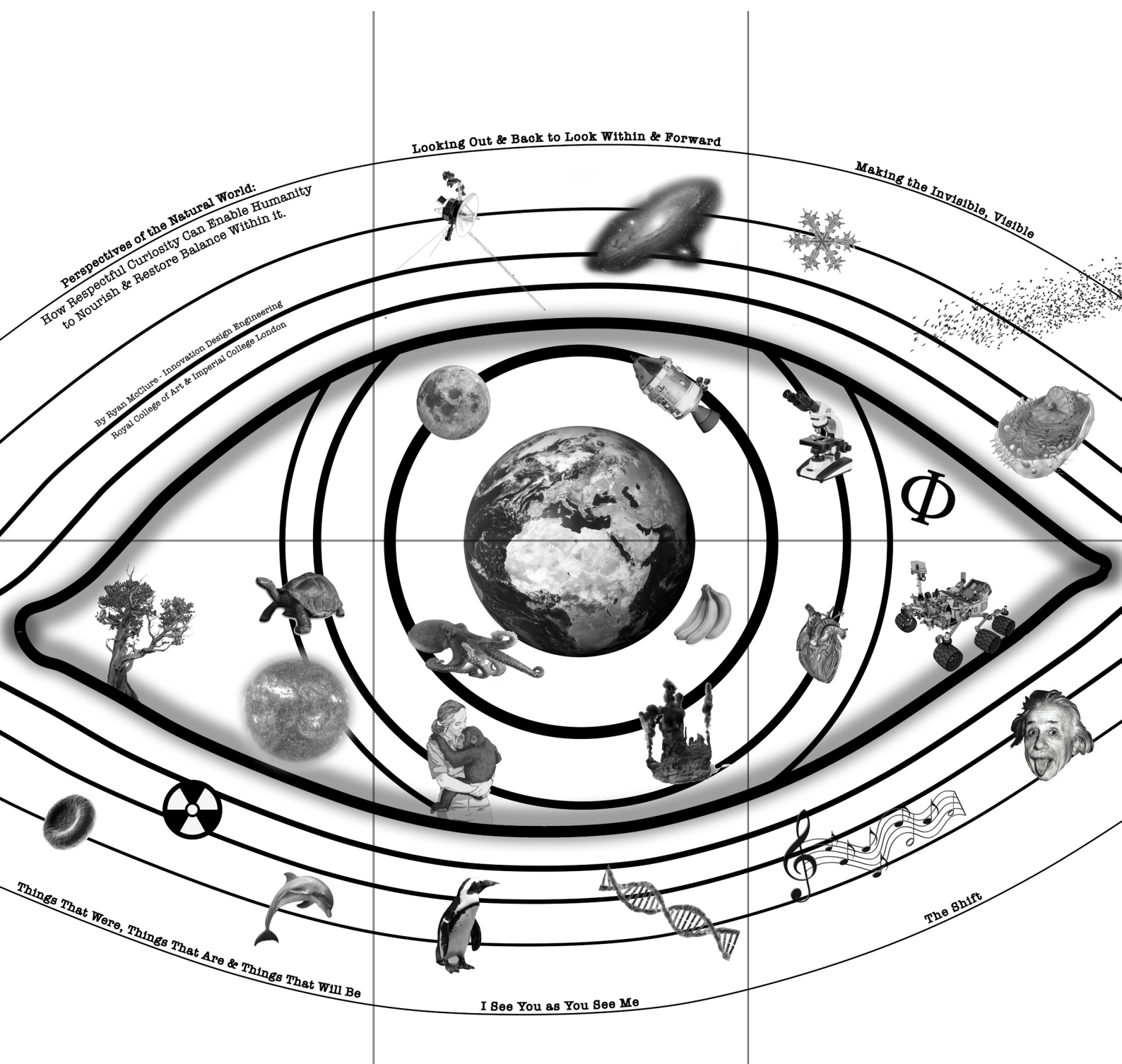


Perspectives of the Natural World:

**How Respectful Curiosity Can Enable Humanity
to Nourish & Restore Balance Within it.**

By Ryan McClure - Innovation Design Engineering
Royal College of Art & Imperial College London



Acknowledgements

I would like to thank the collective systems of our natural world for being the wisest, patient and resilient teachers of care and respect for planet Earth. We learn countless lessons from you time and time again which will allow us to save ourselves and nurture our connection with you ever more so.

