VI

What is Life (at the End of Empire)?

". . . but it can't, not without your help . . ."

In a walnutshell:

Goodbye Bygone Eras >
Goodbygone Eras >
Goodbye Gone Eras >
Unchartered Waters >
On War Ever Onwards >
The Buck Shot v The Buck Stop

Askew Cows Come Home to Jump Over the Moon

The weight of this sad time we must obey,
Speak what we feel, not what we ought to say.
The oldest have borne most; we that are young
Shall never see so much, nor live so long.
– William Shakespeare, *King Lear* (1606)[271]

Has the light gone out for you?
Because the light's gone out for me
It is the twenty-first century
It is the twenty-first century.
– Radiohead, "Bodysnatchers" (2007)[272]

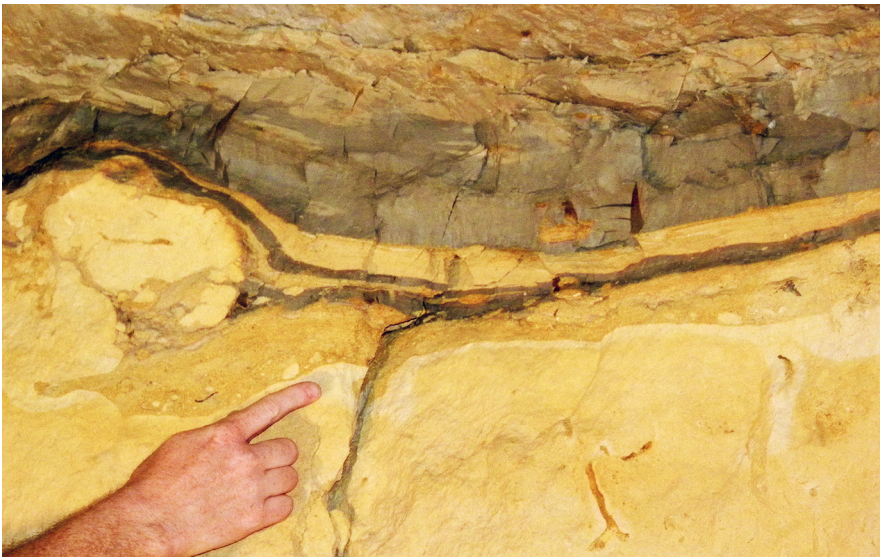

Fig. 12: *Cows Often Sit Down Carefully. Perhaps Their Joints Creak?* Cretaceous–Paleogene boundary, 66 million years ago, Geulhem, the Netherlands, 16 November 2013.

Answering the perennial question of what is life, changes according to the season. When Schroedinger asked *What is Life?* in his eponymously titled 1944 book, notions of ecological precarity or even the civilisational precarity of World War Two were absent from his inquiry. His was not a line of inquiry for finding one's

271 Shakespeare, *King Lear*, Act V, Scene III.
272 Radiohead, "Bodysnatchers," track 2 on *In Rainbows* (XL 2007), LP.

feet amidst falling bombs, but rather to probe properties fundamental to life at the microbial scale.

A half century later a team of renowned biologists and cognate scientists published a homage to Schroedinger's foray, unearthing what the intervening years had yielded on the perennial mystery. *What is Life? The Next Fifty Years: Speculations on the Future of Biology* had a future focus too: looking ahead to the first half of the twenty-first-and-last century.[273] In the same year, 1995, Lynn Margulis and Dorion Sagan published their book *What Is Life?*, also reflecting on Schroedinger's foray, though with renegade marvel at the majesty of the microbial world.[274]

Yet concerns of ecological or even civilisational precarity were still absent from both 1995 works, as if the intervening half century had posed no rejoinder: what is life (when living during a rupture of life on earth)? Travelling *On the Road* with Jack Kerouac in 1947 was a celebratory affair of US excess and hedonism,[275] whereas travelling along Cormac McCarthy's *The Road* in 2007 was a harrowing affair of collapse in terms of both civilisation so-called and the biosphere. Unsurprising, given the *Doomsday Clock* started the year *On the Road* was published, and had already well rundown by the time *The Road* came out in 2007. Meaning that nowadays, asking 'what is life?' is a question that need heed the season, as per the 2007 documentary *What A Way To Go: Life at the End of Empire.*[276]

Husband and wife documentary makers Timothy Bennett and Sally Erickson bring the perennial wonder of *what (on earth)* is life, to bear *on Earth* undergoing a rupture. They reveal how empire, aka civilisation so-called, is tempted by a dire demeanour that insists there is still time to avert the cataclysm downstream. They also demonstrate how all that really remains is the abhorrent *Way To Go* offered by *Life at the End of Empire.* At least, this is all that reasonably remains for those of the dour Bishop Ridley or Bishop Latimer ilk, who acquiesce to their death sentence rather than pleading as Cranmer did, desperate to live longer under the empire, no matter what the conditions.

Whether remaining in the dour demeanour of Ridley and Latimer, or switching to the dire mindset of Cranmer, all three would have likely felt petrified. So too for any sentient mortal creature coming to terms with its imminent mortality.

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273 Luke O'Neill and Michael Murphy, eds. *What is Life? The Next Fifty Years: Speculations on the Future of Biology* (Cambridge: Cambridge University Press, 1995).

274 Lynn Margulis and Dorion Sagan, *What Is Life?* (New York: Simon & Schuster, 1995). See also Ed Regis, *What Is Life? Investigating the Nature of Life in the Age of Synthetic Biology* (Oxford: Oxford University Press, 2009).

275 Jack Kerouac, *On the Road* (New York: Viking Press, 1957).

276 Timothy Bennett, director, *What A Way To Go: Life at the End of Empire* (VisionQuest Pictures, 2007), DVD.

For those living at the end of empire nowadays, actual petrification shadows this feeling of being petrified, bringing the torment of existential fear into equanimity with its realisation.

Call a spade a rose or a rose a spade until the proverbial cow jumps over the moon: a rupture of life on earth is a rupture of life on earth. How do we place this one, then, in the context of all the others? Where, in fact, do we find evidence of all the others? The path leads behind, beneath, beyond, and above. Recall the secondary-school mnemonic: *Cows Often Sit Down Carefully. Perhaps Their Joints Creak?* Cambrian, Ordovician, Silurian, Devonian, Carboniferous, Permian, Triassic, Jurassic, Cretaceous?

The question mark follows the Cretaceous because this is the era that met with Chicxulub's impact, ushering in the Cenozoic's New New Animals, including . . . the cow. Slated to become the proxy land dinosaur of New New Animals, wherein the domestic cow "may well" become "the largest mammal on Earth in a few hundred years"[277] with the margin of error from forecasting near-future extinction of dwindling terrestrial megafauna. An extinction trend that has a long tail extending back into the past, as Alfred Russel Wallace presciently observed in 1876: "we live in a zoologically impoverished world, from which all the hugest, and fiercest, and strangest forms have recently disappeared."[278]

But why the mnemonic in the first place? The cow's creaking joints list the 10 geological eras since multicellular life first evolved 570 million years ago, in the Cambrian explosion. Between each era, a rupture of sorts. Between five of these eras that rupture constituted a Mass Extinction Event, and now at the tail end of the cow the sixth such event unfolds.

To see how the consequences of this event extend from human-to-human to human-to-all-other-life, giving weight to a near-future empire of domestic cows, consider the current relative weights of all terrestrial vertebrate animals. Animals enslaved into providing flesh, skin, milk and so on for *homo sapiens* comprise 67% of the total weight. *Homo sapiens* itself comprises another 30%. Leaving a grand total of 3% that comprises all that remains – "wild animals, covering everything from elephants, camels and polar bears to rabbits, kangaroos and wolves."[279]

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277 Felisa Smith et al., "Body Size Downgrading of Mammals over the Late Quaternary," *Science* 360, no. 6386 (2018): 310–313.

