POSTSCRIPT
(posthumous)

Nothing.Last.Forever.

This Space Intentionally Left Blank

In a walnutshell:

First Breath After Coma >
Of Mice and Man >
Hitchhiking v Carjacking >
Life on Earth v Life off Earth >
ENSO on v ENSO forth >
Better Tardy Than Never

Rubbing Saltation into the Wounds

> Heavy misfortunes have befallen us, but let us only cling closer to what remains, and transfer our love for those whom we have lost to those who yet live.
> – Mary Shelley, *Frankenstein* (1818)[480]

Fig. 20: A National Guard soldier guards a Nematode capsule from the Columbia space shuttle, Ken's Minit Market, Nacogdoches, Texas, United States of America, 2 February 2003. Photograph by Brad Loper.

Life, in a technical sense, is always petrifying. Conversely, life only occasionally goes through ruptures. Seismic upheavals from asteroids, volcanoes, plate tectonics and so on do not even begin to scratch the surface of the ruptures to life that have occurred on this planet. Dig beneath the surface and lo and behold: shit-fuelled land ho! Ruptures do not only happen to life, but are also caused by life itself.

When one of the earliest lifeforms first began to breathe oxygen, it exhaled a gas toxic to all life on earth at the time, save for the cyanobacteria that invented

480 Shelley, *Frankenstein*, 345.

the means to do: photosynthesis. Before this rupture started, 2.4 billion years ago, all life was anaerobic. Then, under the auspices of the Great Oxygen Event/Catastrophe/Crisis/Revolution all anaerobic lifeforms either adapted to tolerate oxygen, or burrowed deep into earth to escape the holocaust happening in the hydrosphere, lithosphere, atmosphere, and nascent biosphere.

The first phase of planetary change, over the following 300 million years, seemed to principally be in the atmosphere, or, rather, the addition of oxygen to an anaerobic atmosphere. However, this phase of the Great Oxygen Event manifested mostly in oceans and seabed rock, which re-absorbed the oxygen back into earth. The oceans produced the most pronounced reactions, their iron-rich waters turning red from life-induced oxidisation. Sedimentary layers of this iron oxide subsequently became a rock known as banded iron formations, distributed extensively around the planet in deposits ranging from a few to a few hundred metres thick. It was as if cyanobacteria had leached all iron from the atmosphere, sequestering it into strata, which then meant their subsequent emissions could oxygenate the atmosphere now that the oceans had absorbed their fill.

This rupture has nothing of the concreteness of Panama, Chicxulub, or the East Africa Rift valley. But it still holds true to the three universal sighs: an anaerobic bacterium could have played 'Stegosaurus Says . . .', just substituting 'aerobic bacterium' rather than mammals doing the taking over. It would have to speak of the world's climates 'being created' rather than changing, and 'stimulus response the size of an amoeba' instead of a "brain about the size of a walnut." To boot, the picture was indeed "pretty bleak" for those that could not make it through the oxygenation of the atmosphere, rendered extinct or cast deep into the earth as subterranean anaerobic lifeforms.

A significant source of our knowledge concerning the volatility and dynamism of life in/on/to earth is the inexhaustible demand for minerals and fossilised hydrocarbons. The rupture encapsulated in banded iron formations is exhumed, as these formations are the principal source of all iron extraction. Similarly, we know about the evolution of extremophiles (namely, the anaerobic descendants living on an aerobic earth) because of industrial scale mining down shafts kilometres deep. These extremophiles were discovered in the thirst for extracting fossil fuels, just as Chicxulub's sea-floor crater was accidentally discovered by geophysicists surveying the area for oil in the late 1970s.

Every rupture cracks the walnutshell in disbelief at the cascading consequences from yet another cataclysm upstream. Closer to home, no Chicxulub asteroid means no dinosaur mass extinction, no ecological niche for mammalian evolution, no *homo* genus, no *homo sapiens*, and no current carbon dioxide emissions at the fastest rate since the Chicxulub asteroid. Life, in an affective sense, is always petrifying.

Storytelling is life excised of all the boring bits, especially for drama and tragedy. Take the life of Queen Mary Tudor, amplify the most decisive moments, such as executing the three bishops, and you have the makings of an evening's entertainment for audiences now and half a millennium ago alike. Life is storytelling including every single one of the boring bits, perpetually unfolding in the present tense.

Geologists nicknamed one such period, occurring from around 1.8 to 0.8 billion years ago, as 'The Boring Billion', because nothing much ostensibly happened on earth's lifestyle channel during that time. This billion years marked the second phase of the Great Oxygen Event, when cyanobacteria's exhaled oxygen had exhausted the capacity of the ocean to absorb it, and so was released from the ocean into the atmosphere, only to be absorbed back into terrestrial earth.

Given the dearth of any major evolutionary change, the only soap opera for those billion or so years were moments of microbial high drama. Though this would be no more or less compelling than a Shakespearian tragedy, or watching the Panama Isthmus close, if the viewer's sensibility encompassed the range of scales, modes, and tempos of life itself. With sensibility only attuned to moments of high drama – whether insurrection against a tyrant, or a rupture of life on earth – the mental remote control fast-forwards through eons of relative stasis. After all, evolution and extinction go fishhand-in-fishhand during ruptures. They are the extraordinary events to the billion boring bits of time at the scale of the universe. They are, as Mike Davis reminds us, "a million years of 'normal' environmental work condensed into hours, even seconds," making for "superchargers of geological and biological evolution."[481]

Which means that for those who prefer their probabilities and statistics with a grain of salty tears, all's well that ends well: at least for the 99.9% of all species that have ever lived, being those that have gone extinct. Perhaps it is the generosity of time that makes this seem so woeful. After all, on the balance of probability any lifeform's familiar lifeworld is going to go a cropper and end when being measured against the passage of four billion solar circulations. Alternatively, the inexorable passage from evolution to extinction is cause for celebration. Not of the inconsolable pathos for such loss, but of the seemingly inextinguishable capacity of life to flourish when feasible, resist when necessary, persist when possible, and adapt when-ever.