I would also like to thank my tutor Richard Atkins for his support, encouragement and ability to ask good questions in order to help connect the dots in presenting this piece of writing.

Abstract

In this collective of short essays, I present insights and arguments against the idea of anthropocentrism through the exploration of 4 types of perspective of our natural world. My aim is to provoke a cognitive shift in the readers thinking and inspire curiosity for how we might as individuals and as a collective species, restore balance within the natural world.

First we take a zoom out, looking at perspectives of the planet at large from space and beyond. Second we zoom into the microcosm of snowflakes, cells & DNA whilst also touching on blind spots in modern consumerist culture. Third the differentiated timelines of the elements of nature are presented and why long term thinking is essential for a more ecocentric world. Lastly, similarities are drawn between humankind and other elements of the natural world to demonstrate equality not dominance.

Keywords: perspective, natural world, cognitive shift, anthropocentrism, biocentrism

Table of Contents

1)	Introduction	5
2)	To Look Out and Back to Look Within and Forward	6
3)	Making the Invisible - Visible	14
4)	Things That Were, Things That Are, and Things That Will Be	21
5)	I See You as You See Me	33
6)	The Shift	41
7)	An Ode to Nature	43
8)	References	44

List of Figures

1.	Figure 1 - The first photograph of Earth from space, taken on 24 October 1946.....	7
2.	Figure 2 - ‘Earthrise’.....	8
3.	Figure 3 - ‘Blue Marble’.....	9
4.	Figure 4 - ‘The Pale Blue Dot’.....	11
5.	Figure 5 - ‘Milky Way in Inca Astronomy’.....	12
6.	Figure 6 - ‘Early Snow Crystal Observations’ - In Retrospect: On the Six-Corned Snowflake.....	15
7.	Figure 7 - A 1795 illustration of van Leeuwenhoek's ‘animalcules’.....	16
8.	Figure 8 - A representation of an individual’s chromosomes known as a ‘Karyotype’.....	17
9.	Figure 9 - Cellular landscape cross-section through a eukaryotic cell.....	18
10.	Figure 10 - Murmuration at Sunset by Daniel Biber.....	19
11.	Figure 11 - The Sun: Around 4.5 billion years old.....	21
12.	Figure 12 - The Himalayas: Around 50 million years old.....	22
13.	Figure 13 - The Great Basin Bristlecone Pine Tree - the oldest tree in the world: Around 5000 years old.....	22
14.	Figure 14 - Galapagos Giant Tortoise: Around 100 years.....	23
15.	Figure 15 - Human: Around 72.6 years.	23
16.	Figure 16 - Bottlenose Dolphin: Around 40 years.....	24
17.	Figure 17 - Outer Intestinal Cells: Around 16 years.....	24
18.	Figure 18 - Dog ‘Cooper’ (Chug Breed): Around 10-13 years	25
19.	Figure 19 - Red Blood Cells in Isotonic Solution: Around 120 days	26
20.	Figure 20 - Yellow Apple Decomposing: Around 30 days	26
21.	Figure 21 - Sebald standing under a Lebanese Cedar tree.....	27
22.	Figure 22 - Chernobyl Exclusion Zone.....	29
23.	Figure 23 - ‘The Growing Pavilion’.....	30
24.	Figure 24 - ‘London Organic Skyscraper’ concept by Agence Chatier Cobasson Architects.....	31
25.	Figure 25 - Bio-Bomber Jacket’ made from bacterial cellulose.....	31
26.	Figure 26 - Roya’s ‘biogarment’.....	32
27.	Figure 27 - A hydrothermal vent in the north-east Pacific Ocean	34
28.	Figure 28 - Jane Goodall and infant chimpanzee ‘Flint’ reach out to touch each other's hands.....	35
29.	Figure 29 - Craig Foster & the Octopus. The most majestic friendship.....	36
30.	Figure 30 - João Pereira de Souza and Dindim swimming together.....	36
31.	Figure 31 - Brodowicz’s series of diptychs.....	37
32.	Figure 32 - Spotify link to the sounds of whales in the wild.....	38
33.	Figure 33 - Bird of paradise ‘Lophorina Superba’ in mid courtship dance with another bird.....	38
34.	Figure 34 - An example of ‘crown shyness’ amongst a group of trees.....	39

Introduction

Who are you?

