

The Anthropocene and Climate Crisis

by

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Abstract

The Anthropocene, the idea that modern humans have the capability to change the environment on geological scales, has grown to prominence as a fashionable method of framing human-driven climate change. Popular across academic disciplines, the Anthropocene has also inspired debates within the humanities on the history, present, and future of the unified species-agent that the Anthropocene posits. I study the Anthropocene in its foundational moments within institutional geology in order to trace its epistemic presuppositions, conditions of possibility, limits, and political horizons. I find that, at its emergence, the Anthropocene categorically empties the elements of the social and the contingent from its figuring of human history. Instead, it recounts the dominance of colonial capitalism as a historical necessity.

I investigate furthermore the connection between the Anthropocene and contemporary activism, exemplified in sources like climate marches, Pope Francis' encyclical on climate change and inequality, and the *Leap Manifesto* against climate change. I find that much late climate action centres around the inextricability of the question of climate justice from other forms of justice. I read such an orientation as a corrective to the limited speculative imagination of the Anthropocene.

Lastly, I extend the insight of the Anthropocene, that every human is equally responsible for our current conjuncture, to the radically democratic conclusion that thus every human should have a say in the organization, decisions, and futures of the species. I end with a consideration of some of the work to be done to fulfill the promise of such an opening.

Praise be to thee, my lord, through all thy creatures,
especially brother Sun, who illuminates the day
and beautiful is he and radiant with great splendor. Of thee,
most high, he bears the likeness.

Praise be, my lord, for sister moon and the stars.
In heaven, thou hast formed them, precious and fair.
Praise be, my Lord, for brother wind, and for all the air and
clouds, and all the weather, through which you give all thy
creatures nourishment.

Praise be, my lord, for sister water. She is greatly helpful,
humble, precious, and pure.

Praise be, my lord, for brother fire, through whom thou
illuminate the night, and who is fair, cheerful, powerful,
and strong.

Praise be, my lord, for our sister, mother earth, who
sustains us and governs us, and brings forth diverse fruits
with coloured flowers and herbs.

...

Praise be, my lord, for our sister, bodily death, from
whom no man can escape.

- Saint Francis of Assisi, *Canticle of the Creatures*

The architecture of this work is rooted in the temporal. Every human problem
must be considered from the standpoint of time. Ideally, the present will always
contribute to the building of the future.

And this future is not the future of the cosmos but rather the future of my century,
my country, my existence. In no fashion should I undertake to prepare the world that will
come later. I belong irreducibly to my time.

And it is for my own time that I should live. The future should be an edifice
supported by living men. This structure is connected to the present in terms of something
to be exceeded.

- Franz Fanon, *Black Skin, White Masks*

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Contents

<i>Abstract</i>	ii
<i>Acknowledgements</i>	iv
Introduction//	
Climate collapse	1
Chapter one//	
The origins of the Anthropocene	16
Chapter two//	
On the Anthropocene and climate activism	49
Conclusion//	
Notes towards a politics of the Anthropocene	64

Introduction:

Climate Collapse

Introduction// Climate Collapse

Sean Connaughty laboured on his art project, “Ark of the Anthropocene,” for years. And for years—like another ark builder—he built slowly, confident in the immanent necessity of his project. Connaughty’s ark consisted of a white, concrete biosphere, and it included in its design three solar panels reaching out to the sun, receiving its light, protruding outwards in a way that bears similarity to an orbital satellite. Connaughty’s ark held “an assortment of growing plants” that got “sunlight through a piece of glass at the top of the structure as well as LED lights powered by the solar panels.” Within its hold, the ark preserved “plants, soil, organic matter, and a time capsule filled with seeds and other artifacts of life on earth,” including what the artist called “‘data’ documenting life on earth, among them audio files” as well as “bison hair, a meteorite, heirloom seeds, and other items collected through an intuitive, somewhat random process.”¹

The point of an ark, if one traces its history from Noah onwards, is that it contains and preserves within a vehicle a contingent configuration, or perhaps representation, of a genetic-ecological memory of its moment. The ark—Connaughty’s apparatus in this instance—is then meant to survive the end of its world, and from this ending point, which is also its point of origin, to reproduce that same world from its genetic-ecological memory. The ark is eschatologically oriented. It hails and anticipates the apocalypse. Connaughty’s ark evokes and echoes Noah’s ark even as rising global sea levels in Connaughty’s—and our—

¹ Sheila Reigan, “An Artist’s Ark Meets Its Fate on Lake Superior,” *Hypoallergic*.

moment are on the cusp of repeating the destruction, in both form and spectacle, of Noah's deluge.²

Two separate studies from 2014 have confirmed that the Western Antarctic ice shelf has collapsed, is collapsing, and that nothing can be done to halt it.³ Studies in 2015 have confirmed and affirmed these results, and found that the rate of the ice melt is accelerating. These 2015 studies predict a global sea level rise greater than those anticipated by the UN's climate change group, the International Panel on Climate Change, which did not include ice sheets from Antarctica in its calculations. James Hansen, NASA's former lead climate scientist, along with 16 co-authors, concluded that "glaciers in Greenland and Iceland will melt 10 times faster than previous consensus estimate, resulting in sea level rise of at least 10 feet in as little as 50 years."⁴ In Nigeria, as if such news had been anticipated, in 2014 construction began off of the coast of Lagos on Eko Atlantic, a city that will rise in the future from ten million square metres of land dredged from the sands of the Atlantic Ocean. Its developers say that its sole purpose is to "arrest the ocean's encroachment."⁵ The elite, politically-connected bankers and advisors to the notoriously corrupt General Sani Abacha have bankrolled the city. The first fifteen story office tower is being built for a

² Warren Cornwall. "Sea Levels Are Rising at Their Fastest Rate in 2000 Years." *Science Magazine*.

³ Suzanne Goldenberg. "Western Antarctic Ice Sheet Collapse Has Already Begun, Scientists Warn." *The Guardian*.

⁴ Eric Holthaus, "Earth's Most Famous Climate Scientist Issues Bombshell Sea Level Warning." *Slate*.

⁵ Martin Lukacs. "New, Privatized African City Heralds Climate Apartheid." *The Guardian*.

British oil and gas company. This city is another kind of ark, dedicated more than most others to the perpetuation of greed and exploitation.

These facts—of the ocean’s rise and encroachment, of the network of the rich and powerful working to secure its future—are the contemporary climate conditions of our planet, and they are worsening. As demonstrated in part by the conditions I’ve just written about above, not a week goes by without more dire warnings that show how little time we have to do something. Most recent reports peg the time we have left at zero, or less than zero. Steven Nerem, lead researcher on NASA’s Sea Level Change Team, confirmed recently that “it’s pretty certain we are locked into at least three feet of sea-level rise, and probably more.”⁶ The idea is that we have already passed the time of no time left. During the same press conference, NASA scientist Tom Wagner stated “people need to understand that the planet is not only changing, it’s changed.”⁷ Eric Rignot, a glaciologist at the University of California in Irvine, added “it would take centuries to reverse the trend of ice retreat.”

Similar sentiments and stories flood the airwaves: how bad it is, how bad it will continue to be, and how much worse it will assuredly get. Prominent climate journalist Eric Holthaus, writing in *Rolling Stone*, in an article grimly entitled “The Point of No Return: Climate Change Nightmares are Already Here,” provides some appropriately bleak exposition as his gambit:

⁶ Taylor Hill, “NASA Says Three Feet of Sea Level Rise is Unavoidable” *Takepart*.

⁷ Irene Klotz, “Global sea levels climbed 3 inches since 1992, NASA research shows,” *Reuters*.

In just the past few months, record-setting heat waves in Pakistan and India each killed more than 1,000 people. In Washington state's Olympic National Park, the rainforest caught fire for the first time in living memory. London reached 98 degrees Fahrenheit during the hottest July day ever recorded in the U.K.; *The Guardian* briefly had to pause its live blog of the heat wave because its computer servers overheated. In California, suffering from its worst drought in a millennium, a 50-acre brush fire swelled seventyfold in a matter of hours, jumping across the I-15 freeway during rush-hour traffic. Then, a few days later, the region was pounded by intense, virtually unheard-of summer rains. Puerto Rico is under its strictest water rationing in history as a monster El Niño forms in the tropical Pacific Ocean, shifting weather patterns worldwide.⁸

In the face of these horrors, which encroach closer and closer to the livelihoods of ever more and more people, global attention and concern grows and accrues. In September 2014, the People's Climate March drew hundreds of thousands of people in 150 countries to calls for action from global politicians and other figures of power on climate change. In New York, the march drew more than three hundred thousand people, including UN General Secretary Ban Ki-

⁸ Eric Holthaus, "The Point of No Return: Climate Change Nightmares are Already Here," *Rolling Stone*.

Moon.⁹ More marches are planned for the tenth anniversary of Hurricane Katrina, a watershed demonstration of climate change in the American imagination. In July 2015, the largest Canadian march ever took place in Toronto. More than ten thousand people assembled and demanded, among other things, “jobs, justice, and climate action.”¹⁰ In a way that has not been typical for an environmentalist march, the Toronto march was notably constituted by a coalition of “labour unions, First Nations, anti-poverty and faith groups, health workers and immigration rights activists” who all “underlined the need to change an economic system so it ‘works for people and the planet.’” The political “cause” of environmental awareness and protection has expanded into other domains, as testament to its wide reaching, uneven, and transnational implications, as it intersects with coloniality, income inequality, and gender justice. At the end of 2015, possibly the largest and most publicized climate talks in history took place in Paris, where 196 delegations met and proposed 187 plans to move the planet towards, in the words of United States Secretary of State John Kerry, “a global and clean economy” and “hopefully prevent the worst effects of climate change from happening.”¹¹

The Paris conference culminated in an agreement widely hailed by the mainstream press and the leaders represented there as “historic.” The delegates

⁹Melissa Davey, Adam Vaughan, and Amanda Holpuch. "People's Climate March: Thousands Demand Action around the World." *The Guardian*

¹⁰ Martin Lukacs. "'Historic' Toronto Climate March Calls for New Economic Vision." *The Guardian*.

¹¹ Adam Vaughan, James Randerson, Fiona Harvey, Suzanne Goldenberg, Lenore Taylor, and John Vidal. "Paris Climate Talks: Governments Adopt Historic Deal." *The Guardian*

signed a legal agreement to set the warming limit of the planet at 1.5 degrees centigrade above pre-industrial levels. The agreement is 0.5 degrees below the 2 degree limit agreed to in Copenhagen in 2009, and it should be noted that the Earth has already passed the one degree mark in 2015, which was the hottest year on record, shattering previous average temperatures by what the United Kingdom Met Office called “a country mile.” The Met Office also called our passing the one degree mark an entry into “uncharted category,”¹² and neither carbon emissions nor indications of climate warming show any signs of reversing the trend. Nevertheless, the 1.5 degrees benchmark represents quite a step from the previous limit, and the delegates at the Paris congress carefully constructed the agreement to limit warming to 1.5 degrees to bypass the authority of their constituent national legislatures, with such a bypass being most notable in the case of the United States Congress, whose Republican majority would have assuredly impeded any climate plan. In Article 4 of the agreement, meanwhile, the delegates agreed to reach net zero emissions by “the second half of this century.”¹³ Despite the drawbacks of the agreement, which include the lack of binding measures to ensure adherence to the 1.5 degrees limit, both the inefficacy and the lack of legal assurance of the “intended nationally defined contributions” which are supposed to contribute to our reaching the 1.5 degree limit (but which, even if adhered to, would lead to warming of 2.7 degrees or higher), and a dearth of resources for developing countries to help them in their transition to less

¹² "Global Temperatures Set to Reach 1 °C Marker for First Time." *Met Office*.

¹³ United Nations. Framework Convention on Climate Change. *Adoption of the Paris Agreement*.

carbon-intensive economies, business groups, national delegates, and Al Gore met the agreement with celebration, weeping, and cheering.

