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All is well. Planet Earth is Safe (1)



It is OK.

All is well.

Planet Earth is safe until the collapse of our solar system when the sun burns out in **5 billion years**. Our planet was formed about 4.5 billion years ago and has survived all onslaughts such as meteor strikes and solar storms. There have been at least five mass extinction events over Planet Earth's life.

Whilst the causes are not clear, perhaps due to volcanic activity or even an asteroid impact, the effect appears to have been climatic.

Consequently, the idea of climate change is not new. Indeed, it is estimated that there have been four major Ice Ages in the last 600,000 years alone. Irrespective, Planet Earth's life has demonstrated its resilience with new lifeforms (e.g. mammals) emerging and taking over to replace the dominant forms that became extinct (e.g. dinosaurs).

So, what is this human preoccupation with climate change, deforestation, biodiversity loss, pollution and the rest? Is it not all part of Planet Earth's lifecycle?

There are many symptoms that something is wrong.

Global warming

The last few years have seen unprecedented weather conditions. In March 2023, the **southern coast of Africa** was hit by one of the strongest and longest-lasting tropical cyclones on record. Just recently (March – April 2024] the **Sahel and West Africa** have experienced extreme heat with temperatures exceeding 45oC. In contrast, **Russia and Kazakhstan** have experienced the worst flooding in 80 years.

Longer term, the dominant greenhouse gas (GHG), **carbon dioxide** (76% of GHGs), has grown by around 5.5 times the level it was in 1950, which took over 100 years to get to that level. The impact of **global temperatures** is that Planet Earth has warmed by about 1.36oC

since the late 19th century, with the last ten years being the warmest on record.

Wildfires are increasing around the globe in frequency, severity and duration - WHO

The World Health Organisation reports that '**wildfires** are increasing around the globe in frequency, severity and duration...'. Since 1970, **mountain glacial retreat** has been equivalent to a 27.5 meters reduction in ice height per glacier this resulting in sea level rise. Indeed, the **global mean sea level** has risen by around 21-24 cm since 1880, this arising from melt water.

The sea level rise over 2006-2015 was 2.5 times the average rate for the previous 100 years. Over the last 120 years, the **sea surface temperature** has increased by 0.93oC, at the average rate of 0.14°F or 0.08oC per decade. A rise of 1oC has a destructive effect on the **coral reef ecosystem**.

Industrial revolutions

One prominent dynamic shaping these changes is climate change, captured in the temperature, precipitation and wind complex and manifesting in such events as floods, droughts, storms, mudflows and heatwaves. Its impact is to change terrestrial, freshwater and marine ecosystems and thus the habitats of local species.

One could attribute this to natural geological events such as earthquakes and volcanic activity. Indeed, past mass extinction might be explained by geological activity.

However, the rate of change of the phenomena mentioned reveals the impact of humans, particularly over the last hundred years or so.

The **first industrial revolution** of the 18th Century was perhaps the trigger for the explosive growth and globalisation of production, trade and consumption that has

subsequently ensued. This first industrial revolution was symbolised by machines, factories and canals.

This recent revolution is perhaps the turning point from a planet being in homeostatic balance with human activity, to one of growing instability with population growth contributing to this

There have since been four more industrial revolutions, with each characterised by the emergence of configurations of new forms of technology, this leading to institutional, economic and social transformations. The 2nd industrial revolution was the age of steam, coal, iron and railways.

The 3rd was the age of steel and heavy engineering. The 4th was the age of the automobile, plastics and mass production. The current 5th industrial revolution, commencing in the late 1950s - early 1960s, is the digital world of information technology and telecommunications.

This recent revolution is perhaps the turning point from a planet being in homeostatic balance with human activity, to one of growing instability with population growth contributing to this.