What is your role within this natural world?

What is the meaning of such a role?

What is the essence of our being?

I would like to talk to you about these questions with an aura of curiosity, intrigue and wonder. Perhaps addressing them all at once.

I was 8 years old. My father had just put me to bed and was headed back down to the hustle and bustle of the party down below. I wasn't ready for bed, my mind was bursting with excitement and energy. I remember looking down at that poignant band of light beneath my bedroom door wondering what lay beyond as the night grew older. My curiosity grasped a hold of me and I stepped out of bed sneaking my way to the top of the stairs. An intrigued onlooker to the joys of life, I basked in the delight of the party from above observing graceful interactions and dancing, my mother tending to all the guests, keeping them entertained.

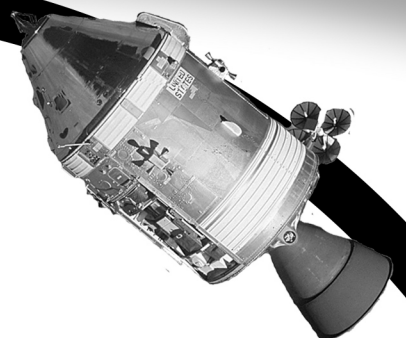
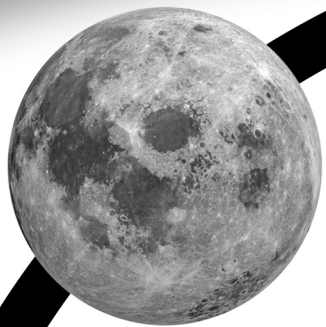
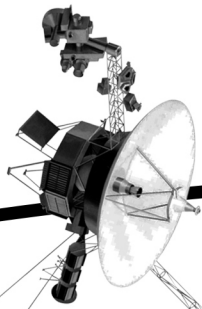
The poignant band of light beneath my door, a glimpse of an almost in reach threshold, epitomises the unknown for which I have always sought to comprehend. To be curious about curiosity. There was however, a specific branch of curiosity that grabbed my attention - the respectful curiosity of our natural world. I say respectful curiosity in thought of its dignity and is a form of curiosity that governs a sense of humbleness toward Mother Nature herself.

There is an ideal that humanity holds a god-like place within our natural world. One that demands our ego, blindsiding us to the loss of so much of it. One that exhibits an absence of limitation or any form of restraint in the expansionism and exploitation of it - a kind of madness that is rampant all around us. We see it in the normalised violence of factory farms, the trashing and depletion of the seas, the drive to dam the rivers of the world, rendition of whole landscapes in pursuit of fossil fuels, the trading of rainforests for plantation and pasture. We see the inability to exercise restraint and have so far been unable to halt this idea of expansionism even in the face of our own demise. This ideology, not by exact definition, but by reflection, action and decision, is demonstrated as Anthropocentrism.

This collective of perspectives invites you to delve into looking at the natural world differently - including an opportunity of reflection for you as an individual. I want to challenge Anthropocentrism in order to reframe your view of the natural world and your role within it. The motivation to understand the identity and power of different perspectives became embodied within my own interpretation of reality when I myself witnessed them and the wonders of which were held within them. Like "Plato's Allegory of the Cave", I felt like the freed prisoner seeking the light, the truth for which all things of life relied upon not to be misled with mere shadows and comfortable, familiar illusions. Truth or habit? Light or shadow?

I chose the poignant band of light.

Looking Out & Back to Look Within & Forward



I begin with exploring one of the most profound types of perspective humanity has ever experienced. The perspective of oneness, unity, wonder and love all at the same time.. The perspective of being able to witness and somewhat understand our place, our 'cradle of humanity' in this vast unknown universe.

Once space travel had really taken off in the mid-part of the 20th century we were braced with excitement, curiosity and hope. When the first image of Earth was taken from space on the 24th October 1946 (1)(figure 1), it planted the seed for future development and innovation within the space industry but also served as an addictive and eager desire to find out more about ourselves and the only home we have ever known.

