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Portrait of a Grief

We assault the living world from every angle, and all at the same time. As we remember this onslaught, we grieve. Reminiscing is a powerful act. In grieving, we consider the state of our natural environment and take the necessary actions to rectify our abuse of the living planet.

Natural systems change from state to state, and we are failing to pay attention. When I was nine or ten, I recall native freshwater fishes – *toragsoy* and *poyo* – and snails – *agihis* and *igi* – were so typical we caught and collected them in streams and even in the small canal across from our home. I barely paid attention to this abundance. But ecosystems are now collapsing, almost year on year, and this has made me think and ask: where are those fishes and snails (Jackson et al., 2001; Peterson, Carpenter, and Brock, 2003; Crispin and Simonetty, 2015)?

Globally, industrial-scale meat production, mining, and fishing continue to swell as the face of the Earth is ransacked clean. Industrial-scale looting of the natural environment is the *fons et origo* of biological obliteration embodied in the bewildering disintegration of our oceans (Hughes et al., 2019; Pratchett et al., 2021), extinction of vertebrate species (Ceballos, Ehrlich, and Dirzo, 2017; Ceballos, Ehrlich, and Raven, 2020), the sprint to chop remaining virgin forests (Barlow et al., 2016), dying coral reefs (Pratchett et al., 2021), melting glaciers and sea ice (Gobbi et al., 2021), and contracting and drying lakes and wetlands (Pham-Duc et al., 2020).

The root of this rapid species decline is no secret. If my village in the southern Philippines is a microcosm of this accelerating change, the decimation can be traced back to rapid changes in the natural environment. Inorganic agricultural practices proliferated (Agboola and Bekun, 2019; Olanipekun, Olasehinde-Williams, and Alao, 2019); the number of mouths to feed increased (Wang and

Dong, 2019; Khan, Hou, and Le, 2021). Economists trumpet this as development, but we should label it as it is: a pillage, an act of plunder. Our natural world is *in extremis*. We are devouring the planet beyond its capacity to replace.

As the COVID-19 pandemic raged, we learned new things about our nearest neighbour in the universe. There is now evidence that flowing water once existed on Mars and that subterranean aquifers might be present on the red planet (Salese et al., 2019; Balme et al., 2020). This is an irresistible find for astrobiologists looking for prospects of life in the universe. As human ingenuity continues to seek new knowledge, we cannot even begin to contemplate other marvels that are set to unwrap in years to come. The idea of life other than on our planet has captivated our species since perhaps the first time our ancestors in the savannahs of Africa gazed at the night sky. Why does it seem that we have lost interest in the species that live on our own planet?

Consider what would be different if we accorded the same importance to the water on Earth as we do to the potential of finding water on Mars. Only 3 per cent of all water on our planet is fresh water, and two-thirds of it is stored in ice (Postel, Daily, and Ehrlich, 1996). Potable water is a crucial resource, but not every country has ready access to it. Hong Kong, where I live, imports most of its water supply from mainland China. Despite this, we continue to think that fresh water is easily accessible, when in fact, many of our streams, lakes, and groundwater supplies are already depleted (Hogeboom, 2020; Chen et al., 2018) and the water left in these areas is often so polluted that it poses health risks to people who continue to use it (Yaleliere, Cobbina, and Duwiejuah, 2018; Mekonnen and Hoekstra, 2018).

On Earth, when we find salty water – like what was presumably found on Mars – we show our gratitude by going on a rampage and destroying everything in it. In an undergraduate class I teach, one of our early class activities is the fish banks game. Developed by Massachusetts Institute of Technology Sloan School, in this multiplayer, web-based simulation my students play the role of fishers seeking to maximise their net worth as they compete against each other and deal with different volumes and prices of fish stocks and their catch. The simulation provides students with the opportunity to manage resources sustainably in a common-pool resource setting, given the changing dynamics of the available common-pool resource: in this case, fish stocks. As is often the case in real life, we would end the simulation with fish stocks almost depleted. All this occurred as ‘fishers’ sought to maximise their catch and increase their net worth. This, of course, came with a price. Fisheries were pushed to the brink due to decisions that unfolded over time.

I am a pescetarian. General Santos City is a seafood capital, on the mouth of Sarangani Bay, south of my home province and about a two-hour drive from

home. Every September, the city hosts a tuna festival. I am now wondering whether these festivities were indeed homage to the bounty of the year's catch or a memorial to once abundant ocean species. The Pacific bluefin tuna, which spawns in the northern part of the Philippine Sea south of Japan and Taiwan and migrates to the eastern and southern Pacific, is threatened. Despite having formerly populated the oceans in their countless millions, this species of tuna, according to the latest estimate, is now less than 50,000 (Geib, 2022). Yet, they are still actively hunted by fishers since they fetch very high prices.