It is no small pattering of feet that Darwin closes *On the Origin of Species* with a sentence about the how "endless forms most beautiful and most wonderful have been, and are being, evolved."[482] His sly slight of poetic hand still holds true:

481 Davis, "Cosmic Dancers on History's Stage?", 84.
482 Darwin, *On the Origin of Species*, 459.

new "endless forms" will fill the voids vacated when most species that currently stalk the earth succumb to the Sixth Extinction Event. Despite being "impossible ever to satisfy," David Hume's "inquisitive humour"[483] would relish the limits of the "endless" in "endless forms most beautiful." Namely, a planet where species persist for eons means that the same species persist for eons. Conversely, novelty goes fishhand-in-fishhand with speciation: a new climate regime means out with some of the old, and not in with some of the new. Because some of the new must first become. Where the becoming of a new species arises out of novel opportunities presented in the new biophysical conditions.

That is part of the beauty of evolution that Darwin speaks of – the ability for incomprehensible novelty to arise, time and time again, from having found, or rather created, opportunity in the face of a world turned upside down by cataclysms. *Ad nauseum infinitum* – such is life, when viewed against deep time at the scale of the entire history of this planet. So, new "endless forms" will fill the voids vacated when most species that currently stalk the earth cease to be. As easy as chopping off mouse tails with a carving knife. But this is only half the tale.

And this is only half of the other half of the tale: turtles all the way down, all the way down, the way down, way down, down.

Did You Ever See Such a Sight in Your Life? (reprise)

There's a brand new mornin'
Rising clear and sweet and free
There's a new day dawnin'
That belongs to you and me.
– Barry Mann and Cynthia Weil, *New World Coming* (1970)

The song of 1842 asks "*Did you ever see such a sight in your life/As three blind mice?*" Whereas, the song of the present tense asks 'did you ever comprehend that your life is one of shared descent, stemming from our mutual Rodentia ancestor that lived during the age of dinosaurs?' Following in our footsteps, living off our detritus, travelling in our luggage, as we (and thus they) spread across the planet, evolving hand-in-hand, plague-in-plague.

The consequences of humanity's planetary spread proved disastrous enough for whatever local flora and fauna there were, before they first arrived. The consequences of the rodent's stowaway arrival merely added insult to injury. None

483 Hume, *Dialogues Concerning Natural Religion*, 38.

of the consequences were more devastating than first arrivals onto landmasses over the two centuries following Queen Mary Tudor's reign. The first wave was the insult: WE* aboard colonial and imperial invasions emanating from Europe. The second was the additional injury: stowaway mice and rats. When Cook gifted Tu'i Malila to King Paulaho of Tonga in 1777, mice and rats would have also jumped ship and made uninvited homes on another new island. (Though the *Rattus rattus* aboard these European vessels were actually the third wave, as the first wave was the Pacific rat (*Rattus exulans*) that had already breached Pacific islands three millennia ago, aboard the vessels of the first Polynesians.)

With every invasion of a new land, *Rattus rattus* and the house mouse (*Mus musculus*) ran amok in the footsteps that forged European colonies. The scenario replayed the unification of North and South America, via the Panama Isthmus. For some, a boon. For others, a death knell. Except that the boon was nearly always enjoyed by invading rodents, because native island animals had few comparable defences, having had no evolutionary co-existence with rodents, prior to the arrival of *Rattus exulan*s. Although nativity and invasion are slippery terms: all species invade at some stage or another, whenever they encroach upon places other than where they speciated. Conversely, all species are native once they have been in a place since time immemorial. Which, viewed at the scale of last common ancestors, is pretty much wherever they happen to be at any one time.

But this zoecentric demeanour provides cold comfort against the agency for spreading rodents across the globe in the half millennium since Queen Mary inspired the nursery rhyme. The 1555 tyranny to which the first version of *Three Blind Mice* spoke, one so seemingly resolutely human and social, actually begat a biophysical tyranny too. Meaning the original 1609 rhyme still only probed the social limits of life, but by the time the second version was published in 1842 the consequences of the human-mouse relationship was already breaching biophysical limits to life across the world. By the time I sang the rhyme in school, the rupture was already well underway. And by the time I came of age enough to dig beneath, behind, above, and beyond the rhyme, the rupture was well beyond reprieve.

Therein, beholding three blind mice is not a question of "Have you ever seen such a sight in your life . . .?" The sight has been before us the whole time. Now restored to primacy as the eyesore at the centre of this new worldview for a *New World Coming*. Now, by this song, one can answer the question posed by the rhyme: to live during the unfolding rupture is to behold the sight of three blind mice in every moment. And for all that are alive not only *during* a rupture of life on earth, but alive *to* the rupture itself, it is to be and become petrified simultaneously in every moment.