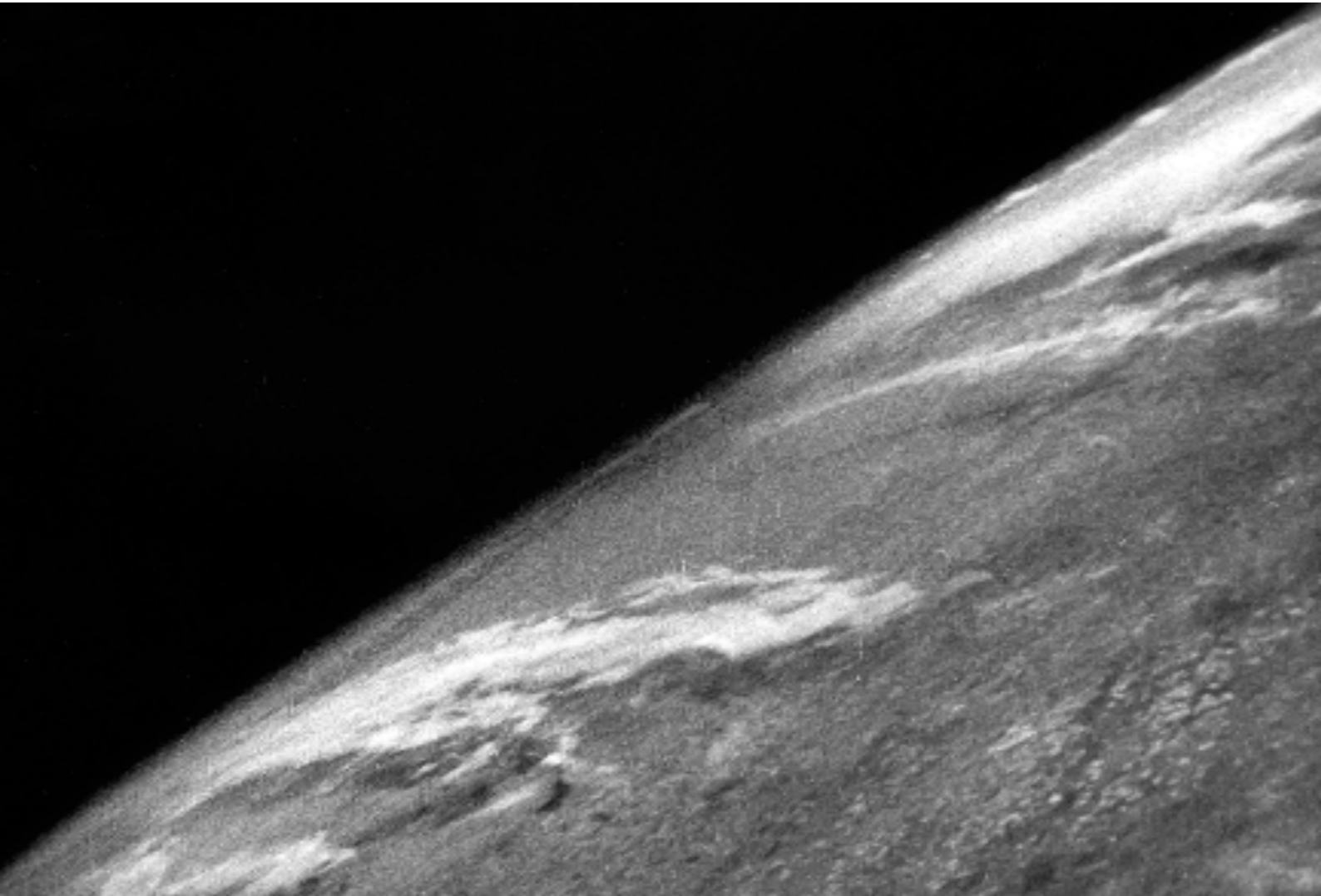


Figure 1 - The first photograph of Earth from space, taken on 24 October 1946 (1)

Later, during the Apollo 8 mission over the Christmas of 1968, another famous image made headlines around the world and became known as 'Earthrise' (2) (figure 2). This was the very first view the general public had of Earth in its entirety becoming an iconic reminder of our need to protect the planet. It ended up becoming featured in LIFE magazine's '100 Photographs that changed the world' (3) and inspired environmental movements across the globe . Shortly after on 22nd April 1970 Earth Day was established where the initial spark for it's commemoration was given due to the powerful perspective these types of images provided to the world (4). On December 7th 1972 Apollo 17 took another image becoming known as 'The Blue Marble' (5) (figure 3) which had similar effects of those that came before it.