278 Alfred Russel Wallace, *The Geographical Distribution of Animals, with a Study of the Relations of Living and Extinct Faunas as Elucidating Past Changes of the Earth's Surface* (New York: Harper, 1876), 150.

279 Vaclav Smil, "Harvesting the Biosphere: The Human Impact," *Population and Development Review* 37, no. 4 (2011): 613–636.

These vertebrate animal proportions speak loudly as to how a human monoculture and its attendant enslavement of non-human lifeforms have induced the Sixth Extinction Event. Call the first grouping of species domesticated, but those at the pyramid base, such as cows, chickens, sheep and so on, are born only into servitude, as are all their descendants. No nursery rhymes can render this atrocity as anodyne. A rose is not a spade. A cow does not jump over the moon. Instead, it will soon jump to take the title of largest mammal on earth.

Nor are the remaining 3% of "wild animals" living independently of human influence. The wild has been pushed into the margins set aside by society: national parks, wildlife reserves, and animal prisons made palatable by the sheltered nomenclature of the 'zoo.' Much of the remaining 'wildlife' is now restricted to this global network of animal prisons. If the monoculture of a single species dominating earth in *Blade Runner* sounds fantastical, picture a map of cities with zoos, where each member of each species is rendered as one colour, with *homo sapiens* designated as red.

Almost the entire map would be red, except for tiny slithers of multi-coloured dots where isolated individual wild animals are imprisoned. Having become recipients of the same biomedical engineering that has been unearthed to extend human life, the wild have become subjects of the court, like replicants in *Blade Runner*. Their kind is kept alive in zoos through games like moving individuals between prisons and using forms of induced breeding. The rebooted all-ages children's classic takes on a title more ominous than the monsters of imagination: no longer *Where the Wild Things Are*,[280] but *Where the Wild Things Were*.

Such a rupture is on the scale of a Mass Extinction Event. This act of clearing house ranges from turning furniture upside down, setting fire to the foundations, disintegrating the floor through magma seeping through the ground, or just whatever facet of earth's behaviour manifests in the upheaval. A rupture is a cosmic joke: the dominion of many lifeforms is brought to an abrupt end, allowing new lifeforms to become dominant tenants in their new lease on life.

Picture the tree of life plotted as a painting, starting on extreme left with the first lifeforms 3.8 billion years ago, then progressively spanning right, branching chronologically for every species since. A Mass Extinction Event acts like a windscreen wiper: removing entire tree branches as it swipes right to left. Then, when the stage regains any semblance of stability, new branches emerge from the strands broken by the windscreen wiper. Chicxulub windscreen wipes dinosaurs into the dustbin, Rodentia then emerge from the broken strands to create entirely

280 Maurice Sendak, *Where the Wild Things Are* (San Francisco: Harper & Row, 1963).

new branches. Rinse and repeat. Such is life, varying in degrees of difference between microbe and megafauna, but united by the universal sighs of changeability, consequence, and comprehension of the same.

Comprehension, though, is a challenge, regardless of whether the brain is walnut- or rockmelon-sized. Deep time is a disorientating walnut cracker. Throw in the vicissitudes of cataclysms that rain down on and rise up from earth and the walnut [neé rockmelon] goes blank. There is no correlation between knowledge of such expanses of time – and evolution – and comprehension of same.

Meaning that there is no such thing as the end of the world. There is only ever the end of whatever-the-world-currently-is. If a new world can become, an old world must first give way. Had many a new world not come before, along with every innumerable incomprehensible fortuitous action and consequence that makes for the emergence of any species, its tenure, its expiration date, and then some, then *this* particular world would never have come to be. Even this 'would' must be abstracted here: the direction was aimless, the events random, the fortune subjective.

For this world to have been, many others were prevented from manifesting. As is the case for all that comes to be, at the expense of whatever else could have become. The end of *this* world is also the end of whatever worlds could have manifested when the next orbital perturbation deflected enough incoming solar radiation to tip the scale back into an ice age. Not 'would' have otherwise been: the accident was unintentional, the sheltered worldview deliberate, the idiocy absolute.

This time round, the rupture amounts to ruining, not pruning the tree of life. The wiper starts on the extreme right of the chronology, with a species that emerged only 200 millennia ago, having unintentionally forced the windscreen wiper into action. What then is the empire that life now lives at the end of? Could identifying it shed light on the disorientating walnut cracker, even if "the light [has] gone out for you? . . . Because . . . it is the twenty-first century."

A Pox on Both your Epochs

> If the question of how to depict the Earth's strange new convolution of multiplicity and unity is a tricky one, perhaps even more so is the challenge of representing a humanity that is deeply divided both by sociopolitical and physical differentials – and yet at risk of being thrown together by the very event of its extinction. Unsurprisingly, the iconography of the Anthropocene is beset by paradox: thresholds whose precise co-ordinates will only be identified by their catastrophic violation, a human geologic stratum for which there will be no

> human witnesses, a posthuman planet gradually effacing the traces of the very being that is beginning to imagine this destiny.
> – Nigel Clark, *Anthropocene Incitements: Toward a Politics and Ethics of Ex-orbitant Planetarity* (2016)[281]

The Anthropocene ('The Age of Humans') is the technical term Paul Crutzen coined to describe the new human-induced geological epoch, having changed the Earth System so profoundly as to shift earth out of the Holocene. In a blog on *Living in the Anthropocene: Toward a New Global Ethos*, Crutzen and Christian Schwägerl detail just why the human-induced geological epoch is not a *continuation* of prior ecological destruction, but rather a *rupture*:

> Albeit clumsily, we are taking control of Nature's realm, from climate to DNA. We humans are becoming the dominant force for change on Earth. A long-held religious and philosophical idea – humans as the masters of planet Earth – has turned into a stark reality. What we do now already affects the planet of the year 3,000 or even 50,000. Changing the climate for millennia to come is just one aspect. By cutting down rainforests, moving mountains to access coal deposits and acidifying coral reefs, we fundamentally change the biology and the geology of the planet. While driving uncountable numbers of species to extinction, we create new life forms through gene technology, and, soon, through synthetic biology.[282]

Rupture is used here for this collective biotic and abiotic state of affairs, because intramural debates and warped non-scientific misreadings have confounded any fidelity to what the Anthropocene actually means. In *Defiant Earth: The Fate of Humans in the Anthropocene*, Clive Hamilton intones against wilful miscomprehension by non-scientists, arguing that "'the Anthropocene' has quickly become so encrusted with misreadings, misconceptions, and ideological co-optations that most who come to it for the first time are liable to be seriously misled."[283] Given its actual meaning, these encrustings perpetuate worldviews devoid of fidelity to the present tense. Against such wilful ignorance and/or woeful incomprehension, Hamilton declares:

> It is of the utmost importance to understand that the 'Anthropocene' is not a term coined to describe the continued spread of human impacts on the landscape or further modification to ecosystems; it is instead a term describing a rupture in the functioning of the Earth System as a whole, so much so that the Earth has now entered a new geological epoch.[284]

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281 Nigel Clark, "Anthropocene Incitements: Toward a Politics and Ethics of Ex-orbitant Planetarity," in *The Politics of Globality Since 1945: Assembling the Planet*, eds. Rens van Munster and Casper Sylvest (London: Routledge, 2016), 142.

282 Paul Crutzen and Christian Schwägerl, "Living in the Anthropocene: Toward a New Global Ethos," *Yale E360*, 24 January 2011, accessed 17 February 2021, https://e360.yale.edu/features/living_in_the_anthropocene_toward_a_new_global_ethos.