Mouse and human – along with all other modern mammals – share the same irredeemable debt to Chicxulub, but mammalian tenure was never going to be

unlimited. Then for Stegosaurus. Now for us. For *now* is neither the first nor last rupture, but the last for me, my kin, and my entire kind. The confluence thus closes between both states of petrification, bringing together individual mortality with the extinction of one's species. As Batty laments just before exhaling his final breath: "all those moments will be lost in time like tears in rain."[484] Just as all rivers eventually empty into the sea. Just as the sea very eventually empties into outer space, once the sun's heat burns away the atmosphere.

After all, nothing lasts forever. Even permafrost. Which is meant to denote 'permanent frost.' Except that its permanency is melting, releasing potent methane into the atmosphere, exacerbating global heating, which is melting more permafrost, releasing more methane . . . ENSO on ENSO forth. Nowadays it is melting permanent frost. Or perhaps Frosty the Snowman v Permafrost the Snowperson. Onwards, ever onwards, endings, ever endings. This is the endocrine disruption.

But what of those that we have not only beheld, but restored to the primary focus of our eyesore? From a rodent-centric perspective, this rupture is but one mega-boon that reaps all the fruits of their planetary expansion over the last half millennium. They bode well, not only for living during the unfolding rupture, but through it and into the next *New World Coming*.

And if we are seeing rodents anew, as interlocutors, then so too must we reappraise some of our other companions, such as pigeons, sea gulls, and cockroaches. Currently besmirched as pests and invasive species, such paragons of evolutionary success will outlive us too, just like the Rodentia that capitalised on the emptied lands following the end of the age of dinosaurs. When all is said and done, they have previously, and will again, make worthy candidates for making it through to the next *New World Coming.* Hark the New New Animals for the New New World Coming. It is theirs whose song will continue to sing. ENSO on ENSO forth.

484 Scott, *Blade Runner*.

The Art of the Fug ue

I don't care about me
feel the animals and the trees
They got nowhere to go
I don't care much about you
I don't give a shit what happens to you
Now we blew it all away.
– Anohni, "Hopelessness," 6 May 2016[485]

Dreamers, they never learn
Beyond the point of no return
And it's too late
The damage is done
This goes beyond me
Beyond you.
– Radiohead, "Daydreaming," 8 May 2016[486]

If this song were a guidebook, it would not be a *Hitchhiker's Guide to the Galaxy*, Douglas Adams' handbook for navigating "life, the universe and everything."[487] A hitchhiker rides high on comet contrails – always at the behest of the driver, their whims, and the uncertain directions where they are headed. Let alone if they are a safe driver or liable to crash *en route*. A hitchhiker makes a living by metabolising what energy is available wherever here and now happen to be, whether with zooxanthellae and their photosynthetic dependence on the sun, extremophile bacteria and their chemosynthetic dependence on hydrothermal vents, or hominids once they learned to control, and thus become dependent on, fire. An act of generosity underpins a hitchhike – the universe gives light, heat, food, ground and the like, and offers us a ride at its behest.

If this song were a guidebook, it would be a Carjacker's Guide to the Galaxy. A carjacker does not wait for consent. Seeing the earth as Fuller's *Spaceship Earth*, carjackers enact violence to get the ride and get their way. Contemporary civilisation carjacked the earth, only to find it was better off being a diligent and conscientious hitchhiker and passenger, without control of the steering wheel. Instead, we forced our way behind the wheel, only to realise we would never be able to learn to drive.

We were never to know how the Spaceship Earth machinery actually operated. Or, that even if we could know how it works, how we would make it work to our

485 Anohni, "Hopelessness," track 10 on *Hopelessness* (Secretly Canadian, 2016), LP.
486 Radiohead, "Daydreaming."
487 Adams, *Life, the Universe and Everything*.

whims. If you are left standing beside the highway in Cormac McCarthy's *The Road*, rather than cruising along in Jack Kerouac's *On The Road*, it is because you did not get picked up for the ride out of town and into the happily-ever-after sunset.

So *what on earth* is the take-home message? What is the song summary rendered neat for a handy plastic take-away food container? There are no neat take-aways, no key concrete message encapsulated in a walnutshell, because there is no such summary. Instead, there is fidelity to being *on Earth*, and to all of its vicissitudes, from those arising deep within its magmatic core, to those irrupting from the outer space of the cosmos.

Indeed, the walnutshell must also grapple with how there is no take-home message because there is no home to take our song too. The turtle carries its shell upon its back, because its back is its shell. The hermit crab also carries its shell upon its back, because it suffuses its mortal coil with its adoptive hand-me-down-home-within-an-empty-shell. The human carries neither shell nor hand-me-down-shell. Instead, we "build our houses on the earth," mistakenly believing the earth to be, solid, permanent, and for us. Collectively forgetting its volatility, except in the form of creation stories and myths in which the earth turns out to be built on an elephant, which was built on a turtle, until it is turtles all the way down . . .

The anthropocentric demeanour appears to have worked well thus far, if the catastrophic extent of human overpopulation can be regarded as something working out well. Never mind the conceit, even when the way we build our houses on the earth is sending it back into a hothouse state. One that is more redolent of the Mid Pliocene Warm Period than the Holocene, mixed with new conditions even more biophysically impossible for our mortal coils. When Dorothy's house is picked up by the tornado in *The Wizard of Oz*, it is relocated to another world – where she survives the journey down the off-world rabbit hole intact. Finally, anthropocentricism will go by the wayside, given all talk of human passage into the *New World Coming* is as fantastical as Dorothy's tornado-delivered home relocation.