The demand for resources

The **global population** is estimated to have been around 50m in 1000BC, this growing steadily to around 813m in 1800, hitting 1 billion sometime around 1830. It took about 100 years to grow by another billion. By 1950, it was around 2.5m, then growing by a billion every 10 to 15 years, until reaching **8 billion in November 2022**. However, a population requires resources to live.

For example, the demand for land is consuming Planet Earth's forests. **Deforestation** is ongoing with a 7.4% reduction in primary forest between 2002 and 2023.

Moreover, whilst around a third of this is due to fire, much of the rest is for land repurposing, such as the production of commodities (e.g. beef, palm oil, minerals). To add, many **terrestrial species** are to be found in forests, with deforestation contributing to biodiversity loss.

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This demand for the Planet Earth's resources, driven by a capitalist model demanding economic growth at any cost, has taken its toll. Economic development demands energy.

Fossil fuels replaced water and wind power in the industrial revolutions amplifying capability. In 2013, **energy consumption** in its various forms (e.g. transportation, electricity and heat, manufacturing and construction) accounted for 75.6% of global carbon dioxide equivalent (GtCO₂e) emissions.

Consequently, those countries with the **highest levels of economic development** are amongst those most responsible for greenhouse gas emissions. In **2019**, China (26.4%) followed by US (12.5%), India (7.06) and EU (7.03) were the top contributors to greenhouse gas emissions.

Pollution is a legacy of the technologies of past industrial revolutions

It is not just the significant rise in greenhouse gas emissions since 1950, that is having its climatic impacts. There is also the pollution arising from the wastes of extraction, production, everyday living and the rest. Indeed, pollution is a legacy of the technologies of past industrial revolutions.

South Asia, comprising Bangladesh, India,

Nepal, and Pakistan (29% global population), has the worse **particulate air pollution** in the world. The South Asian particulate air pollution emerges from **a variety of sources**, that include vehicle and industrial emissions and construction dust, but also intentional **crop residue and waste burnings**.



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Plastic comprises 80% of all marine debris and can entangle marine species. More seriously, it decomposes into small particles down to 100nm size, which is consumed by marine species. It also contaminates the human food chain and is consumed by humans.

With the growth in electronic devices, their disposal has become an issue. Aside from the value of the metals used (e.g. gold), they can contain toxic materials (e.g. lead, mercury, flame retardants). However, the **growth in eWaste** is five time faster than its recycling. The scale of the problem is captured by the illustration

The 62 million tonnes of e-waste generated in 2022 would fill 1.55 million 40-tonne trucks, roughly enough trucks to form a bumper-to-bumper line encircling the equator (**UNITAR**)

Is it too late?

On 10th April 2024, the UN Climate Change Executive Secretary, Simon Stiell stated that there are **Two Years to Save the World**. Is he being optimistic?

The net effect of all that is happening to Planet Earth's biosphere is its complex degradation that is complemented by human deprivation in such areas as water, energy and food security, health, education and economic opportunity, as well as social equity, vocal presence and justice.

This is against a backdrop of the conflict between the right of self-determination and the exploitative and destructive power of authoritarianism, imperialism and capitalism. Self-interest and geopolitics appears to prevail.

Perhaps it is too late. There is the rhetoric of aiding, but still the weapons of destruction continue to flow

The **ACLED Conflict Index** for July 2023 revealed that there was a '27% increase in political violence incidents recorded in past 12 months', highlighting Ukraine, Myanmar, Mexico, and Palestine as topping the listings. Is geopolitics, ideology and militarisation the priority of nation states and powerful political groups?

Perhaps it is too late. There is the rhetoric of aiding, but still the weapons of destruction continue to flow. The rich want to get richer and the tribes that are the current nation states want to assert their power. Has anything changed over the many millennia that humans have spanned?

Never mind.

Despite the assault by humans, Planet Earth will survive and biodiversity will be replenished. The only real damage will be to the species called Homo Sapiens, which through its unrelenting self-destructive activity, will become extinct. From the perspective of Planet Earth, is that a bad thing?

All is well.