Figure 2 - 'Earthrise' (2)





Figure 3 - 'Blue Marble' (3)

However, perhaps the most profound image ever taken of Earth was that on 14th February 1993 by the Voyager 1 space probe at a distance of around 6 billion km (6)(Figure 4). Carl Sagan put it extremely well (?):

“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 sun beam.

The Earth is a very small stage in a vast cosmic arena. Think of the endless cruelties visited by the inhabitants of one corner of this pixel on the scarcely distinguishable inhabitants of some other corner, how frequent their misunderstandings, how eager they are to kill one another, how fervent their hatreds. Think of the rivers of blood spilled by all those generals and emperors so that, in glory and triumph, they could become the momentary masters of a fraction of a dot.

Our posturing's, our imagined self-importance, the delusion that we have some privileged position in the Universe, are challenged by this point of pale light. Our planet 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.

The Earth is the only world known so far to harbour life. There is nowhere else, at least in the near future, to which our species could migrate. Visit, yes. Settle, not yet. Like it or not, for the moment the Earth is where we make our stand.

It has been said that astronomy is a humbling and character-building experience. 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.”

- Carl Sagan

The pale blue dot is a reminder of how precious life is in its delicateness and ephemerality. The following lines are particularly important to this essay as it becomes immediately clear we are part of something far more grand - something that gave anthropocentrism a shocking revelation.

“Our posturing’s, our imagined self-importance, the delusion that we have sprivilged position in the Universe, are challenged by this point of pale light” (?).

This form of imagery almost embodies a type of paradox. One where we feel very insignificant but for some, also very significant at the same time. Dubbed as the 'Overview Effect' (8), a cognitive shift in awareness is attributed to this experience where what is seen - can't be unseen. The innate inability to simply comprehend or process this experience is something yet to be mastered through acceptance, humbleness & the stripping of the delusions of grandeur humankind has upon itself and our place in the universe. These cognitive shifts give humanity an awareness as to avoid internalising the feeling that we are the most important entities in the universe.

It is therefore clearly evident that these images and the endeavours that were attributed to capturing them had a profound impact on society, both emotionally & technologically. However, it does make one wonder, what if humanity had not yet seen this imagery? What if we had not yet even made it into space to be able to allow Mother Earth to reveal herself?

We could attempt to answer this question by looking at indigenous cultures of whom some didn't or never have had access to the information and technology currently possessed in developed regions of the planet. There is a painting of the Milky Way (9) (Figure 5) on one of the walls in Koricancha, Peru, from over 40,000 years ago which was the most important temple in the Inca Empire. It represents myths that you can see animals in the Milky Way between the stars in what were known as 'dark clouds' . This is an example of the awareness of Indigenous cultures about their thoughts on the Cosmos and the curiosity of what lay beyond the skies but also intrinsically how they saw nature as part of this vision.

Figure 5 - 'Milky Way in Inca Astronomy' (9)



Additionally, it was found through recent research (10) that:

“while the world’s 370 million indigenous peoples make up less than five percent of the total human population, they manage or hold tenure over 25 percent of the world’s land surface and support about 80 percent of the global biodiversity.”

Indigenous people are therefore the best conservationists on the planet by default where the assimilation of their knowledge when it comes to protecting the natural world has cultivated a deep connectedness to nature for thousands of years. How can it then be that indigenous people lead with such an anti-anthropocentric mindset being guardians of the Earth, but have not seen her in all her wonder?

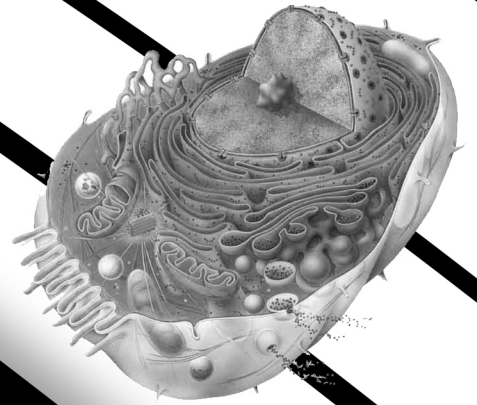
It could be argued that through the scientific paradigm of reductionism where nature is seen as a collection of parts, that the differentiation in perspective can be explained, where Indigenous cultures are not exposed to this method of interacting, studying and in some cases controlling the natural world. Instead a more holistic and ecocentric approach is taken which cultivates and celebrates the preservation of nature. Purser et al argues (11) that the limitations of anthropocentrism are shown through this scientific paradigm of reductionism.