Then again, there never was a real home to take the message to. Rewrite the old adage as: *Because there's utopia like home*. Utopia, which means "no place," means utopia is no place like home. Instead, the only place for the take-home message is the cosmos itself. There lies the measure for our response to desperate measures called for by desperate times. There, and only there, can the response be offered. And there and only there can all offerings be revealed as what they amount to: empty gestures.

But cosmic nihilism can be a cheap trick. An easy out of a dilemma, by reframing it in the cold comfort of the cosmos. As if the feeling of being petrified can be nullified by the knowledge of becoming petrified. Those who reject the cheap trick hold that it was never meant to be this way. Others claim that some capacity for recompense lies up our sleeve, such as eradicating invasive mice

from islands through using gene drives to make them all male, and thus incapable of breeding. Thus, giving a lifeline to native species who make homes on ever-shifting islands. No land is an island.

To which cosmic nihilism yawningly plays its trump card: the only card it ever plays. It holds that nothing was meant to be any which way, because nothing has any meaning. It was never *Apocalypse Now.*[488] It was always Post-Apocalypso Forever! Retrace the long arc of justice that brought Chicxulub or Theia crashing into earth. Recall J002E3 periodically returning to check in on us, before finally being cast off into deep space without return, when all the planetary alignments provide sufficient force for its eccentric orbit to remain solely solar-centric.

We inherit the actions of a universe that long preceded us, and will continue on well without us. And yet, our geological agency influences manifold earthly futures in untoward and unpredictable ways. Sometimes coming back to haunt us, like the first return of J002E3. Sometimes just a harmless scare, as J002E3 turned out to be. But at other times, the return of earlier actions carry the destructive and creative potential of a Chicxulub or a Theia. Now is one of those other-times. Now happens to be a "bad day" in this neck of the universe, a bad day like "whenever a six-mile-wide asteroid hits your planet with the force of over a billion nuclear bombs."[489]

Mouths Open Wide/Eyes Wide Shut

> Uncivilised writing is writing which attempts to stand outside the human bubble and see us as we are . . . Against the civilising project, which has become the progenitor of ecocide, Uncivilised writing offers not a non-human perspective – we remain human and, even now, are not quite ashamed – but a perspective which sees us as one strand of a web rather than as the first palanquin in a glorious procession. It offers an unblinking look at the forces among which we find ourselves.
> – Paul Kingsnorth and Dougald Hine, *Uncivilisation: The Dark Mountain Manifesto* (2009)[490]

J002e3 was not only never meant to return to earth, it was also never *intended* to return. Because meaning is to intention as chalk is to cheese. Despite the universe being intrinsically devoid of meaning, human actions abound with discrete intention. With Batty in *Blade Runner*, it was also never intended that he would return to earth, since his remit was solely to be a slave on off-world colonies. As a prod-

488 Francis Ford Coppola, director, *Apocalypse Now* (United Artists, 1979), 70 mm.
489 Brusatte, "Asteroid Killed Dinosaurs."
490 Kingsnorth and Dougald, *Uncivilisation*, 13.

uct of directed human action, could his unruly return to earth then bear meaning, by way of being born of wayward intentions?

Batty offers up an enigma for his motivation for returning to earth to confront his makers, proclaiming his earthly arrival by misquoting William Blake's *America: A Prophecy.* Entering the science laboratory where the creator of his eyes resides, he announces: "Fiery the angels fell; deep thunder rolled around their shores; burning with the fires of Orc."[491]

For Blake, Orcs were the spirit of revolution, including the recent American and French ones that were subject of his *Prophecy* series. Wherein, Batty alludes to how the returning replicants are like Lucifer and the Fallen Angels in *America: A Prophecy*. All were cast off earth, with the intention they never return. Except the replicants, to quote Blake accurately now, "rose, and as they rose deep thunder roll'd/Around their shores: indignant burning with the fires of Orc."[492] Similarly, Frankenstein's monster turns to confront his creator, Victor Frankenstein, lamenting that "I ought to be thy Adam, but I am rather the fallen angel . . ."[493]

Given the human intention behind a *Blade Runner* replicant or Frankenstein's monster, was either creation *meant* to turn on its creator? Being unlike Blake's Lucifer and his rebellious angels, because their existence is the result of human, rather than 'divine' vision, was it then meant to be, that the indignant Orcs returned, to burn earth to a cinder?

For Blake, it was the Orcs' uprising from subterranean depths that caused our downfall: "fiery the angels rose." For Batty it was the replicants' coming down from deep space that caused our downfall: "fiery the angels fell." Meaning, or its complete absence aside, we are besieged by forces that include our own failings and errors from below and from above, from the past and by the future. But all life was always already besieged by something. As it was never meant to be, but as it became anyway. So be it. Such was life.

Having met his maker and gotten final confirmation that his imminent mortality was inevitable, Batty's curtain call is to proffer his own answer to "did you ever see such a sight in your life?" where the "ever" is the final summation of a life lived, just as it expires:

> I've seen things you people wouldn't believe. Attack ships on fire off the shoulder of Orion. I watched C-beams glitter in the darkness at Tannhäuser Gate. All those moments will be lost in time like tears in rain. Time to die.[494]

491 Scott, *Blade Runner*.
492 William Blake, *America: A Prophecy* (London, 1793).
493 Shelley, *Frankenstein*, 173.
494 Scott, *Blade Runner*.