Suzanne Goldenberg, reporting in the Guardian, quotes the CEO of the Climate Group, the Chairman of the Prince of Wales Corporate Leaders Group, “which represents 23 global businesses including BT and France’s EDF,” and the CEO of “consumer goods giant Unilever” as being univocal in their support of the Agreement. Most tellingly, these figures praise the framework the Agreement sets up for a future economic direction, thus contributing to a stability on which business and their investors may “move ahead.”¹⁴ The president of the World Bank, Jim Yong Kim, released a statement praising the Paris Agreement, specifically that:

it sends the much needed signal to trigger the massive sums of public and private sector investments needed to drive economies toward a carbon neutral world as advised by science. While doing this, we will strive to ensure that there is the necessary finance to provide resilience for developing countries.¹⁵

It is clear that the Paris Agreement is contingent upon the cooperation between corporations and governments. That is to say, its imagined future, limited to 1.5 degrees of warming, not only presupposes the endurance of the current system of financial capitalism, but *is only conceivable under the condition of its persistence*.

The World Bank and various businesses are to bear nominal responsibility, at

¹⁴ Adam Vaughan, James Randerson, Fiona Harvey, Suzanne Goldenberg, Lenore Taylor, and John Vidal. "Paris Climate Talks: Governments Adopt Historic Deal." *The Guardian*

¹⁵ Ibid.

least equal to that of national governments, in constructing such a future. Thus, the Paris Agreement is as much a document to conserve the present configuration as it is a document which changes the present configuration. I want now to focus on the portion of Kim's statement which refers to science's role as an advisor, and I will do so by conducting a broad survey of the state of the climate as perceptible to science.

At a pace without mercy, heedless of climate marches and international conferences, new studies come out every week about the catastrophic climate change we live in the midst of. In 2014, *Nature* conducted an analysis that found that 41% of amphibians, 26% of mammal species, and 13% of bird species on the planet face extinction.¹⁶ In 2015, a study from the National Autonomous University of Mexico found that the extinction rate for species in the 20th century was up to 100 times larger than they would have been without climate impact. The same study found that even conservative estimates of species loss would signal the sixth great extinction of animal species in the planet's history.¹⁷ A 2015 study on plankton population found that "a much larger upheaval of phytoplankton—and therefore the species which probably feed on them—than

¹⁶ Robin McKie. "Earth Faces Sixth 'great Extinction' with 41% of Amphibians Set to Go the Way of the Dodo." *The Guardian*.

¹⁷ Adam Vaughan. "Humans Creating Sixth Great Extinction of Animal Species, Say Scientists." *The Guardian*.

previously estimated.”¹⁸ This upheaval has been unanticipated because the oceans have absorbed 30% of anthropogenic carbon emissions, and have consequently acidified at rates never before seen. A University of California - Davis study found, meanwhile, that it may take the sea thousands of years to recover from trauma wrought by climate change and loss of oxygen.¹⁹

2015 smashed the records for highest annual global temperature set only the preceding year, in 2014²⁰, and every month in 2016 thus far has set new record highs, with February likely to be the “hottest month in thousands of years.”²¹ Furthermore, in 2014, 413 scientists from 58 different countries produced an annual State of the Climate Report. This report was published, in 2015, in the *Bulletin of the American Meteorological Society*. The report found, among other alarming trends, continuing and precipitous rises in global surface temperatures, global sea surface temperatures, greenhouse gas levels, global sea levels, and rates of glacier and sea ice loss. The report found that all of these losses and changes have been accelerating: every metric of change set record or near record levels.²² Thomas Karl, director of the National Oceanic and Atmospheric Administration in America, said “the variety of indicators shows us how our climate is changing, not just in temperature but from the depths of the

¹⁸ Jennifer Chu. "Ocean Acidification May Cause Dramatic Changes to Phytoplankton." *Conversation on Climate Change*.

¹⁹ Kat Kerlin. "Oceans Slow to Heal from Climate Change." *UC Davis*.

²⁰ Chris Mooney and Joby Warrick, "It's Official: 2015 'Smashed' 2014 Global Temperature Record. It Wasn't Even Close" *Washington Post*

²¹ Dana Nuccitelli, "Current Record-Shattering Temperatures are Shocking Even to Climate Scientists" *The Guardian*

²² "State of the Climate in 2014," *Bulletin of the American Meteorological Society*

oceans to the outer atmosphere.”²³ The report added also, with an unrelenting bleakness in common with its findings (this like so many contemporaneous prognostications), that it is already too late to stop sea temperatures from rising, even if there are immediate cuts to carbon emissions, which fuel ocean warming. Greg Johnson, an oceanographer at NOAA’s Pacific Marine Environmental Laboratory, told reporters “even if we were to freeze greenhouse gases at current levels, the sea would actually continue to warm for centuries and millennia, and as they continue to warm and expand the sea levels will continue to rise.”²⁴

Given that the scale, pace, and ineluctability of the oncoming environmental devastation is predominantly, primarily, and dutifully observed and recorded by scientists, it is no coincidence that scientists have begun using the language, much like Connaughty, of the end times. It is important, within the argument of my thesis, to note that this same milieu, what Holthaus calls the “front row of global environmental catastrophe,”²⁵ provides the preconditions for the Anthropocene to emerge as a concept. Thus, I position the Anthropocene at the crossroads of science and religion, where the facts observed empirically and compiled methodically by scientists unfold themselves into a moral imperative.

²³ “International Report Confirms: 2014 Was Earth’s Warmest Year on Record,” *National Oceanic and Atmosphere Administration*,

²⁴ Suzanne Goldenberg. “Warming of Oceans Due to Climate Change Is Unstoppable, Say US Scientists.” *The Guardian*.

²⁵ Holthaus, “The Point of No Return: Climate Change Nightmares are Already Here.” *Rolling Stone*.

The Anthropocene, to return to the story with which I began my thesis, is the idea, first introduced in institutional geology, that humans have ascended into the status of geological agents, shaping and reforming earthly terrain and heavenly atmosphere. The impulse to expand the human into the geologic should be clear now given the mountain of data linking human activity to apocalyptic climate change. Because of the prominence of climate change in the global eye, the Anthropocene has taken on a life of its own since its introduction, with its provocative proposition informing almost every arena of cultural expression.

I want to return to the story of Sean Connaughty's Ark of the Anthropocene, with which I began this introduction. Explaining the symbolic register of his project, Connaughty states that he is "trying to say that the Earth is not safe," that "we are losing land mass." Connaughty thus created his Ark of the Anthropocene as an expression of his fear of global species extinction, and through this expression, Connaughty's Ark embodies a warning, and a peril. His ark performs the sense of urgency and danger that the slow crawl (relative to human lifetimes) of climate change's impact on the natural cycles of the earth renders difficult to represent. This capability, this representation, seems precisely to be one of the discursive promises of the Anthropocene. The Anthropocene makes it possible to give name to a problem, to make visible the problem of climate change within scientific epistemology, within humanities scholarship, within politics. We could thus call the Anthropocene a technology, in concept, that bears and holds the feeling of unsafety and loss that Connaughty identifies. It also bears evidence, of course, of the hope of our preservation.

Connaughty's Ark of the Anthropocene thus operates as an ark on two levels. On one level, it is a physical ark, a self-enclosed boat that has within its hold the material hopes of a post-Anthropocene future: growing plants, seeds, a time capsule, and so on. He hopes that his boat will protect its cargo through time, past the coming deluge, in order to reproduce it at some unknown horizon of futurity. On another level, the Ark of the Anthropocene acts as an ideological hold. It contains and preserves the current cultural preoccupations, contemporary senses of the future, of the past. The Anthropocene no doubt carries within it the conditions of possibility for the ark, for itself, for the ark itself. The Anthropocene is what has happened and is happening—climate collapse—and, at least according to its most fervent champions, it is a concept that is crucial in helping us survive beyond the repercussions of global warming.

My thesis offers two takes on the Anthropocene, with an eye towards its operation in contemporary culture. It attempts to figure and think about what lies within the ideological hold of the Ark of the Anthropocene. What does the Anthropocene preserve, even as it posits the end of the conditions that make its ideological contents possible? To this end, my thesis studies the scientific and cultural articulations of the Anthropocene. My first chapter traces the founding texts of the Anthropocene through its genesis within institutional geology, and attempts to map out its origins, epistemological presuppositions, and its conceptual limits. My second chapter turns towards a study of the contemporary cultural-religious reflection of our global climate and political crisis. I focus on stories of contemporary climate activism and Pope Francis' 2015 encyclical,

Laudato Si': *On Care for Our Common Home*, which has been reprinted by Verso as the *Encyclical on Capitalism and Inequality*. I read *Laudato Si'* as a document that runs parallel to the scientific Anthropocene in its foundational mission of addressing in some way our climate crisis. At the same time, I conduct a comparison of the ways that the Pope's Encyclical and the scientific Anthropocene problematize climate change, what their descriptions of the causes of climate change are, and what they imagine its consequences to be. I find that the Pope, along with much grass-roots climate activism, frames climate change politically, and fundamentally connects climate change to historical and ongoing forms of social organization and consequently oppression and antagonism. The Anthropocene, on the other hand, is relatively apolitical and conservative, narrating its Anthropocene through an assured hermeneutic of European progress and necessity. As a result, I search most of all in this chapter for the way that the Pope's framing of our crisis of environment offers a corrective to what I perceive to be the gaps and failures within the scientific Anthropocene. Lastly, I want to articulate some preliminary lines of flight away from the Anthropocene: is there a latent political impulse within the Anthropocene? How can it be enacted?

On September 2nd, 2014, after completing his ark and filling it with its precious cargo, cargo that will remember the cultural, economic, and natural conjuncture that defined the time of the Anthropocene, Connaughty set his ark

afloat on Lake Superior, 20 feet from shore. After 45 minutes, the ark began to float lower on the lake. It was losing air from a hole in its shell. It was sinking, this ark of hope. In a fortuitous act of foresight, Connaughty had tied a rope to the ark, and after the ark disappeared completely from view he gathered the rope and salvaged it and brought it to shore. It is possible that the failure of the Ark of the Anthropocene demonstrates to us the fate of the Anthropocene much more than its success could.

Chapter One:

The Origins of the Anthropocene

Chapter One// The Origins of the Anthropocene

In 2000, Nobel Prize winning chemist Paul Crutzen, perhaps best known for his contributions to both studying and sounding the alarm on ozone depletion, and Eugene F. Stoermer reintroduced the concept of the Anthropocene to scientific discourse. This reintroduction was originally localized within the annals of the earth sciences, through the newsletter for the International Geosphere-Biosphere Programme (IGBP). In an article entitled “The Anthropocene,” Crutzen and Stoermer provide as introduction a survey of the occasions where “scientists” recognized the growth of the activities of “mankind” into a “significant geological, morphological force”²⁶. They list G.P. Marsh, Stoppani “quoted from Clark,” “the great Russian geologist V.I. Vernavsky,” “the French Jesuit P. Teilhard de Chardin and E. Le Roy”²⁷ as progenitors of schools of thought that emphasize the outsize influence human activity has had on the planet. For the most part, these activities correspond to curious nineteenth- and early twentieth-century notions of human supremacy and progress, such as “visiting almost all places on Earth” and showing “increasing consciousness and thought, and forms having greater and greater influence on their surroundings”²⁸. Crutzen and Stoermer, for their part, repeat the tale of human supremacy by categorizing these proto-Anthropocenes under an awareness of “the growing role played by mankind’s brainpower and technological talents in shaping its own future and

²⁶ Paul Crutzen and Eugene Stoermer, “The Anthropocene,” *The International Geosphere–Biosphere Programme (IGBP): A Study of Global Change of the International Council for Science (ICSU)*, 17.

²⁷ Ibid.

²⁸ Ibid.

environment”²⁹. Crutzen and Stoermer’s main move in the article is to modernize the evidence supporting the idea of the Anthropocene. Understandable given the publication date, which precedes widespread global consciousness about climate change (if *An Inconvenient Truth* and the rise of the Toyota Prius are useful for periodizing) by a few years, they do not mention climate change or global warming as a predication for the Anthropocene. (The age of this piece reveals itself towards the end of the article, where Crutzen and Stoermer enumerate the threats to human existence, including “major catastrophes like an enormous volcanic eruption, an unexpected epidemic, a large-scale nuclear war, an asteroid impact, a new ice age, or continued plundering of Earth’s resources by partially still primitive technology”³⁰ but not anthropogenic climate change.)

