II

Shift.Happen.Stance.

". . . when all of a sudden you look down . . ."

In a walnutshell:

LSD v N-LSD >
Pre-Panama v Panama >
Australopithecus-Panama-Mid-Pliocene-Warm-Period v
The-Twenty-First-and-Last-Century >
Biogenic v Abiogenic Geomorphology >
To Sever the Head v Black Flag Day >
The Perfect Storm (voluntary) v The Perfect Storm (conscription)

Fig. 4: John W. Ivimey, *Complete Version of ye Three Blind Mice* (London: Frederick Warne & Co. Ltd, 1904).

Ghost in the Shell

> When I was a boy, everything was right
> Everything was right.
> – The Beatles, *She Said, She Said* (1966)[57]

> I feel exquisite pleasure in dwelling on the recollections of childhood, before misfortune had tainted my mind and changed its bright visions of extensive usefulness into gloomy and narrow reflections upon self.
> – Mary Shelley, *Frankenstein* (1818)[58]

When I was a boy my parents took me to the Australian Museum in Sydney. The details of the memory have been lost to time. Only fragments remain. It was around the time they said I should sing along to *Three Blind Mice* at school and when Gary Larson taught me to laugh at the universal sigh, on first seeing his 'Stegosaurus Says . . .' cartoon.

Inside the museum I stood before a heavily fragmented skeleton. In its vertical orientation it was much the same size as I. Unsurprising, given it was the petrified remains of a child that ceased to be when it was only a few years older than I was, standing there before it. Is this how the child comes face to face with mortality?

But whose mortality? For the skeleton seemed to hover in the room. An apparition encased in a coffin of glass, dramatically front lit, each bone in suspended animation against the jet-black velvet underpinning and the surrounding darkness. A ghost in the shell of an ever-so-delicate rib cage, each frond of that heart-enclosing palm pinned to the velvet. The shell is a girl who lived 3.2 million years ago. My strongest memory is her name: Lucy.

The name came from my world of here and now. The skeleton came from another world of then and there. An opaque world of the Pliocene, when hominids first appeared. In matters more at hand, I could not understand why she was called Lucy. My mother explained over and over: because the palaeontologists who discovered her were listening to The Beatles song *Lucy in the Sky with Diamonds* while they undertook the expedition. I knew the song off by heart as I was already an avid Beatles fan, something passed down by my mother's (impeccable) musical tastes.

By my childlike/nonsensical reasoning, the only way she could be Lucy was if The Beatles were around in her lifetime, wherein she had been named by Beatlemania parents. A feedback loop emerged between mother and I. Her: "The Beatles

57 The Beatles, "She Said, She Said," track 7 on *Revolver* (Parlophone, 1966), LP.
58 Shelley, *Frankenstein*, 55–56.

did not exist millions of years ago." Me: "So how could she be called Lucy?" I simply could not compute The Beatles having something to do with ancient ancestors. When one is learning to sing *Three Blind Mice*, one is not fathoming the eternal golden braid between evolution and extinction.

My next line of reasoning: "Did John Lennon write the song about her?" No, my mother explained: "Lucy the song came out in 1967, Lucy the skeleton came out of earth in 1974." This causality – that 1974 came after 1967 – came from my world. Trying to compute ancient hominids naming Lucy as 'Lucy' was unfathomable to childhood-me.

Similarly unfathomable is the subtext for *Lucy in the Sky with Diamonds*, which is at least as opaque as *Three Blind Mice.* This is why Lennon intones over and over "when I was a boy/everything was right" in *She Said, She Said.* Adults grapple with how phenomena always exceed limits to our comprehension, just as childhood-me could not fathom Lucy the song versus Lucy the skeleton.

Nonsensical reasoning has a place, though, in grappling with the incomprehensibility of phenomena as an adult. Such unreasonable reasoning does not take us back to childhood when "everything was right." It does however remind us of our most recent ghost – the perceptual imprint of childhood progressively eroded away by adulthood.

Lennon wrote *She Said, She Said* about one of his first experiences with LSD. Peter Fonda, also on LSD at the California gathering, kept declaring to Lennon that he knew what it was like to be dead, having had a near fatal childhood accident with a self-inflicted gunshot. In response, Lennon paraphrased Fonda for the refrain of "She Said: 'I know what's it like to be dead'," while proffering a retreat into his ghostly shell of childhood innocence: "When I was a boy, everything was right/Everything was right." As an adult, Mary Shelley's Victor Frankenstein laments about his own childhood, saying that "the companions of our childhood always possess a certain power over our minds which hardly any later friend can obtain."[59] A century and a half later, Lennon's song came forth from grappling with these tensions between innocence (childhood) and mortality (adulthood).

The same tensions play out in every lifetime, then for Lucy, now for us. Thus, making the Dour, which accepts this permanent state of unfathomable rupture and change, a constant companion throughout hominid evolution. The same tensions play out between being petrified and becoming petrified, then for Stegosaurus, now for us, and the Dour is the temporal portal into pre-historical times when other ruptures of life on earth unfolded. Though the Dour also takes on qualities of the Dire, now that the species undergoing both states of petrification is also witness to its own

59 Shelley, *Frankenstein*, 384.

demise. For those alive to the twenty-first-and-last century, the progression from child to adult is not just the shedding of childhood innocence for the weathered skin of adult mortality. It is the absurdity of coming of age in an age of mass extinction. The revelations impinge on everyone's life story – as if to acknowledge the present situation is to admit to being petrified about how great swathes of species – *homo sapiens* included – are becoming petrified.

At some point along an individual's life, these incomprehensible events cause a rupture without peer in the gravity of concern one brings to the burden. Dipesh Chakrabarty, one of those committed to embracing such an undertaking, likens attempts to comprehend this as being akin to falling:

> With this collapsing of multiple chronologies – of species history and geological times into our very own lifetimes, within living memory – the human condition has changed . . . But the relatively recent collapsing of these differently scaled chronologies now stares us in the face creating an affect that I liken to the affect of falling.[60]

Not only does the fall break the anthropocentric scale of time, space, and significance, there is also nothing to brace that fall, as it really is turtles all the way down, without end in sight or end itself.

