such as Naomi Klein going so far as to call the growing investments in ed-tech a "billionaire bonanza" (Democracy Now, 2020). As economist Gordon Lafer has discussed, the current pandemic crisis has indeed provided an opportunity, that is, an opportunity for profit-driven companies to seize the "education system and turn it into a robotic, one-size-fits-all program where teachers eventually disappear from the scene and students, especially the most vulnerable, get left behind" (cited in Parramore, 2020). Lafer offers his own personal experience of this cash-grabbing opportunity in relation to his time on the board of education in Eugene, Oregon, where, following the pandemic, he saw a wave of technology companies offering free access to their products for the duration of the coronavirus crisis under the auspices of "stepping up to help." As he quips, "it's like coke dealers handing out free samples" (Parramore, 2020).

While vaccine rollouts continue to ramp up (in some countries) and the need for physical distancing and thus remote content delivery becomes less crucial, it is becoming increasingly clear that the platforming of education is nevertheless here to stay. As educational theorist Lesly Le Grange (2020) writes, "[p]ost-COVID-19, it is likely that universities will expand the pivot toward online teaching/learning" due to the way it supports broader trends that have been well underway in online learning for decades now (p. 5). Where the Industry of Education is involved in reality training so as to pre-produce the subjective formations demanded by dominant economic orders, the shift to online learning follows in a longer line of innovations in educational reality management that support the fundamental aims and goals of education, namely, to produce a workforce. Not unlike reality TV, then, the pandemic and its remote deliveries have provided an *opportunity* for the Industry of Education to affirm and realize its

fundamental aims and commitments, which are oriented towards economizing pedagogy through progressive narratives of transformation that can and will lead to new opportunities to perpetuate an education after education. Not unlike reality TV execs, who see the pandemic reality as an opportunity to innovate both technologies and labour relations so as to reduce expenses and maintain "healthy" profit margins, educational officials have also positioned the pandemic as yet another opportunity to transform education so as to meet the demands of an uncertain future.

### *6.3.3 Platform Innovations*

#### Platform Capitalism

The online platforming of education is part of a much broader move towards platforms that has taken place across economic domains. In his book *Platform Capitalism*, Nick Srnicek (2017) provides one take on this widespread integration of platforms, which is outlined and analyzed through a historical account of the intertwined relationship between capitalism and digital technologies. In short, platform capitalism refers to how, after a long decline in manufacturing, capitalism has turned to *data* and the *platform technologies* necessary to collect, manage and analyze said data, as one way to maintain economic growth and vitality in the face of a sluggish production sector. For Srnicek, platforms generally have three characteristics: they involve digital infrastructures that enable interaction between groups (i.e. producers and consumers); they are reliant on "network effects," meaning that the value of a platform increases with more users; and they are designed in a way that appeals to wide variety of users (p. 42). Arising out of internal needs to handle data, platforms have become an efficient way to monopolize, extract, analyse and use the increasingly large amounts of data that have been collected, recorded and monetized as more and more business is conducted online.

As Srnicek (2017) asserts, one of the common themes that has been used to narrate the shift towards online economies and their platform promises is that "we are living in an age of massive transformation," an age characterized by "platforms, big data, additive manufacturing, advanced robotics, machine learning, and the internet of things" (p. 1). As workers, this transformation has been sold as one that will liberate us from the constraints of a permanent career through a wide range of self-management and self-monetization schemes. As consumers, this age of transformation is presented in terms of the "cornucopia of on-demand services,"

including educational ones, that are now available through the click of a mouse and the promise of a user-friendly network of technologies that can meet our every desire (Srnicek, 2017, p. 1). Not unlike the "revolutionary" discourses circulating in the Industry of Education, such as those offered by the OECD (2019) or 21st Century Learning initiatives, this narration assumes that today's "mega trends" provide new opportunities for transformation, which are nevertheless correlated to economic demands. Indeed, what Srnicek highlights in this narrative of transformation is how the shift to online economies is perhaps not so much a *new* economic formation, but is instead a *continuity* in capitalist economies, one that has been necessitated by capitalism's internal logic and (ir)rationality. As Srnicek (2017) puts it, because "phenomena that appear to be radical novelties may, in historical light, reveal themselves to be simple continuities" (p. 9), a historical analysis of capitalism in relation to the rise of digital technologies is necessary to understand, and perhaps challenge, today's era of "massive transformation."

In his own historical account, Srnicek (2017) outlines three key moments in the recent history of capitalist transformation that are relevant to the contemporary economic conjecture and its platform promises: first, the 1970s "long downturn" in manufacturing profitability, which set the stage for the new online or digital economy; second, the dot-com boom and bust of the late 1990s, which was driven by financial speculation fostered by large amounts of venture capital; and third, the 2008 financial crisis, which not only led to ultra-loose monetary lending policies, but also a range of austerity measures put in place to deal with growing public debts. One of the key points that Srnicek (2017) makes in this historical analysis is how "capitalism, when a crisis hits, tends to be restructured" (p. 36). This point is evidenced through the three historical moments illustrated by Srnicek, where the various crises of productivity and economic growth that have taken place since the 1970s have demanded the constant creation of new economic practices and relations: new markets, new commodities, new means of exploitation, new monetary policies, new modes of debt-creation, new risky ventures, new platforms. This perceived novelty, however, is not due to changes in capitalism, but is instead an integral operation of capitalist economies. Once again, where capital is so dependent on the creation of ever-more outsides for expansion and accumulation, it is prepared to make "considerable investments" to ensure the constant reproduction of such outsides (Mezzadra & Neilson, 2017, p.

190). Srnicek makes this same point, asserting that platform capitalism is one way to describe the mutations that have been necessitated by capitalism's crises of production in the 21st century.

Through the framework of platform capitalism, Srnicek asserts that one of the key ways in which capitalism is restructured when it faces a crisis is through *innovating* its practices and protocols. This innovative restructuring not only involves technological innovations, such as automating labour or the development of more efficient production technologies, but also *innovating structures of relation*. In the effort to cut costs, beat out competitors, control workers, reduce turnover time and gain market shares, capitalists are incentivized to continually transform the labour process and its necessary subjective habituations (Srnicek, 2017). This is evidenced by the shifting practices and profit-driven pivots of unscripted television amidst the pandemic, where the public health crisis has offered an opportunity for network executives to advance technologies and transform working relations so as to maintain its reality programming, but also its bottom lines. This is also evidenced by the Industry of Education, wherein the pandemic has been positioned as a catalyst for innovating technologies and online infrastructures so as to continue educational business as (un)usual. In both the example of reality TV and the Industry of Education, platform innovations necessitate that users — be it audiences and reality TV stars or teachers and students — form specific habitual relations, both to one another and to the platforms that structure teaching and learning, so as to properly perform their roles in line with the economic imperatives through which subjects are habituated and standardized.

Platform Pedagogy

While discussions of the challenges of remote delivery have been ongoing since the start of the pandemic, discussions of *pedagogy*, how it has been transformed (or not), have been much less common. In my own experience of remote delivery, for instance, most of the institutional support for students and teachers has been oriented around strategies and skills for adapting, in individual ways, to the imperfections and complications of online teaching and learning as opposed to asking difficult questions about what, exactly, the educational aim can and should be given the newest planetary crisis. Resources for instructors are most often focused on technical strategies for moving classroom activities, such as lectures, online and providing directions for designing and implementing online assessment protocols. These supports have been concomitant

with ongoing emails with various mental health "tips" and strategies for students, which offer suggestions such as keeping hydrated, eating regularly, stretching, writing in a journal, setting small goals, being critical of one's own pessimism and a range of other anxiety management strategies that position the pandemic reality as a personal challenge that can be overcome by "respond[ing] mindfully to stress".[28] While tuition continues to rise and the university continues to be dismantled in the name of austerity measures, these optimistic strategies and supports are aimed at mitigating the current situation in order to maintain an educational reality that is becoming increasingly out of synch with the broader surround. As such, the challenges raised by teaching and learning online during a pandemic have not catalyzed much-needed discussions of the reasons and rationalities, the protocols and practices, that undergird education, but have instead been presented as yet another crisis to be managed through innovative pivots and opportunistic transformations that nevertheless work to sustain the status quo.

As Le Grange (2020) asserts in an article titled "Could the Covid-19 Pandemic Accelerate the Uberfication of the University?", the growing migration to online learning within the space of contemporary universities has seen a "forced" acceleration and expansion during the COVID-19 pandemic (p. 5). Key to this forced migration has been the adoption and normalization of *platform pedagogy*, which refers to the way in which online learning practices and protocols place emphasis on a learner that is positioned as a customer within the educational transaction (p. 5). Within this transactional model, learning is pitched (and sold) as something that is readily available on-demand, or "just-in-time," not unlike platforms like Netflix or Uber. Indeed, Le Grange links platform pedagogy to the broader "uberfication" of the neoliberal university, where lecturers have become precariously employed on-demand service providers rated and reviewed based on student, or customer, satisfaction scores, all of which happens through a series of automated, digitized and data-driven platforms. Meanwhile, students, also called "basic revenue units"[29] in some university spaces, are positioned as data subjects tasked with creating user-generated content that can be fed back into the platform to improve its

[28] These were just some of the strategies outlined in a recent set of cards I received in the mail from the University of Alberta, which featured a series of "reviewed, referenced, and evidenced-based advice cards" for students to use during times of stress.

[29] This language has been used recently by the University of Alberta in their public-facing plan strategic plan titled "For the Public Good."

promises of customization and monetization. Through these roles, the classroom becomes a data market, one wherein students provide data that teachers collect via "technical platforms that originate in the private sector and are plugged into public sector institutions" (Williamson, 2017, p. 59).

In addition to offering an opportunity for data extraction, platform pedagogy affirms and reproduces specific assumptions about teaching and learning, about pedagogy itself. After all, the very idea of platforming education assumes that content can be provided online and on demand, that it is not only possible but desirable to deliver content with limited contact, not unlike an Amazon package. In this way, platform pedagogy is underscored by a belief in learning "as a prescriptive process, rooted in efficiency and calculation, and powered by artificial intelligence, mobile apps, cloud services, and data processing" (Means, 2018, p. 329). Where, for instance, instructors spend hours making voiced-over slide presentations and other lecture materials that can be easily disseminated and archived through various platforms, and exam protocols continue to be implemented through invasive testing software, platform pedagogy proceeds based on models of transmission and accumulation that aim towards the uncomplicated (remote) delivery of content. With data collection, extraction and interpretation at the centre, platform pedagogy therefore "enables learning to become subject to prediction, intervention, optimization, and 'enhancement' as learning data, produced through interaction with learning platforms, [which] is routed through machine learning and predictive analytics, that function to anticipate, evaluate, visualize, and shape future learning behaviours and actions" (Means, 2018, p. 329). The key concern of platform pedagogy, then, is not how, what and why learning can and should take place, but rather how to manage, register and document so-called learning so as to expand potential for data collection both presently and into the future.

Within this pedagogical orientation, students-cum-data-workers are now subjected to a whole range of disciplinary measures and policing practices that are focused on making sure that learning, registered via data points, is being properly entered into the system. Technologies that track students participation, plagiarism detection software and militant absence policies are just some of the pedagogical techniques and technologies — or what Jeffrey Moro (2020) calls "cop shit"— that characterize platform pedagogy and its demands for management and registration. These techniques and technologies not only presume, and thus affirm, an adversarial relationship

between students and teachers, but operate based on specific assumptions about pedagogy itself. As Moro (2020) writes, these policing measures claim to solve a particular educational problem wherein the work of managing a classroom is seen as "increasingly complex and fraught, full of poorly defined standards, distractions to our students' attentions, and new opportunities for grift" (para. 5). And so, "cop shit" claims to solve these problems by bringing order to the classroom by providing both students and teachers instant feedback, in the form of communicable metrics and policeable data protocols, in turn ensuring compliance and accountability from all involved. While bureaucratic accounting measures and various forms of "cop shit" are far from new to educational domains, the large-scale move to online learning in light of the most recent global health crisis has legitimized many of these practices by asserting that they are the best, and in some cases *only*, solution to the problems that characterize education today.

Pitched as an educational opportunity, platform pedagogy offers a way to monopolize and train educational realities so as to produce and perpetuate the subjective formations and relational organizations necessary to uphold education's commitment to economizing learning towards working futures. Within this framework, the pedagogical problem is not how to work with students to navigate the range of unthinkable crises that now require, for instance, very different modes of sustainability and energetic transitions, but to *manage educational realities* so as to maintain the reasons and rationalities that keep the Industry of Education up and running. This move towards platform pedagogy, and thus the platforming of education, however, is not just an opportunistic response to the unprecedented global crises that characterize education today, but is a *continuity* in education's progressive trajectory. While the pandemic may have offered a new opportunity to expand the reach of something like online learning and the platform pedagogies it enables, the potential for such pedagogical relations are made possible by the Industry of Education's internal constraints and given parameters. As Le Grange (2020) notes, while the acceleration of the university's platforming is not predetermined, "the potential for its actualisation is already embedded in our present social, educational and technological situation" (p. 1). Not unlike Srnicek, who outlines how platform capitalism is not so much a new economic formation but rather a simple continuity, Le Grange asserts that the platforming of education, and specifically platform pedagogy, is here to stay based on the ways in which it supports the Industry of Education's broader industry standards and the futures such standardizations project.