Instead, they write about late “human” history (history from the Industrial Revolution onwards), and they list the “many other major and still growing impacts of human activities on earth and atmosphere”³¹ in order to argue for the viability of the Anthropocene as an epoch. Unlike Stoppani, who argued for the Anthropozoic era because “mankind has now visited or inhabited most places on Earth,” Crutzen and Stoermer argue for the Anthropocene epoch from their observations within a different set of data. Data like “the expansion of mankind, both in numbers and per capita exploitation,” “accompanied e.g. by a growth in cattle population to 1400 million,” the increase in “urbanization” (ten-fold) in the last century, “the release of SO₂, globally about 160 Tg/year to the atmosphere by

²⁹ Ibid.

³⁰ Ibid, 18.

³¹ Ibid.

coal and oil burning,” and the transformation of 30-50% of the land surface by human action. Crutzen and Stoermer list also as evidence that “the escape into the atmosphere of NO from fossil fuel and biomass combustion likewise is larger than the natural inputs, giving rise to photochemical ozone (‘smog’) formation in extensive regions of the world,” that “more than half of all accessible fresh water is used by mankind; human activity has increased the species extinction rate by thousand to ten thousand fold in the tropical rain forests . . . and several climatically important ‘greenhouse’ gases have substantially increased in the atmosphere: CO₂ by more than 30% and CH₄ by even more than 100%,” and that “coastal wetlands are also affected by humans, having resulted in the loss of 50% of the world’s mangroves. Finally, mechanized human predation (‘fisheries’) removes more than 25% of the primary production of the oceans in the upwelling regions and 35% in the temperate continental shelf regions.” Crutzen and Stoermer also mention in this initial section as part of the evidence of mankind’s wake of destruction the chlorofluorocarbons that contributed to the hole in the ozone layer, and “the history of biotic communities that leave remains in lake sediments,” whose effects “include modification of the geochemical cycle in large freshwater systems and occur in systems remote from primary sources”³².

In this original essay, in the nascence of the Anthropocene, Crutzen and Stoermer are singularly focused on the wide array of human infringement, on the ways in which humans have disrupted earth cycles that were, prior to this infringement, natural. They mark the “major and still growing impacts of

³² Crutzen and Stoermer, 17.

human activities on earth and atmosphere, and at all, including global, scales” in order to emphasize the central role of mankind in geology and ecology by proposing to use the term “anthropocene” for the current geological epoch”³³. They situate the beginning of the Anthropocene, which is “somewhat arbitrary”³⁴, at the “latter part of the eighteenth century”:

although we are aware that alternative proposals can be made (some may even want to include the entire holocene). However, we choose this date because, during the past two centuries, the global effects of human activities have become clearly noticeable. This is the period when data retrieved from glacial ice cores show the beginning of a growth in the atmospheric concentrations of several “greenhouse gases”, in particular CO₂ and CH₄ (7). Such a starting date also coincides with James Watt’s invention of the steam engine in 1784.³⁵

Astonishingly, Crutzen and Stoermer concede that one may reasonably map the origins of the Anthropocene to the very beginning of the Holocene, that is, to ten or twelve thousand years ago. Such an understanding would orient the entirety of human and what could be pre-human history towards the inevitability of the human destruction of the environment recorded within glacial ice cores. Such an account inscribes one particular form of human being as historically inevitable. It leaves no room for contingency – every human ever born since

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid, 17-18.

twelve thousand years ago is equally implicated within the *telos* of James Watt's invention of the steam engine. As we shall see later on, such an understanding is not uncommon among commentators of the Anthropocene. For the moment, a few provisional lines of questioning emerge: If we are willing to call the entire last twelve thousand years a teleological progression towards the invention of the steam engine, then why start at the beginning of the Holocene, and why not start at the beginning of time? Under such an understanding, wouldn't the extinction of the dinosaurs be as necessary a step as the formation of the earth, and ditto the distance of the earth from the sun? And, if we are not willing to do so, does the version of history offered by the Anthropocene allow us to ask what caused the invention of the steam engine?

It seems as if the conception of the Anthropocene grapples with the emergence of the signs of human history within the geological record: the increase in SO₄ levels, the increase in "urbanization," fresh water use, CO₂ in ice cores and so on all point to *something*, and Stoermer and Crutzen propose the name Anthropocene for it. In papers that followed this original one, Crutzen and Stoermer build on this insight and provide extended and detailed accounts of this something. They study the ways in which human population growth and behavior intersect with the ways that humans have made notable or legible changes within the geological record. That is to say, they attempt to connect human changes in behavior with changes in the natural history of the planet. Furthermore, and allow me to foreshadow here, they introduce a relation of determination between human and geological "histories." On the side of human history, these changes are

mainly reduced to census-based records of human population growth and migration. On the side of natural history, these changes are represented by scientific data, for instance, differential CO₂ levels in samples of the ice core. This is a fundamental move for the initial conceptualization of the Anthropocene.

But let's return to the 2000 essay, "The Anthropocene." Very early on in this paper, right after the introductory paragraph that recounts the history of the idea of the Anthropocene, Crutzen and Stoemer provide an example of the determination of natural history by human history. They posit a connection between a rise in human population and the rise in greenhouse gas emissions. This is a typical move, both in this first Crutzen and Stoemer essay, and in the essays by them and others that follow, which constitute a loose canon of scientific literature on the Anthropocene, and whose collective entanglements and investments will accompany my analysis. To the point at hand, Crutzen and Stoermer write that

The expansion of mankind, both in numbers and per capita exploitation of Earth's resources has been astounding. To give a few examples: During the past 3 centuries human population increased tenfold to 6000 million, accompanied e.g. by a growth in cattle population to 1400 million (6) (about one cow per average size family). Urbanisation has even increased tenfold in the past century. In a few generations mankind is exhausting the fossil fuels that were generated over several hundred million years. The release of SO₂, globally about 160 Tg/year to the atmosphere by coal and

oil burning, is at least two times larger than the sum of all natural emissions, occurring mainly as marine dimethyl-sulfide from the oceans.³⁶

Here, the move to connect human and natural histories relies on the understanding and representation of three statistical phenomena as equal to each other, flattened onto a phenomenal field where facts unfold through their self-necessity. The rise in human population is exemplary in the same way that the rise in urbanization and the rise in SO₂ release levels are. What they exemplify is merely the fact of themselves – their very remarkability. By this I mean that, while there is a clear connection between an increase in human population and an increase in fossil fuel burning, Crutzen and Stoermer do not explain why human populations increased in the first place, nor the specific necessary and formal entanglement between an increase in human populations and an increase in fossil fuel consumption. I am aware that these are big questions, which lie in all probability out of the scope of a newsletter article, but there is a possibility that such questions encounter a different set of constraints (beyond mere formal space) in their articulation through the Anthropocene thesis. To state it bluntly: it is possible that the Anthropocene, in its incipient form, is necessarily unable, for any number of reasons, to approach, formulate, or answer these questions.

I want to pause and consider the possibility that a view of human history as both a) a set of observations about population growth and b) the results of the first set of observations as manifest within a second set of observations of geological data, is unable to answer fundamental questions about the causes and

³⁶ Crutzen and Stoermer, 17.

determinants of either a) or b). This may be a conceptual limit of the geological Anthropocene. For example, within “The Anthropocene,” there is no account of the historical conditions of possibility or causes of urbanization, and Crutzen and Stoermer present the tenfold increase in human population with the same tone and air of inevitability as their presentation of scientific data about nitrogen: “More nitrogen is now fixed synthetically and applied as fertilizers in agriculture than fixed naturally in all terrestrial ecosystems.”³⁷ Both the increase in human population and the increase in nitrogen fixation, though they may be related (but with a mode of relation unaccounted for here), are arbitrary facts within the history of the Anthropocene. To be speculative: it is almost as if the methodology at work in “The Anthropocene” produces the changes in human organization and the changes in the environment as inevitable, causeless stages on the road to our present conjuncture.

This lack of an abiding cause is not necessarily a fault of “The Anthropocene,” as the authors mainly attempt (I think successfully) to present an argument, based on the balance of data, for the viability of the Anthropocene as a geological age. In other words, Crutzen and Stoermer limit their aims here to an introduction to thinking about the existence of the Anthropocene, and not into thinking about the causes of the Anthropocene. The only ambiguity occurs when the authors connect data about human social organization (for example urbanization) to data about geological formation: this connection posits a causal relation, but does not extend such a causal hermeneutics to understand changes in

³⁷ Ibid.

human organization in the first place. It seems as if the paper's lack of interest in the underlying reason for the changes it presents as evidence for the viability of the Anthropocene could lie either within the limit of the Anthropocene hypothesis, or within the epistemology or methodology of a scientific paper. This is a consideration I want to keep near as I continue to trace the emergence of the Anthropocene within the scientific academy.

In any case, I see the Anthropocene, here in its incipience, being able to take a few key positions:

Human and geological destinies, though separate before, have now become entwined: humans have overwhelmed geological destiny

The evidence of this overwhelming appears equally in changes in the geological record and shifts in human organization

The name of this overwhelming is the Anthropocene

In a short 2002 piece for *Nature*, named "Geology of Mankind" and intended as a follow-up to the *IGBP* article for a wider scientific audience, Crutzen is less equivocal about marking the beginning of the Anthropocene. In the *Nature* article, Crutzen traces the beginning of the Anthropocene to the late eighteenth century, and, echoing the *IGBP* article, reasons that such a beginning

date is self-evident because the analysis of air trapped during that period in polar ice “showed the beginning of growing global concentrations of carbon dioxide and methane”³⁸. Crutzen states also that such an origin date “happens to coincide with James Watt’s design of the steam engine in 1784”³⁹. The paper then goes on to reiterate many of the points made in “The Anthropocene,” and it does so in the same mode. It acknowledges the same early thinkers of the Anthropocene (Stoppani, Vernadsky, and Chardin), provides an ample trove of evidence that demonstrates the undeniable effects humans have made on the earth, and calls this geological-atmospheric-planetary damage the Anthropocene. Most interestingly, Crutzen mentions that “so far, these effects [the effects of humans on the planet] have largely been caused by only 25% of the world’s population. The consequences are, among others, acid precipitation, photochemical smog, and climate warming”⁴⁰. Crutzen’s evocation of this 25% resonates with the earlier absence about the cause of the Anthropocene: who is the subject or the agent of the Anthropocene? The Anthropocene limits its conceptual scope to the invention of the Watts steam engine, but it also plays with the idea that humans from the Holocene on can be included. It names a “human-dominated epoch”⁴¹, but it also remains aware that the evidence it gathers in support of itself is caused by “only 25% of the world’s population”⁴². The lack of a theoretical cause in the Anthropocene thesis constitutes these contradictions.

³⁸ Paul J. Stoermer, “Geology of Mankind,” *Nature*, 23.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

To unpack this: the key phrase in “Geology of Mankind” is “happens to coincide,” which constructs, under the sign of the Anthropocene, the purely arbitrary simultaneity of discrete events. The histories of the growing presence of greenhouse gasses and Watts’ steam engine occur in separation from another, and “Geology of Mankind” posits the Anthropocene as the epoch in which they meet. Once again, though the paper clearly connects the fact of the rise of greenhouse gasses to the steam engine, it never approaches a theory or a cause that would explain this connection or that would give reason to this connection. “Geology of Mankind” merely names this connection as the Anthropocene. This naming is silent about the human social history of the Industrialization, which includes and accounts for the invention of the steam engine. Industrialization clearly marks the beginning of a catastrophic exploitation of the earth’s resources and carbon reserves, reflected in the ice core samples, but “Geology of Mankind” does not mention this history.

This gap in the Anthropocene, its construction of a separation between the rise of atmospheric greenhouse gasses and the invention of the steam engine, means that the Anthropocene occludes the possibility of there being a reason that James Watt designed the steam engine, i.e., that the steam engine did not emerge from the void to inaugurate the Anthropocene, that it could have been otherwise. By affixing the beginning of the Anthropocene to the beginning of the Industrial Revolution—the origin and main driving engine, by all accounts, of the notable increase of global concentrations of carbon dioxide and methane—Crutzen, in critic Jason W. Moore’s words, “takes biogeological questions and facts . . . as

adequate for historical periodization”⁴³. As such, the Anthropocene of “Geology of Mankind,” in the second instance of its evocation and the first instance of its widespread circulation, is necessarily silent about the social-historical form of human organization that lay at the root of the data it accepts, perhaps as a precondition of the kind of analysis it undertakes, as inevitable. Through its confusion of natural history for social history, the Anthropocene here naturalizes and objectifies the purely contingent developments of Industrial capitalism.