283 Hamilton, *Defiant Earth*, 18.

284 Hamilton, *Defiant Earth*, 19.

A pox on both your epochs! The humanities and social sciences play name and blame games with the functioning of human societies, then apply the results to how the abiotic world works – and even to how biophysical life works. To say this lacks fidelity is an understatement: it is like applying the mechanics of a needle and thread to a lace-weaving loom, or viewing the formation of a galaxy via the rules of snooker. Their failure is regrettable, because fidelity is needed to both the biophysical and social dimensions of the rupture, after all: "if the Anthropocene is a rupture in the history of the Earth as a whole, then it is also a rupture in the history of humans as a whole."[285]

Conversely, scientific dimensions could well do with insight from the humanities and social sciences, given the Anthropocene thesis is "part geological hypothesis, part planetary alarm."[286] The confluence between becoming petrified and being petrified marks the meeting point between an exterior objective biophysical reality and an interior subjective emotional state.

When Chakrabarty attempts to reckon with this confluence between "species history and geological times into our very own lifetimes" that "now stares us in the face," he likens the affect to falling. Though not like our ancestor Lucy out of her tree and into the earth to become petrified skeleton, nor the mental 'falling' of my childhood encounter with her skeleton and its uncanny reminder of the ghosts lurking in our shells. This is the fall "into . . . deep, geological time" which has thrown up a "shock of recognition . . . of the otherness of the planet and its very large-scale spatial and temporal processes of which we have, unintentionally, become a part."[287] Once again, the difference between intention and its absence has been nullified as a semantic sleight of hand, as per the difference between manslaughter and murder:

> Humans are biological agents, both collectively and as individuals. They have always been so. There was no point in human history when humans were not biological agents. But we can become geological agents only historically and collectively, that is, when we have reached numbers and invented technologies that are on a scale large enough to have an impact on the planet itself. To call ourselves geological agents is to attribute to us a force on the same scale as that released at other times when there has been a mass extinction of species. We seem to be currently going through that kind of a period.[288]

285 Hamilton, *Defiant Earth*, 33.

286 Nigel Clark, "Anthropocene Bodies, Geological Time and the Crisis of Natality," *Body & Society* 23 no. 3 (2017): 164.

287 Chakrabarty, "The Human Condition in the Anthropocene," 180–181.

288 Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry* 35, no. 2 (2009): 206–207.

This fall reveals the human origin of this particular rupture, and then places that rupture in the context of a deep time filled with ruptures. If our agency in creating this rupture fed our dire, human-scaled anthropocentrism and narcissism (not only did we break it ourselves, but we are, in the managerial mindset of a Fuller aboard *Spaceship Earth*, also going to fix it), then the Dour quickly puts us back in our place, sending us back down the endless rabbit hole where we are but one rupture amongst many.

The "force" and "scale" of the human agency that Chakrabarty refers to is on par with the prior five Mass Extinction Events. James Hansen develops this comparison further, likening the unfolding rupture to "a giant asteroid on a direct collision course with Earth,"[289] recalling the first part of Stegosaurus' universal sigh about Chicxulub. Elizabeth Kolbert also declares "we are the asteroid now" in her book *The Sixth Extinction: An Unnatural History*,[290] with the caveat that "the asteroid also had a lot of different effects," including the fact that it "ended okay for our relative . . . [the] little shrew-like creature who crawled through the end of the Cretaceous." Kolbert is however blunt about what life at the end of empire amounts to: "What is going to crawl through this moment? That's the big question."[291]

Hansen's comparison harks right back to Cold War existential anxieties, as he calculated that "Earth's energy imbalance and implications" is equivalent to accumulating four Hiroshima bombs worth of heat per second in the atmosphere. The fairly unambiguous website www.4hiroshimas.info includes a widget to embed a real time Hiroshima-bomb-counter on digital devices. The baseline is any year from 1970 onwards, due to 1971 being when the energy balance shifted to net positive. My widget reads "Our climate has accumulated 4,901,982,836 Hiroshima atomic bombs of heat since 1970" as of 11:08:59am 21 February 2021.[292] Hiroshima-bombs-per-second has since become the standard for measuring planetary energy imbalance.

Yet the unfolding rupture has no proximal signal, like Chicxulub, or even a distal signal, like the day earth moved into net positive energy balance. We are waging a Warm War, as both aggressive belligerent and victim, with diffuse

289 Hansen, "Why I Must Speak out About Climate Change."

290 Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Henry Holt and Company, 2014), 41.

291 Elizabeth Kolbert, quoted in Robert Kunzig, "The Sixth Extinction: A Conversation With Elizabeth Kolbert," *National Geographic News*, 19 February 2014, accessed 17 February 2021, https://www.nationalgeographic.com/news/2014/2/140218-kolbert-book-extinction-climate-science-amazon-rain-forest-wilderness.

292 *Skeptical Science*, "Our Climate has Accumulated 4,901,982,836 Hiroshima Atomic Bombs of Heat Since 1970 as of 11:08:59 am, 21 February 2021," accessed 21 February 2021, http://skepticalscience.net/widgets.

consequences that are orders of magnitude more complex that the neat binaries of enemy and ally, aggressor and defender, culprit and victim, to bomb or not to bomb. Because the Anthropocene boundary layer is not akin to proxies like concrete megalopolises, technofossils of industrial civilisation, radionuclides from the first atom bomb, factory farmed chicken bones, yada yada. Rather, the boundary layer marks a rupture in Earth System functioning, extending across the planet into geological time.

Yet the human scale of the dire mindset still conflates the Anthropocene with millennia- or century-old human impacts on ecosystems or landscapes. How should we define the rupture from the impact, and how should we understand the relationship of these impacts upon the planet to the rupture unfolding now? In a way, the starting point *is* what it *is not*: accumulated human impacts unleashing the rupture like a pile of blocks stacked too high until they finally come tumbling down. But this fails to convey the complete difference in scale between the impacts that opened up the way for the rupture and the rupture itself.

Water boils at 100°. The relationship of water to anything put in it changes drastically with the gradual increase in temperature up to 99° – a teaspoon of sugar melts, a grain of rice begins to swell, and a fish would die and cook well before the water actually boils. But only when it boils does water itself begin to change state, evaporating into steam. So too with the difference between biological and geological agency: the one causes damage that can be quantified, the latter sets in motions processes that change the game and its scale entirely. Like manageable, containable, measurable water turning into ungraspable steam. Like the first engines that combusted coal to boil water into steam, ushering in the game change unfolding for life on earth.

Social limits and scales also affect this history and the way the Anthropocene gets misappropriated. Picture Mount Rushmore in terms of what it symbolises, versus what it amounts to. The human faces carved onto the surface of the earth amount to a human-scaled impact that barely scratches the surface of the planet. In the symbolic realm, the construction is deeply socially and culturally affective, symbolising as it does both the public racism of its creator and the flagrant misappropriation of indigenous lands by the white colonialists. But they do not mark Chakrabarty's qualifier for distinguishing biological from geological agency, the latter of which can only be "on a scale large enough to have an impact on the planet itself."[293]

Nevertheless, Mount Rushmore makes for an apt illustration of how social thought can interrogate "the iconography of the Anthropocene." Namely, it speaks

293 Chakrabarty, "The Climate of History," 207.

to the social and political structures, motivations, and conflicts through which our species acquired the geological agency necessary to unleash a rupture of life on earth. A species does not obtain the Bomb without first forming nation states, taxation systems and xenophobia. The social limits to life shape the formation of such weapons of mass destruction, all the more so when tyrants who thrive on such societal structures are inscribed into the papyrus, or the mountainside.