On the way down, a child comes to learn not only of its own death, or of Lucy's death in her time, but of the collective petrification of mortal remains, subsumed into earth. But falling ever onwards, the adult extension of that child comes to conflate being mortal with being morbid. A morbid outlook is sensible in a non-sense universe: it is after all true that the first two universal sighs, of cosmic changeability and its consequences, offer cold comfort. But the third sigh, which comprises comprehension of this changeability and its consequences, can at least view the ever-present existential predicament with a mindset embracing the morbid the merrier.

Beauty within the bleak of one's life, or the life of a formative ancestor such as Lucy, reveals itself between the book ends of the general and the details, for between these two lie the alternating layers of comedy and tragedy. As Arthur Schopenhauer intoned in 1818, that "the life of every individual, viewed as a whole and in general, and when only its most significant features are emphasised, is really a tragedy; but gone through in detail it has the character of a comedy."[61] Had Schopenhauer been thinking of *Frankenstein*, published in the same year, he

60 Dipesh Chakrabarty, "The Human Condition in the Anthropocene," paper presented at The Tanner Lectures in Human Values, Yale University, 18–19 February 2015, 180–181.

61 Arthur Schopenhauer, *The World as Will and Idea,* translated by R. Haldane and J. Kemp (London: Routledge & Kegan Paul, 1907 [1818]), 183.

would have got an inkling of how much more vexing this becomes when the biological agency that he refers to becomes geological agency.

Wherein, the comedy and tragedy within the bleak of a single life become subsumed into the comedy and tragedy that is evolution itself. For Joseph Meeker, in *The Comedy of Survival*, this is the lesson learned when oscillating between individual tragedy and collective comedy:

> Evolution is . . . a shameful, unscrupulous, opportunistic comedy, the object of which appears to be the proliferation and preservation of as many life forms as possible without regard for anyone's moral ideas. Successful participants in it are those who remain alive when circumstances change, not those who are best able to destroy competitors and enemies.[62]

For Schopenhauer, tragedy lies in the whole, comedy in the details. For Meeker, comedy lies in the whole, tragedy in the self-flagellating tendency of details to recursively close ourselves off from the world in the pursuit of ever more (anthropocentric) detail.

In any eventuality, both beg the question: living during a "moment when crucial life support systems pass through a critical threshold" are we laughing with, or laughing at, the "unscrupulous, opportunistic comedy"? Better yet, could the comedy be laughing at us, even though it has no eye by which to behold us?

Give up the Ghost

> Do I care if I despise this,
> Nothing else matters, I know.
> In a veil of great disguises,
> how do I live with your ghost?
> – Sufjan Stevens, *The Only Thing* (2015)

Where is the merriment in Lucy's story though? The leading theory is that at the age of 12 she fell out of a tree and died from injuries sustained. Not quite a picture postcard of species-level passage from tree-dwelling ape to bipedal hominid. More the awkward leaps and bounds of evolution, where many leaps lead to death. Her merriment is much the same as any life story viewed through Schopenhauer's lens, whether my comedic childhood misunderstanding of mortality and evolution, or Lennon's absurdist adult take on mortality, viewed through his

62 Joseph Meeker, *The Comedy of Survival: Studies in Literary Ecology* (New York: Scribner, 1974), 20.

safety net of childhood reminiscence. Lennon's murder by gunshot does not change his drug-fuelled song inspired by Fonda's childhood near-death encounter with a gun, just as Lucy's accidental death does not change her tenure upon the earth. Merriment is merriment and comedy is comedy, even though it ends one for all and all for none in tragedy.

Just as we sometimes pore over the fragments of a contemporary life lived, we pore over the fragments of Lucy's skeleton to piece together our evolution through a life lived. For Lucy presents a springboard for comprehending not only *homo* genus origins, but the evolutionary descent of all alive today from some who came before. She is a ghost in the contemporary shell, but one sufficiently far removed for any possible imagining of her *Australopithecus* lifeworld. Suffice to say, the details have been lost. All that remains is conjecture.

Lucy presents this springboard as she is one of the closest candidates for the holy grail of a hominid LUCA: the Last Universal Common Ancestor. Namely, the most recent common ancestor from which all subsequent *homo* species could conceivably be conceived. This portal opens out into one much wider still: when a some*one* becomes a some*thing* depending on how far back the tape is stretched. Lucy holds a singular importance for this evolutionary descent, akin to what the Rodentia living during the end of the age of dinosaurs held for the entirety of modern mammalian descent.

Falling somewhere indistinct between so-called human nature and animal instinct, Lucy evokes connections to the first LUCA of all. Arguably, all multicellular life, from yeast to yak, shares a common ancestor if you go back far enough. Meaning that every multi-celled organism alive today could share a common descent, albeit one hidden far, far, far upstream: the prime candidate might turn out to be a bacterium from 3.5 billion years ago, but there *is* a candidate.

In Charles Darwin's *Origin of Species*, the concept of LUCA gave rise to something akin to Hume's "inquisitive humour." Darwin's merriment lay in situating *hominidae* within a tapestry of life stretching back all the way to LUCA:

> From the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.[63]

63 Charles Darwin, *On the Origin of Species by Means of Natural Selection, Or the Preservation of Favoured Races in the Struggle for Life* (London: J. Murray, 1859), 459.

Confirmation of the existence, let alone the behaviour, of plate tectonics did not occur until a century after Darwin wrote this. So, in addition to how the "planet has gone cycling on according to the fixed law of gravity," we now accommodate forces much greater than gravity in earth's workings. Though Darwin's operative use of "cycling" holds true. When continents split at the seams, newly peripheral landmass gets subsumed back into the earth's mantle, melting into magma, perhaps to be reborn as a new surface a handful of hundred million years later. Just as "endless forms most beautiful" emanate through geomorphology so too with biological evolution.

This brings us back to the tragicomedy of Lucy's permineralised skeleton. Her bones, replaced by minerals, lying fossilised in earth for three million years, until being unearthed in 1974. She and her *Australopithecus* kin lived in the southern end of the Afar Triangle in Ethiopia. This area, known as the East African Rift, is both cradle of the earliest hominids and an area of seismic volcanic activity, due to magma upwelling just beneath the crust.