As Andreas Malm and others have pointed out, carbon emissions didn’t rise during the late eighteenth century randomly, or because it was the inevitable appointed time for them to do so: carbon emissions increased because of the proliferation of the demands of commodity production and hence the proliferation of the factory system, which has been studied variously as methods of centralizing labour and methods of extracting energy more efficiently.⁴⁴ Also inseparable from the rise in carbon emissions are the new carbon resources “found” by European colonizers, most specifically the British exploiting Indian coal seams.⁴⁵ When Crutzen blithely notes the coincidence of carbon emissions in ice cores and James Watt’s steam engine, he erases all of the histories, details, and contingencies that mark human destiny. Furthermore, such an erasure replaces the agents behind the factory system and colonialism, which we can broadly note consisted of ruling class European men, with the entirety of the human species, and thus human history as well. A key component of the Anthropocene’s political usefulness lies

⁴³ Jason W. Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*.

⁴⁴ “The Anthropocene Myth,” *Jacobin*.

⁴⁵ *Ibid.*

in its ability to describe and theorize the events that have led to our current conjuncture. I offer, then, the preceding lines as a corrective to the Anthropocene's imagination of human history and agency. The erasure of human history in favour of the history of "the human" (*anthropos*) is a specifically ideological act possible only under certain conditions and configurations of epistemic authority.

In a 2007 paper, "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?" in *AMBIO: A Journal of the Human Environment*, Will Steffan, Paul Crutzen, and John McNeill once again connect the origin of the Anthropocene with the advent of the so-called Industrial Revolution. The paper begins by introducing "Pre-Anthropocene Events," which fill one-and-a-half pages and which are supposed to offer an overview of the entirety of human history since "before the advent of agriculture 10000-12000 years ago"⁴⁶. We can recall that this is roughly the outside range for the beginning of the Anthropocene given by Crutzen and Stoermer in their very first newsletter. In any case, Steffan, Crutzen, and McNeill make a distinction between preindustrial and industrial humans. They write that "preindustrial humans did not have the technological or

⁴⁶ Will Steffan, Paul Crutzen, and John McNeill, "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?," *AMBIO: A Journal of the Human Environment*, 615.

the organizational capability to match or dominate the great forces of nature”⁴⁷. “Technological” or “organizational” capability, then, is what distinguishes modern human history. Most provocatively, the authors here also point to “the mastery of fire,” which “provided humankind with a powerful monopolistic tool unavailable to other species,” as that which put us “firmly on a long path to the Anthropocene” (614). The Industrial Revolution, therefore, marked the beginning of our domination of the great forces of nature, but it is our “mastery of fire” 10,000 years ago that guaranteed the Anthropocene’s inevitability. Once again, the scientific formulation of the Anthropocene constructs a human history that moves teleologically towards the inevitability of the Industrial revolution, of the Anthropocene.

First, naming 12,000 years of human history only as “Pre-Anthropocene Events” enacts a periodization that renders human history only as slow and ineluctable steps towards our current condition, named here as Anthropocene. All history before the Industrial revolution has meaning only as steps towards the Industrial Revolution. Once again, this view vanquishes contingency, or any possibility that it might have been otherwise, that “humankind” did not have to fall into the factory system, into commodity production, exchange, and accumulation – that is, into the Anthropocene. Steffan, Crutzen, and McNeill periodize in such a way that they echo—perhaps symptomatically—the myth of progress. All of the history that their paper reports their paper also enframes within a hermeneutic of progress: all human activity occurs within “a long path to

⁴⁷ Steffan, Crutzen, and McNeill, 614.

the Anthropocene” or “the trajectory of the human enterprise”⁴⁸. In this way, without the possibility of contingency, of struggle, the Anthropocene empties itself of any political potential. There may be some usefulness in positing a species agent (a uniform humanity capable of changing the world geologically), especially perhaps in terms of representing the slow temporality of climate change at work, but there are some real concerns in how such a portrayal of species agency can end up paradoxically stultifying. If all history is an inevitable march to the Anthropocene, then where is the space for individual agency, for the possibility that it might not have been thus, for all of the peasant’s revolts, the struggles of the colonized, against the march towards the Anthropocene?

If everything in the past happened because they must, then what hope is there for current members of the human species to be able to change our species future? It seems as if the question of agency is simultaneously the question of responsibility, and to this end, we may question what the Anthropocene does with the fact that the damage it charts was mainly wrought by white European industrialists and colonizers – that is, by a very minute percentage of all humans who have lived within the Anthropocene. Could it be that not all humans are equally responsible for the Anthropocene? What are the political consequences of such a realization? These are not questions that the scientific iteration of the Anthropocene studied thus far seem to have on its radar, and they are certainly not questions the Anthropocene answers in its formation.

⁴⁸ Ibid.

The other troubling question that the Anthropocene must account for is its telos of human progression and the way that this myth of progress has worked historically to provide ideological justification for colonial brutality and pillage. The myth of progress has been part and parcel of every modernist program to industrialize, to accelerate, and to extract further resources. In other words, there seems to be not a little common ground between the fundamental epistemic presumptions on which the Anthropocene is formulated as a concept, and the narratives and myths that have been handmaiden to certain odious forms of human organization. These forms of human organization, meanwhile, have structured human behaviour to produce the very same data (resource exploitation, human migration) that scientists have used as evidence for the Anthropocene in the first place. The Anthropocene, in other words, founds itself upon the very dross and lies of the capitalist destruction it documents and inscribes as a historical inevitability.

Suspending these considerations for a while, there is more to be said about this origin document. Within the same section examined thus far, “Pre-Anthropocene Events,” the authors also, in addition to narrating history as a teleological march to capitalism, reduce the history of humanity and social organization to the determinism by arche-physiological data. Steffan, Crutzen, and McNeill attribute “enhanced physical and mental capabilities”⁴⁹ to a shift in the diet of “our ancestors” from “mainly vegetarian to omnivorous”⁵⁰. They do not consider that physical and mental capabilities are not stable, transhistorical, or

⁴⁹ Ibid.

⁵⁰ Ibid.

inevitable, that which is considered physically or mentally capable is governed by the habits and practices of a given era, and moreover changes and shifts with the ebbs and flows of history. Furthermore, given the tangled politics and seemingly diminishing possibility of measuring objectively such a thing as intelligence even within a single era or system, Steffan, Crutzen, and McNeill might note the tenuousness or the infeasibility of any claim towards the possibility of measuring “physical and mental capabilities” across time, across societies, across history.

Lastly, what position – which gaze – allows the authors of this paper the arrogance to presume the possibility of an objective measuring of “physical and mental capabilities” of “our ancestors” against, presumably, our own? Could it be that such an unquestioning and eager embrace of quantifying, reducing, and hierarchizing very disparate swathes of human existence and behaviour echoes broader historical tendencies of institutional science in providing justifications that underpin “scientific” measurements of human “physical and mental capabilities,” and thus the missions of European colonial conquest? Could it be also that the assumption of objectivity in describing and constructing human capability and colonial oppression is not only atrocious ethically, but also indicative of a limit of a scientific analysis or understanding of human history?

Another instance of the prevalence of facile biological determinism in the authors’ methodology occurs in their connection of “enhanced physical and mental capabilities” to the fact that “hominid brain size tripled up to an average volume of 1300 cm³, giving humans the largest ratio between brain and body size

in any species”⁵¹. Even if we lay aside, once again, the immense difficulty of being able to describe what intelligence is, much less imagine it to be some ahistorical and fixed quality (much less still compare intelligences across history or across species), Steffan, Crutzen, and McNeill take it for granted that a larger brain size necessarily leads to some enhancement in physical and mental capability. This contention echoes chillingly, in its casual attribution of hierarchy and status to physiology and biological form, claims that a phrenology text may have made in the early twentieth century.

Even more boldly, and with similar degrees and kinds of troubling assumptions, Steffan, Crutzen, and McNeill cite as a direct result of our hominid ancestors’ tripling in brain size the appearance of language itself:

As a consequence, spoken and then, about 10 000 years ago, written language could begin to develop, promoting communication and transfer of knowledge within and between generations of humans, efficient accumulation of knowledge, and social learning over many thousands of years in an impressive catalytic process, involving many human brains and their discoveries and innovations. This power is minimal in other species.⁵²

The first thing to note here is that what language is and does is still held up to considerable debate within linguistics and philosophy, and even is it be some immutable and transhistorical ability. Similarly, science has not answered

⁵¹ Ibid.

⁵² Ibid.

resoundingly and finally the question of whether language is limited specifically to humans. If anything, it seems as if the more that science learns about non-human species, the more tantalizing the evidence that emerges of sophisticated communication systems among a range of species. Take as just one example German forest ranger Peter Wohlleben, who writes in his book, *The Hidden Life of Trees: What They Feel, How They Communicate — Discoveries From a Secret World*, about the abilities, “long known to biologists,” of trees to

count, learn, and remember; nurse sick neighbors; warn each other of danger by sending electrical signals across a fungal network known as the “Wood Wide Web”; and, for reasons unknown, keep the ancient stumps of long-felled companions alive for centuries by feeding them a sugar solution through their roots.⁵³

Given just one instance of the extraordinary complexity of living beings and their sociality, how can we accept that only humans are capable of “communication and transfer of knowledge within and between generations of humans, efficient accumulation of knowledge, and social learning over many thousands of years?”⁵⁴ There are several claims here: that there is such a thing as language that we can recognize from the moment of its origin, that this language arises from our increased brain size, that our increased brain size is the cause of a switch in our diets, and, of course, that our language leads us to the “efficient

⁵³ Peter Wohlleben, quoted in Sally McGrane’s “German Forest Ranger Finds That Trees Have Social Networks, Too,” *New York Times*.

⁵⁴ Steffan, Crutzen, and McNeill, 614.

accumulation of knowledge,” and to our “discoveries and innovations.”⁵⁵ This last claim itself shows the definitive turn from hominid to anthropos, though probably not for the reasons the authors think: efficiency, discovery, and innovation are not any more natural than language. They are themselves historical and changing, and their presence in the paper here documents the paper’s embeddedness within the episteme of neoliberal capitalism, the same form of capitalism that fetishizes notions of innovation and novelty as a market necessity. We can perhaps point to the unquestioning reification of efficiency and innovation itself as a sign of the Anthropocene.

Steffan, Crutzen, and McNeill no sooner bring up language than do they instrumentalize it, describing it only as a tool that promotes “communication and transfer . . . efficient accumulation of knowledge, and social learning.” They then position knowledge and learning as catalysts or elements for “discoveries and innovations.” As stated above, the language here is exceedingly redolent of the language of neoliberal capitalism, with its focus on efficiency, “accumulation”⁵⁶, discovery, and innovation. Indeed, the language of the entirety of this Steffan, Crutzen, and McNeill paper is heavily littered with the language of capital. From the text quoted thus far alone we have “technological and organizational capability”⁵⁷ as the condition of humanity-as-*Anthropos*, and we have a description of fire as “a powerful monopolistic tool”⁵⁸. In this last instance, the authors equate power and monopoly, naturalize both as categories that pre-date

⁵⁵ Ibid.

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ Ibid.

written history, and inscribe fire into a tradition of tool use – that is to say, within the logic of utility. The close connection between the language of science and the language of capital inheres throughout “The Anthropocene.” One is led to wonder whether the Anthropocene itself, built as it is out of the language and logic of the contemporary capitalist moment, might not be a way to naturalize all of the sordid contingencies of the present: a way to iterate, and reiterate, the claim that it has always been thus, even before fire.