Like Frankenstein's monster, Batty evokes compassion, alongside the more obvious revulsion to human experiments that run amok. Even when they make their maker fear for their life. And especially when they make their maker petrified. Contrary to Deckert's original remit to assassinate Batty, by the time the two have battled, Deckert has come to view him with compassion:

> All he'd wanted were the same answers the rest of us want. Where did I come from? Where am I going? How long have I got? All I could do was sit there and watch him die.[495]

Wherein, Deckert gets his own answer as to "did you ever see such a sight in your life?" And we have received the same answer to the desert tortoise dilemma: "all I could do was watch him die." In the here and now, all the while that we have been watching the upturned turtle dehydrate, becoming resigned to the utter helplessness of its predicament, a strange attractor has emerged between the interlocked human and reptile eyes. Such is the "unblinking look at the forces among which we find ourselves" of The Dark Mountain's *Uncivilisation Manifesto*.

We have been dehydrating, all the while we have watched the tortoise do same. The tortoise has been dehydrating, all the while watching us do same. Exhaling the universal sigh of changeability, consequence and comprehension of same, we recognise that our fates are as interlocked as our eyes. The entwining of our imminent extinction confirms that the act is done, the deed despicable, the cataclysm unleashed, the rupture unearthed.

The first universal sigh is the ever-changeable nature of changeability: the only constant is change. Scaled down here from the cosmic rate of inflation, to climatic change on any and all planets. Good planets go bad: picture the halcyon days of lore at near neighbours Venus and Mars, before they broke bad. Bad planets turn good: picture early states of earth, so vastly different from both each other and the present tense as to herald alien worlds, some of which more closely resembled Venus and Mars as they exist nowadays.

The second universal sigh is the consequences of such changeability for evolution and its twin, extinction. Cataclysms clear out the old and make way for the new, where new are forms so alien from the old as to herald worlds alien to one another. An earth with separate continents, flowering trees, reptiles, insects, plants, and other homely placemakers constitutes only the most recent tenth of this planet's history.

The third universal sigh is the comprehension of such changeability and its consequences. A worldview premised on the first two universal sighs presents a once-in-a-species opportunity to see the world anew, from the abyssal predicament of an ever-present event horizon, to whatever worlds may manifest and

495 Scott, *Blade Runner*.

whatever new forms may fill niches made vacant by our kind and kindred species, unable as they were to live on through. It remains to be seen whether the walnut's plasticity can embrace equanimity between these worlds. Equanimity between being petrified and becoming petrified.

For our present tense, the portal to the cosmos via the universal sigh yields a comprehension of petrification that can only be celebratory. Life, always at the behest of cataclysms that are always upstream. Changeability, more volatile, dynamic, and complex than we dare imagine. Consequences, more dire than we dare care for. To embrace comprehension of same is to live with fidelity to cosmic vicissitudes. Becoming petrified, side by side with the turtle we flipped, and alongside all else. Ashes to ashes. Dust to water.

Yet that feigned attempt to embrace for impact cannot answer the question following Radiohead's recognition that "the ocean blooms" and this is "what keeps me alive." The line that follows asks "So why does this still hurt?" To which they can only counter:

> Don't blow your mind with why
> I'm moving out of orbit
> Turning in somersaults
> A giant turtle's eyes.[496]

Such Was LIFE

> This is a present from a small, distant world, a token of our sounds, our science, our images, our music, our thoughts and our feelings. We are attempting to survive our time so we may live into yours.
> – President Jimmy Carter's message on the Golden Record sent on Voyager 1, 20 August 1977[497]

> Once I understood Bach's music, I wanted to be a concert pianist. Bach made me dedicate my life to music, and it was that teacher who introduced me to his world.
> – Nina Simone, *I Put a Spell on You: The Autobiography of Nina Simone* (1992)[498]

Over and out: the end of LIFE on earth in 2012, 35 years after Jimmy Carter's message was launched with Voyager 1, was an experiment that terminated in an acci-

496 Radiohead, "Bloom."

497 Jimmy, Carter, *Voyager Spacecraft Statement by the President*, 29 July 1977, https://www.presidency.ucsb.edu/documents/voyager-spacecraft-statement-the-president.

498 Nina Simone, *I Put a Spell on You: The Autobiography of Nina Simone* (New York: Pantheon, 1992), 22.

dent gone off the rails, when the Living Interplanetary Flight Experiment attempted an interplanetary mission to obtain Martian samples for analysis back on earth. Stowaways hitchhiked aboard the spacecraft, inside a sealed wallet-sized container holding ten types of organisms, each in triplicate. These were Closed Ecological Systems designed to self-perpetuate throughout the three-year round-trip to the Martian moon Phobos.

That was the plan, but the spaceship in question could not punch the surly bonds of gravity and never escaped earth's orbit. Crash-landing in a watery grave beneath the Pacific Ocean, LIFE on earth ended on 15 January 2012. Like J002E3, the intention went wayward. An empty gesture if ever there was one, LIFE put into action Jimmy Carter's sentiments, encoded onto a golden record plastered to both Voyager spacecraft exteriors when they left earth in 1977.

Had they found safe passage aboard their ark, the organisms in their wallet-sized package would have demonstrated that transpermia may be possible. Namely, that life can hitchhike inside rocks, thereby surviving interplanetary travel. Beyond this lies the panspermia theory, which holds that life did not originate on earth, but that it hitchhiked here inside asteroids, meteoroids, or comets. Beyond that lies directed panspermia, meaning human attempts to sow life on other planets.