Over the millions of years that early hominids evolved in the East African Rift valley, they encountered sustained periods of volcanic and tectonic activity. After all, it was this activity that created the valley in the first place, then continued to reshape it through eruptions and continental rifting. From the disastrous effects of eruptions through to behavioural adaptions that advantageously harnessed changing valley contours for hunting and dwelling, volcanism arguably played major roles in contouring hominid evolution.

Nowadays Africa is tearing into two. At the southern end of the fault line where Lucy lay a rift began opening up in Kenya in March 2018.[64] The rift is constantly expanding – the earth's surface rupturing as one continent once again becomes two: "cycling on according to the fixed law of gravity" (read: plate tectonics). Rupture is a permanent state. From those who fall out of a tree and break bones on an earth that subsequently cleaves in two, through to those whose hearts were broken, even if their bones were not, at the prospect that when the earth ruptures, it swallows whole multitudes of species, including one's own. The heart-broken observer decries – this home has always been broken.

For every Lucy – of which less than a handful are known – there are countless unknown others. Her playmates, parents, friends, and foes still lie subsumed along the Eastern edge of the west side of the rift line, now poised to face the edge of the new continent breaking away, before being sub-ducted into earth's

64 Sarah Gibbens, "Why this Giant Crack Opened up in Kenya," *National Geographic News*, 4 April 2018, accessed 22 February 2021, https://www.nationalgeographic.com/news/2018/04/east-african-great-rift-valley-crack-spd.

belly, their petrified skeletons melting into magma. In life, true to "endless forms most beautiful," as volcanism manifestly influenced hominid evolution. In death, true to "endless forms most beautiful" as they return to the source of volcanism itself.

Is Africa already the Solomon pie torn asunder? Uneven halves rifting, one drifting eastwards to South America, the other westwards as Old Africa. But what is Africa? Spike Milligan hit the head on a nail in a Goon Show chase scene. On being told the person he seeks has fled there, Seagoon the buffoon declares: "So he's in Africa, now we've got him cornered![65] Only with non-sense can stagnant assumptions about what belies stability or underlies earth be loosened and lost.

When Hume lamented how "dour philosophy has never improved the world,"[66] he had it the wrong way round. Dour philosophy was never about improving the world, because it is about acquiescing to how the world is impervious to notions of better or worse. There are no home improvement television shows for those attuned to a dour demeanour – there is only home, as habitable or inhabitable as it may be. In the long run, earth is impervious to our act of making a home, built as it is on Fichte's elephant that rests on a tortoise. For Lucy's kin this will become even more clear when they are underwater, once New Africa fully breaks apart and the inland volcanic depression of the East Africa Rift valley becomes a sea shore for the first time in many a million years.

In a walnutshell: the Dour is the act of breathing the universal sigh. It is not only the comprehension of cosmic changeability and its consequences, but also the embrace of this worldview – no matter how dire the feeling of being petrified in the face of the unfolding rupture. This has telling repercussions for assessing any philosophy concerned with the improvement of the world. The song began with three blind mice: three Protestant bishops sentenced to death by Queen Mary Tudor. Of the three, bishops Ridley and Latimer accepted their fate with a dour demeanour, since they did not seek to improve their prospects for clemency.

Cranmer, by contrast, surrendered himself fully to the sense that his predicament was dire, and so, wanting to extend his life, he played the dice by opting to recant to his master Queen Mary. Even though she had made him bear witness to his two co-conspirators' public execution, and it meant living with the petrifying prospect of being executed if she changed her mind at any moment. This is what it means to abandon the Dour, in favour of either the Dire or the Dice. As it

65 Spike Milligan, director, *The Goon Show*, season 5, episode 3, "The Dreaded Batter Pudding Hurler. Of Bexhill-On-Sea," aired British Broadcasting Corporation, 12 October 1954.
66 Hume, "Of Commerce (1752)," 256.

turned out, Cranmer's moment of being burned alive in public followed a mere five months on the heels of his co-conspirators. The Dire or the Dice may appear to hold prospect for improving the world, but the Dour would counter that such prospects are not in keeping with the biophysical limits to life: Cranmer played dice with the social limits of his life, and gained a precarious, terror-filled reprieve. But his game did not change the biophysical limits to his life. He was as vulnerable to flame after his throw of the dice as he had been before.

On a knot in the thread much closer to home, a supervolcano eruption at Mount Toba on the Indonesian island of Sumatra, 70 millennia ago reduced the population of *homo sapiens* to less than a handful of thousands.[67] Meaning those alive today descend only from those who got through the evolutionary bottleneck formed by the planetary-scale climate change occasioned by that eruption (rinse and repeat for every other time too). A bottleneck is so named because the narrowing neck is shaped like fitness curves changing too rapidly from wide to thin, thus irretrievably breaching lifeforms' biophysical limits.

From the story of one alive today, to one who lived long ago, on a "planet [that] has gone cycling on according to the fixed law of gravity" all life follows the footsteps of the departed's petrified presence. Mike Davis conveys the feeling of the former in how "life, at any one time, may seem only an insignificant scrim on the face of the Earth" relative to the knowledge of the latter: "the total mass of all organisms that have ever lived has been estimated as 1,000 or even 10,000 times the mass of the Earth itself!"[68] How could any philosophy seek to improve upon a world such as this?

It is almost as if it is not that the planet teems with life, but rather is home for colossal banks of living organisms, who the earth erratically evicts and swallows whole, then regurgitates in order to begin again with a new world order, until disorder returns once more. The lives of those who stalk its surface may all end in tragedy, but the Earth System processes to which they are party to only ever seem to revel in comedy. As the rhyme goes: ashes to ashes, dust to water.

67 Clive Oppenheimer, "Limited Global Change due to the Largest Known Quaternary Eruption, Toba ≈74kyr BP?", *Quaternary Science Reviews* 21 (2002): 1593–1609.

68 Mike Davis, "Cosmic Dancers on History's Stage? The Permanent Revolution in the Earth Sciences," *New Left Review* 217 (1996): 63.