Even when the authors do not write with the spirit of a corporate report, their language betrays their investment in a discourse that resembles or perhaps is akin to capitalist discourse. At the end of the excerpted paragraph, Steffan, Crutzen, and McNeill note that “[the power of language] is minimal in other species”⁵⁹. Again, the authors harken towards some hierarchy of advancement and ability that structures their entire understanding of human history. Similarly, the relation between humans and fire somehow must be a relation of “mastery”⁶⁰, and preindustrial humans were at a distinct position of inferiority to us modern industrial humans because they lacked our sophisticated “organizational and technological capability”⁶¹. Furthermore, in stating that “preindustrial humans did not have the technological or organizational capability to match or dominate the great forces of nature”⁶², the authors presume that preindustrial humans wanted to “match or dominate the great forces of nature”⁶³. It does not occur to the authors

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² Ibid.

⁶³ Ibid.

that if “preindustrial humans” did not impact the earth at a “geological” level, it can not be because of say, other cultural and material situations of their world in relation to nature, other ways of surviving and thriving in this world, it must be because they lacked our capability. They do not consider that industrialization is not necessarily the goal or the end of all human civilization, that many cultures have thrived and sustained themselves on principles other than those of discovery, accumulation, and mastery: principles, for example, like reciprocity, or stewardship.

It seems as if, in the authors’ account, the point of human development has always been a *telos* oriented towards the present, and, from our position of organizational and technological complexity, we can survey history and read it as a series of rudimentary movements towards our vantage point. Steffan, Crutzen, and McNeill offer no other form of the social, and no gesture at other possibilities of human organization. The authors provide no inkling of human cultures that have not prioritized and impulsively naturalized accumulation, efficiency, capability, enhancement, or technology. Through the prism of the Anthropocene, every human ever born is either part of some failed society, lacking the modern and Western love of material accumulation and inequality, or they are subjects of the inevitable movement of humanity towards our present moment. The archive of the Anthropocene lies not only in the ice sample, but also in the teleological reading of all human history, and the Anthropocene that produces and is produced by this archive is a reactionary one that seeks to make human history and “nature” in its own ruthless image.

As is becoming clearer, the Anthropocene, while putatively focused on the possibility and necessity of species-agency (our “central role” in “geology and ecology”⁶⁴), is also simultaneously about inscribing a kind of species-helplessness. To clarify, the Anthropocene has an easier time imagining the equal embeddedness and burden of responsibility that every human ever born shares in our inevitable march to capitalism than it does imagining that capitalism is not a historical inevitability, that there was or can be other forms of the social. We can underline this early Anthropocene’s uncritical operation within the capitalist logic and modalities by looking further at the 2007 paper by Steffan, Crutzen, and McNeill, especially as it moves towards actually inaugurating and naming Anthropocene.

In this pivotal section, “The Industrial Era (ca. 1800-1945): Stage I of the Anthropocene,” just as they have in previous instances, but more egregiously this time around, Steffan, Crutzen, and McNeill use capitalism—the social organization around the value form—as the taken-for-granted and silent precondition upon which they build their case for the Anthropocene proper. Here, the authors posit the unequivocal connection between the Enlightenment and capitalism by locating the onset of Industrialization “in the footsteps of the Enlightenment”⁶⁵. After taking this position, however, Steffan, Crutzen, and McNeill seem to double back, and to abandon this thread. Instead, they write in the very same sentence that Industrialization emerged for “reasons that are in

⁶⁴ Crutzen and Stoermer (2000), 17.

⁶⁵ Steffan, Crutzen, and McNeill, 616.

dispute among historians”⁶⁶. They then provide a summary of these reasons, naming “material factors such as wood shortages and abundant water power and coal in England” and “social and political structures that rewarded risk-taking and innovation, matters connected to legal regimes, a nascent banking system, and a market culture”⁶⁷. They keep a clear distinction, an old idealist one, between the “culture” and “legal regimes” that dominated England and the “material factors such as wood shortages” which presumably shaped the reality from which the “market culture” and the “social political structures” emerged. This separation is inconsistent. On one hand, they assert that the Anthropocene—humanity dominating natural forces, human culture bleeding into natural history—began with Industrialization; on the other hand, they maintain a separation between human culture and the environment surrounding that culture. Even at the same time as they assert the importance of culture in the rise of Industrialization, however, they disavow the effects of the Enlightenment on the birth of industrial capital. The connection between the Enlightenment and the ideologies and social positions it provided for the emergence of capitalism is a tangled and provocative one,⁶⁸ a complexity that is recognized by the authors – “social and political structures that rewarded risk-taking and innovation, matters connected to legal regimes, a nascent banking system, and a market culture”⁶⁹ -- and it is disappointing that they do not make the connection more explicitly.

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ cf. Adorno’s “The Concept of Enlightenment,” Kant’s “What is Enlightenment?”

⁶⁹ Ibid.

In articulating the Anthropocene, Crutzen and his co-authors thus make a number of troubling gestures. First, this vision of the Anthropocene conceives, through causally positing a stable and trans-historical quality it calls capability (among other qualities), all human history only in its teleological relation to the Anthropocene, that is, either as precursor moments to the Anthropocene or as failed moments that never reach the Anthropocene. Second, the Anthropocene names the motivations, consequences, and violences of (Industrial) capitalism. Third, despite making, almost against its wishes, a connection between the rise of the Industrial Revolution and the Enlightenment, this version of the Anthropocene disavows this causal relationship with a flippant “whatever [the Industrial Revolution’s origins]”⁷⁰. The last of these maneuvers is especially troubling if one considers the context and environment in which the formative papers of the Anthropocene have emerged and circulated. What is the connection between the Enlightenment values that provided the field of emergence for the Industrial Revolution and contemporary institutional science? More specifically, what is the position of this connection in relation to the way that institutional science has abetted colonizing missions, which sneak in resource extraction and industrialization under the guise of supposedly trans-historical and hierarchical qualities like civilization? I am tracing here a possible limit of the Anthropocene as it is articulated through the orthodoxies and disciplinary presumptions and framework of a natural science.

⁷⁰ Ibid.

There is no doubt that a substantial archive of evidence has pointed to the violence and destruction human behavior has wrought onto earth environmental systems, but the Anthropocene is here stultified as a political project because its origins – both the origin it narrates about itself, and also its conditions of origin *per se* – accept colonialism and capitalism as inevitable, and in this way are imbricated within the logics of colonialism and capitalism, and has their theoretical horizons as the same theoretical horizons of capitalism. The geological and statistical data that the Anthropocene assumes is the evidence of some inevitable human tendency is really the data of centuries of capitalist expansion, accumulation, exploitation, and exhaustion. It is capital, and not humanity, that centralizes labour into factories, that valorizes efficiency, that produces and crushes surplus populations, forcing them to migrate. It is capital that coalesces into the corporate form, globalizing poverty and environmental destruction. One of the foremost tasks of any politics of the Anthropocene is to figure this key conceptual difference (and writers such as Donna Haraway and Jason Moore have done so) and to articulate a future Anthropocene that clarifies this confusion. An Anthropocene founded on the presupposition and theoretical necessity of the present capital-colonialist order can only have as its horizon of possibility the perpetuation, reproduction, and maintenance of that same capitalist-colonialist order. In this way, the Anthropocene is conservative, if not reactionary. The Anthropocene has within its hold the theoretical necessity of capital, and, as its vision of the history and formation of *anthropos* is necessarily (if unconsciously)

a capitalist one, its vision of the present and future of the *anthropos* is similarly a capitalist future.

I contend that the Anthropocene's misidentification of the damage caused by a contingent, that is to say, unnecessary, social formation (capitalism-colonialism) for a species damage that was fated from mankind's discovery of fire is symptomatic of its essentially limited *Weltanschauung*. For the rest of this section, I will attempt to underscore and clarify further the limited historical and speculative imagination of the scientific Anthropocene through my reading of "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature."

In the portion of "The Anthropocene: Are Humans now Overwhelming the Great Forces of Nature" entitled "The Great Acceleration (1945-ca. 2015): Stage 2 of the Anthropocene", Steffan, Crutzen, and McNeill describe the vastly increased growth rate in human population, energy expenditure, and "the explosion in electronic communication, international travel and globalization of economies" marking the period they call the Great Acceleration. They write, as their main contention, that "over the past 50 years, humans have changed the world's ecosystems more rapidly and extensively than in any other comparable period in human history"⁷¹, and report chillingly and flatly, as we learned earlier, that "the Earth is in its sixth great extinction event, with rates of species loss growing rapidly for both terrestrial and marine ecosystem"⁷². Steffan, Crutzen, and McNeill then support their position of humans changing world ecosystems

⁷¹ Steffan, Crutzen, and McNeill, 617.

⁷² Ibid.

more extensively than in any other comparable period with a wide array of geological evidence:

The atmospheric concentrations of several important greenhouse gases have increased substantially, and the Earth is warming rapidly (39). More nitrogen is now converted from the atmosphere into reactive forms by fertilizer production and fossil fuel combustion than by all of the natural processes in terrestrial ecosystems put together.⁷³

Once again, after this undoubtedly compelling list of evidence, the paper either halts itself or turns itself away from any theory, reason, logic, or historicization of the facts it points towards as unequivocal proof of the Anthropocene, and of the Great Acceleration. In the very next sentence, Steffan, Crutzen, and McNeill inscribe “the remarkable explosion of human enterprise”⁷⁴, the implicit and putative cause of climate change, fossil fuel combustion, and the other geological data the authors gather as that data’s mere equivalent: that is, the explosion of human enterprise is itself as equally arbitrary and unexplained a phenomenon as all of the geological indicators of the Great Acceleration. This tendency is borne out also in the very beginning of the section, where the authors introduce the Great Acceleration by stating that “the human enterprise suddenly accelerated after the end of the Second World War”⁷⁵. The authors do not define here or elsewhere exactly what constitutes the human enterprise, outside of the aforementioned geological indicators and others like “the explosion in electronic

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ Ibid.

communication, international travel, and globalization”⁷⁶ which are as vague and decontextualized as “human enterprise” itself.

In any case, human enterprise did not “suddenly” accelerate, nor did it “accelerate” for all humans equally. We can respect the scientific and geological evidence presented in favour of the Great Acceleration and not accept the Great Acceleration as an inevitability, nor should we accept the name of a period as its cause. We can be attentive to how the events described as constitutive of the Great Acceleration each have their own histories of emergence within determinate social, political, and economic contexts. We can connect the Great Acceleration to the rise of Fordist conditions of production and accumulation, the American state’s creation of a white consumer home-owning class through the G.I. Bill, and any number of analyses of post-war history. It seems as if we must pursue other theories and analyses if we wish to believe that it could have been otherwise, that the development of a wasteful, polluting, racist, and unjust order was not inevitable.

The point here is that Crutzen, Steffan, and McNeill flatten different orders of indices of catastrophe—geological and social—into a single inevitability. They record and report accurately the phenomena engendered by a specific and historic form of social organization, but they fail to grasp the contingent forces and structures that set the condition of possibility for these phenomena. They invent instead, to get around this absent cause, an ahistorical and, by all accounts, timeless category of the human, to which they attribute the

⁷⁶ Ibid.

woes and misfortunes of our current ecological condition. This human began from a shift in the diet of our hominid ancestors and it is the same human that invented and profited from the steam engine, that experienced the boons of post-war American middle class wealth. With the discursive construction of this Human, the *anthropos* of the Anthropocene, the authors render inconsequential certain critical nuances in the social developments it takes as neutral and inevitable. These critical nuances could sustain lines of critique, for example anti-colonial and anti-capitalist critique, that also aim to address the same dismal geological figures that the Anthropocene was invented to address.

Such trajectories of critique could even buttress or reinforce the claims and force of the Anthropocene. However, my argument, which I have been building towards, is that this originary and scientific Anthropocene, in its foundational moment, excludes the possibility of such critiques in its assertion of a singular Anthropocene human history. A paragraph near the end of the “The Great Acceleration” section exemplifies such an exclusion:

The Great Acceleration took place in an intellectual, cultural, political, and legal context in which the growing impacts upon the Earth System counted for very little in the calculations and decisions made in the world’s ministries, boardrooms, laboratories, farmhouses, village huts, and, for that matter, bedrooms. This context was not new, but it too was a necessary condition for the Great Acceleration.⁷⁷

⁷⁷ Steffan, Crutzen, and McNeill, 618.