Such is the aim of The Panspermia Society, who also go by the name Society for Life in Space. Their vision is encapsulated in a manifesto by the founder, Michael Mautner: *Seeding the Universe with Life – Securing Our Cosmological Future*.[499] In this vision, directed panspermia is a means to live on beyond this planet, over and out into the cosmos. Inextricably entangling the web of life between planets as well as within.

How far can that web stretch? The most distant human-made object in space, currently travelling beyond the heliosphere, is Voyager 1. The Golden Record riding aboard the spacecraft's exterior carries a music selection intended to be broadly representative of cultures across the world, as part of Carter's "token" of human expressivity. The empty gesture taken via LIFE was not, however, comparable to this token, but rather a literal attempt "to survive our time so we may live into yours." Where "our time" is the present tense, but the "we" that may live into the time of this new planetary future eviscerates any anthropocentric-we, or even a biocentric-we. The "we" that "may live into yours" can only be a zoecentric-we.

Because, the only anthropocentric-we that will live into the time of an interplanetary other will be human expressivity after all. The intention behind the Golden Record was that Voyager should continue its lonely space odyssey and,

499 Michael Mautner, *Seeding the Universe with Life – Securing Our Cosmological Future* (Weston, Florida: Legacy Books, 2004).

upon discovery, that the music will provide a portal for otherwise incomprehensible communication. After all, the medium is the most mystical of human expression, with Beethoven finding it to be "the one incorporeal entrance into the higher world of knowledge which comprehends mankind but which mankind cannot comprehend."[500]

Beethoven would perhaps turn in his grave to discover two pieces of his music included on this ultimate *Desert Island Disk*. After all, space is at a premium in space – all the sounds, images, and text had to be transcoded into the physical format of the standard sized record grooves of a double-sided LP. The album closes with a movement from one of Beethoven's late String Quartets, written when he was already deaf. Meaning the composer never got to hear it, just as the Golden Record may never be heard either. The joke now closes in on itself in an eternal golden braid.

Bach took the honour of having the most pieces of music by the same artist. An honour reflecting his status, which Max Richter aptly expresses: "there is Bach, and then there is everything else."[501] A sentiment echoed by biologist Lewis Thomas, when asked what message he would choose to send with Voyager:

> I would send the complete works of Johann Sebastian Bach . . . But that would be boasting . . . Perhaps the safest thing to do at the outset, if technology permits, is to send music. This language may be the best we have for explaining what we are like to others in space, with least ambiguity. I would vote for Bach, all of Bach, streamed out into space, over and over again. We would be bragging of course, but it is surely excusable to put the best possible face on at the beginning of such an acquaintance. We can tell the harder truths later.[502]

However, the harder truths will never be told, as there will be no one left to tell them. Any such acquaintance will now only be with human artefacts that outlive the aftermath of human extinction. The music, Bach's music, will only speak for itself, travelling out endlessly into a void, never to be heard, save for the infinitesimal chance an alien lifeform picks up the signal.

Putting "the best possible face" for "such an acquaintance," the Golden Record includes microfiche-like photographs, to be viewed by whatever chances upon Voyager during a day in the life of the universe. The photographs make a family album of sorts, each representing facets of different human cultures, rife with nostalgia for the long-departed portraitists and subjects alike.

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500 Ludwig van Beethoven, quoted in letter from Elizabeth Brentano to Goethe, 28 May 1810, cited in John Sullivan, *Beethoven: His Spiritual Development* (New York: Alfred A. Knopf, 1936), 5.

501 Max Richter, "Inside Max Richter's Vinyl Collection: Aphex Twin, Bach, Grouper and More," *The Guardian*, 2 September 2015, accessed 27 August 2018, https://www.theguardian.com/music/musicblog/2015/sep/01/aphex-twin-bach-grouper-max-richter-vinyl-playlist.

502 Lewis Thomas, *Lives of a Cell: Notes of a Biology Watcher* (New York: Penguin, 1978), 43.

Closer to home, 100 portraits of people adorn satellite EchoStar XVI, in geostationary orbit 36,000 kilometres above earth. The artwork is entitled *The Last Pictures*, by US artist Trevor Paglan.[503] Like the Golden Record, the portraits are enclosed in a gold disk, affixed to the satellite exterior. However, these photographs are visible to the naked eye, as tiny thumbnails that make up one contiguous rectangular grid. Their subject is similar to those depicted on the Golden Record: the complexity, absurdity, and anxiety of modern human history. But their intended audience is terrestrial earthlings, since they are anchored to a satellite that can go nowhere other than the geostationary orbit to which it is wedded.

During the first 15 years following its September 2012 launch, *Last Pictures* will share the stage with EchoStar's function, which is to beam high definition television to the US. Then, around 2027, the satellite will go dark, no longer beaming images, but still continuing its graveyard orbit, along with hundreds of prior ones already doing likewise. *The Last Pictures* exhibition will be on show for the following 800,000 years, being the anticipated duration during which EchoStar XVI will hover in that particular locale over earth, before its own fiery closing ceremony.

Drawing closer to home, another US artist, Byron Rich, made *M-Ark I (Microbiome Ark)*,[504] a fictitious device for re-seeding evolution in the event of human earthly extinction. The conceit is that the entire human microbiome is housed within a biocapsule the shape and size of a chicken egg, aboard an orbiting micro-satellite the shape and size of a basketball. This micro-satellite is programmed to jettison once humanity is annihilated, to return in a controlled descent to earth, safely delivering its payload of indispensable microorganisms for making anew a primordial MADDADAM[505] Adam and Eve for that *New World Coming*.