These inscriptions are a symbol of proximal biological agency, but they cannot demarcate the rupture between one geological epoch and another, which are driven by both proximal and distal cataclysms and inscribed deep below the surface, beyond human sight. If Mount Rushmore is the shallow scratch of human impact, then ruptures are inscribed into strata, in the form of significantly different vertical layering, like the slender boundary between Cretaceous and Paleogene clay at Geulhemmergroeve in the Netherlands that attests to the Cretaceous–Paleogene extinction event.[294] Lodged above the boundary layer are the fragments that remain of the Age of Dinosaurs, and beneath, those from the Age of Mammals. With this thin (less than one centimetre in most places) boundary being all that remains of Chicxulub, at least in terms of the geological traces of the rupture. Because the remains of Chicxulub also live on in all those whose speciation benefitted from the rupture, from ape to zebra.

If a civilisation only proves capable of destroying itself, as so many have done throughout history, then it is subsumed back into earth as no more than Percy Shelley's "colossal wreck" of "two vast and trunkless legs of stone," around which "boundless and bare/The lone and level sands stretch far away."[295] Ashes to ashes. Dust to water. A desert tortoise may wander those sands, undisturbed by any civilization determined to flip it over onto its back. It may still die of thirst, but that would be a death faithful to the vicissitudes of the cosmos. But what happens when a civilisation amasses the force and scale sufficient to unleash a Mass Extinction Event? When not only the civilisation disappears from the desert, but the desert tortoise, and the desert to boot? Only when a civilisation acquires geological agency on this scale does its Self Assured Destruction become the Mutually Assured Destruction of bringing down the entire biosphere with it.

In a walnutshell: the uniqueness of the unfolding rupture is more than just earth, or life-at-large, having no analogous precedent. It is a rupture first and foremost of biophysical life, made possible by systemic inequalities of race, class, and gender in social and political life, particularly in the half millennium since

294 Geology Page, "K-Pg Boundary Cretaceous–Paleogene Boundary," *Geology Page*, 30 March 2019, accessed 17 February 2021, http://www.geologypage.com/2019/03/k-pg-boundary-cretaceous-paleogene-boundary.html.

295 Shelley, "Ozymandias."

Queen Mary and the twenty-first-and-last century. Though to comprehend the *scale* of the rupture and its context, social and political thought needs to drag itself from the surface scratchings of Mount Rushmore's portraits and all the human failings they represent, down into the deep time underground of the earth's strata, where we find the record of this planet building, breaking, and renewing life for several billion years.

This might prove an empty gesture too, given the nearness and totality of the rupture, but if social and political thought need to travel down into geological time to gain some semblance of fidelity to the physical workings of this world, then bio-physical thought need heed the fact that the question of 'what is life?' in the present tense is overwhelmingly determined by empire. Calling the Anthropocene 'The Age of Humans' just adds insult to injury for that vast majority who contributed next to nothing to flipping the turtle. Yet Clark's challenge "of representing a humanity that is deeply divided both by socio-political and physical differentials" cannot remain rhetorical, given it is "at risk of being thrown together by the very event of its extinction." To unearth these divisions we need dig into "the iconography of the Anthropocene" in terms of how it "is beset by paradox." Beginning with this word 'we', that can also be rendered, in the name of fairness, as WE*: White Europeans, with * as addendum for the politico-economic hegemony descended from them and globally imposed through colonialism, capitalism & co.

Dial Idioteque for Idiolect

> Let me hear both sides (let me hear both sides)
> Ice age coming (ice age coming)
> Throw it in the fire (throw it in the fire).
> – Radiohead, "Idioteque" (2000)

> It seems possible that man will be able efficaciously to regulate the future climate of the Earth and consequently prevent the arrival of a new Ice Age . . . It is too early to judge of how far men might be capable of thus regulating the future climate. But already the view of such a possibility seems to me so grand that I cannot help thinking that it will afford to Mankind hitherto unforeseen means of evolution.
> – Nils Ekholm, "On the Variations of the Climate of the Geological and Historical Past and Their Causes" (1901)[296]

Nils Ekholm's desire to acquire geological agency in order to "efficaciously . . . regulate the future climate of the Earth" did not fall on deaf ears. A half century after his 1901 article in the *Quarterly Journal of the Royal Meteorological Society*, this hubris had become concrete proposals to "prevent the arrival of a new Ice Age." In *The Challenge of Man's Future* nuclear chemist and geoscientist Harrison Brown argued that carbon dioxide generators should be built to increase plant growth and thus food production. Published in 1954, the book did not mention the greenhouse effect, or any deleterious biophysical effects of carbon dioxide.[297] No lesser figure than Albert Einstein endorsed Brown's book, with his praise prominently displayed on the rear cover. Four years later Frank Capra brought mainstream recognition to human-caused climate change in his 1958 *Meteora* television documentary, although the science vastly predates Brown's 1954 publication.

Another half century later, climatologist David Archer laid out the temporal reach of human-caused climate change in *The Long Thaw: How Humans Are Changing the Next 100,000 Years of Earth's Climate.*[298] Archer detailed how Ekholm's 1901 desire to "afford . . . hitherto unforeseen means of evolution" has been fulfilled: existing greenhouse gas emissions have already delayed the next ice age onset by at least 50,000 years. Whatever new worlds would have otherwise been formed by that ice age have been foreclosed, yielding not "unforeseen means of evolution," but rather foreseeable means of Mass Extinction.

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296 Nils Ekholm, "On the Variations of the Climate of the Geological and Historical Past and Their Causes," *Quarterly Journal of the Royal Meteorological Society* 27 (1901): 1–61.

297 Harrison Brown, *The Challenge of Man's Future: An Inquiry Concerning the Condition of Man During the Years That Lie Ahead* (New York: Viking Press, 1954).

298 David Archer, *The Long Thaw: How Humans Are Changing the Next 100,000 Years of Earth's Climate* (Princeton: Princeton University Press, 2016).

The first edition cover of *The Long Thaw* illustrates how "the iconography of the Anthropocene is beset by paradox": an iceberg floating in the ocean, viewed in profile to accentuate the vast majority lying below the surface. The metaphor encapsulates a thesis core to Earth System Science: social thought about changeability and its consequences rarely penetrate beyond the iceberg's tip to encompass the broader gamut of cosmic vicissitudes, represented here by the bulk of the iceberg hidden from view below the water line.

Conversely, climatological scholarship such as *The Long Thaw* is versed in the gamut of biophysical changeability, but rarely folds the human into this menagerie with commensurate fidelity to the role of societal power and inequality in terms of how WE* became the we that has now acquired geological agency. The cover does not show an iceberg photograph, but rather an iceberg line drawing made using a thumbprint, to symbolise human imprints across every sphere: biosphere, cryosphere, lithosphere, and hydrosphere. The thumbprint however lies mostly below the sea's surface – bringing together the revelations of human geological agency with how ecological thought fails to consider the out of sight or out of mind, such as the fact that whatever happens next, WE* have already changed the next 100,000 years of climate.

In a walnutshell: worldviews of *The Long Thaw* ilk tend toward 'humans caused climate change', seldom even acknowledging how only a small portion of humanity is responsible for the greater bulk of the ecological crisis, and how this is differentiated by race, class, and gender. The general critique of the social sciences is that they are versed in the gamut of the social limits to life, but erroneously map this worldview onto the ecological crisis, because they have next-to-no fidelity to the science.