Lucy in the Sky with Diamonds

> 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)[69]

Just as entanglements bind hominid descent to Lucy, so too are we – at the species level – entangled in a rupture contemporaneous to her and her *Australopithecus* kin. The rupture catalysed over the same timeframe and latitude where Lucy and her kin lived, though thousands of kilometres away, in Panama. Except in this timeframe, there is no such thing as Panama. At best, a pre-Panama, because no land connects North and South America.

Pacific and Atlantic oceans flow back and forth from either side of separate American continents. Over millions of years a chain of submarine volcanoes progressively build land mass between the southern tip of North America and the northern tip of South America. The ocean between both continents becomes more and more shallow, fed by waves eroding away landmass newly formed by volcanoes, coupled with currents depositing sediment as they become increasingly unable to pass from one side of the Americas to the other. Volcano by volcano, stone by stone, handful by handful of sand, two continents connect via the Isthmus of Panama.

By connecting two continents the submarine volcano chain divides two oceans. After all, what is a land-bridge but a seawall? Making the parting of Pacific and Atlantic oceans a rupture for marine life. Mating, feeding, habitats, and migratory paths are profoundly changed by new physical barriers. Along with a host of other changes to the geology, biology, chemistry, and even the physics of their newly constituted local environs. Yet it is also a rupture of sorts for terrestrial life. In the mass migration from one continent to the other, the veritable boon of a *New World Coming* for some, and the death knell of an old world foreclosed for others.

Global ocean currents and movements change markedly, now that Pacific and Atlantic oceans are completely separated by the isthmus. Consequently, so too does heat and moisture conveyance around the hydrosphere and atmosphere, as oceans circulate the vast majority of heat around the planet. Oceans otherwise passing through the space between the Americas are now pushed poleward to the northern and southern limits of the Americas, along with the heat and moisture

69 Richard Strauss, *Four Last Songs* (London: Boosey & Hawkes, 1948).

they convey. Winds follow the courses of the new currents, along with increased moisture content, courtesy of the warmer waters, eventually depositing their moisture content at high latitudes that are conducive to ice sheet formation, which, in turn, precipitate the first climatic effects: northern hemisphere glaciation.

The leading hypothesis argues that the Isthmus of Panama precipitated planetary climate change, including the Quaternary Ice Age, beginning with this glaciation 'moment.'[70] Given there have only been half a dozen major ice ages throughout earth's history, this onset was a watershed. Conversely, the relative infrequency of ice ages makes a hothouse state the rule, and ice ages the exception. Thus, for most of the greater mammalian history, our animal-cousin ancestors evolved in hotter and deeply volatile environments, while for most of specifically hominid history, our ancestors evolved in colder, though no less volatile, environments.

Repercussions from the post-Panama ice age onset continue to reverberate today. Significant not only for Lucy's kin, living on the cusp of the rupture, and for her descendants over the next 2.8 million years, living through the relentless series of glacial and inter-glacial periods of the Pliocene-cum-Pleistocene.[71] On this scale, the present tense descends directly from the same protracted series of interconnected glacial and interglacial periods precipitated by Panama. (Or rather the present tense *was* directly descended from this chain of events. Until that same present tense triggered a *New World Coming* in the middle of the twentieth century – anon to that in Act II).

Between the full formation of the Panama Isthmus and the first ice age following, there was a taste of things to come: the Mid-Pliocene Warm Period (MPWP). Owing to earth's energy balance going into net positive, MPWP featured a marked increase in temperatures, carbon dioxide levels and climate threshold crossings, starting 100 millennia after Lucy died, and lasting for the next 300 millennia. Thus, the Panama Isthmus speaks to us now as it did to Lucy's descendants: MPWP is posited to be the most recent analogue for the climate change anticipated toward the later end of the twenty-first-and-last century (all other things being unequal).

The silver lining to this rolling thunder building on the horizon is only that these past glimmers cannot be premonitions of futures. Nothing is set in stone – not even stones. Sooner or later eroded by water and wind, splintered by rifting continents, or subducted to melt back down into magma. Nothing is set, not only because we are in a "no-analogue" state, but because novel states have always been the norm, and it always will be turtles all the way down.

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70 Aaron O'Dea et al., "Formation of the Isthmus of Panama," *Science Advances* 2, no. 8 (2016): 1–11.

71 William Calvin, *A Brain for All Seasons: Human Evolution and Abrupt Climate Change* (Chicago: University of Chicago Press, 2002), 405.

Life gets where it is going, falling out of a tree or tripping over its shoelaces one day at a time. But how long is a piece of string theory? The current rupture is just a single instance on an earth full of surprises for our ancestors, as the current unravelling of its range and change capacity reveals. The *Australopithecus*-Panama-Mid-Pliocene-Warm-Period analogue shows that "sudden threshold transitions in climate systems" are nothing new under the sun. No matter how dire the situation was for *Australopithecus*, alongside the multitudes of species driven to migrate, adapt, or perish as a result of the climatic change, the coming of this particular new world reveals just why a dour demeanour is in keeping with the vicissitudes of the cosmos.

Why on earth did we ever think future(s) could, should, or would be easy strolling? The halcyon Holocene continuing to roll out in front like a yellow brick road, on the sides of which, cookie cutter houses and domesticated dreams going toe to toe all the way to the Wizard's castle. No less of a fantasy than an angel longing to sing her troubles away over the rainbow. A Lucy in the Sky with Diamonds "with the sun in her eyes"[72] sings "somewhere over the rainbow/way up high."[73] Or substitute a Judy: 17-year-old Judy Garland opened to the world in CinemaScope, followed one week later by the opening of World War II. As loners sing love songs to the atmosphere, the masses devise means to send missiles from the sky. Can you still hear her singing above the bullets flying across the skies? Can you still hear Holocene fantasies playing out in this twenty-first-and-last century? Can you still hear hominid realities playing out over ceaseless cycles between glacial and inter-glacial eras?