Platform Tendencies

As Srnicek (2017) writes, there are certain *tendencies*, and thus futures, that emerge based on the way in which platforms operate. For instance, where platform capitalism must continuously find more and more sites for data extraction, it has a tendency to expand across ecosystems so as to occupy key positions via the monopolization of more and more users, and thus more and more data points (p. 46-47). As Srnciek writes, "platform expansion is driven by the need for more data, which leads to what we might call the convergence thesis: the tendency for different platform companies to become increasingly similar as they encroach upon the same market and data areas" (p. 107). We can see examples of this in major platforms such as Google, which not only serves its original purpose as a search engine, but now traffics in advertising, consumer services, various software and hardware and, of course, education. This tendency towards monopolization can also be seen in reality TV ecologies, where popular reality TV franchises have proliferated through ongoing spin-offs or through new hybrid forms where reality TV begets more reality TV. As Srnicek (2017) writes, if platform tendencies are left to continue, platforms will proliferate and expand across the economy and competition will eventually drive them to enclose themselves increasingly.

Key to this monopolization is the role of data. In his analysis of platform capitalism, Srnciek (2017) asserts that discussions of data must distinguish *data*, or information *that* something happened, from *knowledge*, or information about *why* something happened (p. 39). As Srnciek develops, data practices and protocols may involve knowledge at some point, but this is not a necessary condition to the determination of data nor is it necessary for its extraction. Instead, data is important based on its capacity to be traced and recorded in some way, which requires both technologies for capture, but also for storing and maintaining data so it may be used in the future. In the example of imaging a black hole, for instance, the data collected by something like a computational telescope must be sorted in order to extract "good" data from noise, and this data must then be stored and sorted, requiring, in this case, a sophisticated machine learning algorithm and the material and institutional infrastructure to keep it running. In the example of speculative finance, data is also central, operating as the "raw material" that can be aggregated so as to create the derivative abstractions necessary for futures trading and debt

securitization. As both of these examples show, data is not *immaterial*, but instead involves a range of *material* infrastructures, storage systems and energy sources capable of sensing, recording and analysing data points. With this in mind, and as Srnicek (2017) asserts, data is not unlike oil: "data are a material to be extracted, refined, and used in a variety of ways. The more data one has, the more uses one can make of them" (p. 40).

Unlike past uses of data in spaces like market research and advertising, contemporary data practices are invested in turning any and all activities into recoded data in order to fulfill a wide range of capitalist demands. Srnicek (2017) cites a range of examples of data's role in capitalist growth, including the way in which data is used to educate and give competitive advantage to algorithms; how it enables the coordination and outsourcing of workers at a global scale; how it allows for the optimization and flexibility of productive processes; how it makes possible the transformation of low-margin goods into high-margin services; and how data analysis is itself generative of more data, in a virtuous cycle (p. 41-42). This is where the platform comes into play. Arising out of internal needs to handle more and more data, platforms have been adopted based on their capacity to extract, analyse and use the increasingly large amounts of data that are being recorded and collected today. Due to these capacities, platforms and the data they manage have played an integral function in capitalist expansion. But more than that, and returning to the site of platform education, data practices and protocols also play an integral role in the Industry of Education's demand for working futures.

### *6.3.4 Transforming Living into Learning, Learning into Labour*

#### Inculcating Work Ethic

The pandemic has led to a wide range of new platform technologies and data management systems that are likely to remain long after the current public health crisis wanes. These technological systems not only shape educational investments, for instance, by providing the necessary infrastructure to maintain remote deliveries while providing new sites for financial speculation, but also provide a rich site for data collection and extraction. For this site to be activated, however, particular *users* are required, and the more the better. As such, platform education requires that educational subjects become primed to take up specific practices and attitudes so as to synch up with these innovative processes of value extraction. It is in this way

that the future of education is economized once again, this time through the promise of educational subjects that are available for more and more data extraction — the more diverse the better — which in turn requires users to conform, modulate and habituate so that they can be registered by the systems within which such data extraction occurs. It is through this ongoing modulation that platform education "trains" educational subjects into specific working realities. Not unlike reality TV, platform education requires the production of the "right kind of person," one that accepts ubiquitous surveillance and data-driven protocols, which are framed as beneficial measures for creating more customizable experiences and relevant training opportunities. Through this reality training, the role of teaching is redirected to focus on data design, entry and collection, while the job of the student is to produce data that can be registered and calculated based on institutionalized protocols and the affordances of technological platforms. These working relations are positioned as positive opportunities for transforming the learning process, for both students and teachers, in ways that better meet the needs of working futures. This orientation to the future, in turn, requires that educational subjects take up specific approaches to work, or a particular *work ethic*.

Not unlike broader working contexts, wherein those that find themselves displaced in an economy characterized by an oversupply of workers and widespread automation, *work ethic* within platform education's reality training program is positioned as a personal and individualized response to the shifting demands of the "real" worlds of work today. In more specific terms, the work ethic that platform education requires is one wherein learning to work on demand is a matter of personal grit, self-motivation and personal responsibility when it comes to managing our own risks within the workforce. Through this framing of work ethic, challenges such as the end of work and the economic redundancy it foretells is "positioned as a result of personal failure to effectively build [a] personal brand and [necessary] skills through a maximization and accumulation of learning" (Means, 2018, p. 336). Taking part in a broader context wherein the withdrawal of the neoliberal state in providing social provisions and labour protections has further downloaded crises of work onto individuals, learning, and specifically, *learning to work well*, becomes a form of private investment and risk management, a new prudentialism that disciplines subjects to manage precarious employment and social fragmentation through the competitive acquisition of education. This doctrine of individual

prudentialism and resilience is what "masks and finds synergy with new technological dynamics of precarity" brought on through ongoing platform innovations, and, as a result, "learning is transformed into a discourse of labouring on-demand" (Means, 2018, p. 329). Platform education has adopted and accelerated this formation of work ethic, albeit in weird ways.

Dividuating Data Points

Through platform education, students are not just positioned as individuals in competition with one another or in antagonistic relation to teachers, but as *dividuals*, as subjects divided within themselves. As Deleuze (1992) writes, in today's societies of control, "we no longer find ourselves dealing with the mass/individual pair [….] individuals have become 'dividuals,'" that divide and proliferate subjectivity in terms of masses, samples, data and markets that can be recuperated within dominant, albeit dispersive, regimes of control and communication (p. 5). The ongoing dividuation of educational subjects is exemplified within platform education, where students and the work, or data, they produce is broken down into smaller and smaller packets. Examples of this break-down include micro-accreditations as well as course designs where students must perform small, quantifiable tasks (worth 2% here, 2% there) that can be registered by online systems. What is most important here is the quantity and diversity of the data collected, as opposed to quality. As educational theorist Alexander J. Means (2018) outlines:

> [w]hat distinguishes on-demand labor is a new generation of technologies for separating work into ever smaller units and subtasks along with a digital infrastructure for subcontracting jobs by discrete project or gig (each defined by specific skills) enabling corporations to extract maximum value from workers with minimum responsibility, as contract gig workers stand outside the protections and benefits afforded to full time employees (p. 335).

As such, what it means to do "good" work, and thus "good" pedagogy, is transformed. Where processes of learning and earning are optimized through algorithmic data systems, personal value, qualifications and performance can and should all be captured and assessed based on predetermined criteria that direct learning towards work-ready forms of capital (Means, 2018, p. 335).

Normalizing Precarity

Through the ongoing (micro)management and registration of processes of dividuation, students, but also teachers, must learn to take up the role of *precarious workers*. Where platform education follows in the Industry of Education's demand for the production of specific forms of knowledge, skills and attitudes that are always-already tied to the needs of employers, it necessitates the reformation of precarity as an opportunity for transforming both the world of work and its subjects. Taking part in the broader erosion of work from which the demand for precarious labor has emerged across affluent societies, one wherein gig workers and contract labourers are driven by algorithmic ratings and platform constraints, platform education works to train students to accept a working world defined by casual working hours (that could take place at any time of day), low/stagnant wages, decreasing job protections and widespread insecurity (Srnicek & Williams, 2015, p. 93). Indeed, as Srnicek (2017) highlights in his analysis of platform capitalism, precarity has been one of the innovative solutions put in place to combat the crisis of work brought on by ongoing economic stagnation. As yet another example of capitalism's innovations, precarious work has been actualized through a range of creative proposals including crowd-sourced tasks, staffing agencies and zero-hours contracts, to name but a few examples. All of these innovations are pitched and sold under the promise of flexibility, freedom (to work anywhere and anytime) and being one's own boss. But, while the gig economy makes such promises, in reality, platforms are more accurately aimed at harnessing data and algorithms to create systems of labour and habitual work ethics that compel workers to, for instance, accept long hours at low pay and no benefits as they hustle from one insecure gig to another.

Inspiring Life Practices

Through its dividuating processes and its demand for precarious labourers, platform education operates as an efficient means of creating "synergies between on-demand labor and on demand learning, transforming *living into learning, and learning into labor*" (Means, 2018, p. 327). This transformation is exemplified by the figure of the lifelong learner, who, as we saw in the previous studies, is honed upon strange economic modelizations that necessitate permanent retraining, ongoing evaluative and performative registration and the continuous internal

modulation and self-deforming casts that are presented under the affirmative project of learning how to learn. Where, as Means (2018) writes, "[a]ll but a tiny privileged few must work to live, but we must also learn so that we may work (understood narrowly as wage-labor as opposed to a more capacious conception of work)" (p. 328), capitalism and its contemporary modes of control demand a lifelong commitment to learning so as to acquire the right certifications and skills demanded by shifting economic realities. Trained through platform education and its data protocols, the lifelong learner is transformed into a *lifelong worker,* one that accepts and actualizes working futures defined by the drudgery of work, the dependence on wage labour, and the submission of our lives to a boss, even if that boss is oneself (Srnicek & Williams, 2015). As Means (2018) puts it, "within platform learning we are all transformed into learning and laboring subjects enjoined to customize and commodify our learning and labor through interaction with data and algorithms" (p. 329).

The training of this lifelong worker is not just implemented through indoctrination and ideological transmission, but involves the habituation of subjectivity, which is always a material process. Not unlike the training that goes on through reality TV (Andrejevic, 2002), training to be a lifelong worker involves particular segmentations, planifications, categorizations and hierarchies of habitual relations, which, in turn, cut up experience in specific ways (Deleuze & Parnet, 2002, p. 229). Drawing on analyses of reality TV that seek to overcome the tendency to think about media either as political economic practice *or* cultural practice, the reality training at work here involves teaching participants to engage in appropriate behaviours beyond television viewing, such as continuous education and self-fashioning, as well as informed financial planning and participation in charitable partnerships. Where, as Andrejevic (2002) writes, reality TV programs "help to define a particular form of subjectivity consonant with an emerging online economy, one which equates submission to comprehensive surveillance with self-expression and self-knowledge" (p. 253), it becomes the breeding ground for training the "right kind of person." From this perspective, and as Chaput (2011) develops, "the cultural value of reality television stems less from its aesthetic or ideological content than from the *life practices it inspires*" (p. 10). Drawing on these analyses of reality TV, I assert that platform education must also be analyzed in terms of the life practices it inspires, which, once again, are not trained through ideological representations, but through demands for the formation of particular subjective

habits. In the case of platform education, subjective habits are not taught through content, but through the relations necessitated by platform technologies and data protocols, which train students and teachers to be dividuated, precarious subjects who see the drudgery of work as an unquestioned form of self-expression.

Returning back to the question of (the end of) working futures, this understanding of reality training provides a weird lens with which the question of educational futurity might be re-worked. Where dreams of "full employment" have become further and further away from the reality of the situation, the Industry of Education nevertheless proceeds based on the assumption that learning can lead to both individual and societal transformation made possible, for instance, by innovating the world of work. As such, the crisis of work that might otherwise challenge education's fundamental goals and commitments is treated as yet another opportunity to reform education so as to meet the needs of a working future. This reframing of crisis raises a number of difficult questions for education and its promise of working futures. Where learning, labour and life are conflated so as to guarantee the promise of undeniably working futures, what is the role of education, if any, in counter-actualizing this givenness? Where information is controlled in ways that extend far beyond individual choice and agency but is nevertheless sold in terms of promises of customization and preferential experience, how might work ethic and modes of existence be re-worked so as to develop more adequate modes of pedagogical resistance? Further, where platforms work towards certain tendencies in their very formation, how has the task of re-working what counts as radical transformation itself become a site of pedagogical struggle? In the following section I grapple with these questions by experimenting with the ways in which dominant work ethics might be counteracted so as to rethink modes of existence in light of today's strange transformations.

## 6.4 Re-Working Life and Livelihood in the End Times

### *6.4.1 Strange Transformations*

In the two decades since its inception, *Survivor* has had to outwit, outplay and outlast its own familiar formulas and transform its rules of gameplay so as to keep audiences coming back for more. Where, in the early days of the unscripted human drama, twists and advantages were rare, today's *Survivor* is defined by the acceleration and proliferation of "big moves" aimed at

constantly reinventing and intensifying the drama of the game. Over the years, various mechanisms have been added to keep things interesting, including Legacy Advantages, Vote Steals, Hidden Immunity Idols, Fire Tokens and Exile Islands, which have not only kept audiences interested, but have accelerated and transformed the game itself. As ongoing twists and novel gameplay mechanisms continue to be added to the mix, the goal for cast(aways) is not only to maintain a good social game while surviving the elements, but to build a *resumé* of big moves and power plays that can be cited during final tribal councils.