As much as *M-Ark I* is made to look like it could technically perform these functions, its functionality is pure fiction. The work, commissioned for the *In Case of Emergency* exhibition at Science Gallery Dublin in 2017, is a critique of the conceit of rebooting a new season of humans, not a slipping in of MAD science-as-art. While the Panspermia Society is dead-set earnest in their desire to begin *Seeding the Universe with Life – Securing Our Cosmological Future*, Rich's *M-Ark I* rubbishes the conceit and the hubris of so doing.

Returning to earth's surface and actual action (rather than satire), another US artist, Sean Connaughty, launched *Arc of the Anthropocene* on the shores of Lake

503 Trevor Paglan, *The Last Pictures*, 2012, https://creativetime.org/projects/the-last-pictures.

504 Byron Rich, *M-Ark I (Microbiome Ark)*, 2017, https://www.byronrich.com/M-Ark-I-Microbiome-Ark-2017.

505 Margaret Atwood, *The MaddAddam Trilogy* (New York: Penguin, 2009).

Superior, the largest freshwater lake on the planet.[506] The two-metre wide sphere contained a selection of plants, soil, and microorganisms that were intended to be a self-perpetuating Closed Ecological System, much like Latimer's terrarium, except with a range of plants rather than just one. Resembling a science experiment more than an artwork, the floating sculpture featured a glass portal at its top to allow the plants to absorb sunlight, alongside solar panels to provide further electric light within.

An experiment, nonetheless, and one where the instigator anticipates being outlived by the duration it would take for the results to bear fruit. Launching the arc on 2 September 2014, Connaughty declared that his intention was for it to only open to the external world after the aftermath of the ecological crisis had subsided. The incubating plants crawling out to become the new progenitors, having "survive[d] our time so we may live into yours." Like the LIFE that failed to leave earth, the arc sank within hours of being launched, leading Connaughty to crowd-fund money to raise the first arc from the lake bottom, and to rebuild one that would swim, not sink.

A few months earlier on 15 July 2014, in another part of the US, Japanese artist Azuma Makoto launched *Exobiotanica – Botanical Space Flight*, 30 kilometres above Black Rock Desert.[507] Lifting a camera, bonsai plants, and bouquets of arranged flowers into earth's atmosphere via a weather balloon, the artwork killed its subjects, as the altitude breached the biophysical limits of plant, microorganism, and bacteria alike. Unlike Connaughty, Makoto had no intention of designing an ark for the living planet. Instead, this is life persisting as a *memento mori.* The remains of the day being photographs of life frozen in death and frozen in time, like *The Last Pictures*.

Further afield, aboard the International Space Station, in 2009 NASA experimented with making an actual ark of life in space. Taking aboard seeds of four Australian plant species for six months to test the effects of microgravity and ionising radiation on the seed's propagation afterwards, back on earth. Tim Entwisle, one of the project collaborators, and then executive director of the Royal Botanical Gardens Trust in Sydney, declared that the *Seeds in Space* experiment concerned the efficacy of off-world seed banks, as a backup to the potential destructions of on-world seed banks, alongside the actual riverbanks on which they need to survive.[508]

Seeds in Space proved that space incubation is no place for seeds, since the returned travellers could not propagate back on earth. Though, even if seeds were to show a capacity to propagate after near-earth orbital storage, what biosphere would

506 Sean Connaughty, *Arc of the Anthropocene*, 2014, https://www.seanconnaughty.com/ark-of-the-anthropocene.

507 Azuma Makoto, *Exobiotanica – Botanical Space Flight*, 2014, http://exobiotanica.com/award.

508 Richard Macey, "Lofty Ambitions for Zero-Gravity Native Seeds," *The Sydney Morning Herald*, 7 August 2008.

such temporary-extra-terrestrial-earthlings return to grow up in? Those from the old world going have no home in the *New World Coming*, unless they can evolve in step, becoming something else altogether in so doing.

Post-Apocalypso Forever!

> We have through sorrow and joy
> gone hand in hand;
> From our wanderings, let's now rest
> in this quiet land.
> – Richard Strauss, *Four Last Songs* (1948)

> I don't need a pardon
> There's no one left to blame
> I'm leaving the table
> I'm out of the game.
> – Leonard Cohen, "Leaving the Table" (2016)

Whatever the vein, however earnest or cynical the expression, pestilence runs through all such future imaginaries. Whether off-world, or thoroughly down to earth, a persistent strain runs through these human views from the present tense, all of which imagine life going on, with or without us. Yet the present tense portal into life-at-large is constrained by being petrified in the present tense. Every waking moment presents a new tragedy, a new emergency, a new crisis that forecloses the event horizon. This mode of being is integral to being petrified in the long emergency that is the-twenty-first-and-last century.

With no end in sight, the only promise lies beyond, both of the temporal and the evolutionary. Because being overwhelming preoccupied with the immediate here and now is at the expense of wonder about the then and the there. About Lucy becoming petrified. About the endless cycling of plate tectonics. About how, 100 million years hence, an average of "the stratigraphic thickness of a piece of cigarette paper" will constitute the Anthropocene strata across earth.[509]

Voyager 1 is a continual reminder of the way worldviews preoccupied with the present tense have lost their sense of wonder about the then and the there. The further it gets from earth, the less often it reaches yet another milestone of performing an event never before done in astronomy, and so the less it makes the news. But when it does, these intrusions into the daily news manage to puncture the present tense and re-open the portal.