The universal sigh would be the largely same for *Australopithecus* as it was for the Stegosaurus. The world's climates were changing for both, though *Australopithecus* would then sigh that the ice, rather than the mammals, was taking over. As for the third part, the being trying to comprehend this did so with a passionfruit-sized rather than a walnut-sized brain. Then for them, now for us. To picture entanglements that bind us to Lucy and her unfolding rupture, imagine watching the Panama Isthmus form, not over the five million years it took to complete closure, but over a handful of decades, knowing the world beforehand and afterward will be/are unrecognisable to one another. Like North and South America. Like childhood and adulthood. Like Lucy the skeleton and Lucy the song. Like innocence and mortality. Like sobriety and LSD.

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72 The Beatles, "Lucy in the Sky with Diamonds," track 3 on *Sgt. Pepper's Lonely Hearts Club Band* (Parlophone, 1967), LP.

73 Victor Fleming, director, *The Wizard of Oz* (Metro-Goldwyn-Mayer, 1939), 35 mm.

No Society Is an Island

Even though earth is literally always rupturing somewhere or other in some way or other, only in extraordinary 'moments' are there ruptures of life on earth. The closure of Panama is a rupture orders of magnitude greater than such 'everyday' ruptures, but a rupture of life on earth is orders of magnitude greater than the closure of Panama. In the game of snakes and ladders, a moment can only really be considered extraordinary when all and sundry must pass through their respective bottlenecks of evolutionary adaptation, in ways that have never (or at the very least exceedingly rarely) been experienced by said all and sundry species before. True, every generation will experience the seasons in some way, shape, or form, and then experience a shift in seasons if they happen to live for a few decades or more. True, successive generations may come to experience wilder shifts, which, multiplied by millennia, may take on climatic changes. But only when climatic changes are simultaneously abrupt, global, pervasive, and novel does the passage come to resemble a rupture that constitutes one that life on earth is behest to.

With this in mind, Clark declares that we have "entered a situation which cries out for a degree of fidelity to events unfolding around us."[74] Except there can be no fidelity to that which is unfolding around us if we do not extend the events back across their venerable historical trajectory. Having entered the situation of a turtle flipped onto its back is not even half of the story, and neither is the story of the turtle, the desert, or the human, because how all those came to be, and how they are co-constituted, stands front and centre in "events unfolding around us."

How, then, can we have fidelity to the unfolding rupture when events are never really discrete in space or time, as per the myriad connections between the present tense and the Panama Isthmus formation, or even *Condensation Cube* and its ambient environment? The lack of discretion is especially vexing for the type of "events" that cry out for fidelity, because they are cataclysmic "moments" that render concrete the "idea of sudden threshold transitions in climate systems." High fidelity to one's surroundings may seem a concrete behavioural quality, achievable when directly experiencing the world in real-time. Not so for climate regime shifts, which occur on scales of time and space that make them difficult to render concrete: this is why Clark refers to the necessity of cataclysmic moments to push the "idea" of such change into perceivable reality. Fidelity to 'everyday' rupturing of earth, such as that occurring now along the East African Rift, appears to be attainable, but fidelity toward the unfolding rupture remains an opaque and enigmatic "idea," until the sudden threshold is crossed.

74 Clark, "Volatile Worlds, Vulnerable Bodies," 33.

Later in the same article, "Volatile Worlds, Vulnerable Bodies: Confronting Abrupt Climate Change," Clark probes a bridge between the concrete and the ideational: feeling. Confronting abrupt climate change through bodily sensitivity and flight-or-fight sensibility – albeit of the daily news variety. A grappling with the "inherent variability and volatility of our planet" through events that inculcate "a sensitivity toward the no-less inherent vulnerability and openness of human bodies – to each other and to the wider universe."[75]

This brings home the pressing relevance for such sensitivity. Recall the perennial "moment when crucial life support systems pass through a critical threshold." Clark remarks how such moments pivot on pushing or breaching the "tolerance levels of an individual or collective body."[76] Such tolerance levels can only be felt in the here-and-now on a daily basis, whether by an individual turtle dehydrating in a desert, or a turtle species dwindling in a sea. Exploring the social and biophysical limits to life, that is, their tolerance thresholds, offers a means for mediating between sensing the world, and sensitivity to its changeability and ensuing consequences. Including, of course, for breaching our tolerance thresholds, whether Lucy falling out of a tree or a species falling out of the tree of life.

Bodily vulnerability to earthly volatility extends from the intimate and deeply personal, to the genuinely atemporal and universal. It is where we go to gamble every day, in how we continually probe the biophysical limits within which we can live. It is also where we come into play with proximal and distal forces, not only running across space and time in the present, but in myriad ways that extend back into the deep past. And as with much of this stage where we come to do our gambling, the set-pieces have violent origins in the form of direct portals into earth's inherent volatility: volcanoes.

Floating beneath earth's mantle lie vast repositories of magma, stationary beneath the tectonic plates sliding across them. Those magma repositories are much hotter than the surrounding mantle, containing enough heat to penetrate and rupture earth's surface. And, over geological timespans, the 'moments' when they rupture earth's surface issue forth colossal eruptions that create landmass, leaving behind streaked snail trails across the surface as they pass over the immobile repository. Hold out your fist as the earth core and your knuckles become protruding magma deposits. Your other hand slides over this earth, moving away along the knuckle ridge. The top hand is a tectonic plate. As it moves across the fist, some knuckles will rupture through the hand, leaving behind volcanic islands now attached to the tectonic plate.

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75 Clark, "Volatile Worlds, Vulnerable Bodies," 36.

76 Clark, *Inhuman Nature*, 251.

The violent origins of such landmass are owed to forces that outstrip even the magnitude of tectonic plates: hotspots, or 'large igneous provinces' in technical parlance. The Society Islands is one such place. Or rather, Society Hotspot under the Pacific Ocean is one such place. The hotspot, sitting stationary half way between Australia and Panama, has created a string of islands over the last five million years, each the remains of the day when magma punctured the continental crust passing overheard.

At the eastern end of Society lies Tahiti: a relatively new kid on the block, created by the hotspot only 250 millennia ago. Society is not unlike the volcanoes that created Panama, except that after the continental plate has finished passing over a hotspot, new landmasses like Tahiti will get swallowed up by the ocean. Whereas the volcanoes that created Panama will keep erupting along the continental plate boundary, because they literally always rub one another up the wrong way. The thriving source of friction, fractures and fissures makes for an ever-dependable source of fire and fury bursting through the lithosphere. Which means that for those who dwell upon the surface, whether human, animal, mineral, or mountain, it can only ever be ashes to ashes, dust to water.