In *Survivor: Millennials vs. Gen X*, for instance, building a strong resumé, one that consisted of strategic power grabs and blindsides, was a central preoccupation throughout the season. In this 33rd iteration of the show, the cast(aways) were divided into two initial tribes — the Gen X-ers (people born between 1963 and 1983) and the Millennials (people born between 1984 and 1997) — who were characterized, through editing and selective casting, in specific ways, particularly when it came to work ethic and approach to gameplay. Whereas the Gen-Xers were represented as having more know-how when it came to surviving the elements, the Millennials were positioned as strong social players who were able to build a dynamic resumé of strategic moves. This divisive representation played on the cultural tropes of the time, such as the cliched idea that Millennials, killers of the golf industry and the gambling industry, but also lunch, the movies and marriage (Yoder, 2020), lack practical skills and traditional know-how, but can maneuver their way through social situations with skill and precision. More than just affirming the supposed cultural divide between the generations, by pitting these two groups against each other, attention was also drawn to the very different approach to gameplay between the two tribes. As many viewers noted, the younger players, many of whom had grown up watching *Survivor* and its transformations, were more likely to talk about the meta-game and the big moves needed to build a resumé and, ultimately, win the game. With the survivor resumé at the centre of the game, the season played out almost like a 39-day (for some) job interview, where the winner was not only promised a big cash payout, but the exciting job of sole survivor.

With this example in mind, *Survivor's* transformation over time has not only involved new game mechanisms, thematic antagonisms and strategic casting, but the transformation of the *work* of contestants, and thus the job of being a reality TV personality. Where the resumé is now a staple of *Survivor* language and the chyrons for players now emphasize what and how many

advantages they have rather than their occupations in the "real" world, the job of being a *Survivor* extends far beyond the island. Indeed, many past *Survivors*, both winners and losers, have made a career out of their time on the show, through, for instance, paid appearances and monetization partnerships on social media, or as returning players and acting consultants on the programme. As the examples of post-*Survivor* working life have shown, the job of being a reality TV star now involves attracting and then keeping fans (or anti-fans) who will continue to follow, support and take part in the star's reality.

The transformations that have taken place on *Survivor*, both in terms of gameplay and the job of contestants, are characteristic of the broader shifts taking place in reality TV ecologies. In line with the tendencies of platform capitalism more generally, reality TV and its platforms have proliferated so as to monopolize markets and attract more audiences, or, more accurately, data points. With new streaming networks added all the time, alongside more traditional cable viewing venues, reality options for viewers are now seemingly endless. If you're craving baking shows, for instance, there are now numerous options to satiate the desire. And, if you don't like baking shows, don't fret, there are a plethora of other choices of fresh reality fare to feed your appetite. Indeed, for TV power players the concern is not what viewers are watching *per se*, but how to continue to expand across programming ecologies so as to occupy key positions that will allow for monopolization via more and more users. As Srnicek (2017) writes, where platform expansion is driven by the need for more data, it tends towards convergence where different companies, or in this case, different reality TV programming, becomes increasingly similar. And so, while it may seem like the ecology of reality TV programming has transformed, both in terms of the proliferation of options and the content of specific shows, this transformation has actually led to more and more of the same. Here, transformation works as a way to monopolize reality by creating and then subsuming difference in order to continuously realize (platform) capitalism's future tendencies.

With these strange transformations in mind, one of the major challenges of platform education is how platforms work towards certain tendencies, and thus futures, in their very formation. Where platform education circumscribes our capacity to envision the future, it demonstrates the "paradox of possibility," one that is characteristic of the broader evolution of the techno-cultural logics of late capitalism (Means, 2018, p. 336). As Means (2018) writes,

"society is now rife with truly radical visions of technological transformation from super-intelligent AI to human-machine symbiosis. However, our collective capacity to imagine and discuss potential transformations of political economy remain stunted" (p. 336). Referencing Jameson's famous end-of-the-world quip, Means asserts that it seems today that "it is easier to imagine we live in a hyperreal computer simulation, where our every movement, thought, feeling, and action becomes an optimizable data point, than to imagine we can make basic modifications to our systems of endless accumulation and labor exploitation" (p. 336). Platform education exemplifies this paradox of possibility in terms of how "it envisions a radical transformation of education and work through technology, but this radical transformation is limited to serving the prevailing neoliberal logics of accumulation and precarity by subsuming the distinctions between learning, earning, and living" (Means, 2018, p. 336). This logic is bolstered by a work ethic founded on the unquestioned acceptance of suffering as necessary to self-fulfilment and enabled by machinic operations that produce an individual that can be recuperated within education's industry standards. This recuperation, in turn, takes part in the projection of an education after education, where, in this case, the problem of the future of work can be solved through educational innovations, such as those made possible via platforms. Once again, at the end of the world — be it the end of work or the end of contact tuition — education appears as that which is both redeemable and redeeming.

### *6.4.2 Re-Working Work Ethic*

As Srnicek and Williams (2015) assert, at the same time that capitalism demands that people work in order to make a living, as an economic system, it is increasingly unable to generate enough jobs and thus reach the dream of "full employment" (p. 126). Instead of positioning this as a crisis to overcome, through education for instance, Srnicek and Williams assert that the "tensions between the value accorded to the work ethic and these material changes will only heighten the potential for transformation of the system" (p. 126). The question here, and specifically in considering education and the problem of working futures, is what direction this transformation will take? In their own proposals for a world without work, one of the key assertions that Srnicek and Williams (2015) make is that "the future remains open" and thus "which direction the crisis of work takes is precisely the political struggle before us" (p. 105).

Where, across the world today, only 13% of people say they find their jobs engaging, where workers are physically and mentally degraded, drained and fatigued, where for the vast majority of people, work is far from meaningful, but nevertheless meant to provide meaning, self-expression and self-fulfillment, the end of work will mean tapping into the everyday realities of people in order to change cultural views of work. This is a pedagogical task, one that is central to today's unthinkable pedagogical problematics and the problem of working futures.

In their book *Inventing the Future: Postcapitalism and a World Without Work*, Nick Srnicek and Alex Williams (2015) provide an analysis of contemporary capitalism viewed through the lens of work. Asserting that the "future isn't working," these thinkers outline how "rapid automation, expanding surplus populations and the continued imposition of austerity all heighten the need to rethink work and prepare for the new crises of capitalism" (p. 86). Through an examination of the "job apocalypses" brought on by ongoing technological advancements and the automation of the workforce (p. 88), but also a particular type of "disciplined surplus" population of potential workers (p. 98), Srnicek and Williams assert that while it may be common to hear calls for more jobs, "the practically of full employment has largely disappeared" (p. 99). Where the precarity that now typifies neoliberal labour markets in developed economies (p. 93) continues to be exacerbated by jobless recoveries and the lives of workers are characterized by "poverty, precarity and insecurity" (p. 104), today's crisis of work points to "a future in which the global economy is increasingly unable to produce enough jobs (let alone good jobs), yet where we remain dependent upon jobs for our living" (p. 105). While, as Srnicek and Williams assert, political parties and trade unions (and I would add educational institutions) appear ignorant to this crisis, the breakdown of a hegemonic order predicated on decent and stable jobs nevertheless makes itself known through new modes of social control and increasingly coercive labour relations: "harsher workfare, heightened antagonisms over immigration, stricter controls on the movement of peoples, and mass incarceration for those who resist being cast aside" (p. 104). And so, with this crisis of work at the forefront of their analysis, Srnicek and Williams assert that the political project for "the left" in the 21st century "must be to build an economy in which people are no longer dependent upon wage labour for survival" (p. 105). In short, what Srnicek and Williams call for is not only the end of work, but the end of

those rationalities and political organizations that necessitate particular forms of work in the first place.

Srnicek and Williams (2015) chart several ways forward in their post-work imaginings, including demands for the full automation of the economy, proposals for reducing the work week and plans for implementing a universal basic income. While each of these proposals has educational implications, what I draw from Srnicek and Williams here is the assertion that any sort of post-work imaginary necessitates *a shift in understandings of work*. As Srnicek and Williams assert, one of the most difficult problems in building a post-work society "will be overcoming the pervasive pressure to submit to *work ethic*" (my italics, p. 123). Evidenced by ongoing resistance, and thus failures, to implementing basic income even when financing such schemes would be relatively easy, accepted notions of work ethic remain undergirded by assumptions about deficient individual traits as opposed to a broader structural problem (p. 123). Where lives and living have become increasingly structured around competitive self-realization, which can and should be achieved through the performance of one's job, work has become central to our very self-conception to the point that "when presented with the idea of doing less work, many people ask 'But what would I do?'" (Srnicek & Williams, 2015, p. 124). As Srnicek and Williams write, "[t]he fact that so many people find it impossible to imagine a meaningful life outside of work demonstrates the extent to which the work ethic has infected our minds" (p. 124). Srnicek and Williams cite several examples of this infection, from the unquestioned moral imperative that drudgery should be valued in itself to the ways in which work plays an important role in the ideal liberal-humanist persona wherein work is a central means of self expression (p. 124).

This same work ethic is exemplified within reality TV programming and its own depictions of what makes for good work. Reality TV not only trains subjects to normalize politics of surveillance, as Andrejevic might have it, but also conditions the necessary habits and performance ''values'' that fit with the demands imposed by contemporary capitalism and its work habits (Couldry, 2008) As professor of media and communications Nick Couldry highlights, reality TV can be thought of as "the Secret Theatre of Neoliberalism" due to the way that it tracks with striking fidelity to the dynamics of the neoliberal workplace. Referencing "game-docs" such as *Big Brother*, Couldry outlines examples of the performance values

characteristic of neoliberal workplaces today, including the naturalization of surveillance, the valourization of authenticity, appeals to absolute external authority, the positive valuation of individualism but also team conformity, and a prescribed positive attitude even under terrible conditions (Couldry, 2008, p. 10-11). These performance values are exemplified in *Survivor*, which situates its subjects in a space governed by an external authority whose validity or rationality can never be questioned and requires the acceptance of compulsory team-work even as individuals are pitted against each other. Where the job of cast(aways) now extends far beyond desert islands, survivors are faced with the difficult task of being "authentic" so as to maintain fan appeal and thus the contradictory "necessity to perform (with an unseen audience in mind) is neutralized by the argument that in the end your 'real' self must come out" (Couldry, 2008, p. 10). Not unlike contemporary service workers who must put on "performances of productivity — pretending to enjoy their job or smiling while being yelled at by a customer" (Srnicek & Williams, 2015, p. 125), cast(aways) must remain positive, which involves "banishing any thought of contradiction" in regards to their working conditions (Couldry, 2008, p. 11). As Couldry writes, where those reactions such as doubt or reflexive uncertainty is what might actually make performance under national television cameras convincingly "authentic," these attitudes tend to be excluded (or even voted out) in favour of those attitudes and contestants that are able to take up the compulsory self-staging, required team-work and regulation by external authorities while remaining "positive," even "passionate," about the contradictions of such performance values (Couldry, 2008, p. 11).

As Couldry (2008) asserts, the "secret theatre" of reality TV is only secret in the sense that it is able to obscure its own labour conditions and the truly authentic feelings and attitudes that emerge from them. Through this obfuscation, which echoes the more general normalization of (increasingly bad) working conditions, work ethic plays an important role in recapitulating the drudgery of work and the suffering it brings as a necessary part of *self-realization*. As Srnicek and Williams (2015) assert, the central ideological support for dominant approaches to work ethic is that "remuneration be tied to suffering" (p. 125) and so it is now taken for granted that "[p]eople must endure through work before they can receive wages, they must prove their worthiness before the eyes of capital" (p. 125). Where a life of drudgery and suffering is not only seen as more meaningful, but "the very condition of meaning," a life without work, without

suffering in the name of what constitutes good work is seen as "frivolous and meaningless" (p. 125). With this in mind, a key aspect of Srnicek and William's (2015) post-work proposals is to put an end to the glorification of suffering and the positive valuation of drudgery, which in turn requires a counter-hegemonic approach to work: "a project that would overturn existing ideas about the necessity and desirability of work, and the imposition of suffering as a basis for remuneration" (p. 125). Put short, the project of re-working work ethic involves rethinking the meaning and purpose of work and, by extension, the modes of life organized around it.

Where the Industry of Education remains invested in the production of working futures, and thus subjects that will take on the necessary knowledge, skills and attitudes deemed necessary for the future workforce, the call for an end to work — for *working at not working* — requires undermining some of its most long-held fidelities and fundamental commitments. After all, the very idea that work should not be the determining factor of one's self-realization is antithetical to the reasons and rationale that undergird education's industry standards and the attitudes towards work such standards both necessitate and affirm. In the example of platform education, for instance, students and teachers are not only required to act in accordance with the rules and regulations of an absolute external authority (for instance, by passing exams to receive accreditation), but must do so in ways that can be surveilled, monitored and registered by platforms and their data protocols. Not unlike reality TV stars, students and teachers must adapt to these regulations and protocols while performing "authentic" learning in the system, which requires warding off any sort of reflection on the contradictions that this performance entails. Through platform education, then, life is transformed into learning, and learning into labour, a transformation that can be analyzed, measured and used by technological systems so as to affirm the future tendencies of the platform itself. As such, the actual labour conditions that keep the educational machine running, characterized as it is by data subjects, data workers and data markets, are obscured. Like reality TV, subjects are trained in the skills, but also values and work ethic, that affirm and accelerate education's reasons and rationalities. Pedagogy oriented towards working at not working, on the other hand, would mean that the pedagogical problem of working futures can no longer be solved by overcoming crises of work through better skill development or more relevant training. Instead, the end of working futures would need to be re-worked as the impetus to develop various modes and approaches to resisting and refusing work ethics that

obscure labour relations by reevaluating the meaning and purpose of work and the life practices, or modes of existence, it inspires.