509 Zalasiewicz, *The Earth After Us*, 89.

The first fly-bys of our two immediate neighbours, Venus and Mars, provided their closest yet observation, yielding critical insights into how, when, and where they both had a liquid ocean, atmosphere, volcanism, and other resemblances. Both fly-bys were major news events. After all, understanding that good planets go bad is of critical importance for locating the "cataclysm upstream."

When Voyager 1 reached Uranus, however, the fly-by was marked by a particularly telling intrusion of the 'here-and-now' into the 'then-and-there.' It began with a major NASA media briefing on 28 January 1986, to announce the fly-by results. But much closer to home, the Challenger spacecraft exploded while the briefing was being held. Word spread like wildfire throughout the auditorium, which emptied as the journalists promptly left to file live broadcasts about the explosion.

The panel now addressed an empty room. Revelations from the first fly-by of Uranus were rendered silent because Challenger, like LIFE, failed to leave Earth in line with human intentions. While the LIFE journey crashed trying to pierce upwards through the atmosphere, and Challenger broke apart shortly after take-off, the Colombia shuttle crashed on trying to pierce downwards through the atmosphere in 2003. Disintegrating on its return to earth, hundreds of pieces of the shuttle and its human passengers landed across Texas. Like the Challenger disaster, the sheer violence and visible spectacle of the Colombia astronauts' death became the focal point of public mourning.

Yet there was cause for celebration too. The debris brought back to earth the nematode *Caenorhabditis elegans* that had been on board, part of the experiments being conducted on how space travel affects terrestrial organisms. Like the organisms aboard LIFE, the one-millimetre worms too had been in Closed Ecological Systems: petri dishes inside aluminium canisters. Not only did they return to earth alive, having thus survived the spacecraft disintegration, atmospheric re-entry, and crashing into the ground, but they had successfully bred throughout. Since their life cycle completes in less than ten days, their discovery, weeks after the incident, meant that these were fourth or fifth generation descendants from those that had left earth.

While an anthropocentric worldview would find little cause to celebrate this, a biocentric worldview may rejoice in the knowledge of successful passage from a fellow traveller from the Animalia domain. Though the real cause for celebration lies in a zoecentric worldview, as a stowaway lifeform survived too. A bacterium, *Microbispora,* was discovered in the debris as well, causing consternation as it was not meant to be on board.

Subsequent research concluded that the *Microbispora* must have been a contaminant accidentally introduced before launch, which only adds fuel to the fire that a stowaway lifeform survived the same extremes as the nematode worms.

Whereas LIFE had failed, the scientists who discovered the stowaway managed to dig proof out of the disaster that panspermia is possible, declaring that since "this organism survived disintegration of the space craft, heat of re-entry, and impact, it supports the possibility of a natural mechanism for the interplanetary spread of life by meteorites," whereby, "our findings provide experimental support for biological survival given the atmospheric-passage, heat and impact of a space-borne object, such as might occur during panspermia."[510]

Indeed, the fields of aerobiology and aeroecology have revealed the extent of aerospheric life, from bacteria that live ten kilometres above earth's surface, riding atmospheric winds between continents, to sea plankton and other microorganisms found living on the International Space Station exterior. None of this was lost on The Panspermia Society, who included three fellow eukaryotes in their LIFE mission: from Fungus, *Saccharomyces cerevisiae* (yeast); from Plantae, *Arabidopsis thaliana* (mouse-ear cress seeds); and from Animalia, *Tardigrades* (water bears).

While the *Tardigrades* aboard LIFE must have met with a watery grave in the Pacific Ocean, these curious 'water bears' have been found pretty much everywhere and anywhere one would not expect to find animals. Members of this maximum one-millimetre-sized phylum (roughly the same size as the *Caenorhabditis elegans* nematode) range in habitat from hot springs to volcanic mud, the tropics to the poles, mountain tops six kilometres above sea level to the deep sea four kilometres below, and can survive temperatures of 2°C above absolute zero through to 150°C, as well as ionising radiation in the order of an atom bomb or gamma-ray bursts, and the vacuum of outer space. Their tolerance for extremes is coupled with an ability to enter suspended animation, living without food or water for upwards of 30 years, by turning their metabolism dormant like that of a plant seed. When they do so they curl up into a ball, only to unfurl and spring back to life when reanimated by water.

Bleak, after all, is in the eye of the beholder – and from a *Tardigrade's* point of view the present tense is just yet more "endless forms most beautiful." These water bears shatter notions of life, and its limits – even here, right next to us in the Animalia kingdom. Measured against the scale of the cosmos, desperate times do not call for desperate measures, so well may we cease "attempting to survive our time" by making it through this particular rupture of life on earth, and instead take cold comfort in how we'll meet again some sunny day, given how something – and we will never know what – "may live into yours."

Did you ever see such a sight in your life?

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510 Robert McLean, Allana Welsh, and Valerie Casasanto, "Microbial Survival in Space Shuttle Crash," *Icarus* 181, no. 1 (2006): 323–325.

Fig. 21: Of Mice & Man: Western European house mouse (*Mus musculus domesticus*) meets wise human (*Homo sapien*), 11 December 2018. Photograph by Dorian Moro.