In this case, the Anthropocene erases the uneven development of capital and in this erasure it positions the weight of responsibility for our current climate conjuncture, the rise in the earth's greenhouse gas levels, the sixth great extinction event on geological record, the explosive growth rate in population, equally on "ministries, boardrooms, laboratories, farmhouses, village huts, and . . . bedrooms"⁷⁸. This equal distribution of responsibility functions as a granular iteration or an instance of the kind of totalizing logic that names the damage wrought by industrial capitalism as the damage wrought by the human species, *that interprets all human history as the necessary procession towards industrialization.*

It seems impossible to assign equal amounts of responsibility and culpability for our current climate quandary to corporate boardrooms and "village huts"⁷⁹. It is an empirical fact that the largest share of carbon pollution since the Industrialization, that is, emissions responsible for climate change, is the result of industrial activity in the Western world, and, even more specifically, is precisely the result of decisions made in the boardrooms of a few corporations.⁸⁰ When the Anthropocene thesis operates on the presumption that the decisions of a migrant worker in China or a herder in Mongolia is equal in its climate impact as those made by the board of Exxon Mobil, it does not perceive or correspond to, or even interpret correctly, the material reality of our social order. The same inaccuracy plagues the Anthropocene's larger position on human history, where the history of

⁷⁸ Ibid.

⁷⁹ Ibid.

⁸⁰ Goldenberg, Suzanne. "Just 90 Companies Caused Two-thirds of Man-made Global Warming Emissions." *The Guardian*.

a small portion of people profiting from resource extraction and consumption is called the history of humanity. This seems to be a limit of the Anthropocene in its representational capability, and it stands to reason that the Anthropocene would carry this gap whenever it is drawn from, talked about, discussed, or repeated. A political task then arises – to render the representational flaw of the Anthropocene visible.

Chapter Two:

On the Anthropocene and Climate Activism

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Given the limits of the Anthropocene, not least its misidentification of the fundamental agents and causes driving climate change, then, what is, or can be, the relationship between the Anthropocene and the climate crisis at hand? Is the Anthropocene capable of energizing or contributing to the growing momentum of contemporary climate activism? Or, to invert the relationship, can activism and scholarship repair the limited capabilities of Anthropocenic discourse? The current state of this relationship leaves much to be desired. While references to the Anthropocene have proliferated in academic papers⁸¹, conferences⁸², art exhibitions⁸³, and within other similar circuits, the Anthropocene finds scarce mention in the slogans, actions, discussions, and methods among those most fervently working against climate change. At best, the Anthropocene might be mentioned as part of the growing and irrefutable scientific consensus around climate change, but all too often it is left out entirely. It is possible that the discussions which have largely centered around the Anthropocene – dispassionate observations in rarified spaces about periodization and so on – do not befit the urgent, possibly already-too-late necessity of coordinated political action. For whatever reason, the Anthropocene proves dispensable to climate or other social action.

⁸¹ In 2016 alone, Google Scholar finds 1,570 mentions of the Anthropocene

⁸² The Anthropocene is the keynote topic for 2016's Global Studies Conference at UCLA, the 2016 International Conference on Interdisciplinary Social Sciences at Imperial College London, the 2016 Arts in Society Conference at UCLA, among many, many others.

⁸³ Cf. the 2015 Taipei Biennial, the long-running series at Haus der Kulturen der Welt in Berlin, and many local galleries (Princeton, Forth Worth, etc.)

Take for example the *Leap Manifesto*, the political document produced in 2015 by “by representatives from Canada’s Indigenous rights, social and food justice, environmental, faith-based and labour movements,”⁸⁴ and signed by some 36,000 others, and which has gained traction in national politics and media⁸⁵. Though the *Leap Manifesto* is also essentially top-down in its conception, it includes within its conception a wide array of activists, and since then has been able to be an organizing object among fossil fuel divestment activists, labour unions, artists, and so on. The *Leap Manifesto* has reached some success in its social saturation, in being relevant within social struggle against the forces causing climate change. In line with much other climate activism, and departing significantly from the discourse of the Anthropocene, the manifesto highlights the inextricable relationship between capitalism, colonialism, and climate destructions. As such, it begins from respecting indigenous communities, that is, the manifesto begins from recognition of the inevitably historical and social conditions of climate change. Most notably, the text of the *Leap Manifesto* does not mention the Anthropocene even once.

The Anthropocene does not feature much in contemporary climate activism elsewhere, even the activism already oriented around the axis of opening up the findings of climate science – about the causes and effects of human environmental degradation – to public knowledge. This opening takes many

⁸⁴ "Who's On Board? | The Leap Manifesto." *The Leap Manifesto*.

⁸⁵ The most recent NDP convention passed the “Leap Resolution,” which promises among other things to implement the manifesto as “a high-level statement of principles that speaks to the aspirations, histories, and values of the party.”

forms, including evangelical proselytization, mass demonstrations, and the work of articulating the consequences of climate change along the lines of other forms of oppression, be they class, race, gender, or otherwise, and in these contestations they all depart from the claims and stakes of the Anthropocene. Eric Holthaus reports in “The Point of No Return: Climate Nightmares are Already Here” that “of the two dozen or so scientists [he] interviewed for this piece, virtually all drifted into apocalyptic language at some point.” Elaborating on this observation, he chronicles the story of “Katharine Hayhoe, a climate scientist and evangelical Christian” who moved from Canada to Texas with her husband, a pastor. “There,” explains Holthaus, “she engages with the evangelical community on science — almost as a missionary would.” The impulse to match “unfathomable” climate change with the Messiah seems possibly related to the impulse to build an ark in the face of the certainty of a global deluge. Yet, despite the marked similarity between the apocalyptic imagination of climate scientists and the apocalyptic tendencies implicit within the Anthropocene (expressed most clearly through Connaughty’s Ark), and despite the eminence of the Anthropocene in institutional climate science, none of the climate scientists in Holthaus’ article mentions the Anthropocene.

In her practice of proselytization on climate change, Hayhoe synthesizes the scientific method (i.e. a certain empiricist positivism from which she gathers the array of data about our impending climate collapse) with the method of religious mission to produce alarm and form of warning. In contrast, though the Anthropocene is fittingly alarmist in its evidence, proselytization and social

practice are not internal to its prescriptions. Puzzlingly, perhaps as another contradiction within the Anthropocene, the idea of the Messianic, heavily religious and beholden to an end-times oriented *telos* derived from the Book of Revelations, has in its historical Western form butted epistemological heads with the onset of Enlightenment rationalism and positivism that underlies the findings and impact of institutional science.⁸⁶ Of course, this is a somewhat crude and simplistic way of looking at a culturally and historically specific relationship between science and religion; the nuances and depths of such a relationship lie beyond the scope of this document (indeed, it furnishes enough arguments and materials to lie beyond the scope of much longer document!). For now, we can say that the conditions of life and the world under the current epoch, the Anthropocene, find resonance with certain religious articulations of apocalypse. We could say perhaps that the vastness of climate change, of all our current climate disasters, is equal to the scale of religious-apocalyptic doom.

Even if the Anthropocene is equal to the scale of religious apocalypse, it conserves tacit and somewhat reactionary notions of human history. Luckily, the scientists behind the Anthropocene do not seem to extrapolate the horizons of the Anthropocene solely from the reactionary and teleological version of the human they conserve. Steffen, Crutzen, and McNeill seem to recognize, that “the institutions and economic system that have driven the Great Acceleration continue to dominate human affairs” (619). They do not propose, however, a dismantling

⁸⁶ cf. the fate of Copernicus, or Darwin’s reception by the church, or contemporary efforts by various American lawmakers to exclude evolution from biology classrooms

of these institutions and the economic system as an imperative of the Anthropocene. Instead, they subordinate “changes societal values and individual behavior” (619) to technology and engineering-enabled programmes of “mitigation” and “geo-engineering,” leaving open once again the question of the connection between the conditions of possibility for technology and engineering and the conditions of possibility for “the institutions and economic system that have driven the Great Acceleration” (619). In any case, I argue that the political imperative of the Anthropocene necessarily involves responding to “the institutions and economic system” behind climate change, and I argue that the Anthropocene fails to do so to its own detriment in terms of its relevance to struggle, the possibility of it passing into favour in the broader social world, and, perhaps most importantly, its ability to catalyze the kind of political action necessary to stop climate change. It is here that we can make a connection to the scientist driven environmental activism chronicled by Holthaus.

Returning to the story of Katharine Hayhoe, which seems to both Holthaus and me to be exemplary, it can be seen how the science of climate change operates as something that activated a course of practice of environmental politics. In particular, we can surmise that part of the journey from scientific data to activism, in these cases, always means some form of social engagement that goes beyond an academic conference. It is precisely the social inflection of the findings of climate science which fuels the energy and passion of Hayhoe and others like her. Holthaus writes about James Hansen, who retired from climate science in favour of activism, and about his advocacy for a carbon tax. Hansen

has focused his energies mainly on the implementation of a carbon tax because he believes that an American and Chinese implementation of such a tax would halt climate change. Unfortunately, Hansen's plan has only received "tepid" support in a number of pitches to Congress. Holthaus notes "even though a carbon tax is probably a long shot, for Hansen, even the slim possibility that bold action like this might happen is enough for him to devote the rest of his life to working to achieve it." Resolving such a feeling of futility and impossibility for many people could mean, like it did for Connaughty, imagining a force or a story or a narrative that is equal to the problem of climate change, of established interests impeding climate action, or that provides a way of escaping from the problem. Indeed, if part of the challenge of confronting climate change is arriving at some representation of both its consequences – i.e. the severity and the doom that awaits – and its causes – Steffen, Crutzen, and McNeill's "institutions and economic system" that we can name as capitalism, colonialism, and as the movement of the value form through cycles of accumulation, among others. If this representation is the challenge of the Anthropocene, then the Anthropocene both succeeds and fails. It succeeds because it is large and capacious enough to function as a compelling narrative and nexus of organization, and it fails because it cannot name in actuality the knot of determinate causes that lead us to our current conjuncture.

In lieu of the Anthropocene's foundational silence on its cause, contemporary activists have searched for a vocabulary of climate action. It is no coincidence that climate justice has grown to prominence as a primary organizing

call to action. The term, used often alongside records of the uneven impacts of climate change, which destroys the livelihoods of those already most vulnerable and least visible, renders climate action into an ethical imperative inseparable from other notions and practices of justice. It is to this knot of social, political, and environmental justice that Pope Francis addressed his 2015 Encyclical.

Animating the Encyclical is the realization that climate change, after any kind of extended thought, is not a problem that ends, at the final analysis, with degree changes in global temperature. There are reasons grounded in concrete material and institutional practices for the oceans' acidifying and warming, and there are material reasons that global CO₂ emissions have had an unprecedented rise. These reasons are fundamentally social – they rely on the relationships between human beings, on the organization of human activity. Climate justice is necessarily a question simultaneously of women's rights, of indigenous rights, of the right to water, of the problem of global inequality. Within and against the Anthropocene, the fight for climate justice, one that recognizes the root causes and impacts of climate change, means the fight against capitalism, racism, cis-patriarchy, and so on. The Pope expresses this growing awareness of the necessity of a unified and intersectional framework of struggle, demonstrated by the 2015 climate march in Toronto comprised of “labour unions, First Nations, anti-poverty and faith groups, health workers and immigration rights activists” in his articulation of the challenges of climate change within the network of other injustices faced by most of the people on the planet.

It is not for nothing that Pope Francis' encyclical, entitled *Laudato Si'*, after the first lines of St. Francis' "Canticle of the Creatures" with which I began this thesis, is subtitled "On Care for Our Common Home." The encyclical is a document of almost 200 pages, and has since been republished by both Verso Books and Penguin Books. Its main move, as I have been foreshadowing, is to reposition climate action as something inseparable from other forms of struggles for human thriving. This inseparability exists not least upon the fact that the causes of climate change originate in the same form of organization (named by Steffen, Crutzen, and McNeill as "the institutions and economic system") that produces racism, sexism, poverty, and so on. On this point: the connection and codetermination of racism, sexism, global poverty, colonialism, and climate destruction is not an arbitrary one. As Sue Ferguson and David McNally state in "Social Reproduction Beyond Intersectionality," under intersectional frameworks, radical social theorists have convincingly presented us with an image of the messy experiential world, and they have identified key social, political, economic and psychological dynamics that sustain racialized and settler colonial relations to name but a few. And the best intersectionality accounts have rightly insisted that it is impossible to isolate any particular set of oppressive relations from the other.