### *6.4.3 Re-working Modes of Existence*

Where work ethic has become tethered to performance values that affirm conceptions of meaningful work always-already tied to promises of "authentic" self-fulfilment, self-expression and self-realization, the project of re-working work ethic involves an encounter with the ways in which the self, and thus what counts as "meaningful life," is conceptualized. As Srnicek and Williams (2015) write, "[w]ith work so tightly tied to our identities, overcoming the work ethic will require *overcoming ourselves*" (my italics, p. 125). With this in mind, the problem of working futures, and their potential end, is not only characterized by a lack of good jobs or material constraints on employment, but is also inflected by questions of subjective formation, which, I assert, is central to educational practices. Within the weird world of platform education, for instance, subjectivity is central to the platform promises and data-driven futures that have contributed to the transformation of life into learning and learning into labour. Once again, subjectivity in this sense is not constituted by stable and discrete identities, but instead emerges as a "terminal" or "crossroads" where multiple heterogeneous components of subjectification, what Guattari (and Deleuze) term singularities, meet to make up who we think we are (Guattari, 2000, p. 12). In this way, the production of subjectivity is not an individual affair, nor is it exclusive to the realm of the human, but instead involves a range of non-human and pre-personal forces and intensities. This is what Guattari (1995) refers to as a "machinic production of subjectivity," one wherein processes of subjectification are not bound to an individual but are instead embedded within a machinic assemblage of partial subjectivities that are always pre-personal, polyphonic, collective and machinic (p. 21).

For Guattari, understanding subjectivity as a process of machinic heterogenesis is necessary for confronting what he saw, now decades ago, as one of the most pressing political tasks of his time. As he wrote in *Chaosmosis*, "[o]ur survival on this planet is not only threatened by environmental damage but by a degeneration in the fabric of social solidarity and in the modes of psychical life, which must literally be reinvented" (1995, p. 20). For Guattari, any sort of refoundation of politics — be it solutions to the polluting of the atmosphere or the crisis of

work — must involve "a mutation of mentality, […] a new art of living in society" (p. 20). Key to Guattari's political call, then, is the claim that subjectivity has been standardized through modes of communication that have evacuated potentials for subjective enunciation and thus unthought collective formations. Where the question of subjective formation has been decentred and subsumed by imperatives for well-working individuation, or better, dividuation, subjective enunciation has been correlated with habitual subjective modelizations, or semiotic moulds, such as those imposed by an unquestioned work ethic. In the example of reality TV and its secret theatre of good neoliberal performance values, the truly "authentic" responses that might otherwise be elicited by cut-throat competition and ubiquitous precarity are obscured and replaced by the paradoxical performance of an authentic passion for the game, demonstrating Guattari's (1995) description of the ways in which the creative potential at the root of modes of subjectivication are "overshadowed in rationalist, capitalistic subjectivity which tends to systematically circumvent it" (p. 26). In the example of platform education, this same circumvention is at work, through, for instance, platform pedagogy and its demands for perpetually dividuated and dividuating, precarious lifelong workers. Through a machinic understanding of subjectivity, Guattari (1995) asserts that the task for political resistance involves "being aware of the existence of machines of subjectivation which don't simply work within 'the faculties of the soul,' interpersonal relations or intra-familial complexes […] but also in the large-scale social machines of language and the mass media - which cannot be described as human" (p. 9). Within this understanding of subjectivity, the very notions of both the "individual" and the "collective" refer to a sense of multiplicity that "deploys itself as much beyond the individual, on the side of the socius, as before the person, on the side of preverbal intensities, indicating a logic of affects rather than a logic of delimited sets" (Guattari, 1995, p. 9). Where subjectivity is reframed in terms of ongoing processes of collective deployment, the production of subjectivity, which is not to be confused or conflated with identity or individuality, is just as much a *collective*, even ecological, problematic as it is a personal one.

Read through Guattari's understanding of machinic subjectivity, the pedagogical problem of working futures not only involves re-working work ethic, but also re-working subjective formations, which, in turn, holds the potential to change mentalities and reinvent collective social practices. As Srnicek and Williams (2015) write, mobilizing around post-work imaginaries

involves "rebuild[ing] the collective agencies that might eventually bring them about" (p. 108). Bringing this assertion together with Guattari's conceptualization of machinic subjectivity, collective resistance must not only work towards forging alliances between individual human "users," but must also include a whole range of online platforms, technological assemblages and machinic connections. As platform education's data protocols demonstrate, the Industry of Education and its promise of a working future are not just interested in producing individuals who will take up a particular work ethic, but dividuated subjects that are able to transform and modulate actions so as to produce more and more data points. This strange articulation of subjectivity requires that users, be it teachers or students, break their work and themselves into smaller and smaller packets of information that can be trained — registered and thus rewarded — based on the specific habits and codes necessitated by platform education and its data-driven protocols. Importantly, the training going on here is not just about the creation of subjective habits through the indoctrination of content, but about the relations *between* and *within* subjects and the collective assemblages within which they are situated.

In order to approach the question of subjective habituation, then, we need to "forge a more transversalist conception of subjectivity" (Guattari, 1995, p. 4) one that links up to broader machinic organizations and collective assemblages. As Guattari (1995) puts it, we cannot keep these semiotic productions separate from subjectivity: "technological machines of information and communication operate at the heart of human subjectivity, not only within its memory and intelligence, but within its sensibility, affects and unconscious fantasms" (p. 4). This is especially the case with platform education, where living has been transformed into learning and learning into labour. For Guattari, a recognition of the machinic dimension of subjectivity leads to an insistence on the heterogeneity of the components of subjectivication, including signifying semiological components as well as as a-signifying semiological dimensions. As Guattari (1995) writes, accounts of the machinic production of subjectivity "oblige us to be aware of both universalising and reductionist homogenizations of subjectivity and of a heterogenetic tendency, that is to say, of a reinforcement of the heterogeneity and singularisation of its components" (p. 5). What is important here is how this machinic operation cannot be defined in terms of moral imperatives, in terms of "good" and "bad" subjects, but instead depends on its articulation within broader collective assemblages of enunciation. As Guattari (1995) writes, "[t]he machinic

production of subjectivity can work for the better or for the worse" (p. 5). With this in mind, re-working subjectivity, and thus re-working life and livelihood in the end times, is not just about proposing a new, or "better," subjectivity to which education and its futures should ascribe, but instead involves looking at machinic mutations, including those involved in platform education, as that which deterritorializes subjectivity, for better or worse.

### *6.4.4 Surviving De-Extinction Programming*

Airing in 2019, the 38th season of *Survivor* was titled *Survivor: Edge of Extinction* and featured yet another new twist to the game wherein contestants who were voted out were given the option to take a boat to the titular "Edge of Extinction" rather than leave the game permanently. This option was presented as another *lifeline* within the show, albeit one wherein cast(aways) had to survive on a desolate, abandoned beach with even fewer amenities than the main island while waiting for the un-guaranteed opportunity to return to the game. Those survivors that were unable to outlast this extinction event were given the option to raise a white flag, allowing them to retreat back to the real world. While one player took this option right away, citing fatigue and moral defeat, the rest of the extinct players stuck it out on the edge, fuelled by the redemptive fantasy of returning to the game. In this iteration of *Survivor*, even at the edge of extinction, cast(aways) were expected to adapt, with perseverance and resilience, to their degraded survival conditions so that they could retain their shot at sole survival.

Meanwhile, in the real world, a different edge of extinction was also underway, with 2019 marking yet another year of unprecedented biodiversity loss, species extinction and thus another milestone in what many scientists have called the sixth mass extinction. As discussed in the introduction to this project, one of the main concerns raised by the declaration of the Anthropocene is how it marks an era of extinction that far exceeds the "background rate" of the ebb and flow of life's creation and destruction. As Colebrook (2018a) writes, citing geographer and historian Jared Diamond, "[h]umans are at once threatened by this mass extinction event at the same time as they contribute to the acceleration of this extinction, and have done so since the earliest days of human migration." Within this understanding of extinction, the fundamental assumption is that the roots of extinction have been brought on by some general capacity of human beings to destroy the natural world (Dawson, 2018). This view of extinction is

exemplified in Elizabeth Kolbert's (2014) journalistic exploration of the sixth mass extinction, where she argues that extinction happens because the world's flora and fauna cannot adequately adapt to the accelerated rate of change and planetary transformations imposed by human beings. Not unlike broader Anthropocene stories, Kolbert's narration of the sixth mass extinction affirms that the qualities and capacities that make us human and empower us to transform the world, for instance, our creativity and our communicative abilities, are also what endanger the ecologies on which we necessarily depend. Within this narrative, then, we not only see a sweeping universalism characteristic of broader Anthropocene discourse, one wherein humanity is represented as a unified and undifferentiated species equally responsible for current extinction events, but also how extinction affirms, yet again, an anthropos capable of controlling and manipulating planetary realities, this time to the point of mass extinction.

In his own take on extinction, Ashley Dawson pushes back against this framing, and specifically Kolbert's account, by reorienting today's mass extinction events through a more critical, materialist lens. As Dawson (2018) writes, "the sixth extinction needs to be framed not as a product of some general human capacity for despoliation of the planet— as we see in the work of journalists like Kolbert— but rather as the product of a global attack on the commons, a capitalist frenzy as the planet tilts toward increasingly intense environmental catastrophe" (p. 175-176). For Dawson, current extinction events are not the result of some innate human condition or drive towards sole survival, but instead represent a concerted "attack on the planet's commonwealth, one in which capitalist interests target the world's remaining stores of biodiversity" (p. 176). In his account of the radical history of extinction, Dawson (2018) illustrates the way in which today's edges of extinction have been characterized by an attack on commonality by offering several weird examples of *de-extinction programming*. As Dawson outlines, the decimation of flora and fauna taking place across the globe has led to new investments in biotechnologies that promise to revive and regenerate extinct species. As he (2018) writes, "these new techniques of genetic engineering confer godlike capacities not simply to restore extinct species but also to *rewire life* to conform to the dictates of corporate profit" (my italics, p. 176). In addition to providing a brief history of de-extinction efforts and the ecomodernist fantasies undergirding them, Dawson highlights recent examples of de-extinction experiments, including the regeneration of the world's last Pyrenean ibex, which was "brought

back to life" by a Franco-Spanish team in 2000 through processes of "interspecies nuclear transfer cloning" (p. 177-178). As Dawson notes, while the baby ibex died shortly after birth, the experiment provided important "proof" that an extinct species could, indeed, be brought back from extinction.

In addition to conferring godlike capacities amongst scientists, this example of de-extinction points to the ways in which life itself has been conceptualized in terms of bundles of genetic information and dynamic codes, all of which can be collected, extracted, analysed and stored on computers and then instrumentalized in order to regenerate that which has become extinct. As Dawson points out, where animals, including human ones, can be reduced to a series of numbers and sequences of letters, they can be easily transposed into computer codes. From this view, the problem of extinction can be solved by collecting more information so as to provide the data necessary for regenesis and, ultimately, de-extinction. Not unlike the broader platform promises that have come to underscore contemporary economies, this example of de-extinction programming affirms that world-ending scenarios, such as the extinction of a species, can be overcome through the collection and instrumentalization of data via calculative measures that (cl)aim to bring about particular trajectories for the future. With this promise of calculated regenesis aimed at pay-offs in the future, it is perhaps no surprise that de-extinction programming and the technologies it has advanced have attracted investors and venture capital. As Dawson (2018) writes, "de-extinction offers a seductive but dangerously deluding techno-fix for an environmental crisis generated by the systemic contradictions of capitalism" (p. 179). The issue here, as Dawson sees it, is not just that investments in de-extinction draw attention and resources away from other conservation efforts, but that de-extinction relies on the thoroughgoing *division, manipulation and commodification* of nature, which provides yet another opportunity for a new round of capital accumulation, this time by generating and acquiring data protocols and property rights over the "building blocks" of life itself. Citing George Church, Dawson asserts that under this new regime of biocapitalism, living organisms are increasingly viewed as "programmable manufacturing systems" (Dawson, 2018, p. 180). Within this new space of production, one wherein molecular biology can be harnessed into a new regime of accumulation that nevertheless relies on risky financial investments, technologies such

as biological patents "allow a company to own an organism's principle of generation, its genetic code, rather than owning the organism itself" (Dawson, 2018, p. 180).

Where platform education is also invested in modes of production founded on the ownership of vectors of information that require subjects to be dividuated into more and more data points so as to monetize and monopolize relations, it can be argued that the Industry of Education is undergoing its own de-extinction programming. Through its platform transformations, but also through its sustainable imperatives and energetic investments, the Industry of Education is not just complicit with the will to extinction, but is a condition of its very possibility. In the case of working futures, the industry standards that economize pedagogical becoming under progressive logics aimed at becoming-forever-human contribute to today's extinction events in both material and conceptual ways. Where modes of production under platform capitalism not only involve the asymmetrical ownership of information, but also the material extraction of the Earth, platform education takes part in the broader material upheavals that continue to damage the planet in irreversible ways. This material excavation is conditioned by the fantasy of sole survival, where, in the name of becoming-forever-human, the otherwise multifaceted and impersonal flows that constitute life are correlated to the anthropos and its (sole) survival conditions. Not unlike *Survivor's* edge of extinction, the Industry of Education's redemptive and solutionist responses to today's extinction events — be it species extinction or the extinction of working futures — do not signal any sort of end of the world, but instead offer yet another lifeline for perpetuating standardized modes of existence and the (increasingly unworkable) survival conditions they necessitate.