Also in my country, the West Philippine Sea is not only a military hotspot but also a paradise – for now – for Chinese fishers dragging their trawls in the waters. No one knows the extent to which these trawling operations impact the rich marine diversity of these waters. The West Philippine Sea is not only a space that provides fish for Filipinos; it also serves as spawning grounds for schools that populate the seas of South East Asia. As climate change accelerates, coral reefs are also under so much strain (Pratchett et al., 2021), and it is possible that by the middle of this century – that is, in less than thirty years from now – most of these reefs may no longer exist (Goreau and Hayes, 2021).

The best approach that governments have found to handle the problem of the devastation of the natural world, thus far, is to step back and let the market decide. The proliferation of corporate sustainability branding and Environment, Social, and Governance (ESG) standards signals how governments are leaving the problem of dwindling and disappearing resources up to consumers' consciences (Albert, 2020; McLennan and Banks, 2019). Because so little knowledge is available, the onus is left on our shoulders. It is now up to us to determine what we should take from other species and from other people. It is also up to us to decide what we should keep for ourselves or pass on to the generations who will come after us. This is a recipe for destruction.

Dredging, drilling, excavating, and polluting appear – it seems to me – to be preconditions for ensuring humans have access to the full range of human experience. Ingenious methods of destroying things are developed every year. And every year, humans grow more desensitised to the imbecilic exploitation of our planet's valuable resources. As economies become wealthier, it will no longer be a surprise to learn that those living in affluent countries in the Minority World – including Hong Kong – are almost becoming less concerned about the impacts of their actions on the living Earth. I live in Hong Kong, where almost everything the city consumes is imported. I tried to grow okra on my windowsill, but I failed.

The loss of biodiversity and ocean acidification are called slow-onset climate change hazards. If there is one thing we know about the impending climatic collapse, it is that the processes leading to the catastrophe will not be linear or smooth. Our climate system will take the load for a time, then – most likely

without warning – abruptly flip (Alley et al., 2003). However, adaptation programmes adopted worldwide to prevent climate shocks are straight, seamless, and gradual. Accelerated and swift climate action given the possibility of surprise is an absolute need right now.

The problem with the unhurried and piecemeal climate action approaches in current proposals is that they were designed on the assumption that a climate system functions as a simple system. The climate system is considered as if it is a washbasin, in which one can stop the tap until the input is less than the outflow. But the climate system is a complex one. All systems seek equilibria, meaning that systems flip quickly into another state when pushed too far out of their balance.

Often, complex systems have the characteristic that pushing them beyond their tipping points will be far more straightforward than pulling them back from those points. When change has already occurred, it is impossible to go back in time and undo it. Once it has flipped to a new equilibrium, the climate system will not be as it was. At the end of his 1925 poem *The Hollow Men*, T. S. Eliot tells us: ‘This is the way the world ends, not with a bang but a whimper.’ Perhaps, and more likely, it will be the other way around.

What is worrisome is not only that fish stocks are dwindling and coral reefs are bleaching but also that we build our assumptions of the Earth’s tipping points as being a long way off. These are dangerous assumptions. In February 2021, at the height of the COVID-19 pandemic, it was found that the Atlantic meridional overturning circulation, often known as the mechanism that drives the Gulf Stream and responsible for distributing heat all over the globe, may now be nearing a crucial change (Caesar et al., 2021). This circulation has experienced several phases of ‘on’ and ‘off’ over prehistoric periods, which has resulted in extreme cold in northern Europe and eastern North America, increased temperatures in tropical regions, and disruption of monsoon patterns. The article by Caesar et al. (2021) strongly suggests that this heat redistribution mechanism is now at its weakest state in over a millennium. Juxtaposing present evidence with prehistoric shifts and their impacts, the future seems to be bleak.

Other systems might also be reaching their thresholds within a generation or two, including the West and East Antarctic ice sheets (Ge et al., 2022), the Amazon rainforest (Amigo, 2020), the Arctic tundra (Foley, 2005; Lenton, 2012), and the boreal forests (Lenton, 2012). These ecosystems are fast depleting the carbon they store, which drives a cycle of increased global heating. The Earth systems do not remain confined to their designated spaces; hence, it is possible that as these systems transition into their new states, they will cause changes in other states. It will be a snowball effect (Lenton et al., 2019). This means that even a temperature increase of just 1.5 or 2°C might still bring about abrupt changes in present conditions.

Increasing volatility is a classic indicator that complex systems are getting close to their tipping points (Scheffer et al., 2009). Volatility indicates that systems have begun to fluctuate. The weather extremes observed, felt, and experienced in 2020, 2021, and, as this chapter is written, in 2022 are, to put it bluntly, scary. Fires and floods became familiar events. While some parts of the world baked, other places were inundated with rain. If the Earth's systems start to tilt due to global heating, taking insufficient action, or none, will not make much of a difference in the long run. All that we have done and everything that we have been – the intricacies of human knowledge, our experiences, our stories, our love, our fury, and our hope, will be reduced to relics.