As a volcanic island, Tahiti is composed of precipitous mountain slopes that drop straight into deep ocean. Although no continental shelf abuts the slopes, coral extend outward, creating shallow lagoons along the island's southern edge. For the first few hundred metres the lagoon is just a few metres deep. Then, at the point that the coral reef stops, the ocean depth suddenly plunges, creating a great discrepancy between the lagoon depth above the reef and the ocean depth just beyond the reef edge.

Along this southern edge lies a surf break named Teahupo'o. The combination of coral, ocean depth, angle of descent and an excruciatingly complex series of other factors mean that it has an extraordinarily forceful wave system. The physics are of course the same as wave systems across any planet with landmasses and ocean. Such volatile processes are genuinely atemporal and universal, at least for the time since planets and water came online. But the physical intensity here is arguably unique on earth.

In English, *Teahupo'o* means "to sever the head" or "place of skulls." The potent symbol of bodily vulnerability to earthly volatility was evidently not lost on indigenous Tahitian culture (though the same cannot be said for legacy incurred by Cook, colonialism & co., leaving severed heads and places piled high with skulls here, there, and everywhere).

The force behind the volatility is thousands of kilometres in the making, comprising wave energy that passes uninterrupted across the oceans, dissipating onto shorelines the world over through broken waves. Ironically, it is coral's exoskeleton cityscape just beneath the sea surface that determines a wavebreak's placement, as

well as accentuating wave intensity. At Teahupo'o the wave energy is composed of water being pulled from the deeper ocean and instantaneously dumped onto the reef, lying only half a metre beneath sea level in low tide. In their effort to grow as close as possible to the sea surface, coral effectively make a vertical wall in the ocean.

As the reef is impassable, all incoming water must suddenly rise up out of the ocean, only to end as abruptly as it rose, crashing down directly onto the reef edge of the lagoon. The wave depth is staggering – metres thick, when even a few feet is already considered substantial. It resembles a sheer vertical wall of water rising up out of nowhere (wave energy pulsing through the deep ocean), then in the space of a few seconds, collapsing in on itself. A tsunami-like wall making landfall in the exact same spot, over and over, each and every day.

At play here are a range of limits to coral's tolerance thresholds, including wave intensity pounding down from above, solar intensity in the sea, and water temperature. The stage makes a poignant play for witnessing coral's bodily vulnerability to earthly volatility. And an eminently suitable stage for what Clark means about "confronting abrupt climate change."

Lower Your Eyelids to Die with the Sun

> Who am I without you, by my side?
> – George Harrison, "What Is Life?" (1970)[77]
>
> "We're not going to make it," he explained how the end will come
> You and me were never meant to be part of the future.
> – The Flaming Lips, "All We Have Is Now" (2002)[78]

Teahupo'o is also formed, inadvertently, by another of coral's tolerance thresholds: salinity. A reef stretches the entire length of south-facing Tahiti, save for where abundant tropical rain cascades down the steep volcano sides, creating rivets that funnel channels of freshwater to the ocean. Because of these thin strips of coral-less lagoon, no waves form in the protrusions where these channels funnel out, replacing the turquoise lagoons and white surf spray with the dark blue of deep water. While able to tolerate massive walls of water crashing down no more

77 George Harrison, "What Is Life?", track 5 on *All Things Must Pass* (Apple, 1970), LP.
78 The Flaming Lips, "All We Have Is Now," track 10 on *Yoshimi Battles The Pink Robots* (Warner Bros., 2002), LP.

than half a metre above their bodies, coral cannot grow along these channels, as they cannot tolerate low salinity water.

Limits to life are nonsensical, just like life itself. It seems unreasonable that a lifeform would suffer less from making its home directly beneath a powder keg of explosive wave activity, than in a slow-moving stream of not-quite-salty-enough water. There is no rhyme or reason as to why lifeforms have seemingly expansive tolerance thresholds for some limits – say the physics of ecosystems in which they exist – and such constricted threshold for other limits – say the chemistry of ecosystems in which they exist.

Teahupo'o is partly formed by one of these rivets, which also provides surfers with access to the massive waves by boating out along the channel. Professional surfers who want to submit their bodies to such volatility are drawn by this particular combination of optimal conditions, at what they perceive to be optimal times. The conflagration of extreme bodily vulnerability with planetary volatility comes to a head here by way of convection currents, upwelling from Antarctica, travelling up the West coast of South America. As they come to where South and North America meet at the Panama Isthmus, they are pushed hard West by a Northern barrier, thanks to the equator, and an Eastern barrier, thanks to Panama being and thus no longer being a thoroughfare. These currents coalesce into a weather system that pervades much of the Pacific. On the opposite side of the Panama Isthmus it is a mirror image, with Panama again catalyst for the corresponding Atlantic weather system.

The Society Islands bear the brunt of such storm systems, as the first obstacles in thousands of kilometres of storm gestation. One such storm had particular repercussions for Teahupo'o when, on 27 August 2011, the storm swell became so perilous the French navy declared a Black Flag Day (their colonial presence still unsubtly looms thereabouts). The declaration made it illegal to enter the sea, whether as human body or human body in boat. The aim was to prevent the surfing competition that had recently arrived for the storm-accentuated waves. For the surfers, of course, a higher probability of such storm systems at that time of year meant the contestants actually planned to enter this wave system precisely at the moment when it was likely to become extra-extraordinary.

Looking down upon this melee is a surreal sight: the surfers who defied the ban and entered the waters, along with their support boats. The boats form a small traffic jam as they delicately manoeuvre along the channel to beyond the lagoon, depositing volunteers who choose to subsume their bodily vulnerability into this here-and-now of earthly volatility. Out beyond the breaking point they are ridden into the wave barrel by jet ski riders, who then accelerate to get back to the freshwater channel before the barrel closes over them. Surfers let go of the jet ski and then attempt the same, now powered only by the wave.