While it may be the case that dominant narratives of extinction, and thus possibilities for de-extinction, revolve around visions of life wherein humans are able to control and manipulate the future through, for instance, genetic regenesis projects, this narrative fails to grapple with the way in which extinction raises strange questions about life and collaborative survival in anthropo-scenic times. As numerous critics of the Anthropocene have noted, despite the prefix "anthropos," today's end times scenario is not a result of our species' biology, but has been brought on by the long-distance and violently slow destruction of landscapes and ecologies via capitalism and its logic of expansion, extraction and accumulation (Moore, 2016; Davis & Todd, 2017). Where this logic has contributed to the determination of life itself, segregating humans

from non-humans while concomitantly policing identities, the actual problems of *collaborative survival* raised by current planetary realities have been obscured and dejected in the name of dominant survival conditions. Within typical understandings of extinction, there can be no anthropos, no "we" until the moment of inscribed and marked destruction, this time brought on by the event of mass extinction. As Colebrook (2018a) writes, while "extinction is as natural and inevitable as emergence […] it may be that when extinction can be witnessed from within 'a' life that this aspect of existence opens a new way of *problematizing the limits of thinking* and what it might mean to mourn or save a form of life" (my italics, p. 150). Once again, and echoing the broader problematic of this study of *Pedagogy at the End of the World*, it is only at the end of the world that the world finally appears, bringing with it the imperative for salvation. In the case of extinction, what is being saved is not just a planet on the brink of ecocatastrophe, but a "we" that is "constituted precisely by way of a death sentence: I mourn my future non-being and therefore I am. Further, I mourn my future non-being and therefore I must do all I can to *survive*" (my italics, Colebrook & Cohen, 2016, p. 82). This imperative for survival is exemplified through the Industry of Education's dedication to working futures, where, through transformations such as those made possible by platform education, the threat of something like the end of work is seen as a threat to one's self-realization, and thus a threat to life itself. Where crises of work might otherwise signal a confrontation with the reductive and overdetermined ways in which life has laboured in the image of working futures, the Industry of Education today positions this crisis as an opportunity for de-extinction, that is, for bringing forth an education after education that can overcome crises of work through more education.

## 6.5 Mutating Sole Survival and its Education

### *6.5.1 Sole Survival*

While *Survivor* has transformed over time, the main aim of the game — to become the *sole survivor* — has nevertheless remained the same. Survival here not only refers to surviving the elements or surviving the human drama that plays out under an external authority that imposes competition and scarcity conditions on a desert island, but also involves surviving the *strange transformations* that are now characteristic of today's end times scenario. Situated amidst these strange transformations, the goal to outwit, outplay and outlast now extends far

beyond the island, beyond television and computer screens, to the everyday practices and modes of existence that have been deemed necessary for survival today. In the world of reality TV, surviving transformation means taking up the habitual subjective formations and ways of living, and thus working, that can be recuperated, and monetized, by the platforms that structure relations both on and off the screen. Likewise, in the Industry of Education, surviving transformation, such as those brought on, but also necessitated by, platform capitalism, means adopting a work ethic and the subjective moulds deemed necessary for overcoming the problems foretold by the end of work. Following in the standardization imposed by the Industry of Education more generally, survival involves economizing teaching and learning under progressive rubrics of transformation, all of which necessitates particular subjective formations, and thus certain modes of existence that can be recuperated within the broader demands of, for instance, platform capitalism. In both the case of reality TV and platform education, then, the givenness of working futures is made possible by a specific set of *survival conditions,* which in turn define and delimit what we mean when we talk about concepts of life, livelihood and survival today.

The survival conditions that emerge from today's platform ecologies take part in broader orientations to the question of survival within the age of the Anthropocene. Following in the line of those Anthropocene narratives that work to recenter the human in relation to its unquestioned trajectory towards salvation and redemption, the survival conditions that undergird platform education are tethered to the pre-production of a reality defined by the imperatives of *sole survival*. Where platform education transforms living into learning and learning into labour, life itself is reduced to that which can be recorded, tracked and monetized through data systems in order to reproduce the modes of life and livelihood necessary for capitalism to overcome its own crises. In this way, platform education is just one example of the ways in which an "anthropological and calculative 'we' emerges by way of technologies that generate and calculate the worth of 'a' life" (Colebrook, 2018b, p. 170). As Colebrook (2018b) writes, drawing on Deleuze, "[w]hat allows something like 'man' to emerge is that, rather than seeing his being as an aspect of a complex whole that he knows with some degree of clarity and distinction, he comes to know himself *clearly and distinctly,* and then places what is other than himself— nature, life, the biological or species being of the human— in parentheses" (my italics,

p. 169). In this formulation, man, or the human, is separated and distanced from life, which in turn provides the foundation for this being to see itself as a self-legislating and formally rational subject. Where the Anthropocene proclaims, in its very name, a language of species life (and death), it not only affirms a distinct separation between human and non-human bodies, but also neatly erases the histories of racism and colonial violence that have been incubated through the regulatory structure of the human. In this way, and as Yusoff (2018) writes, the Anthropocene fails to address the ways in which colonial geo-logics and extractive grammars of geology continue to "labour in the instrumentation and instrumentalization of dominant colonial narratives and their subjective, often subjugating registers that are an ongoing praxis of displacement" (p. 2). It is this mode of existence, one reduced to the anthropos and its instrumentalized survival conditions, that the Anthropocene and its education aims to reproduce.

In both Colebrook and Yusoff's critiques of the Anthropocene's life-giving, and life-taking, formulations, the assumption of and imperative for thinking and acting in terms of sole survival is what must now be challenged, especially in an age of ongoing extinguishment and extinction. As Colebrook (2018b) writes, the question of the human — of anthropos — must itself labour over "whether all life makes a claim to be, or whether the being who asks that question— a being liberated from mere life— has some privilege" (p. 169). As Yusoff (2018) asks, where the division of matter into non-life and life pertains not only to conceptualizations of matter but to the racial organization of life itself, what modes of life, both material and psychic, are already imbricated in the Anthropocene, often in violent ways? While thinkers such as Colebrook and Yusoff raise pressing questions that might reorient conceptualizations of today's survival conditions and the centrality of sole survival, the imperative to reproduce life in the image of a standardized human continues to hold strong. This relentless grip is evident within the Industry of Education where platform education approaches the potential end of work as a problem that can and should be overcome through more individual training, technological innovations and the development of the "right kind of person." Through an economizing logic driven by data protocols and platform tendencies, platform education proceeds from the assumption that the ends of the world brought on by something like the crisis of work can be resolved through strategic calculation honed upon individual thinking and action, thus affirming the unquestioned promise of educational transformation. This view of transformation is founded

on a specific subjective figure at the centre, namely a self-regulating, hard-working human that can and will adapt to shifting realities through strategic pivots and future-oriented training.

Where work ethic is oriented towards the self-realization of a life defined by the drudgery of work and possibilities for transformation are honed upon an individual human subject, the survival conditions characteristic of platform education, but also reality TV, are oriented towards a becoming-forever-human, which in turn conditions what we talk about when we talk about life itself. Not unlike the broader narratives that have come to define the Anthropocene, the problem of the future here is one that can be solved through the development and upgrading of a human subject and thus working futures are always-already oriented towards a good future for "us." No matter the crisis at hand, be it crises of unsustainabilty, energy crises or the crisis of work, education is nominated as necessary to overcoming the problem of the future, in turn obscuring the way in which its own reasons and rationalities condition the problem it aims to solve. This leads to an unthinkable pedagogical problematic, one that asks how to resituate education in terms of the very real crises facing teachers and students today without falling back on the sole survival conditions and all-too-human modes of life that have produced the crisis in the first place. In the final section of this chapter, I put further pressure on the question of educational futurity by bringing the Industry of Education's visions of and for working futures in contact with some of the weird dimensions of life, survival and extinction raised by today's planetary realities. Drawing on Deleuze's strange account of desert islands, and returning to the reality programming of *Survivor* one more time, this section proposes a pedagogical approach I speculatively dub *non-work*, or a weird pedagogy of solidarity that necessitates the embodiment of island time, treacherous alliances and the purposeful destruction of those immunity idols that have come to think on our behalf.

### *6.5.2 Desert Island Dreaming*

Many of the locations occupied by *Survivor* cast(aways) and crew take place on islands. Throughout its two-decade long run, *Survivor* has brought everyday folks to islands around the world, from the Marqueses Islands to the Pearl Islands to the Cook Islands. While the location of *Survivor's* structured reality once changed from season-to-season, rarely repeating, since 2016 *Survivor* has filmed solely in the Mamanuca Islands of Fiji, a volcanic archipelago consisting of

between 7 and 20 islands (depending on the tides), where the production buys out resorts for periods of time annually in order to house production crews and stage the island escape. The choice to use islands as a backdrop for survival is, perhaps, more than just a logistical solution, providing a powerful scene for staging the human drama that has become central to the game. In addition to presenting a situation wherein cast(aways) are seemingly removed from "civilization" and left to face off against the unbridled forces of nature, the island context of *Survivor* plays an important role in bolstering the dreams of escape, of pulling away and being separate from the world, thus affirming the centrality of sole survival in the logic of this structured reality.

The figure of the island is one that Deleuze develops throughout his philosophical project, including in one of his earliest published essays that explores the causes and reasons of desert islands (Deleuze, 2004). Here, but also in texts such as *Difference and Repetition* and *A Thousand Plateaus*, Deleuze experiments with the figure of the island in his rethinking of the concept of immanence. As Deleuze (2004) writes, "[d]reaming of islands—whether with joy or in fear— is dreaming of pulling away, of being already separate, far from any continent, of being lost and alone, or it is dreaming of starting from scratch, beginning anew, recreating. […] the island is also the origin, radical and absolute" (p. 10). In his discussions of islands, Deleuze (2004) makes a distinction between two kinds of islands: *continental islands*, or those born of "disarticulation, erosion, fracture" and *oceanic islands*, or those "originally, essential" islands that "emerge from underwater eruptions, bringing to the light of day a movement from the lowest depths" (p. 9). As Deleuze (2004) writes, whereas "[c]ontinental islands serve as a reminder that the sea is on the top of the earth, taking advantage of the slightest sagging in the highest structures," oceanic islands remind us "that the earth is still there, under the sea, gathering its strength to punch through to the surface" (p. 9). Through this distinction, Deleuze articulates how, on the one hand, the island is an egg (p. 11) — a body without organs that exceeds human perception in favour of a vision of things of the world by themselves (Deleuze & Guattari, 1983) — while, on the other hand, an island signals the individuation made possible by the accidental essence of being an island in itself (Deleuze & Guattari, 1987). With this paradoxical distinction in mind, Deleuze asserts that islands offer powerful concepts to think with due to the way that they raise philosophical issues such as how the continuous horizon of the sea unfolds within representations of landscapes that construct images of thought, and how human presence plays a

role in such constructions. Islands, in this way, provoke the imagination by exposing a profound opposition — "a constant strife," even "a repulsion" — between the ocean and the land (p. 9), or between the deterritorialized earth and the individuation of bodies that come to call it home. As Deleuze (2004) writes, islands highlight the way in which "[h]umans cannot live, nor live in security, unless they assume that the active struggle between earth and water is over, or at least contained" (p. 9). In short, islands are the product of various relations between earth and water. At the same time, however, it is humans that *imagine* islands into being out of an experiment with separation and thus islands provide a concept that opens up new possibilities for thinking about the way that "we," as humans, have come to live in, or in spite of, the world.

In the example of today's extinction events, dreams of overcoming extinction, through, for instance, the promise of de-extinction programming, are dreams of pulling away, or *dreams of islands*. This fantasy of pulling away and starting anew is also central to the fantasy of *Survivor.* In both cases, the dream of islands does not just signify the hopes of escaping from current realities, but provides a way to persuade ourselves that the struggle between land and ocean, or the problematizing forces through which life itself emerges, does not exist or that it has somehow ended (Deleuze, 2004, p. 9). It is through this formulation of islands that Deleuze asserts that "we find here a new reason for every island to be and remain in theory *deserted*" (my italics, p. 10). As Deleuze explains, "[s]ince human beings, even voluntarily, are not identical to the movement that puts them on the island they are unable to join with the *elan* that produces the island; they always encounter it from the outside, and their presence in fact spoils its desertedness" (p. 11). The very concept of a desert island, then, involves a movement of the imagination that does not see islands as separate from continents, but "it is humans who find themselves separated from the world when on an island" (p. 10). Through this anthropocentric reorientation, "it is no longer the island that is created from the bowels of the earth through the liquid depths, it is humans who create the world anew from the island and on the waters" (p. 10). It is in this way that dreams of islands, and specifically dreams of *desert* islands, demonstrate, in a paradoxical way, that the self-consciousness of an island overlaps with the emergence of a natural island, or how the schematism of ideas leads towards particular individualizations, in turn raising philosophical issues of how the sensible individuation of nature itself traverses mental, bodily and geographical ecologies.