How (on earth) can the human be folded into this quagmire *on Earth*, sensitive to both the profound inequalities behind acquiring geological agency, and the utter indifference to consequences from who caused what, when, or how . . . ? The twain shall not meet so long as science tomes continue talk only of consequences, whereas social sciences speak only to causation. The two can only really meet if *The Long Thaw* cover is wilfully misread, with the thumbprint as acknowledging 'we' as WE*. The title now reads: *How WE* Changed the Next 100,000 Years of Earth's Climate.*

The WE* that catalysed the cataclysm is the minuscule iceberg portion lying above the surface. Below, a telling reminder that the vast masses of humanity represented by the submerged portion of the iceberg thumbprint have been dragged down by WE*. Regarding humanity as the collective anthropos in Anthropocene may, therefore, be necessary to reveal the tyranny of melting icebergs for the next hundred millennia, but this regard conceals that fact that the great majority of humankind actually contributed next to nothing to this dangerous acquisition of geological agency.

The misread cover really only amounts to an empty gesture in terms of justice or accountability. It is important for our clarity, but the consequences,

beyond an enlightening capacity to alter our own demeanour, are few. WE* already has been rendered into past tense. Now it is the sheer weight of this exponentially increasing anthropos which crowds out the dwindling more-than-human world. While WE* caused the initial turtle flip, present sense contributions and causation have become a collective: "the 'Anthropocene' was a Eurocentric idea when it was coined, it is now Sino-Americo-Eurocentric, and in a decade or two it will be Indo-Sino-Americo-Eurocentric."[299] The title now reads: *How WE* Initially Changed the Next 100,000 Years of Earth's Climate, and How WE* Became We . . .*

All the World's a Sinking Stage

> All the world's a stage,
> And all the men and women merely players;
> They have their exits and their entrances,
> . . . Last scene of all, that ends this strange eventful history,
> Is second childishness and mere oblivion,
> Sans teeth, sans taste, sans eyes, sans everything.
> – William Shakespeare, *As You Like It* (1623)[300]

What then, of sensitivity from the social sciences to the science itself? Given that much of the social sciences limits itself to portioning responsibility for producing *The Long Thaw* thumbprint, to what end does this endeavour reveal "the iconography of the Anthropocene"? WE* did the catalysing, but we are now all well and truly aboard the lifeboat, and this 'we' includes the entire living world save for microbial or chemosynthetic life. What ethics *on Earth* can be sensitive to a situation that makes mockery of justice, just as it does accountability? Without fidelity to biophysical limits, ethics is also rendered irrelevant.

The lifeboat metaphor makes an apt raft for navigating the melting icebergs of *The Long Thaw*. In *Living on a Lifeboat*, Garrett Hardin explored the relationship between biophysical limits and socio-economic inequality. He likened wealthy nations to lifeboats filled with comparatively rich people, whereas:

> the poor of the world are in other, much more crowded, lifeboats. Continuously, so to speak, the poor fall out of their lifeboats and swim for a while in the water outside, hoping to be admitted to a rich lifeboat, or in some other way to benefit from the 'goodies' on board. What should the passengers on a rich lifeboat do? This is the central problem of the ethics of a lifeboat.[301]

299 Hamilton, *Defiant Earth*, 31.

300 William Shakespeare, *As You Like It* (Oxford: Oxford University Press, 2008 [1623]), Act II Scene VII.

301 Garrett Hardin, "Living on a Lifeboat," *BioScience* 24, no. 10 (1974): 563.

So far this raises questions of principle, but when a dilemma goes from abstract to concrete, the ethical problem becomes "the same for all"[302] as principles are pushed into practice:

> Here we sit, say 50 people in a lifeboat. To be generous, let us assume our boat has a capacity of 10 more, making 60 . . . The 50 of us in the lifeboat see a 100 others swimming in the water outside, asking for admission to the boat, or for handouts. How shall we respond to their calls?[303]

Hardin's analogy is only existential for the swimmers. Rich lifeboats can ignore those swimming, notwithstanding their guilty conscience at having chosen to let the poor drown.

In 1974, when this paper was published, there were outs for refugees to gain access to a rich lifeboat. Rich boats still had some carrying capacity, meaning they could assist those in need, by sharing more "'goodies'" and helping more selflessly. The outs were grossly inadequate and insufficient to the endemic inequality, as Hardin's rich lifeboat can only accommodate 10 of the "100 others swimming in the water outside," but they did exist.

In *Living Within Limits: Ecology, Economics, and Population Taboos* Hardin expanded his critique of economic theories proposing more equitable resource distribution, arguing that they had no fidelity to intrinsic biophysical limits: if rich lifeboats attempt to remedy inequality by admitting too many of the poor swimmers as possible, then they will also sink.[304]

As abhorrent as Hardin's argument may seem, the situation has since moved on to far more serious consequences. Once Lifeboat Ethics goes from abstract to the concrete in the present tense, the entire premise sinks. Today, irrespective of how many swimmers are accepted onto rich lifeboats, the question remains as to where any lifeboat can make landfall and its inhabitants begin anew?

Fuller's *Spaceship Earth*, for all its limitations in terms of our relationship with earth, is apt here. Aboard a planet cast adrift in the cosmos, having lost its moorings: there is no 'Planet Ho!' for a scout to sight from the deck, onto which the ruinous spaceship lands and its crew and passengers may start to rebuild their lives. The Dire is not about safe passage through an isolated instance of emergency – it is a protracted crisis with no end in sight, like a heatwave that becomes a heatflood that does not subside.

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302 Hardin, "Living on a Lifeboat," 564.

303 Hardin, "Living on a Lifeboat," 564.

304 Garrett Hardin, *Living Within Limits: Ecology, Economics, and Population Taboos* (Oxford: Oxford University Press, 1993).

Hardin's lifeboats do not factor in storms or icebergs: like most metaphors, they reduce the world to a stage, with "all the men and women merely players." But in the present tense Hardin's Lifeboat Ethics become Sinking Lifeboat Ethics. The existential predicament encompasses rich and poor, despite the former's much over-estimated buffer of relative insulation. All the world's a sinking stage, and all but a few disproportionately powerful men and women are merely players. The Tyrells, Queen Maries, and Dr. Strangeloves are the ones reconfiguring how much of the world's stage will sink. Or, conversely and perversely, how much of the world will rise.

For Chakrabarty, this situation brings social science in line with biophysical limits:

> Unlike in the crises of capitalism, there are no lifeboats here for the rich and the privileged . . . The anxiety global warming gives rise to is reminiscent of the days when many feared a global nuclear war. But there is a very important difference. A nuclear war would have been a conscious decision on the part of the powers that be. Climate change is an unintended consequence of human actions and shows, only through scientific analysis, the effects of our actions as a species. Species may indeed be the name of a placeholder for an emergent, new universal history of humans that flashes up in the moment of the danger that is climate change.[305]

The semantic journey has gone from the all-encompassing 'humans' that dominated in writing from Ekholm to Archer, through the gradations of 'we' to WE*, only to fall back into a singular category of Chakrabarty's "species" all aboard a sinking lifeboat. Distinctions collapse in the present tense because, even "if not every human is responsible for bringing on the Anthropocene, every human is destined to live in it."[306] So argues Clive Hamilton, in his impassioned *Defiant Earth: The Fate of Humans in the Anthropocene.*

Hamilton is scathing about the failure of academic philosophy to grapple with the distinction between Lifeboat Ethics and Sinking Lifeboat Ethics. In an article whose title gives the game away, "The Banality of Ethics in the Anthropocene," he finds no landfall for the sinking lifeboat:

> What does all this mean for justice and ethics? I would like to suggest that, without relieving individuals of culpability, when we step back and survey these Earth-shattering events our established ethical categories and legal principles appear banal and feeble. If the human impact has been so powerful that it has deflected the Earth from its natural geological path, describing the state of affairs as 'unethical' or 'unlawful' seems to be some kind of category error.[307]

305 Chakrabarty, "The Climate of History," 221.

306 Hamilton, *Defiant Earth*, 61.

307 Clive Hamilton, "The Banality of Ethics in the Anthropocene," *The Conversation*, 13 July 2015, accessed 18 February 2021, https://theconversation.com/the-banality-of-ethics-in-the-anthropocene-part-1-44568.

