

# Pale Blue Dot, heating

*Humans need the perspective of distance to see how much damage they are doing to the only planet on which they can ever thrive*



By John Gibbons

**O**N FEBRUARY 14, 1990, the Voyager 1 spacecraft, then some 6.4 billion kilometres from Earth, turned its cameras backwards and captured a picture of our home planet. It was the tiniest of images, covering barely one tenth of a pixel on the digital frame, a faint speck suspended in the inky black infinity of space.

The idea for the photo came from famed scientist and science communicator, Carl Sagan. The following passage, from his 1994 book ‘Pale Blue Dot’ is perhaps one of the most poignant in all of modern literature:

“Look again at that dot. That’s here. That’s home. That’s us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. The aggregate of our joy and suffering, thousands of confident religions, ideologies, and economic doctrines, every hunter and forager, every hero and coward, every creator and destroyer of civilization, every king and peasant, every young couple in love, every mother and father, hopeful child, inventor and explorer, every teacher of morals, every corrupt politician, every ‘superstar’, every ‘supreme leader’, every saint and sinner in the history of our species lived there – on a mote of dust suspended in a sunbeam”.

Amid the awe and beauty, his writings contained a



Our climate-system trajectory is still in the zone of uncertainty. The areas that have already smashed into the red zone of extreme danger are the global biodiversity crisis and nitrogen and phosphorus flows to the biosphere and oceans.

dire warning. That mote of dust, our only home, “is a lonely speck in the great enveloping cosmic dark. In our obscurity, in all this vastness, there is no hint that help will come from elsewhere to save us from ourselves”.

Despite the delusional dreams of interplanetary adventures and Mars colonies peddled by billionaires like Elon Musk and Jeff Bezos, who believe their

staggering monopoly on wealth and resources will allow them to shake off the very shackles of this planet, in reality, humanity will survive or it will perish right here on Earth.

Earlier this year, Musk’s SpaceX company unveiled his latest gadget, named with characteristic modesty ‘Starship’. This craft is capable of transporting up to 100 people the 350 million kilometres to Mars.

To put this voyage in context, the Red Planet is almost 1,000 times further from Earth than our moon. Its destination, Mars, is a barren rock, utterly bereft of the ingredients for life, infinitely more hostile to humans than the remotest point in Antarctica or the peak of Mount Everest.

The ethos behind the race for space is a creeping realisation among the hyper-rich that life on Earth is critically endangered. “History is going to bifurcate along two directions. One path is we stay on Earth forever, and then there will be some eventual extinction event”, Musk said in 2016. “The alternative is to become a spacefaring civilisation and a multi-planet species, which I hope you would agree is the right way to go”.

The “eventual extinction event” may well be much closer at hand. Our billionaire elite can clearly sense it, but rather than deploy their vast resources and access to the levers of political, economic and media power to effect the revolutionary scale of changes necessary for our collective survival and well-being on Earth, they instead engage in fantastical projects as monuments to their colossal egos and unbounded hubris.

The great twentieth-century economist, John Kenneth Galbraith, clearly understood the corrosive influence of affluence. His book ‘A Short History of Financial Euphoria’ offered some sharp insights. “Individuals and institutions are captured by the wondrous satisfaction from accruing wealth. The associated illusion of insight is protected by the public impression that intelligence marches in close step with the possession of money”.

This is the best explanation I have encountered for the staggering myopia of extremely wealthy people who have unlimited access to expert advice and are in a position to quickly make the changes that could truly matter.

One of the enduring challenges of addressing the multiple ecological crises that confront us has been to find a way of seeing them as part of an integrated system, a ‘spaceship Earth’ floating in the void, with its crew entirely dependent on the on-board life support systems and the integrity of the hull, which on a planetary scale, means the thin atmospheric envelope that surrounds us.

In 2009, a group of Earth system scientists, led by Professors Johan Rockström and Will Steffen set about the interdisciplinary task of mapping out a “safe operating space for humanity”, to help advise governments and international organisations on how to identify and remain within this safe zone.

This led to the identification of the nine key ‘planetary boundaries’, within which Earth systems must operate, and beyond which lie thresholds or tipping points with dangerous or even catastrophic consequences when breached.

The boundaries are: climate change, novel entities, stratospheric ozone depletion, atmospheric aerosol loading, ocean acidification, biochemical flows of phosphorus and nitrogen, freshwater use, land-system change and biodiversity integrity, including functional and genetic diversity.

The famous pie-shaped visualisation (see graphic, bottom right) developed by the Stockholm Resilience Centre is colour-coded green, orange and red, to demarcate the safe, uncertain and high risk zones. All nine of these should lie well within the green ‘safe’ zone, the region where Earth systems have remained throughout the unusually stable 11,700 year recent epoch known as the Holocene.

“There is increasing evidence that human activities are affecting Earth system functioning to a degree that threatens the resilience of the Earth system, its ability to persist in a Holocene-like state in the face of increasing human pressures and shocks”, according to a 2015 paper authored by Will Steffen which aimed to update and extend the original ‘planetary boundaries’ study from six years earlier.

While all nine boundaries are vital, two (climate change and biosphere integrity) are identified as “core”. If planet Earth were indeed a spaceship, right now its red warning lamps would be flashing and its alarm bells buzzing, warning that a hull breach was imminent unless drastic remedial action were taken.

Given the global focus on the climate crisis, you might expect its indicators to be the most alarming. At the moment, our climate-system trajectory is clearly unstable, but it is rated as still being in the zone of uncertainty, meaning increasing risk.

The areas that have already smashed into the red zone of extreme danger are the global biodiversity crisis and nitrogen and phosphorus flows to the biosphere and oceans. Ecosystem damage resulting from human activities over the last half century in particular are “the most rapid in human history, and increase the risks of abrupt and irreversible changes”. So severe has the loss of biological diversity and accompanying pulse of species extinctions been that it has been characterised as the Sixth Mass Extinction event in Earth history.

To truly grasp the devastation that has already

occurred, consider that 96 per cent – by weight - of mammals on Earth today consist of humans and their livestock, with the totality of the world’s remaining wild mammals a mere 4 per cent. At the start of the Holocene, humans and their livestock would have accounted for less than one per cent of Earth’s then-teeming population of mammals.

Humanity’s race to increase food production has thrown global cycles of both nitrogen and phosphorus into chaos. Humans now create more artificial nitrogen (as a chemical fertiliser) than all Earth’s terrestrial processes combined. This is leading to serious and escalating pollution crises, both globally and as witnessed in Ireland in recent years as nitrogen-dependent industrial dairying expanded rapidly.

Thanks to decisive intergovernmental action in the 1980s, the ozone crisis has been largely averted, but other planetary boundaries are under growing pressure. These include ocean acidification (now occurring at its most rapid rate in 300 million years) and freshwater over-extraction and pollution plus atmospheric aerosols and thousands of novel chemical entities that have been suddenly introduced into the biosphere.

There remain large areas of uncertainty, but our current trajectory of ever-increasing resource extraction, consumption, pollution, land use change and spiralling emissions push us ever further beyond our planetary safe zone. With wry understatement, Steffen warned: “A continuing trajectory away from the Holocene could lead, with an uncomfortably high probability, to a very different state of the Earth system, one that is likely to be much less hospitable to the development of human societies”.

As Carl Sagan concluded: “There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we’ve ever known”. 📌

*John Gibbons is an environmental writer and commentator.*



96 per cent – by weight - of mammals on Earth today consist of humans and their livestock, with the totality of the world’s remaining wild mammals a mere 4 per cent.