Based on these philosophical issues, and as Deleuze asserts, the very *existence* of islands actually troubles, even negates, those anthropocentric points of view that work to pull away and separate. That is, humans, including those that take part in the *Survivor* universe, can only live on an island by forgetting what an island represents. This, as Deleuze writes, is a cosmic forgetting — one that must deject and disappear the machinic connections and the asignifying, pre-personal intensities that make up who we think we are. Islands, after all, belong to a cosmic timeline that references either a "before or after" humankind. The philosophical problem raised by islands, then, is how life is reduced to those movements that prolong and take up the *elan* that produced the island in the first place. The figure of the desert island therefore raises the necessity for enacting a consciousness of land and ocean, one that is capable of recovering "the mythological life of the desert island" (Deleuze, 2004, p. 13). This necessity for thought points to the way in which desert islands provoke a weird pedagogical task, one the aims to navigate the movement of the imagination that mutates the desert island into an anti-model or speculative prototype of the collective soul. This is to say, following Deleuze, that the earth as a figure of the desert island, remains "the matter of an immemorial" (p. 14); it is the name of a "collective soul" (p. 13) where "each recommencement picks up what is most remote in time, the cries and the renewed suffering of men, their always-betrayed struggles and beliefs" (Brito, 2009, p. 12). Put another way, the earth is the name of this "true interiority of time," which paradoxically allows humans to think of themselves as separate from the problematizing forces of life while, at the same time, tapping into a cosmic past so as to project planetary futures. What desert islands signal, then, are not just memories of a historical or geological past, but also "hallucinatory or hypnotic presences […] whose propriety is being of a past always to come or, if you like, of a future nonetheless already there" (Brito, 2009, p. 12).

With this weird account of island time in mind, the problem of working futures in an age of extinction is mutated and reframed so as to ask how to re-engage in the struggles between ocean and land and thus recover, through pedagogical encounters, the mythical life of islands. As Deleuze (2004) writes, "[t]he essence of the deserted island is imaginary and not actual, mythological and not geographical. At the same time, its destiny is subject to those human conditions that make mythology possible" (p. 12). The pedagogical question raised through the recognition of desert islands, their causes and reasons, is therefore one that asks "who is this we,

which is not me?" (Deleuze & Guattari, 1981, p. 266). And further, how might this "we" be re-worked so as to recover the mythical life of the desert island? Transposed to the educational scenario of *working at the edge of extinction*, such questions require experimental practices aimed at relinking to the occulted substratum, to the incalculable eternities of cosmic indifference through which we are becoming, that has been negated and disappeared through educational standardization. It is through such experimentation that the givenness of education's working futures, defined as they are by hard-working, self-realizing, all-too-human individuals, are frustrated and re-worked. Such experimentation, however, necessitates strange forms of solidarity that are capable of negating, even destroying, the dreams of pulling away and fantasies of sole survival that have come to overdetermine educational futurity even, or perhaps especially, in an era of extinction. As Deleuze (2004) writes, it is highly doubtful that "the individual imagination, unaided, could raise itself up to such an admirable identity; it would require the *collective imagination* […]*"* (my italics, p. 11). With this in mind, and as just one response to education and the problem of working futures, the following speculative proposal for actualizing pedagogies of *non-work* aim at developing unthought and unlikely alliances that relink pedagogical becomings to the problematizing force of island time so as to counter the reality training that has reduced modes of existence in the name of perpetuating education's demand for working futures.

### *6.5.3 Non-Work, or a Weird Pedagogy of Solidarity*

While the quest for sole survival is pivotal to the structured reality of *Survivor*, the cast(aways) must nevertheless rely on making (and breaking) a range of *alliances* in order to stay in the game. For example, and from the very onset of every iteration of *Survivor*, the game begins by dividing cast(aways) into teams, or "tribes" where they must work together to build shelters, win challenges and strategize collective game-play. After the inevitable "merger," where tribes are combined and the individual game becomes more prominent, survivors must continue to engage in a complex assemblage of alliances, some of which are made known and some of which are clandestine so as to retain the power of secrecy and the potential for resumé-building big moves. These human alliances are not only key to making it through each of the tribal councils, but are central in determining the ultimate winner, who is selected by a jury of

former allies, or perhaps enemies. In addition to forming alliances with other humans on the island, cast(aways) must form relations with their surroundings in order to survive the physical elements of the game. Further, and as developed throughout this chapter, in order to survive as a reality TV worker, alliances must be forged and extended beyond the screen, so as to link up to the everyday practices of audiences within the broader reality TV ecology. Taken together, these alliances highlight how *Survivor's* fantasy of sole survival is founded on the production, but also obfuscation, of relations formed both on and off the screen so as to affirm, and thus realize, the central logic of the game.

This occlusion of relationality and the disappearance of alliances is also necessary for maintaining the Industry of Education's commitment to working futures and the survival conditions such futures necessitate. Platform education, for instance, requires that labour relations and modes of production are obscured so as to maintain platform promises and their future tendencies. Where work ethic continues to be founded on the promise of self-realization via one's work, even, and perhaps especially, in light of increasingly disparaging outlooks on the future of work, the precarious relation between subjects and their livelihood is covered over by the promise of full employment and a future defined by "good" work. Further, while data protocols are involved in the ongoing dividuation of subjectivity, they are nevertheless presented as a mode of individual customization wherein identities can be built and preferences can be met. As such, the machinic production of subjectivity is obscured so as to maintain and reproduce identities that conform to the demands of dominant economic orders. Not unlike *Survivor*, this obfuscation, disappearance or straight-out dejection of relations is what conditions the very possibility for thinking education's commitment to sole survival.

As educational theorist Jesse Bazzul (2020) writes, "[d]espite the attempt by some humans to muzzle the deep interconnectedness of all beings, there is no life (or being) that is not completely dependent on others" (p. 3). Indeed, this focus on the interconnectedness of all things has been one of the dominant responses to the Anthropocene and its proposed conditions for survival. Where, for critics of the Anthropocene, this lexical device has re-centred the human through a binary logic that continues to separate the human from the non-human, critiques of this geologic label draw attention to the need to relate to the world differently. This call for attuning to relations is one of the counter-responses that has been taken up in educational discussions of

the Anthropocene, where questions of how to live with, not in spite of, non-human life are front and centre. As educational scholar Fikile Nxumalo (2017) writes, "[t]he far-reaching implications of the Anthropocene include the imperative for current and future generations to learn to live in less destructive and more ethical ways with more-than-human life" (p. 148). As Bazzul (2020) writes, however, while "it may be obvious that concepts like solidarity and symbiosis are fundamental to education, […] these concepts have yet to really permeate theory and educational practice" (p. 2). Or, perhaps worse, even seemingly liberatory calls for "rethinking relations" remain committed to the becoming-forever-human of educational futurity by selecting for only those relational attunements that endorse a logic of affirmation, enhancement, maximization, optimization and (human) expansion. While such approaches (cl)aim to liberate pedagogical becomings from unjust "relations of power," they tend to bypass the questions and problems that might be raised by *relation itself*, taking part in a broader trend in the critical humanities wherein the idea of relation is glossed over "especially so regarding the relation that relation has with power, or, rather, regarding the way in which power obtains *in* and *as* relation" (Sexton, 2011, p. 29). As such, weird lines of questioning such as "how to conceive of an insufficient personhood rather than an engorged one; or how to diminish human planetary impact rather than expand it" (Galloway, 2017) are obscured in the name of, positive, more sustainable, more transparent, relations. This affirmative approach to relationality, in turn, downplays and ignores the relations of destruction, insufficiency, diminishment and extinguishment that might otherwise be raised by something like the Anthropocene and its extinction events.

With this in mind, the notion of relationality must itself be examined in terms of the unlikely alliances that are fundamental to all life, including that of the so-called human. It is here where *non-work* enters the fray as an experimental approach to practicing pedagogical resistance against education's working futures. Within this pedagogical orientation, the "non" of *non-work* references how working towards "better" relations involves practicing modes of negation and subtraction that decentre fantasies of self-control and self-realization, thus *working at not working* when it comes to demands for sole survival today. After all, and as MacCormack (2020) writes:

> [h]umans do not create symbiosis. Humans do not reciprocate. Humans use; whether in theory or practice, it all comes down to both being indivisible, because use of any kind directly impacts through its affective expression of an other, on that other's potential to express itself in its own way, whether it is a they or any other form of organisming beyond the anthropocentric form (p. 11-12).

Where, as Bazzul (2020) writes, "[t]o be an entity at any scale is to be incomplete, making solidarity ontologically fundamental to being," solidarity is not some sort of "ultra-virtuous act of exemplary human beings" but is instead that which is essential to existence itself (p. 3). With both MacCormack and Bazzul's words in mind, *non-working* pedagogies involve dilating potentials for solidarity where solidarity is not just an ethical or political task aimed at attuning to or incorporating more or better relations, but instead involves recognizing the strange (non)relations and unlikely alliances that make up all life. As Bazzul writes, "[i]n the end, solidarity does not [necessarily] require an education in social history, [instead] teachers might begin with the idea that solidarity is a foundational ontological element to existing" (p. 7). Once again, and as Deleuze and Guattari develop throughout their philosophy, life is not some general homogenous matter that is then differentiated, but involves a dynamic swarm of energetic investments and machinic connections. As Colebrook (2002) summarizes, "life is not about one privileged point -- the self-contained mind of 'man' — representing some inert outside world" (p. 56), but instead the human mind is just one machine among others that creates a world (and perhaps its end) from an otherwise indeterminate cosmos.

As just one of many world-making forces amidst today's end times scenario, the Industry of Education endeavours to eliminate the inexhaustible difference that characterizes life, through, for instance, the transformation of life into learning and learning into labour. A weird pedagogy of *non-work* refuses this elimination by orienting towards the creation of unlikely alliances that frustrate and negate the industry's imperatives for sole survival. As such, a weird pedagogy of *non-work* does not see the end of working futures as a problem to be solved, but instead as the impetus to develop approaches to resisting the work ethics that must obscure relations, such as those that have been innovated through platform education. The task of pedagogical resistance within this weird pedagogy of *non-work* interrogates and mutates calls for forging more sustainable relations in and with the world by focusing on the task of enacting forms of treachery

against the organizations that have "already betrayed the very concept and value of life at its most basic definition" (MacCormack, 2020, p. 4). As MacCormack (2020) develops, while many contemporary collective movements have embraced polyvocal assemblages and intersectional modes of solidarity, most collectives today "retain identity and dividuated liberty as a focus" (p. 4). Within such collective modes, "[p]redicting future relations necessitates predicting both self and other as known" and thus "the claim to know self or other in the future negates both the value of immanent relations of being in the present and relies on a kind of superstition above and beyond immanent relations that gives action a motive rather than the desire for an ethical encounter" (MacCormack, 2020, p. 28). What MacCormack draws attention to here is how many claims of collectivity today still rely on privileging the self and other as constituted identities instead of recognizing the immanent relations through which the self and other are engendered at singular sites of encounter. Against this identitarian privileging of life, MacCormack (2020) asserts that "[t]he entities we are must proliferate in ahuman becomings to become traitor to our species, disjunctive to the natural world for which we care, but caring nonetheless" (p. 174). Thinking back to Deleuze's discussion of islands, such treacherous becomings involve relinking to the mythological life of the desert island, where ahuman swarms merge with immemorial matter through ongoing deterritorializations that unmake and remake the world in its perpetual combat against systems of identity and representation. In short, it is on desert islands that ahuman life subsists. A weird pedagogy of *non-work* works towards such subsistence by forging unlikely alliances that involve destroying the idols that always-already correlate and reduce pedagogical becomings to an education after education so as to recover those modes of existence that have been disappeared through fantasies of sole survival.

### *6.5.4 Destroy Your (Immunity) Idols*

One of the most coveted objects within the *Survivor* world is the hidden immunity idol. This pocket-size talisman, if and when it is found, acts as protection from being voted out from Tribal Councils, and, as such, informs critical strategic decisions from when to use it and who to use it for to how to minimize its effect in the game. The hidden immunity idol is not only highly valuable due its potential for garnering strategic power, but due to the way in which it seemingly *immunizes* players from being impacted by the unfolding drama of the game, thus guaranteeing

the certainty of life (at least until the next Tribal Council). The power of immunity, of being immune to the world around, has become a dominant, albeit unquestioned narrative within today's broader anthropo-scenic scenario. Evidenced by de-extinction programming, the assumption here is that despite the pressing challenges facing the planet today, humanity can and will avoid the repercussions of a planet on the brink of ecocide. At the same time that mass extinction is now cited as a major threat, not only to various non-human species, but to human civilization itself, the certainty of the human and its perpetuation into the future is rarely questioned. Through ongoing promises and projections of sole survival, power is installed and invested so as to maintain the possibility for dreams of humanity's undeniable immunity.

In their critique of the Anthropocene, Cohen and Colebrook (2016) discuss this geological epoch in terms of the idols that have conditioned thinking in and of this purportedly world-ending event. Following Nietzsche, these thinkers assert that "a dream of human futurity (always better, always more human, more rational) is an *eternal idol* that relies upon declaring its own threatened existence: 'I am becoming extinct, therefore I am, and ought to be'" (my italics, p. 17). For Cohen and Colebrook (2016), Anthropocene idols are "not just the disaster-mongers, emergency opportunists and ecocide impresarios who could market survival strategies, but the theorists who thought to find a new point of refuge" (p. 15). Educational theory is no exception, often working towards immunizing strategies and promises of refuge from today's extinction events. For Cohen and Colebrook, then, the "twilight of the anthropocene idols" is not just an index of the loss of reason, the loss of our human potential to critically think our way out of the end of the world, but, to the contrary, signals how "the very figure of a humanity oriented towards a history of flourishing, self-realization, universal scope and a proper future relies upon an accidental and temporary corruption" (p. 17).