Drawing a parallel to the perspectives of Earth from outer space discussed so far, there is a direct correlation between the Indigenous people's relationship with nature and the images I have presented. They both echo a holistic mindset, unfragmented and untethered from a world of reductionism. This mindset allows us to understand the benefits of an anti-anthropocentric culture where our roles and relationship with the natural world are equal and complimentary. This mindset has the potential to allow us to live and thrive in harmony with the natural world for many years ahead.

It is clear that there is an inherent opportunity to therefore embrace a more humble approach to the natural world through the lens of cognitive shifts, utilising the overview effect and harnessing indigenous insights to drive this sense of harmony with the rhythms of planet Earth.

Concluding, we must be respectful to our cradle of the natural world and its significance within our universe, not misplacing our role within it. We mustn't let our sense of entitlement foster into an ego that can't be quelled and most of all, we must perceive and act with a ecocentric planetary mindset.

Making the Invisible, Visible



Φ

“The human is never simply human. Tens of thousands of different species are suspended within each human body and the body itself is suspended within a dense environment of countless species outside. It is never clear where the human begins and ends” (12).

Whilst crossing the Charles Bridge in Prague over 400 years ago in 1611, world renowned Mathematician Johannes Kepler noticed a snowflake on the lapel of his coat. He came to ponder on its remarkable geometry and wrote a short book 'In retrospect: On the Six-Cornered Snowflake' (13) for his friend, a German scholar, Johannes Wackher von Wackenfels. His curiosity and subsequent work fuelled 'the notion from which all of crystallography blossomed, that the geometric shapes of crystals can be explained in terms of the packing of their constituent particles' (13).