Hamilton then attempts to develop a sensibility commensurate with present tense biophysical limits. Though, as per Jasper's attempt to inculcate "epochal consciousness" in relation to the atom bomb, Hamilton first eviscerates the wilful ignorance that dominates Anthropocene discourse. The evisceration is well-deserved, but it means that, again like Jasper, the endeavour amounts to a litany against every folly, making precious little ground for any commensurate ethics of epochal consciousness.

For instance, Hamilton brings down the whole notion of virtue ethics, without claim for what, if anything, could or should follow in its wake:

> Are we not in this predicament because hubris has defeated humility, because self-interest has trumped concern for others? Perhaps, but the virtues that guide us in daily life tell us nothing about the place of humans on the planet, and that is now what is at stake. The attempt to frame a transformed climate by mere ethics risks normalising an event without parallel, of rendering prosaic a transition that is in fact Earth-shattering.[308]

He thus concludes his book with a confession by a Professor of Public Ethics: "we have to confront the most difficult truth – in the Anthropocene we have no ethical resources to draw on. The cupboard is bare."[309] Neath the house containing the cupboard lies the earth. There may be nothing to "draw on" from the domesticated dreams of the house, but outside the house there is a planet to dwell on. And there a different realm of ethics may lie, one unfamiliar but inalienable to conventional kinds of ethics. For if there were truly no ethics outside of the house, then to what purpose do we even engage in the empty gesture of examining our demeanour, here, at the end of our empire?

This is the difficult task that Nigel Clark offers as a last remaining wellspring for human ethics: go beneath the stage to ground surface affairs in all the subterranean contraptions and mechanisms which make play on earth's surface possible. Because the idea that all the world is a stage, sinking or not, limits the scope to the liquid and crustal surface, where the biosphere mingles with the tops of the lithosphere and cryosphere, and the bottom of the atmosphere. In place of a two-dimensional caricature of earth-as-stage, he suggests

> The Earth itself must be understood as much more than a mere surface or stage on which political contests take place: it must acquire a volumetric or vertical dimension . . . But this requires . . . us to bring politics into an intensive engagement with the planet's own dynamics: its processes of sedimentation and mobilization, its layering and folding, its periodicities and singularities. This means that the crucial borders or thresholds on the political agenda

308 Hamilton, *Defiant Earth*, 11.
309 Hamilton, *Defiant Earth*, 11.

> are not only those which divide nations or other socially inscribed territorial divisions of the Earth's surface, but also the spatio-temporal junctures at which one state or regime of an Earth system passes into another.[310]

To bring the politics of the Dire (in all its anthropocentric glory) into engagement with the currently rupturing state of "the planet's own dynamics' is to subsume politics into "the spatio-temporal junctures" of a particularly dynamic passage between two "state[s] or regime[s] of an Earth system." It is to subsume the surface of the stage into the menagerie of contraptions unpinning it, making the stage expand to encompass the entire planet.

In this way, the politics that always imagined itself as sitting atop the earth will discover that not only is it currently entirely at the behest of the "volumetric or vertical dimension" of the earth, but that it always was, and hence lose its human-scaled dire demeanour in favour of some humility. To let go of the Dire is to let go of human scale, after all, along with ideas of human salvation.

This makes for no stable ground on which to build an ethics, but it shows that "the cupboard" is not entirely bare. It is just that we have to go beyond the apparently empty cupboard, using it instead as a portal into a worldview commensurate with the world itself. To dwell on such an earth is to abandon Hardin's (Sinking) Lifeboat Ethics, disembark from Fuller's conceited *Spaceship Earth*, and settle with open-eyed abandon into Bataille's dour demeanour.

Here we understand that the boiling of the water, or the straw that breaks the camel's back, is already coming from upstream, as it always has, compounding intractable challenges for keeping any lifeboat from tipping over at any time. Recall Fichte remarking that "we build our houses on the earth," and still do, when that earth rests on a restless World Turtle, whose volatility we have managed to provoke with all the effectiveness of a Chicxulub. Or Tennessee Williams, who reminds us that "we all live in a house on fire, no fire department to call; no way out, just the upstairs window to look out of while the fire burns the house down with us trapped, locked in it."[311]

The morale of the sinking lifeboat story thus seems to be that taking the moral high ground (when the high ground has gone under the rising seas) is utopian – it literally has no place. Though none of these abhorrent options have yet to touch on what to make of life (at the end of empire)? The Court Jester bows, acknowledging the digression with nothing more than a wry smile and a teary rejoinder. All aboard, all abhorred, all the same, none more, no less . . .

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310 Clark, "Geo-politics and the Disaster of the Anthropocene," 31.

311 Tennessee Williams, *The Milk Train Doesn't Stop Here Anymore* (New York: Dramatists Play Service, Incorporated, 1998 [1963]), 245.

A Rose is a Rose is the Last Rose of (Endless) Summer

> We find ourselves, all of us together, poised trembling on the edge of a change so massive that we have no way of gauging it. None of us knows where to look, but all of us know not to look down . . . Our question is: what would happen if we looked down? Would it be as bad as we imagine? What might we see? Could it even be good for us? We believe it is time to look down.
> – Paul Kingsnorth and Dougald Hine, *Uncivilisation: The Dark Mountain Manifesto* (2009)[312]

> As my world comes crashing down
> I'm dancing
> Freaking out, deaf, dumb, and blind.
> – Radiohead, "Present Tense" (2016)[313]

In 2008, US singer-songwriter Zach Condon was touring with his band *Beirut* in Brazil. During an ocean swim after a concert, Condon nearly drowned. He explained that

> A rip tide took me out pretty far – I was struggling to get back in. And as I came back in, a wave crushed me and actually punctured a hole in my eardrum. It just got me thinking: these last five years of my life, me and everyone I'm close to have all been taken by this bigger force that's mostly out of our control.[314]

The experience formed the catalyst for his song *The Rip Tide*,[315] which meditates on a state similar to being petrified in a world that has become a sinking stage. Being dragged out to sea in a rip tide forces us to acknowledge the "bigger force that's mostly out of our control."

The music video features a lone empty sailboat travelling across the open ocean. The viewer is invited to follow the boat on its funeral march journey into the abyss of a transformative storm that completely reconfigures the sky, from typical light sky blue to a special-effects kaleidoscope of colours, textures, patterns, and forms.

It appears as if Condon's near-drowning in the ocean is manifested by the sailboat in a world-changing storm. Once outside of the lifeboat, socio-political differences between individuals disappear, especially when any and all lifeboats

312 Kingsnorth and Hine, *Uncivilisation*, 9.

313 Radiohead, "Present Tense," track 9 on *A Moon Shaped Pool* (XL, 2016), LP.

314 Zach Condon, quoted in Kristianna Smith, "Beirut: A Jet-Setter Settles Down," *NPR.org*, 10 September 2011, accessed 7 December 2015, http://www.npr.org/2011/09/10/140318038/beirut-a-jet-setter-settles-down.

315 Zach Condon, "The Rip Tide," track 6 on *The Rip Tide* (Pompeii Records, 2011), LP.

in the vicinity are sinking too. The present tense long ceased to be about the plight of an individual or an individual species. It is about a *New World Coming* on a planetary scale, as dramatic as the wild and complete atmospheric transformation featured in *The Ripe Tide.* Ashes to ashes, dust to water.