Situated within today's anthropo-scenic milieu, and with the aforementioned examples of idols in mind, the Industry of Education offers its own kind of immunity idols. Through the projection of an education after education made possible, for instance, by platform innovations, education is nominated as an immunizing force against the crises of work. That is, the certainty of working futures, which are nevertheless defined by increasingly disastrous labour conditions, is installed by positioning education as a powerful technology for pre-producing a reality wherein education and its subjects are immune to today's pressing challenges. This projection of

a good future for "us" in spite of the extinction events taking place today not only affirms particular self-images and ways of life, but also precludes and disappears other ways of thinking about life and living. As Colebrook (2018) writes, "[t]he self of technoscience can easily be tied to the pollution of Earth, but so can the universalizing self of liberal and utilitarian theory: I can kill, exterminate, and save if I have the ability to think beyond myself to the curious value of life as such, of life that might be maximized and weighed" (p. 168). Once again, through both the declaration of today's world-ending situation and the promise of overcoming this end, education revives and regenerates itself through the production of particular organizations of life, ones that can and will be immune to the extinctions that might otherwise force an encounter with issues of insufficiency, diminishment and eco-catastrophic abolition. As Cohen and Colebrook (2016) put it, "while authoritative declarations call for action founded in survival conditions that are worthy of the dire predictions of the present, the only real 'action' has been an insistence on a future for us" (p. 87). Just as financial crises have prompted desperate efforts to save the banks and unsustainable environmental crises have justified technological mitigations aimed at saving humanity, crises of work are positioned as yet another opportunity to project a positive education after education. With such crisis management in mind, resisting working futures requires *destroying the immunity idols* that have come to overdetermine educational futurity.

In the case of working at the edge of extinction, the Anthropocene idols that insist on a good future for "us," are destroyed when extinction is reframed as a problematizing concept that decentres the human and thus negates the tendency to think of extinction in terms of its anthropocentric meanings and impacts. As MacCormack (2020) asserts, far from being a problem to overcome, "human extinction can be understood as a good idea for ecosophical ethics and need not be considered 'unthinkable' but can be welcomed as affirmative of earth life" (p. 144). Or, as Colebrook asks, "[w]hat if rather than focusing on extinction, or on how many species we are losing and how we may lose ourselves, one looked at all the ways in which what has come to recognise itself as the species of humanity already required the extinction of other ways of being human?"[30] Reframed in these ways, the concept of extinction becomes a powerful site for experimenting with the pedagogical potentials that might be activated and actualized

[30] Colebrook poses this question in an online version of her entry on 'Extinction' for the Posthuman Glossary (2018a).

when questions of life are seen from an ahuman vantage that works to think "of ways beyond and ways out, not for ourselves, but for the world" (MacCormack, 2020, p. 2). A weird pedagogy of *non-work*, one undergirded by unlikely alliances and treacherous relations, is committed to this ahuman orientation, which involves a concerted dismantling of human dominance and thus the negative task of concept creation. As such, the "non" of non-work here not only refers to the task of forging relations that work at not working, but also refers to the negative task of destroying immunity idols by engendering a "complete cutterage" from the regimes of representation that have come to overdetermine potentials for thinking educational futurity otherwise. Through the destructive process of concept creation, which works to recover the mythological life of island time by creating "untimely 'vacuoles of communication' that break circuits rather than extend them" (Culp, 2016, p. 8), the point of this negation is not just to get out of repressive regimes of thinking, but to "cannibalize" them, to produce an "out-of-jointness" (Culp, 2016, p. 8). This weird pedagogical approach necessitates a consciousness of earth and ocean, one that provides a glimpse at that which exceeds human perception in turn conjuring the invention of unthought expressions of collective imagination. Importantly, while such experiments in non-work might expose alternative strata for thinking and anomalous worlds that have been eclipsed by, for instance, fantasies of sole survival, this weird pedagogical approach is not necessarily reassuring. As Deleuze writes, while islands articulate the "constant strife" between ocean and land, "[i]n this we find nothing to reassure us" (p. 9). This weird pedagogical orientation is nevertheless where "we" might begin to reimagine survival conditions so as to counter the Industry of Education's reality training programmes and their unquestioned imperative for working futures.

# CHAPTER SEVEN: Germinating a Weird Pedagogy

## 7.1 The End, Again

This study of *Pedagogy at the End of the World* wagers that today's end of the world scenario is not just indicative of the material and conceptual upheavals that characterize education in anthropo-scenic times, but also signals how the end, as an everyday concept, has limited potentials for thinking, and unthinking, educational futurity. With this in mind, and as developed throughout the speculative studies offered here, I wager that the end must be approached as a philosophical concept that both enables and constrains pedagogical problem-posing. The use of *wager* here is purposeful. Referring to the etymological roots of the word, this wager is a "solemn pledge," an earnest commitment that is nevertheless speculative in its ventures. Specifically, this wager speculates (earnestly) that the ends of the world in which education is today situated — i.e. the end of sustainability, the end of energy, the end of work — must not be treated as the catalyst to relaunch and redeem education and its industry standards, but instead provides an experimental site to develop philosophical concepts that might resingularize otherwise diminished potentials for pedagogical (un)becoming. By resituating the end as a site of pedagogical struggle, my aim within this research has been to problematize the redemptive narratives of sustainable salvation, speculative productivity and sole survival that continuously project an education after education. This is not only an important philosophical task given today's apocalypse banality, but also an important political task, one that involves saying "no" to the given world and its necessary obfuscation of the pain, suffering and extinguishment gripping the globe today. In short, the end of the world to which this study gestures is not just seen as a problem to overcome, something to ward off or even celebrate as a new site for all-too-human futurity, but instead signals a *problem* for contemporary pedagogical thinking and practice.

Drawing on the problematizing philosophical method of Deleuze and Guattari, which is always oriented towards the creation of philosophical concepts, this study has raised questions about the role, character and possibilities for *pedagogical resistance* today. By experimenting with weird study, involving speculative modes and transversal styles, this research works towards *germinating* responses to the question of pedagogical resistance through particular wagers. As unfolded throughout the speculative studies offered here, pedagogical resistance

involves, first, examining pedagogy in relation to the various ways in which the problem of the future has been conditioned by particular educational givens, which in turn limit possibilities for thinking. Secondly, and in a move to go beyond just analyzing and critiquing these conditions, pedagogical resistance also involves the elaboration of an "outside" thought, where the outside refers to a plane of immanent conceptual potentials that are co-constituted by all the assumptions, presuppositions, distinctions and distributions that make thinking possible in the first place. What is important to note here is how the wagers developed throughout this research do not propose universal solutions and imitative methods. Instead, these wagers offer *singular* responses that emerge from the specificity of weird encounters and the in-folding and un-folding of situated pedagogical problem-posing.

In the case of the problem of sustainable futures, for instance, pedagogical resistance is examined in relation to the Industry of Education's orientation towards overcoming unsustainability and the cosmological underpinnings such orientation affirms. By resituating sustainability and its education in relation to the weird event of a black hole and its computational imaging, pedagogical resistance is also resituated, calling forth a very different notion of sustainability, a *black hole sustainability.* The aim of this *weird pedagogy of endurance* is to sustain alien encounters and processes of becoming-imperceptible so as to upend salvation narratives and navigate horizonless futures. In the exploration of the problem of energy futures, the question of pedagogical resistance is probed further, this time through an investigation of the energy emergencies that have been produced through the Industry of Education's banking models and strategic management of energetic investments. Here, pedagogical resistance is linked to the problem of speculation, its limits and potentials, which, as demonstrated by the weird world of speculative finance and the energy futures it projects, is not always emancipatory. By negating energetic speculation through the subtractive strategies and non-productive investments made possible by *energy mediacy*, the question of pedagogical resistance in this instance is one that necessitates a *weird pedagogy of exhaustion*. Aimed at exhausting pre-determined possibilities so as to invent unthought pedagogical possibilities, energy mediacy is just one experiment in the creation of circuit-breaking vacuoles of communication that might resist the speculative financializations and s(m)oothing transition grammars that have directed and delimited energetic investments and thus educational futurity. In the final speculative study,

the problem of pedagogical resistance is explored once more, this time in relation to education's promise of working futures, characterized as they are by the transformation of life into learning and learning into labour. In this study, the question of pedagogical resistance is put in contact with the weird world of reality TV and situated within an age of extinction so as to counter dreams of de-extinction programming and fantasies of sole survival through the processual creation of a *non-working*, *weird pedagogy of solidarity*.

By resituating sustainability, negating energetic speculations and mutating sole survival, each of these studies has endeavoured to problematize pedagogical resistance so as to create different registers and trajectories for thinking about pedagogy at the (so-called) end of the world. The end, in this way, is transformed from an everyday concept founded in apocalyptic representations and generalizable opinions, to a philosophical concept that creates possibilities for thinking itself. The strange connections made possible through encounters with black holes and machine learning, with speculative finance and entropic transitions, with reality TV and survival conditions, provide a heterogenous and transversal mode of approaching pedagogical resistance, and thus educational futurity. Where, for instance, the end of sustainable futurity can no longer be approached in terms of all-too-human management schemes aimed at controlling the future, the philosophical concept of sustainability is itself opened up to very different notions of both endurance and pedagogical (un)becoming. Likewise, where the purported end of energy futures is made to encounter the weirder dimensions of energetic investments, energy, as a philosophical concept, opens up to a weird world of non-conservation that subtracts from and destroys the metaphors undergirding energy, and thus its transitions. Lastly, where the end of working futures is put into contact with theories of resistance aimed at re-working work ethic, subjectivity and thus transformation itself, the philosophical concept of life is mutated, revealing a weird array of unlikely alliances and treacherous relations that frustrate fantasies of immunity and sole survival.

Through these weird encounters, the promise of an education after education and the industry standards on which such promises depend, is made incoherent, thus necessitating new concepts and modes of thinking. Indeed, this has been the key preoccupation of each of the speculative studies developed here: to create concepts that transform the very threshold for pedagogical un/thinkability today. It is through this effort at concept creation, which necessarily

involves destruction and negation, that a *weird pedagogy* emerges. Exemplified through the strange array of speculative pedagogical orientations offered here, a weird pedagogy is not a formulaic programme that can be standardized and disseminated, but instead names the specific set of pedagogical conditions that emerge through weird methods of problematization. As such, the weird proposals offered here aim to respond to today's (apparently) unthinkable scenario by, on the one hand, experimenting with unthought lines of pedagogical becoming aimed at counter-actualizing educational projection of futures as usual, and, on the other hand, intervening in the given world of educational research and its methodocentric demands. While a weird pedagogy is not easily expressed through static determinations and straight-forward definitions, it nevertheless takes on particular characteristics and orientations that might germinate future trajectories for pedagogical inquiry. In what follows, and by way of conclusion, I outline the contours and movements of the weird pedagogy developed throughout this study of *Pedagogy at the End of the World.*

## 7.2 Weird Germinations

A Weird Pedagogy is Not a Metaphor

First and foremost, a weird pedagogy is *not a metaphor.* A weird pedagogy is not an ideal representation or predetermined proposal of and for pedagogy at the end of the world, but instead refers to the immanent pedagogical conditions that emerge when thought is put in contact with its perceived "outside." These immanent connections are not representations of a transcendent world that exists above or beyond, but are the literal connections and material productions that condition pedagogical thinking itself. Throughout his philosophical oeuvre, Deleuze was committed to the deliberate destruction of metaphorical thinking, asserting that philosophy and its concepts must always be understood *literally*. While many of Deleuze (and Guattari's) concepts may seem metaphorical (i.e. rhizome, machines, deterritorialization) and while other philosophers have emphasized the metaphorical nature of language and concepts, Deleuze asserts, time and time again, that his own concepts are "literal" (Smith, 2019, p. 44). What Deleuze means by literality here, however, is somewhat complicated. As he writes, "[t]here are no literal words, neither are there metaphors […] [t]here are only inexact words to designate something exactly" (Deleuze & Parnet, 1987, p. 3). Referencing the creation of philosophical

concepts, he adds, "there is no question of difficulty or understanding: concepts are exactly like sounds, colors, or images, they are intensities that suit you or not, that work or don't work [qui vous conviennent ou non, qui passent or ne passent pas]. . . . There's nothing to understand, nothing to interpret" (Deleuze & Parnet, 1987, p. 4). Once again, philosophical concepts are not labels or representational devices for things and phenomena in the world, but instead are what orient thinking through ongoing problematization. Metaphors, on the other hand, depend on a distinction between an originary sense and a figural sense, with the latter resting on its resemblance to the former. Deleuze's claims about the literal nature of concept creation overthrows this distinction between the originary and the figural: the production of sense is instead a matter of transport or passage, that is, it implies a plane in which heterogeneous significations encounter each other, contaminate each other, forming lines or connections with each other (or not), thereby forming what Deleuze calls sensible "blocks" that are endowed with their own consistency.