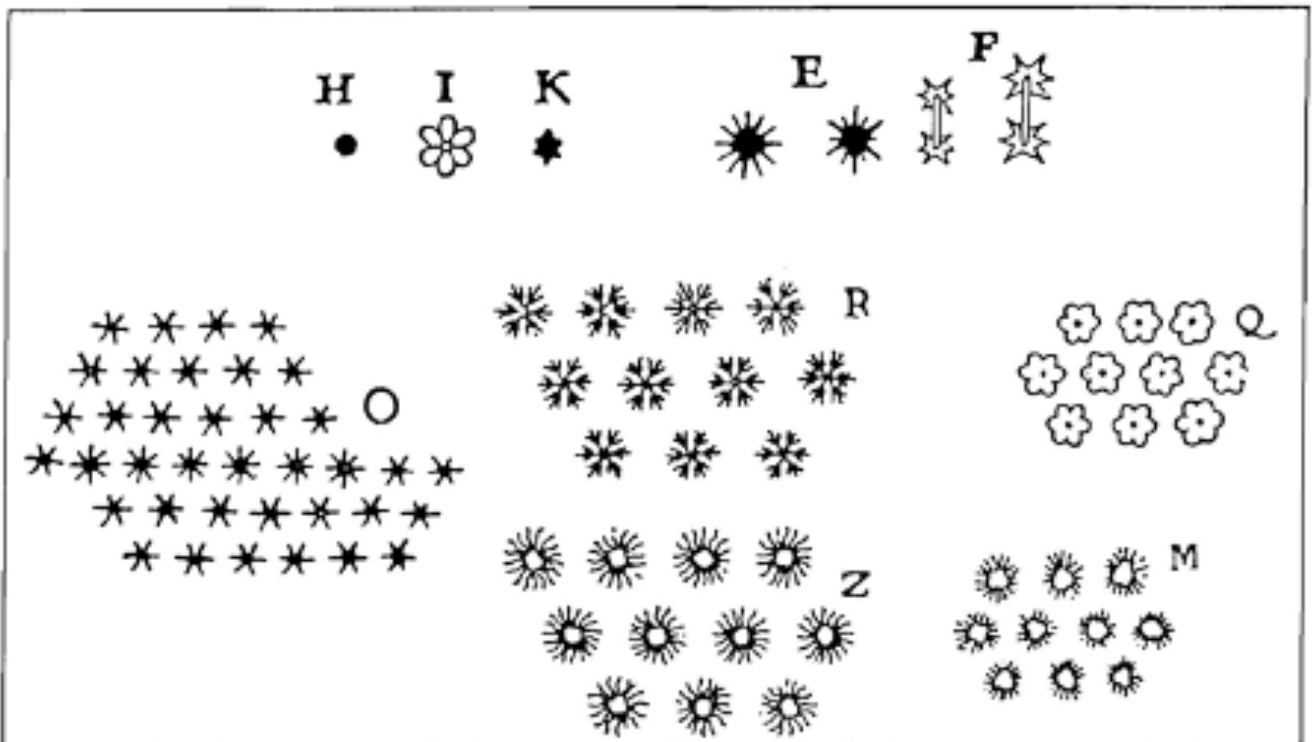
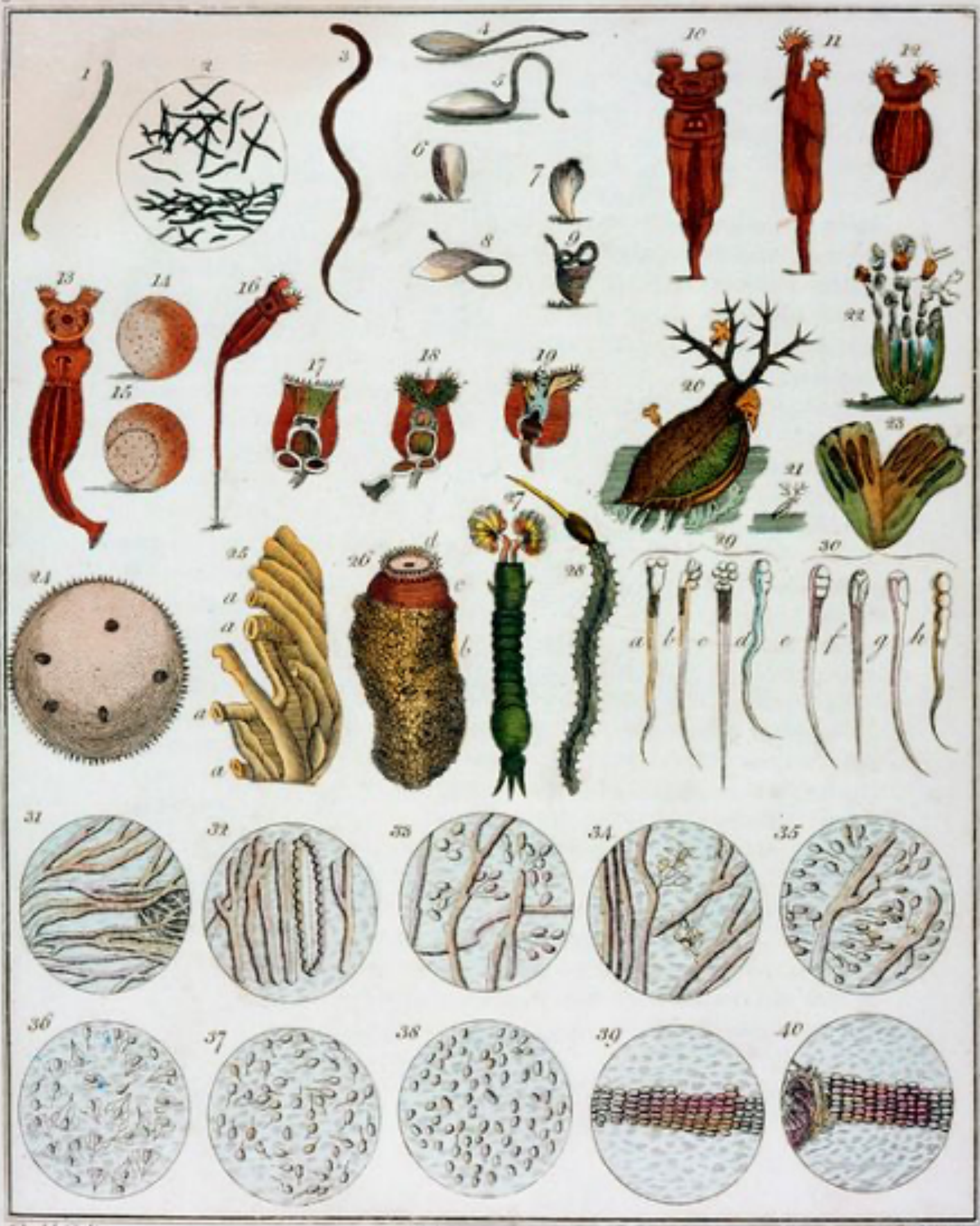