Those that fell that day were dumped onto the reef, pummelled into the lagoon, and smashed from forces intolerable for us mere mortals. One needs to be able to withstand being held underwater for 50 seconds or more in the torment. Unable not only to take in oxygen, but also having such force on one's chest that any existing oxygen is pressured out. No safety stance can be held. One can only try to be bounced around within the aquatic inferno, without drowning, getting concussed, or sliced on the coral. For professional surfer and environmental activist Kelly Slater, one of those who surfed that day:

> Witnessing this was a draining feeling, being terrified for other people's lives all day long, it's life or death. Letting go of that rope one time can change your life and not many people will ever experience that in their life.[79]

An understatement if there ever was one, given those who went in pit their bodies against extreme surf conditions professionally, day in day out. Though what Slater was privy to on that Black Flag Day was in the order of one-in-a-million: the precious few who have the capital, skill, determination, aptitude, and fearlessness to survive such a maelstrom. The remainder would perish even at the thought of being near the wave system, let alone the terror of being deprived of oxygen for a minute underwater, pressed between coral reef and thunderous wave crashing down from above.

Slater's one-in-a-million mindset and embrace of being petrified is palpably captured in footage shot by Chris Bryan. Shooting at 1,000 frames per second, already vulnerable bodies become stretched and contorted beyond limits of what seems possible. The terror plays out in excruciating slow-motion when watching this back in 'real time', of 25 frames per second. Six seconds of a breakdance with death plays back as a four-minute ballet.

Human figures are dwarfed by the enormity and ferocity, sliding down the wave face, desperately trying not to buckle at the forces pushing the surfboard one way or another as it slides down a near vertical surface. No sooner has the surfboard created ripples, than the ripples rise up the waveface, towering overhead, forming a spiral that becomes the wave lip crashing into the water surface just above the razor-sharp coral. The wave lip crashes with the iridescent light of exploding foamy water in the tropical sun, whereas the wave's thickness makes the inside of the barrel so dark that surfers seem to pass from day to night when they enter it.

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79 Kelly Slater, quoted in Chris Bryan, *Biggest Teahupoo Ever*, 27 August 2011, accessed 18 December 2015, https://vimeo.com/35328567.

Time stands still inside a life-or-death predicament moving so rapidly that the surfboard ripple appears to defy the spacetime continuum. If the surfers make it down the waveface, they disappear into the void that is the wave barrel, upwards of five times their height. If they make it through to the other side, they slide smoothly off the board into the wave-less freshwater corridor, mere metres away thanks to the abrupt change in salinity of the channel. If they falter, they are swallowed whole by the monster, to be spat out upwards of a minute later hundreds of metres down in the shallow lagoon. Or, on other days, to not be. Five surfers have died at Teahupo'o, though ironically none on Black Flag Day.

Bryan's excruciatingly slow-motion footage is set to the song *Lower Your Eyelids to Die with the Sun*, by French electronic musician M83.[80] The song is a bombastic *tour de force* of shimmering choir and heavy-laden keyboard chords falling somewhere between a slow-paced funeral march and watching the last sunset of your life fade before your eyes. Sound and vision marry in perfect harmony: an invitation to consider volatility and vulnerability in, of, and to life and the universe.

Coral are not visible in the video, though their wave-accentuating presence stamps every frame. The universe is also not visible as such, though the gravitational forces working galaxy M83, 15 million light years away, are the same that work the wave system. Bodies – whether human or planetary – imbibe these invisible forces and ultimately acquiesce to them, even if the apparent plasticity of the human form gives the impression that it may dance at will, when it is actually being puppeteered by forces it feigns to see, the same as those it feigns to understand. Nowhere is this more the case than when "confronting abrupt climate change" and at no time is this more the case than now.

ENSO on ENSO forth

> The whole series of my life appeared to me as a dream; I sometimes doubted if indeed it were all true, for it never presented itself to my mind with the force of reality.
> – Mary Shelley, *Frankenstein* (1818)[81]

Speeding up the closure of Panama Isthmus renders a rupture unfolding over the duration of a human lifetime. Rendered here into comic relief like a sped-up Benny Hill chase scene, the farcical speed is not actually farfetched. Greenland

80 Anthony Gonzalez, "Lower Your Eyelids to Die with the Sun," track 15 on *Before the Dawn Heals Us* (Gooom, 2005), LP.
81 Shelley, *Frankenstein*, 322.

ice cores attest to numerable past changes in the order of 10°C over periods of decades.

Slowing down Teahupo'o on Black Flag Day renders palpable the biophysical limits to a human life, closing in over the duration of a moment. Like watching Panama form as a metaphor for witnessing abrupt climate change, Bryan's footage offers a metaphor for human tolerance thresholds against climatic forces.

In a technical sense, Teahupo'o's surfers have comparable limits to life as you or I. Like our dehydrating turtle, individual humans have negligible plasticity for tolerating less oxygen, more concussion, or sharper coral cuts to their flesh (with the exception of the demands of local adaptations, such as high-altitude Tibetan and Peruvian peoples' ability to live with less oxygen in their blood than sea-level attuned peoples). Blunt force trauma is blunt force trauma.

In an affective sense, the existential challenge thrown up by Teahupo'o on Black Flag Day serves up a metaphor for the bottleneck facing *homo sapiens.* The proportion who could potentially make it through the rupture is akin to the proportion of those who can already surf Teahupo'o on Black Flag Day: 'Challenges to Present You' are a subset of 'Challenges to Present Us', which become a subset of 'Challenges to Future Us' (including whether there will be a Future Us at all). This metaphor falls down though when considering that volunteering to submit one's vulnerability to earth's volatility was represented at Teahupo'o by thoroughly unrepresentative survivalists of the fittest. And if this is the one-in-a-million *homo sapiens* who could pass through the narrow bottleneck, it is because the remainder are conscripts, not volunteers, to the maelstrom.

Once again, distal and proximal effects still flowing from the Panama Isthmus manage to highlight this discrepancy between volunteers versus conscripts for confronting abrupt climate change. While one weather system was creating the storm that resulted in Black Flag Day on the Pacific side of the isthmus, on the Atlantic side Hurricane Irene had also been building up for the week prior. And like the storm system that produced Black Flag Day, Hurricane Irene also owed its origin to the upwelling of ocean currents from the Antarctic. Though on the Atlantic side convection currents push down the west coast of North Africa, where the equator pushes them westwards at the point of Panama. Blocked by the isthmus, the warm waters run northwards along the east coast of North America, bringing the gulf stream to Europe.