The key point that contemporary climate activism makes, and the point the Pope underscores, is that the crisis of environmental destruction is similarly inseparable from the set of oppressive relations that constitute our "messy experiential world." The intervention of climate activism is to make visible the

damage that our “messy experiential world” itself endures. It is to show that “the set of oppressive relations,” or in Steffen, Crutzen, and McNeill’s idiom “the institutions and economic system that have driven the Great Acceleration and continue to dominate human affairs,”⁸⁷ has the destruction of the earth and the uneven distribution of environmental disaster⁸⁸ as their condition and as their consequence. This is where the *Leap Manifesto* succeeds and the Anthropocene has thus far failed.

The politics of climate activism must recognize that the effects of climate change will follow and entrench existing inequalities of power and wealth. In *Laudato Si’*, Pope Francis cites the Bolivian Bishops’ Conference’s “Pastoral Letter on the Environment and Human Development in Bolivia”:

we cannot adequately combat environmental degradation unless we attend to causes related to human and social degradation. In fact, the deterioration of the environment and of society affects the most vulnerable people on the planet: “Both everyday experience and

⁸⁷ Steffen, Crutzen, and McNeill, 619.

⁸⁸ One needs only to look at the example of Hurricane Katrina to see how the extreme weather brought about by climate change, itself caused by a social formation which benefits a wealthy few, destroys the lives of the already-impooverished many. That is to say, the differential impacts of climate change repeat and contribute to the creation and distribution of precarity under capitalism. This logic repeats itself in other examples, like the droughts and rising temperatures that have left 36 million people across Africa facing hunger, like the Mongolian pastures, and its way of life, destroyed by climate change, like the study indicating that “failure of the rice crop in southern China due to heatwaves could change from a one-in-a-100 year event to a one-in-four-year event in 2100,” and predicting that 500,000 globally will die per year from climate change’s destruction of global food supply. It will not be the rich and powerful who feel the brunt of these disasters. As *Eko Atlantic* shows, they are already planning for their survival.

scientific research show that the gravest effects of all attacks on the environment are suffered by the poorest”. For example, the depletion of fishing reserves especially hurts small fishing communities without the means to replace those resources; water pollution particularly affects the poor who cannot buy bottled water; and rises in the sea level mainly affect impoverished coastal populations who have nowhere else to go. The impact of present imbalances is also seen in the premature death of many of the poor, in conflicts sparked by the shortage of resources, and in any number of other problems which are insufficiently represented on global agendas.⁸⁹

The Pope politicizes the problem of climate change, placing its impacts and causes alongside human and social systems. Most clearly, he writes that “we have to realize that a true ecological approach *always* becomes a social approach; it must integrate questions of justice in debates on the environment, so as to hear *both the cry of the earth and the cry of the poor.*”⁹⁰ In integrating ecology into the domain of social inequality, the Pope gestures towards the antagonism, demonstrated unequivocally in the case of Eko Atlantic, between the rich, the corporations, those that predominantly drive and accelerate global climate change, and the global poor, who by and large feel its effects. We may recall here that Pope Francis is the first ever pope from the Global South, and that he chose his papal name (that is, St. Francis) while setting the intention of “helping the poor” as one of the main goals of his papacy, that he refers to St. Francis in one of the

⁸⁹ Pope Francis, *Laudato Si'*, §48.

⁹⁰ Ibid, §48.

sections of his Encyclical, admiring St. Francis' "care for the vulnerable and of an integral ecology,"⁹¹ his concern for the "poor and outcast," his embodying a practice of relation to the world that is not one of "masters, consumers, ruthless exploiters."⁹²

The Pope followed his encyclical at a conference for mayors in July 2015, where he connected migrant populations to climate change: "The UN really needs to take a very strong position on this issue, particularly the trafficking of human beings ... [a problem] that has been created by climate change."⁹³ He also affirmed and underscored his encyclical's point of critique, saying that "his was not a 'green' encyclical, but rather a 'social' one, which reflected an 'attitude of human ecology.'"⁹⁴ In this contention, that the "green" is formed by the "social," nature by humanity, the Pope offers yet again a corrective to the relative asociality of the Anthropocene thesis, that the "green" is formed by the "social," nature by humanity.

Moving from those most vulnerable to those most insulated: climate change shaped the agenda at the most recent G7 meetings, which saw most powerful political leaders of the current system of international capitalism, the exact same system that has bestowed political economic power to those leaders, attempt to reconcile the demands of development with its clear insanity. This is a cautionary tale for the Anthropocene, whose popularity is high among the same

⁹¹ Ibid, §11.

⁹² Ibid.

⁹³ Stephanie Kirchgaessner. "Pope Laments 'meaningless Lives' in Tying Human Trafficking to Climate Change." *The Guardian*.

⁹⁴ Ibid.

Davos set, as evidenced by *The Economist*'s in depth feature on the Anthropocene back in 2011.⁹⁵ Fittingly, it is the same magazine that reports: "Meeting on June 7th and 8th in Bavaria, the Group of Seven (G7) industrial nations ended their summit by talking of the 'decarbonisation of the global economy over the course of this century'. The members of the club—America, Japan, Germany, France, Britain, Canada and Italy—also promised to cut greenhouse-gas emissions by the 'upper end' of a range between 40-70% of 2010 levels by 2050."⁹⁶

It has been noted that these emissions targets and the goal of decarbonisation are mostly aspirational, that there is no binding obligation to any of the members to follow through with their proposed goals, and that the final agreement represents "a watered-down goal from what German Chancellor Angela Merkel as host of the summit had sought."⁹⁷ Finally, perhaps of highest local interest, Canada was the lone dissenting voice, and made the strongest effort to weaken the statement. Despite all of this, however, there is some heft to this pronouncement by the most heavily industrialized nations, whose wealth and industrial might derive in no small part from exploiting, for the past few centuries, energy resources and, from that extraction and exploitation, raising carbon emissions to their present unbearable level. The parable of the Ark stays with us here, as it did, perversely, even in the story of the Eko Atlantic. The G7 is also

⁹⁵ "The Anthropocene: A Man-Made World"
<http://www.economist.com/node/18741749>

⁹⁶ "The G7 and Climate Change"
<http://www.economist.com/news/international/21653964-why-g7-talking-about-decarbonisation-sort>

⁹⁷ Ibid.

attempting to save something here. It is trying to save itself and to save the system that made it possible. The G7 is both Noah and Nephilim, punisher and punished.

Sticking with the concerns of the wealthy and powerful, *The Economist Intelligence Unit*, which traces its roots unbroken back a traditional political economic publication entitled *The Economist: A Political, Commercial, Agricultural, & Free-Trade Journal*, recently added its voice to the growing clamour about the dangers climate change presents to the current era. It reported that “private investors stand to lose \$4.2tn (£2.7tn) on the value of their holdings from the impact of climate change by 2100 even if global warming is held at plus 2C.”⁹⁸ The report, which the Group produced “to highlight the relevance of climate change to the asset management industry and beyond,” called for financial regulators to recognize “systematic financial risk.”⁹⁹ It furthermore stated that “warming of 5°C could result in US\$7trn in losses – more than the total market capitalization of the London Stock Exchange - while 6°C of warming could lead to a present value loss of US\$13.8trn of manageable financial assets, roughly 10% of the global total.”¹⁰⁰ We see in these prognostications – the Economist Group’s attempt at quantifying, in the terms of current systems of currency and value – a cataclysmic future, the spectre of the Ark. Noah’s Ark, Connaughty’s Ark, and this Economist Group report all attempt to speculate. Each tries to project itself into the sea of an uncertain future, and each hopes that it remains unchanged after the deluge. The Economist Group report, true to the classical economic tradition,

⁹⁸ Terry Macalister. "Investors Could Lose \$4.2tn Because of Climate Change, Report Warns." *The Guardian*.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

which presents “its own categories as reflecting the laws of nature,” supposes the legibility and viability, post climate catastrophe, of finance, of loss, of investment, of currency. It presupposes that the categories, laws, and institutions that guarantee those categories will remain, as the globe warms and the seas rise and species die. In any case, the report is an implicit attempt to preserve—manage—assets even as impending climate catastrophe threatens to depreciate (at best) those assets.

In the same way that the scientific Anthropocene inscribes the coherence and necessity of things such as ability, hierarchy, and intelligence over pre-human history, as it makes eternal the ideologies of the present, the Economist Group report presupposes the endurance and necessity of things like a capitalist exchange economy, currencies, and value writ-large into deep future. Both perspectives are deeply conservative, and what they conserve is the present, despite the present’s constitutive climate crisis rendering the endurance of the present impossible. If the Anthropocene does not join in contemporary political action, if it does not align itself, recognizing the basic entanglement of climate justice with all other forms of justice, with struggles against colonialism, capitalism, inequality, and so on, then it risks being just another expression of the fears of the ruling class. At best, it survives the flood in order to reproduce capitalism, colonialism, inequality, resource exploitation, and hierarchy.

Conclusion:

Notes Towards a Politics of the Anthropocene

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For Connaughty, the Anthropocene is an epoch to be survived, temporally transcended through the mediation of an ark. Describing his biosphere, Connaughty writes “the driving concern in the design phase and during construction, was that it must float, endure the elements, and sustain life.”¹⁰¹ Furthermore, Connaughty offers the following diagnosis of societal ills that have befallen us, and that have created the conditions of our demise:

Reciprocity with the land has gone by the wayside today. We use technologies today in which the raw materials necessary for producing goods come from far-flung landscapes and places. Most of so-called modern society has no connection to the land or people where these resources originate. At one time human civilizations gave a little of themselves to the spirits in order to use some of what the earth provides. We have sacrificed our spirit by not being dimensionally attuned in this way.¹⁰²

The construction of the ark is an apolitical act in that it represents a retreat from the domain of the social. Its goal is not to *change* the world so much as to escape it. It can be noted here that Noah also made no attempt to reform the wickedness, evil, corruption, and violence of the world. As recounted in the book of Genesis, he merely listened and acted according to the word of God. His act was one of retreat, escape, and survival and not one of revolution, or even political engagement.

¹⁰¹ Sean Connaughty, “Ark of the Anthropocene,” Kickstarter.

¹⁰² Ibid.

The scientific articulation of the Anthropocene is ambivalent about a solution for the climate conditions described by the self-same Anthropocene. This should not be altogether surprising, as the scientific Anthropocene never explicitly perceives or makes a connection between the climate catastrophe it documents and the social and political causes of this climate catastrophe. The social-political prescriptions that the literature does make never go beyond the techno-capitalist imaginary of the present. In the first articulation of the late Anthropocene, “The Anthropocene,” Crutzen and Stoermer perceive no escape from the Anthropocene: according to this Anthropocenic framing of human history and futures, we have already reached the stage of humanity where we have a “central role” in “geology and ecology”¹⁰³ and the only thing capable of disrupting this pattern of human behavior—this pattern which they name the Anthropocene—is some kind of apocalyptic disaster that would extinguish human life in general. In other words, there is nothing, short of human extinction, that can alter our status as geological agents. They write:

Without major catastrophes like an enormous volcanic eruption, an unexpected epidemic, a large-scale nuclear war, an asteroid impact, a new ice age, or continued plundering of Earth’s resources by partially still primitive technology (the last four dangers can, however, be prevented in a real functioning noösphere) mankind will remain a major

¹⁰³ Crutzen and Stoermer, 17.

geological force for many millennia, maybe millions of years, to come.¹⁰⁴

At this early stage Anthropocene, Crutzen does not perceive it to be fraught with internal crisis – that is, he does not perceive climate change as both the primary characteristic and the immanent terminus of the Anthropocene. If anything, Crutzen here sees the Anthropocene as an epoch of hope. In contrast to Connaughty's view of the Anthropocene as an age of doom to be survived, Crutzen here expresses a belief in the empowering potential of the newfound geological destiny of humanity. Because "mankind will remain a major geological force," mankind also presumably has the power, as a geological agent, to shape its own history through its mastery of the natural world. It is in this vein and according to this logic that Crutzen continues:

To develop a world-wide accepted strategy leading to sustainability of ecosystems against human induced stresses will be one of the great future tasks of mankind, requiring intensive research efforts and wise application of the knowledge thus acquired in the noösphere, better known as knowledge or information society. An exciting, but also difficult and daunting task lies ahead of the global research and engineering community to guide mankind towards global, sustainable, environmental management.¹⁰⁵

¹⁰⁴ Ibid, 18.