We can relate the sky's technicolour transformation in the music video to the "volumetric or vertical dimension . . . of the planet's own dynamics" that Clark refers to, since the highly volatile and changeable colours resemble optical side effects from volcanic eruptions. The video offers a rendering of the rupture, as if our sinking lifeboat were caught at the behest of a storm born of a volcano eruption. Sensibility toward such untoward torment runs rife in the arts. For instance, the 1883 Krakatoa eruption "would have turned the deep blue skies of rural areas into a Parisian-style white haze – but also have made dramatic fiery sunsets like the Krakatoa-induced one painted by Eduard Munch in *The Scream* entirely routine."[316]

Munch, petrified by sky colours like those in *The Ripe Tide*, recalls how he transferred his experience into the painting:

> I was walking along the road with two friends – the sun was setting – suddenly the sky turned blood red – I paused, feeling exhausted, and leaned on the fence – there was blood and tongues of fire above the blue-black fjord and the city – my friends walked on, and I stood there trembling with anxiety – and I sensed an infinite scream passing through nature.[317]

Munch sensed in the uncanny sky a *New World Coming* – one without parallel or even the slightest reference within his life experience or normative notions of the world. Simone's apocalyptic premonitions in her *New World Coming* also share a heartfelt sense of being petrified at the passage from the known present to unknown futures, as does Condon's transferral of his near-death experience into a rumination on the profundity of volatility and vulnerability that is both personal and planetary.

In Munch's time the connections between the effect of an Indonesian volcano to phenomena in the Norwegian skies were largely unknown, meaning no one had a reference for the strange things going on above their heads. Nowadays that same infinite scream has taken on a bitter human twist. The mystery of planetary atmospheric transformation has been solved, but the problem of its human-causation proves insoluble. The ship is still headed for the rocky bar, but now we understand that bar promises not only shipwreck for the Old World Going, but also passage into a *New World Coming* unrecognisable to its predecessor. And there is no human pas-

316 Bronislaw Szerszynski, "Colouring Climates: Imagining a Geoengineered World," in *Routledge Handbook of the Environmental Humanities,* eds. Ursula Heise et al. (London: Routledge, 2017), 85.
317 Edvard Munch, "Nice 22 January 1892," diary entry.

sage aboard, safe or otherwise. *The Rip Tide* punctures an eardrum and gives out a song of being at home in a world ungrounded and turned upside down.

Bruno Latour offers an all-too-relatable explanation for why he is barely able to acknowledge this elephant in the room, let alone speak to it:

> One of the reasons why we feel so powerless when asked to be concerned by ecological crisis, the reason why I, to begin with, feel so powerless, is because of the total disconnect between the range, nature, and scale of the phenomena and the set of emotions, habits of thoughts, and feelings that would be necessary to handle those crises not even to act in response to them, but simply to give them more than a passing ear.[318]

In contrast to "a passing ear," those working on the front lines need a song like *The Rip Tide*, that actually punctures the eardrum.

Science communicator Joe Duggan sought to capture such dire emotional responses in his 2014 project *Is This How You Feel?* He invited Australian climate scientists to compose handwritten letters describing their unsheltered worldview, to be photographed and displayed on his eponymous website. One of the scientists, Sarah Perkins, writes to "My Dear Friend":

> For some time now I've been terribly worried. I wish I didn't have to acknowledge it, but everything I have feared is happening. I used to think I was paranoid, but it's true . . . Certain behaviours that were only rare occurrences are starting to occur more often, and with heightened anger . . . How can anyone not feel an overwhelming sense of care and responsibility when those so dear to us are so desperately ill? How can you push all this to the back of your mind? This is something I will never understand.[319]

Whereas for another, Steve Sherwood, the way forward implies the subject is both at the forefront, but one that we need to "get over" at the same time:

> The main things I feel about this are deep disappointment and anger, though I should probably try not to. People have always faced challenges and adversity. When these are accepted and faced together, it can bring out our best . . . The opposite is happening with this issue . . . Global warming doesn't bother me as much as what it is revealing about humans. Maybe I need to just grow up and get over it![320]

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318 Bruno Latour, "Waiting for Gaia: Composing the Common World through Arts and Politics," transcript of speech delivered at the French Institute, London, 2 November 2011, accessed 6 May 2019, http://www.bruno-latour.fr/sites/default/files/124-gaia-london-speap_0.pdf.

319 Sarah Perkins, quoted in Joe Duggan, *Is This How You Feel?*, accessed 14 February 2015, https://www.isthishowyoufeel.com/this-is-how-scientists-feel.html#sarah.

320 Steve Sherwood, quoted in Joe Duggan, *Is This How You Feel?*, accessed 14 February 2015, https://www.isthishowyoufeel.com/this-is-how-scientists-feel.html.

Condon, Munch, Latour, Perkins, Sherwood: a musician, painter, sociologist, climatologist, and atmospheric physicist respectively, all allude to solastalgia, a term coined by philosopher Glenn Albrecht to describe "the homesickness you have when you are still at home."[321] Except that Albrecht refers to the present tense, where home is earth and the sickness is "solace" and "nostalgia," making up his portmanteau 'solastalgia.'

The growing unease of those intellectually and emotionally present to the ending of the world-as-it-currently-is and new world-that-is-coming-into-being lies behind *Dark Mountain*, a UK collective of ecological writers, artists, and activists. Two miles south of the pyre where the three bishops were burned alive by Queen Mary Tudor, and half a millennium later, *Dark Mountain* co-founders Paul Kingsnorth and Dougald Hine launched their *Uncivilisation: The Dark Mountain Manifesto*. Under the first heading, *Walking On Lava* they proclaim that "human civilisation is an intensely fragile construction. It is built on little more than belief: belief in the rightness of its values; belief in the strength of its system of law and order; belief in its currency; above all, perhaps, belief in its future."[322]

Here again Clark's "volumetric or vertical dimension" of "the planet's own dynamics" are brought to the stage's surface, through lava well-springing beneath our feet. Their manifesto appeals for a solastalgic home by uncivilising civilisation so-called:

> This is a moment to ask deep questions and to ask them urgently. All around us, shifts are under way which suggest that our whole way of living is already passing into history. It is time to look for new paths and new stories, ones that can lead us through the end of the world as we know it and out the other side. We suspect that by questioning the foundations of civilisation, the myth of human centrality, our imagined isolation, we may find the beginning of such paths.[323]

Therein, acquiescing to the full and unsheltered history behind the nursery rhyme, following twisted tales, breadcrumb trails, and severed tails into the reality behind *Three Blind Mice.* No longer bracing for impact, but rather embracing for impact. Ready to lose eardrums rather than straining not to hear. Ready to recognise the something untoward going on in the strange skies of increasingly unseasonal seasons and catastrophically frequent transformative storms. Ready to make a home amidst the rupture, even if it has the solastalgic feel of a sinking boat heading at full speed for a rocky bar in the midst of a rolling thunderstorm.

321 Glenn Albrecht, *Earth Emotions: New Words for a New World* (Cornell: Cornell University Press, 2019), 3.

322 Kingsnorth and Hine, *Uncivilisation*, 2.

323 Kingsnorth and Hine, *Uncivilisation*, 17.

Ready to look beyond *Life at the End of Empire*, to what life there could be for the more-than-human world, when "the myth of human centrality" finally comes tumbling down.

Subterranean.Homesick.Blues.

> The Anthropocene incitement to think with and through the 'geologic' implies more than just imagining that inorganic matter or minerality may be more life-like than we assumed. It is about confronting the possibility – signalled by Anthropocene geoscience's concern with the trace our species will leave behind in the geological record – of our own extinction, fossilisation, or becoming mineral.
> – Nigel Clark, "Anthropocene Bodies, Geological Time and the Crisis of Natality" (2017)[324]

Given that answering the perennial question of what is life changes according to the season, the present tense begs inquiry into what is life *at its limits?* These limits are thresholds, fitness curves within which an individual can survive. They are the critical minimum and maximum climatological bandwidth that an individual can tolerate. Thresholds are time sensitive: at best, species are attuned to local here and now conditions as they morph from month to month, year to year, decade to decade. Over time, the limits or thresholds of those species will change as (and if) their organisms adapt.