Hurricane Irene made landfall on the United States at the exact moment the surfers were jumping into Teahupo'o. Touching down in North Carolina, Irene continued inland, only returning to sea at the far northeast coast of Canada. It left behind a trail of destruction, including 49 direct deaths. While North Carolinians flee water whipped up from ocean onto land, surfers voluntarily leave land to enter the Black Flag waters of Teahupo'o.

One decisive "moment" in time. Two irreconcilable encounters with mid-oceanic storm systems on opposite sides of Panama. As the one embraces for impact, leaning in to the maelstrom, the other braces for impact. Polar icecap differences aside, both also connect to the formation of the Panama Isthmus in another way, too tangled up in blue to be true: storm systems on both sides of Panama are heavily influenced by the El Niño Southern Oscillation (ENSO). Enso on and so forth**:** ENSO is arguably a phenomenon created by the Atlantic and Pacific oceans being cut in two by the Panama Isthmus. Making the decisive moment of voluntary near death at Teahupo'o on Black Flag Day inter-fold with the involuntary moment of multiple deaths carried across the continental US by Hurricane Irene, and connecting both with the geological moment of mass death manifested by the volcanic activity that brought the Panama Isthmus into being in the first place. A moment "when crucial life support systems pass through a critical threshold – the realignment of meshing tectonic plates, the irruption of a viral epidemic, the tipping of climate into a new regime . . ."[82]

These are the confounding stage directions of the present tense and the fidelity it requires to extend presently unfolding events back across their venerable historical trajectory. Who thrives and who dies in daily life or in the midst of a planetary scale rupture has no rhyme or reason. For some, a boon. For others, a curtain call. Rinse and repeat for life at all scales and forms. The dour demeanour that sings the universal sigh does so with an added despondency in the present tense, recognising how we are all ensnared in Black Flag Days now: "the future" as William Gibson remarked, "is already here. It's just not very evenly distributed."[83] But the real lack of 'even distribution' lies in our recognition that *that* future is here.

This is how the million to one face the rupture of abrupt climate change. Whereas, for the other 999,999, when colossal forces come into our lives, they send us scurrying away like the *Three Blind Mice*. Legions of support people are obliged to rescue extreme sportspersons, or to recover their corpses when they do not make it through the barrel. Likewise with hurricane victims. But both analogues break down in the dour acknowledgement that there is no one or nothing coming to rescue humanity.

Not that there aren't telling inequalities in how the million to one come to face abrupt climate change, because of the uneven distribution of the future. Teahupo'o's barrel-as-bottleneck metaphor does not revel in heroic (white, European)

82 Clark, *Inhuman Nature*, 251.

83 William Gibson, interview with Neal Conan, *NPR Talk of the Nation*, 30 November 1999, https://www.npr.org/programs/talk-of-the-nation/1999/11/30/12966633/.

men valiantly navigating the maelstrom to find safe passage on the far side. A species facing an evolutionary bottleneck is a collective failure for the 99% whose tolerance thresholds cannot withstand the constricted conditions of the wave barrel. Nor does Irene's vertical hurricane funnel-as-bottleneck metaphor endorse a myopic business as usual attitude, right up to the point of buttressing the windows to withstand the approaching hurricane. (The unrepentant idiocracy of business as usual will be burned at the stake in Act II).

When house and inhabitant alike are sucked into a hurricane, the bottleneck is equally careless of those who ride it out in a concussed Joseph-and-the-technicolour-dreamcoat state, singing their troubles away over the rainbow, and those who ride in full awareness of the catastrophe into which they have fallen. So what do we gain from no longer conflating the world with our worldviews of it? What life-affirming quality could possibly be etched into the layers of paint? The Dour demands we recognise the fundamental volatility of the cosmos, and the vulnerability of life-at-large to those vicissitudes. But what sort of affirmation is it, to bring the "inherent variability and volatility of our planet" into a "sensitivity toward the no-less inherent vulnerability and openness of human bodies – to each other and to the wider universe"?[84] To which the improv comic can only respond: 'Yes, and . . .?' to see what more the wider universe has in store for becoming "'true' to conditions and processes that threaten a radical undoing of the human capacity for collective action."[85]

We can barely speculate about how Lucy and her kin grappled with their vulnerability to planetary volatility, though we can suspect that they lived with a truth toward "conditions and processes" for their radical undoing that is as lost to us as their extinction is to the history of life on earth. Whereas, we can more than faintly recall the ghosts in our shell of our *homo sapien* ancestors living during the Mount Toba eruption, with their songs, stories and myths coalescing in such acts as the ritualised burial of their kin. Whether *Australopithecus* or Upper Palaeolithic *homo sapiens*, we retain a great corpus of their biophysical limits, just as we face the same cosmic vicissitudes that they lived at the behest of.

Here the Dour rears its head once again – reminding us of our venerable lineage, punctured by insufferable vulnerability, played out subject to planetary volatility. Ashes to ashes, dust to water. Such is life. Such is now (with the bitter twist that the venerable lineage is ending with us endlings, having exposed our vulnerability to suffering at the hands of the *human-enhanced* volatility of the planet.)

84 Clark, "Volatile Worlds, Vulnerable Bodies," 36.
85 Clark, "Volatile Worlds, Vulnerable Bodies," 31.

To attune a sensitivity toward that dour demeanour we need take leave of earth and go back to the formation of the planet itself, to do away with any and all notions of predictability and periodicity. The stream of water cascading down the Tahitian mountainside may appear to end as it empties into the ocean, but the cataclysm continues upstream and down. Giving and taking like a moon waxing and waning, a tide ebbing and flowing, or the unannounced arrival of an unlikely companion:

". . . when all of a sudden you look down . . ."

Fig. 5: Teahupo'o, Black Flag Day, Tahiti, 27 August 2011. Photograph by Ted Grambeau.