¹⁰⁵ Ibid.

One of the most notable pronouncements here is the way in which the “great future task” is approachable only through “knowledge or information society.”¹⁰⁶ While on its surface, there is nothing reprehensible about leaning on knowledge, there is no doubt that the actions, policies, and statements of those in power, especially in colonialist states, have repeatedly and necessarily devalued indigenous knowledge systems in favour of continued expansion, development, accumulation, and acceleration – in short, in favour of the material processes that have driven the Anthropocene.¹⁰⁷ The point is that there is no such thing as a singular “knowledge or information society”: the questions of who is permitted to reside in such a society have always followed the lines of other forms of oppression and exploitation, and the viability of such a society can only be the product of struggle. Here, hints towards who gets to lead and to constitute the “noösphere” already emerge. Even as Crutzen universalizes the current condition of mankind, he maintains that “the global research and engineering community” ought to be the leaders of any oncoming societal transformation, that they “guide

¹⁰⁶ Ibid.

¹⁰⁷ Examples of such a devaluing, and their analysis, could fill another thesis, and I recognize that my claim follows the alarm raised by many indigenous writers, scholars, and activists over the historical and ongoing silencing of their voices and worldviews. Take for example Zoe Todd’s take on the blindness that the Western academy has held towards indigenous cosmological systems, and its subsequent appropriation of such systems under various philosophical turns. Take also for example the illegibility of Indigenous relations to the land under the liberal juridical structure from first contact onwards, written about extensively by writers like Sylvia McAdam in *Nationhood Interrupted: Revitalizing Nêhiyaw Legal Systems*, and Glen Coulthard and his “grounded normativity.” The Unist’ot’en encampment against the Canadian state’s development plans for the BC coast acts, among other things, as an embodiment of this illegibility and its necessary violence.

mankind towards global, sustainable, environmental management.”¹⁰⁸ Most strikingly, the absolute horizon of the upcoming changes, these changes that will ensure the survival of mankind, is still “environmental management.”¹⁰⁹ In other words, the future direction for mankind described in this Anthropocene is merely a reflection of the current forms of social governance, where capital has rendered large swathes of the global population precarious under the doctrine of management and efficiency.

To believe that the information society of the Anthropocene will deliver us from climate doom is another way of entrusting the status quo, of believing that the free market and the directives of expansion, dispossession, and accumulation that have controlled and shaped the current “information society” will dig us out of our hole. Given the Anthropocene’s radical (however problematic) reframing of human history – one of the equal culpability and responsibility of all people – why not imagine a radically new form of social organization that takes into account this equal culpability? A form of social organization inspired by the opening of the Anthropocene would presumably not rely on one set of people (be they engineers, politicians, etc.) to lead one “knowledge society” to a managerial future; instead, such a social organization should, if the constitution of the Anthropocene through a common and shared responsibility (*qua* humans) for our current conjuncture is to be taken seriously, be radically open and radically democratic. In other words, if all human individuals share blame for the onset of

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

the Anthropocene, why not share among all human individuals the responsibility of diverting us from the terminal climate crisis of the Anthropocene?

Of course, this is not an easy task, and creating the conditions for a truly democratic participation across humanity certainly means much more work. This work will necessitate an active engagement across all lines of difference and division in order to build the infrastructures, coalitions, and common strategies that would open the scientific insight of the Anthropocene to the people. The construction, maintenance, and organization of such a project would mean many things to many groups.

This politicization of the Anthropocene is already occurring, under different names, in the many examples of climate and social justice activism mentioned in this thesis. What are the *Leap Manifesto* and the Pope's Encyclical but calls for climate change to be treated as a political (that is to say public) problem? What are they but calls for climate change and its histories and causes and effects to be recognized, encountered, and confronted socially? First and foremost, the work of confrontation means precisely investigating the historical problems and current possibilities of a "public" as such. It means sharing responsibility equally in a way that takes into account history, and that is different to representational parliamentary democracy. It means destroying the capitalist mode of production and its ineluctable imperatives of class, race, gender, its inevitable closure and pillaging of the public.

An Anthropocenic future must unfold from its internal democratic claim and reconcile its own foundation within the emaciated and privatized publics of

late capitalism. It must take the public not as some liberal and state-administered given, but always as a terrain and the result of struggle and conflict. It must fight at every opportunity against the historical determinism marring the scientific Anthropocene and maintain that it could be otherwise. The result of a truly democratic political practice of the Anthropocene will most likely be unrecognizable, and may be called in another idiom a revolution.

Works Cited

- Chu, Jennifer. "Ocean Acidification May Cause Dramatic Changes to Phytoplankton." *Conversation on Climate Change*. MIT News Office, 20 July 2015. Web. 10 Apr. 2016.
- Connaughty, Sean. "Ark of the Anthropocene." Kickstarter, 14 Sept. 2014. Web. 10 Apr. 2016.
- Cornwall, Warren. "Sea Levels Are Rising at Their Fastest Rate in 2000 Years." *Science Magazine*. 22 Feb. 2016. Web. 13 Apr. 2016.
- Crutzen, Paul J. "Geology of Mankind." *Nature* 415.6867 (2002): 23. Web.
- Crutzen, Paul J., and Eugene F. Stoermer. "The 'Anthropocene'." *The International Geosphere-Biosphere Programme: A Study of Global Change of the International Council for Science*. 41 (2000): 17-18.
- Cpac. "#NDP2016 Votes to Adopt Resolution." *Twitter*. 10 Apr. 2016. Tweet. 11 Apr. 2016.
- Davey, Melissa, Adam Vaughan, and Amanda Holpuch. "People's Climate March: Thousands Demand Action around the World." *The Guardian*. Guardian News and Media, 21 Sept. 2014. Web. 10 Apr. 2016.
- Ferguson, Sue, and David McNally. "Social Reproduction Beyond Intersectionality." *Viewpoint Magazine*. 31 Oct. 2015. Web. 10 Apr. 2016.
- "Global Temperatures Set to Reach 1 °C Marker for First Time." *Met Office UK*. 9 Nov. 2015. Web. 10 Apr. 2016.
- Goldenberg, Suzanne. "Just 90 Companies Caused Two-thirds of Man-made Global Warming Emissions." *The Guardian*. Guardian News and Media, 20 Nov. 2013. Web. 11 Apr. 2016.
- Goldenberg, Suzanne. "Warming of Oceans Due to Climate Change Is Unstoppable, Say US Scientists." *The Guardian*. Guardian News and Media, 16 July 2015. Web. 10 Apr. 2016.
- Goldenberg, Suzanne. "Western Antarctic Ice Sheet Collapse Has Already Begun, Scientists Warn." *The Guardian*. Guardian News and Media, 12 May 2014. Web. 13 Apr. 2016.

- Hill, Taylor. "NASA Says Three Feet of Sea Level Rise Is Unavoidable." *TakePart*. 27 Aug. 2015. Web. 10 Apr. 2016.
- Holthaus, Eric. "Earth's Most Famous Climate Scientist Issues Bombshell Sea Level Warning." *Slate*. 20 July 2015. Web. 10 Apr. 2016.
- Holthaus, Eric. "The Point of No Return: Climate Change Nightmares Are Already Here." *Rolling Stone*. 05 Aug. 2015. Web. 10 Apr. 2016.
- Horkheimer, Max, and Theodor W. Adorno. "The Concept of Enlightenment." *Dialectic of Enlightenment: Philosophical Fragments*. Trans. Gunzelin Schmid Noerr. Stanford, CA: Stanford UP, 2002. Print.
- "International Report Confirms: 2014 Was Earth's Warmest Year on Record." *National Oceanic and Atmospheric Administration*. 16 July 2015. Web. 10 Apr. 2016.
- Kant, Immanuel. "An Answer to the Question: What Is Enlightenment? (1784)." Ed. Mary J. Gregor. *Immanuel Kant: Practical Philosophy*. Cambridge: Cambridge UP, 1999: 11-22.
- Kerlin, Kat. "Oceans Slow to Heal from Climate Change." *UC Davis*. UC Davis Today, 06 Apr. 2015. Web. 10 Apr. 2016.
- Kirchgaessner, Stephanie. "Pope Laments 'meaningless Lives' in Tying Human Trafficking to Climate Change." *The Guardian*. Guardian News and Media, 21 July 2015. Web. 11 Apr. 2016.
- Klotz, Irene. "Global Sea Levels Climbed 3 Inches since 1992, NASA Research Shows." *Reuters*. Thomson Reuters, 26 Aug. 2015. Web. 10 Apr. 2016.
- Lukacs, Martin. "'Historic' Toronto Climate March Calls for New Economic Vision." *The Guardian*. Guardian News and Media, 06 July 2015. Web. 10 Apr. 2016.
- Lukacs, Martin. "New, Privatized African City Heralds Climate Apartheid." *The Guardian*. Guardian News and Media, 21 Jan. 2014. Web. 10 Apr. 2016.
- Macalister, Terry. "Investors Could Lose \$4.2tn Because of Climate Change, Report Warns." *The Guardian*. Guardian News and Media, 24 July 2015. Web. 11 Apr. 2016.
- Malm, Andreas. "The Anthropocene Myth." *Jacobin Magazine*. 30 Mar. 2015. Web. 13 Apr. 2016.

- "A Man-made World." *The Economist*. The Economist Newspaper, 28 May 2011. Web. 11 Apr. 2016.
- McAdam, Sylvia. *Nationhood Interrupted: Revitalizing Nêhiyaw Legal Systems*. Vancouver: Purich, 2015. Print.
- McGrane, Sally. "German Forest Ranger Finds That Trees Have Social Networks, Too." *The New York Times*. 29 Jan. 2016. Web. 10 Apr. 2016.
- McKie, Robin. "Earth Faces Sixth 'great Extinction' with 41% of Amphibians Set to Go the Way of the Dodo." *The Guardian*. Guardian News and Media, 13 Dec. 2014. Web. 10 Apr. 2016.
- Moore, Jason W. "7. Anthropocene or Capitalocene?: On the Nature and Origins of Our Ecological Crisis." *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. London: Verso, 2015.
- Pope Francis. "LAUDATO SI' of the Holy Father Francis On Care for Our Common Home." Encyclical. 24 May 2015.
- Reigan, Sheila. "An Artist's Ark Meets Its Fate on Lake Superior." Hyperallergic, 11 Sept. 2014. Web. 10 Apr. 2016.
- "Sort Of: Why the G7 Is Talking about Decarbonisation." *The Economist*. The Economist Newspaper, 10 June 2015. Web. 11 Apr. 2016.
- "State of the Climate in 2014." *Special Supplement to the Bulletin of the American Meteorological Society*. 96.7 (2015).
- Steffen, Will, Paul J. Crutzen, and John R. McNeill. "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature." *AMBIO: A Journal of the Human Environment* 36.8 (2007): 614-21. Web.
- Todd, Zoe. "An Indigenous Feminist's Take on the Ontological Turn: 'ontology' Is Just Another Word for Colonialism (Urbane Adventurer: Amiskwacî)." *Uma (in)certa Antropologia*. 26 Oct. 2014. Web. 11 Apr. 2016.
- United Nations. Framework Convention on Climate Change. *Adoption of the Paris Agreement*. Paris: 2015. Web.
- Vaughan, Adam. "Humans Creating Sixth Great Extinction of Animal Species, Say Scientists." *The Guardian*. Guardian News and Media, 19 June 2015. Web. 10 Apr. 2016.

Vaughan, Adam, James Randerson, Fiona Harvey, Suzanne Goldenberg, Lenore Taylor, and John Vidal. "Paris Climate Talks: Governments Adopt Historic Deal." *The Guardian*. Guardian News and Media, 12 Dec. 2015. Web. 10 Apr. 2016.

"Who's On Board? | The Leap Manifesto." *The Leap Manifesto*. Web. 11 Apr. 2016.