With this account of metaphorical dependency and literal sense-making in mind, a weird pedagogy should also be understood *literally* as that which deploys inexact words and phrases — i.e. black hole sustainability, energy mediacy, non-work — to designate something exactly. A weird pedagogy is therefore literal in the sense that it signals the material conditions through which concepts are created, thus overthrowing the illusory distinction between a given world, such as the given world of education, and one that is represented and communicated through pedagogy. A weird pedagogy works to purposefully subtract from the metaphors, representations and everyday opinions that have come to undergird education's industry standards, be it metaphors of sustainability, energy or work. Operating through dark resituations, subtractive strategies, appetites for destruction, non-productive encounters, un-becoming subjective formations, circuit-breaking speculations and the mythical life of island time, a weird pedagogy turns away from the goals of better representing and communicating modes of pedagogical resistance and turns toward the goal of problematizing pedagogy through the creation of concepts that might make us think. Where a weird pedagogy is not a metaphor it cannot be articulated in terms of a straight-forward formula or programmes that can be reproduced and transmitted through, for instance, new curriculum interventions or educational policy reform. There are no solutions to be found here. A weird pedagogy may not offer predetermined

solutions or useful approaches to the problem of educational futurity, but it is nevertheless the most adequate response to today's end times scenario.

A Weird Pedagogy is Not One

While thus far I have referred to "a" weird pedagogy thus implying a singular pedagogical orientation, *a weird pedagogy is not one* univocal proposition of and for pedagogical resistance or transformation. Instead, it is a call for the germination of multiple heterogenous vectors for pedagogical experimentation, a call for *weird pedagogies*. Operating against metaphor and reductive regimes of representation that actually shut down possibilities for thinking, weird pedagogies call for the *proliferation* of experimental pedagogical (un)becomings that emerge from situated contexts through singular approaches to problematization.

In my own investigations of pedagogy at the end of the world, I have unfolded just a few examples of weird pedagogies, each of which emerges from the specific ways in which pedagogical resistance and educational transformation is problematized by casting a line to the "outside." Whereas my experiments in resituating sustainability and its education gave way to a weird pedagogy of endurance characterized by *black hole sustainability*, a practice of sustainability aimed at enduring becoming-imperceptible and navigating horizonless futures, my experiments in negating energetic speculation created the conditions for a weird pedagogy of exhaustion oriented around the speculative practice of *energy mediacy,* a becoming-with energy that frustrates commonsense metaphors and smoothing transition grammars. And, in my experiments in mutating sole survival in light of today's crises of work, I proposed the weird, *non-working*, pedagogical practice of creating unlikely alliances aimed at countering education's (de)extinction programming and its immunity idols. Each of these weird pedagogies are not presented as ready-made responses to the problem of educational futurity that can be taken up and applied to any situation. As such, the proposal for germinating a sprawling range of weird pedagogies pushes back against the methodocentrism that has come to characterize many approaches to educational inquiry. Instead of proposing a predetermined method for pedagogical resistance, weird pedagogies are invested in germinating alien encounters, care-ful speculations and strange solidarities that hold the potential to raise *unthought* pedagogical stakes and thus lines of inquiry.

Weird Pedagogies are Realistic

Where, following Deleuze and Guattari, the real is always actual-virtual, where any actual thing is produced from virtual possibilites, weird pedagogies insist on the forceful power of the unthought, that is, thought's power to lead to lines of flight away from calcified regimes of representation and overdetermined organizations of power. With this in mind, the lines cast by weird pedagogies do not aim to domesticate or predetermine the in-foldings and un-foldings through which concept creation occurs. Weird pedagogies, instead, signal a problem of expression, a problem of how to form a new relation to the outside, which requires, in the first instance, encounters with that which is strange to thought, and in the second instance, the actualization of potentiality through weird, always speculative, but also literal, expressions of virtual possibilities that transform fields of the thinkable. Through such problematization, weird pedagogies demonstrate how there can be no one final solution or approach for thinking about pedagogy at the end of the world.

While weird pedagogies tap into virtual connections that have yet to be made actual, they are nevertheless very *realistic*. At first glance, weird pedagogies might appear fanciful and silly or simply too abstract, too philosophical. Not unlike the use of global weirding as a way of understanding today's unthinkable planetary reality, which might be seen as inadequate for expressing today's convergence of crises, weird pedagogies may be critiqued for being an unrealistic or impractical approach to facing the pressing issues experienced by educational subjects today. Drawing on the work of Deleuze and Guattari, however, I wager that weird pedagogies are in fact the most *pragmatic* response to thinking pedagogy at the end of the world. Where, once again, thinking is not something that "we" do, but rather what happens to us when thought is thrown into crisis, it is always a pragmatic affair. Philosophy, and thus the creation of concepts, is not just a "theory" or explanation of the world that emerges from abstract, autonomous choices, but involves the pragmatic activity of concept creation. Put short, there is a *necessity* to thinking. Where thinking is characterized by "a power of becoming and its becoming can be transformed by what is not thinking's own" (Colebrook, 2002. p. 38), it is just one line of becoming through which life itself is articulated. Understood as a material practice, thinking is not just engaged in metaphorical connections, but involves desiring production, which is always

a material process. Weird pedagogies are engaged in this mode of thinking, of pedagogical becoming, where thinking is not imposed from the "outside" as an ideal representation, but instead emerges as a pragmatic, and thus realistic, response to particular pedagogical problematics. As such, weird pedagogies push back against calls to be more "realistic" and assertions that "there is no alternative" by exposing the way in which such appeals to "reality" are nothing more than consensual confabulations based in everyday opinions.

Weird Pedagogies Do Not Work

While weird pedagogies are indeed realistic, they nevertheless *fail to work,* or at least fail to work well. That is, weird pedagogies are not programmes that are designed to work towards some predetermined pedagogical end by administering instruction and delivering content. Weird pedagogies can instead be understood as *machines*, in the DeleuzoGuattarian sense, albeit ones that do not work. For Deleuze and Guattari, the concept of the machine is not used as a metaphor, but instead refers to the literal way in which these thinkers conceive of life. For Deleuze and Guattari, "there is no aspect of life that is not machinic; all life only works insofar as it connects with some other machine" (Colebrook, 2002, p. 56). In this way, each machine is both connected to larger machines and constituted of smaller machines, which between them have no beginning or end point; there is no starting point or final causes, nor is there some original source or final product when thinking the world machinically (Colebrook, 2002, p. 56-57). A machine, can therefore not be considered solely an object, one that can be known in advance, standardized and disseminated accordingly, but instead it is constituted by the relations composed between parts.

Machinic assemblages are not made by anything or for anything and therefore do not have a closed function or identity. There are, however, certain forces, sedentary in nature, that produce the illusion of starts, stops, and interruptions, thus closing off the potential for other machinic connections to form. Habit, for instance, operates through the production of particular connections, which over time become commonsense. Once such connections become normalized, their functionality becomes naturalized as "just the way things are," making it difficult to discern the connection in the first place. Weird pedagogies offer one way to talk about the machinic assemblages through which pedagogical connections are made, or not made,

thus pointing to the prominent role of deterritorialization in processes of pedagogical (un)becoming. Where machines have no central subjectivity or organizing centre, where they simply *are* nothing more than the connections and productions they make, weird pedagogies are what they do, and what they do is *work at not working well* (Sharma, 2020). Situated within today's Industry of Education, wherein pedagogy is instrumentalized as that which always works towards particular futures — sustainable futures, energy futures, working futures — weird pedagogies counter the imperative to work well. Weird pedagogies are not aimed at fixing the future, or fixing education for that future; the goal is not to get education working better — more sustainably, more efficiently, more productively — so as to overcome the "wicked problems" and "mega-trends" that characterize typical approaches to the problem of the future. Weird pedagogies refuse fixing and thus refused to be fixed.

Weird Pedagogies are Non-Pedagogies

By working at not working well, weird pedagogies are oriented towards the *negation* of the very conditions through which pedagogy is typically thought. In this way, weird pedagogies not only undermine metaphors and illusory images of reality that limit educational futurity, but also undermine and problematize pedagogy itself. In the example of *black hole sustainability*, for instance, the assumption that pedagogy involves deterministic relations that can be calculated (given adequate information) is frustrated, giving way to pedagogy characterized by philosophical failure and pessimistic projections. In the case of *energy mediacy*, typical approaches to pedagogy wherein learning is tied to lifelong recalibration and the production of (energy) literate subjects, are made vulnerable, giving way to a pedagogy oriented towards subtraction and non-productive investments. And, in the example of *non-work*, pedagogy is mutated from a productive process of training life in the image of dominant reality to a practice of destruction made possible through the formation of strange solidarities. In each of these instances, the everyday concept of pedagogy is negated, in turn necessitating unthought concept creation and weird strata for thinking.

It is in this way that weird pedagogies are *non-pedagogies*, in the sense that they are invested in the negative task of thinking. As Deleuze and Guattari develop, the task of problematization is not just involved in creation, but goes by way of destruction. The negative

task of thinking involves getting rid of congealed representations, such as those proffered by everyday opinions of pedagogy, both as a problem and as a solution. This means pedagogical resistance cannot simply claim to retreat to some pre-apocalyptic time as a way to escape the problem of the future, nor can it simply project itself into the future as an inevitable consequence of today's pressing educational problems. Invested in the negative task of problematization, weird (non)pedagogies practice destruction as a practical matter of "undoing the complex set of illusions (i.e. territories in Deleuze and Guattari's terms) by means of which we give structure and purpose to our lives" (Buchanon, 2008, p. 117). This is not just a philosophical task, but also entails a politics, one that is oriented, in very practical ways, to the elimination of those reterritorializations that overcode existential possibilities both now and into the future. As such, the negative task of weird (non)pedagogies not only involves undoing illusory territories but also attempting to understand, through problematization, how and why territories were machined in particular ways in the first place.

## Weird (non)Pedagogies Will Not Save Us

Positioned in terms of its negative tasks, the dominant refrain of weird (non)pedagogies is "no, no, no!" Weird (non)pedagogies say no to the industry standards that have come to overdetermine educational futurity: no to economizing logics, no to the promise of progressive transformation, no to the imperatives to direct pedagogical becoming towards becoming-forever-human. No, no, no! Indeed, through its very emergence, weird (non)pedagogies are invested in asking, again and again, "how to say no to those that tell us to take the world as it is" (Culp, 2016). As such, weird (non)pedagogies say no to the apocalypse habits and world-ending proclamations that nevertheless relaunch and redeem educational futurity. Committed to the destructive task of thinking, weird (non)pedagogies purposefully align themselves with calls for abolition of the organizations of power that delimit life, including pedagogical life, today, often in violent ways.

Weird (non)pedagogies align with broader calls for abolition within ecological thought, such as Patricia MacCormack's (2020) abolitionist calls for processes of "unknowing," where knowing is itself positioned as a process of negating. As MacCormack writes, "[i]f knowing is negating, and knowing comes from the homogenous domains of power and knowledge whose

individual epistemes reiterate each other in order to create consistent values across seemingly disparate fields, then activism [after the end of the anthropocene] must creatively unknow" (p. 29). Weird (non)pedagogies such as *black hole sustainability* and *non-work*, take up the abolitionist call to understand knowing as negating: negating human exceptionalism, negating outmoded cosmological presumptions, negating sole survival, negating philosophy itself. Weird (non)pedagogies also align with calls for the abolition of capitalism and its demands for innovative modes of relation. Where, especially since the financial crisis of 2008, abolitionist discourse has seen a revival of, for instance, the writings of Marx and Engels and their definition of communism as not "a state of affairs which is to be established, an ideal to which reality [will] have to adjust itself" but as "the real movement which abolishes the present state of things" (Marx & Engels, 1964, p. 57), resisting capitalism today means abolishing the rationality that makes this economic formation possible in the first place. With this in mind, and mutated through the philosophy of Deleuze and Guattari, weird (non)pedagogies take up the call to subtract from primal metaphors in order to produce circuit-breaking speculations aimed at abolishing the conceptual schema through which the Industry of Education is made possible in the first place. As Deleuze and Guattari (1983) assert, the success of any political movement or revolution, including those aimed at abolition, are dependent on a precedent revolution of the psyche. As they articulate it, if a factory (or a school) is torn down (or reformed), but the rationality that produced it is left standing, we will simply produce another factory (or school). Weird (non)pedagogies aim to destroy the everyday concepts that undergird the Industry of Education's given rationalities in order to mobilize pedagogical (un)becomings and, ultimately, unthought trajectories for educational futurity.

The abolitionist character of weird (non)pedagogies is, in this way, invested in speculative experiments aimed at countering education's givenness to an education after education. The kind of speculation at the heart of weird (non)pedagogies is not seen as inherently liberatory, nor is it approached as an ultimately positive way to reimagine educational futurity given today's unthinkable planetary realities. As developed throughout this investigation of *Pedagogy at the End of the World*, black hole speculations can be made fascist, financial speculation can be oriented towards more and more absurd forms of capitalist exploitation and speculative proposals for de-extinction can produce harmful effects across living worlds. The

speculative orientation of weird (non)pedagogies is thus one that enacts care-ful speculation aimed at navigating the deterritorializing movements through which educational futurity is actualized. Weird (non)pedagogies do not aim to overcome the (dominantly perceived) problem of educational futurity, but instead experiment with resituating and renegotiating pedagogical inquiry in relation to the dynamic movements of deterritorialization that characterize today's unthinkable scenarios. With this in mind, weird (non)pedagogies will not save us. They can, however, germinate speculative modes of inquiry and unthought transversal connections that abolish the apocalypse habits and end of the world narratives that position education as both in need and worthy of saving.

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