The goal that most countries have now set for climate action – reaching net zero by the year 2050 or even earlier for some – starts to appear insensible and insecure (Lin, 2022; cf., Hale et al., 2022). It is correct that some kind of net zero is our only chance of preventing a climatic breakdown of catastrophic proportions. Greenhouse gas emissions must be decreased by decarbonising economies and removing carbon dioxide from the atmosphere. Without achieving both, it is already too late to meet the temperature objectives set in the 2015 Paris Agreement. There are, therefore, two aspects that governments should be concerned with: pace and authenticity of climate action. The transition must be accomplished quickly before systems spin out of control; and climate action must be truthful and honest. This means facing up to the challenge directly.

At its worst, the goal of achieving net-zero emissions by some future year is a vehicle for countries and nations to shuffle the blame temporally and spatially. Those in power now attempt to shift the burden of their responsibilities onto those who will be in charge tomorrow. A number of these plans depend on either technologies or the natural world to collect the carbon they want to continue emitting. These methods include carbon capture and storage. One of the technologies involves collecting emissions from power plants and cement and steel factories and depositing them in rock layers. Another technology is via direct air capture: containing carbon directly from the atmosphere and burying these emissions too. Although carbon capture and storage has been discussed over the last twenty years, it is improbable that these technologies will ever be implemented at a large scale (Low and Schäfer, 2020; Haikola, Hansson, and Anshelm, 2019). The reason for this cynicism is that these technologies are not yet being implemented at large scale today, because of constraints that we already knew.

The only thing that is left in this technocentric approach is to manipulate nature by banking on the ability of the world's biological systems to soak up the gases that humans emit. The problem, however, is there is not enough land in the world to fulfil the commitments made by governments to reduce emissions. Farmers and farm owners would also prefer someone else to be responsible for dealing with the

gases produced by their properties. This preference contrasts with governments' net-zero promises that require farms to first achieve significant reductions, including ceasing industrial livestock and grain farming practices.

Let us be honest here. The prospect of a climate system restored to its safe levels is derailed by governments' inability to halt fossil fuel combustion and replace energy systems with renewables speedily and at scale. Even in a scenario of the most optimistic future, when governments deploy all of the planned technological solutions, the climate action we now have in place is still set to condemn us to a disastrous increase in global heating of 3°C. A mere 2°C heating could already flip the system. Changes cannot be undone when that point is reached. Relying on technologies that have not yet been developed and on capabilities that do not yet exist is a recipe for disaster.

The only way to halt the full-spectrum attack we are launching on Earth systems is to scale down the aggression we are hurling at the planet. The sheer magnitude of economic activity powered by the wanton burning of fossil fuels is the root cause of all of these impacts (Kallis, 2011). We are overdoing almost everything, and the Earth's biological systems are struggling to keep up with us. However, since we cannot perceive the big picture, we will be unable to address the climate catastrophe in a systemic and successful way. When we pigeonhole the climate dilemma, our attempts to find a solution to one facet of the emergency make another facet of the crisis worse.

When coral reefs are harmed by human activities such as overfishing, trawling, and the coral bleaching induced by global heating, the appropriate response is to harvest the bounty of the sea sustainably (Melnychuk et al., 2021). This entails letting ocean resources recover before they are harvested again. The droughts and fires inflicted on the landscapes by climate disruption can be addressed by reining in livestock grazing and industrial agriculture (Bezner-Kerr et al., 2011). Reducing, if not curtailing, human activities on the seas and lands has to be paired with efforts to intensify the reduction of present and future emissions.

Indeed, a rapid mitigation project to curtail emissions is essential. This means deploying market-ready and cost-effective renewable energy systems to replace extant coal, oil, and gas power plant facilities while reducing energy consumption of all sources. Suppose we were to construct direct air capture devices instead of transitioning to renewables. The critical challenge is not only that we do not have these technologies ready for deployment, despite decades of research, but this moment in history – when the world is in the midst of a pandemic – offers governments an opportunity to make the transition – both technologically in our energy systems and in the ways we consume things.

If we do not reduce the amount of economic activity that is taking place, we have no chance of escaping the climate crisis (Victor, 2012). To keep our life-support systems running, we need to do less of almost everything. There may be a more significant number of bicycles and electric cars plying the roads; however, there are also more aircraft and internal combustion engines. It makes no difference how many positive things we do; the only way to stop the environment from breaking down is to curtail economic activities, particularly in the Minority World.

One cannot just gloss over this underlying issue. Economic progress, the power that pulled millions out of deprivation, provided education, and treated diseases, is now tipping us back. It is difficult to challenge ideals such as economic growth, consumption, and materialism, especially since they are questioned the least in many Minority World societies. However, the notion that this existential crisis is not taking place is the most remarkable kind of denial. It is a disservice to humanity.

Then what to do? We start a conversation. The resolve of campaigners, organisers, and activists to shift public attitudes around contentious issues was a significant contributor to the sea change in views that has taken place in recent years. Regardless of how uneasy it makes us, and those around us, feel about the climate emergency, we need to discuss major taboo topics: not just the deterioration of the environment but also the rise of unfettered consumerism – especially by the uber wealthy – widening inequalities, and the decline of the culture of care, empathy, and respect.

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