Limits are intrinsic to all life forms, and when these limits are breached *en masse* they lead down one of two principal pathways. If a species can change its tolerance thresholds, via genotypic and/or phenotypic plasticity, then it lives on. This is the nuts-and-bolts mechanics of evolution. The other pathway is more obvious: if a species cannot adapt to change its limits, it goes extinct. Shape up. Or ship out. Step up. Or step off. If evolution is indeed a comedy, it has a limited character range.

Changing climate regimes mean lifeforms generally strive to find new ground. What is too cold now for a species may become tolerable for the descendants of that species, but only where there is sufficient time to adapt. Drop an elephant overnight in the Siberian traps and it will freeze to death within a day. Slowly nudge them northwards from India over 200 millennia and they will survive, but will arrive as a woolly mammoth. Whether staying put or moving with the flow, the continual process of re-attuning to changing localities may mean descendants evolve into a new species altogether, like brown bears speciating into

324 Clark, "Anthropocene Bodies, Geological Time and the Crisis of Natality," 160.

polar bears as they migrated into the Arctic. Home is not only where the heart is, but where the heart travelled from before it got here.

At present species the world over are on the move *en masse*, or are dying trying to do so. Rates of biophysical change both exceed existing tolerance thresholds and the adaptive capacity for thresholds to accommodate continuous redefinitions of the new normal. On the latitudinal plane the move is away from the equator, in search of cooler climates. On the elevation plane the move is away from sea level, upwards into the lithosphere for terrestrial species, or downwards into the hydrosphere for marine species. The search is on for refugia: somewhere to take shelter from the no-longer-so-proverbial storm brewing. Sooner or later each lifeform reaches the physical ends of the earth: the top of a mountain, the bottom of the ocean, the extremity of a landmass. If a species can survive in a refugia until a time of turbulence runs its course, then it may thrive in the more palatable conditions following. If a species cannot, then it goes extinct.

What then, is the answer to what is life (at the end of empire)? When 'where do we go from here?' has been downgraded to 'do we go from here?', and those asking are the same perpetrators of this violence, who have been caught in their own feedback loop of Self-Assured Destruction. In riposte to Cormac McCarthy's rhetorical question as to the "the whole thing now is, what do you do?", and in dour appraisal of Yellowstone erupting "on Thursday" or "another three to four thousand years from now," we can instead ask the question differently: where does life go from here? This brings into play a different order of questions, rich with answers, none of which our species will survive to see. Come what may (all other things being equal).

For *homo sapiens*, the Dire terminates in an ill-fated underground refugia manufactured to preserve not only the species, but the WE* that catalysed the rupture in the first place. If we are playing blame games, Kolbert's claim that "we are the asteroid" is indeed justified, but it is perhaps more fitting to let the *Dr. Strangelove* character Major Kong take the fall: a white racist American soldier who shrieks with glee as he rides the atom bomb out of the plane, falling to collide with earth and set off the Doomsday Device.

In response to Major Kong's catastrophically destructive antics, the eponymous scientist proposes to the War Room that the military-industrial establishment take refuge from impending nuclear holocaust by retreating into repurposed mine shafts. He pitches his idea to the US President thusly:

> It would not be difficult *mein Fuhrer*! Nuclear reactors could, heh . . . I'm sorry Mr. President. Nuclear reactors could provide power almost indefinitely. Greenhouses could maintain plant life. Animals could be bred and slaughtered. A quick survey would have to be made of all the available mine sites in the country. But I would guess . . . that ah, dwelling space for several hundred thousands of our people could easily be provided.

Protected inside from the nuclear radiation and collapse of the biosphere, the humans would repopulate and emerge from their refuge when the radioactive dust settled, ready to make America great (again).

Dr. Strangelove depicts a bottleneck for *homo sapiens*. Only a minuscule proportion of a species make safe passage through a maelstrom. However, this is not Black Flag Day at Teahupo'o, where the fittest make it through the massive tunnel of a wave to find safety on the other side. Here we observe the evolutionary function of refugia, except that the ones permitted refuge and therefore a chance of survival are the self-selected creators of the bottleneck itself. Life at the end of empire is at the behest of a military-industrial complex that willingly co-opts ecological disaster for genocide and entrenchment of their authority, even though the *New World Coming* will be a veritable wasteland with neither military or industry, like the world depicted in *The Road*.

Life at the end of empire is the human-thumbprint-iceberg on the cover of *The Long Thaw* rendered into reality. The relatively powerless majority of the species, who are not responsible for the War Room men, nor the ideology under which they hold the world hostage with the Doomsday Device, drown beneath the waterline. Appeals to ethics are empty gestures enacted between the traded ivory towers of academia or the soapbox sermons of social justice warriors. And to add insult to injury, any concrete ability to leverage the Dire resides within windowless War Rooms. Global warmongers and industry heads have made and still make decisions on behalf of our species in any event, with vastly differentiated effectiveness observable between tyrants who wield power and their subjects. Yet away from intraspecies and anthropocentric concerns, planetary scale and deep time consequences play out regardless, as per the *The Long Thaw's* subtitle: *How Humans Are Changing the Next 100,000 Years of Earth's Climate.*

Dr. Strangelove's schema is also in keeping with the biophysical limits posed by Latimer's terrarium and Fuller's *Dome over Manhattan*. Mine sites would be manufactured into Closed Ecological Systems, protected from nuclear fallout like Manhattan under Fuller's *Dome*, and sealed like Latimer's terrarium, the sun simulated by nuclear reactors, powering greenhouses to grow plants, which provide the oxygen to sustain the WE*.

In keeping with truth being no stranger to fiction, the *Dr. Strangelove* finalé parodied actual US plans to use mine shafts and subway stations for this purpose. The real-world plans sought to mimic refugia, except that like all attempts to outwit the World Turtle, applying teleology to evolution is at odds with the aimless, designer-less, purposeless, and directionless nature of life itself.

Whether real world plan never enacted, or fictional comedy never more real, the schema encapsulates life at the end of empire. Of all human-made transformations, the most substantial lie in subterranean realms. Resource extraction has

exhumed hundreds of millions of years of accumulated chemical energy, dispersing it into the bio-, litho-, hydro- and atmos-spheres in a couple of centuries. Surface transformations such as deforestation and pollution are so highly visible that they tend to distract from his simple fact, but in reality they pale in comparison with the consequences of un_earth_ing.

Waiting out the apocalypse in caverns hollowed of their fossil fuels is the terminus for being caught between a rock (a mine shaft) and a hard place (an extinguished biosphere). Fossil fuels represent a deeply ironic cycle of life, being played out all over the world: fossils of ancient life forms, having been resurrected through combustion, cause the biosphere to become petrified through a Mass Extinction Event, as members of the species that caused the cataclysm retreat into holes the fossil fuels were extracted from. Unlike the petrified human remains at Pompeii, huddling anywhere that provided an illusion of shelter when Mount Vesuvius buried the city in pyroclastic flows, petrified human remains of those huddled in old mine sites will be our endlings, when the earth once again will have no humans alive on it. As the refugees hide in subterranean strata, the confluence between being petrified and becoming petrified finds its fullest expression.

Such is life (at the end of empire).

Fig. 13: Sinkhole, Guatemala city, Guatemala, 1 June 2010. Photograph by Paulo Raquec, Guatamalan government.