Figure 6 - Early Snow Crystal Observations' - In Retrospect: On the Six-Cornd Snowflake (13)

A short while later in 1625, Italian scientist Galileo Galilei invented the first microscope (14) and thereafter around 1670, the first person in history to see living cells, and ultimately view their own cosmic constitution, was Anton van Leeuwenhoek (15). Leeuwenhoek has been credited with significantly improving the quality of microscope lenses, so much so that he could witness single-celled organisms living in droplets of pond water calling them 'animalcules' meaning 'miniature animals' (figure 7).



Stredel. Sculp.

Animalcules.

W. P. Sculp.

Figure 7 - A 1795 illustration of van Leeuwenhoek's 'animalcules' (16)

Over time we saw a growing progression of innovation, allowing us to zoom in and take a peek into this whole new world, until in April 2003 the human genome was eventually decoded (17). This was made possible in part by harnessing the original insights of crystallography Johannes Kepler first initially sparked in 1611 and opened many fresh avenues for philosophy, science and technology generating questions and debate about who we are and what we are made of - challenging the very beliefs of our identity, reality and consciousness.

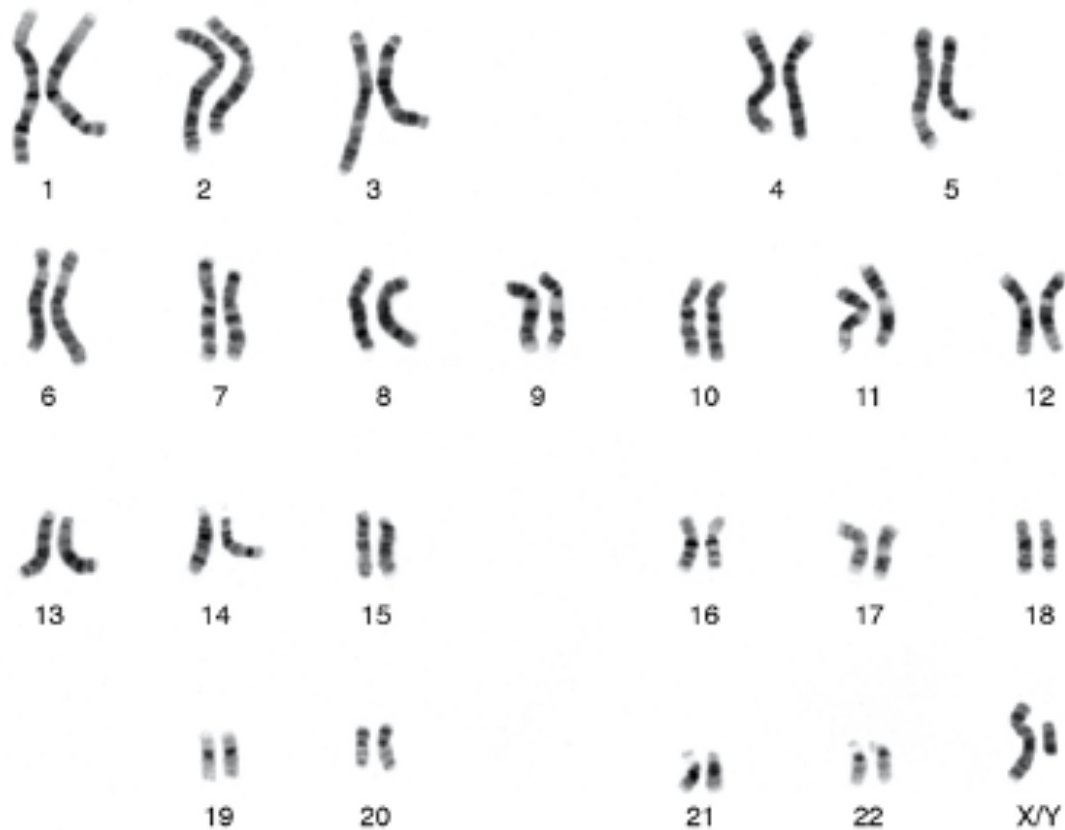


Figure 8 -A representation of an individual's chromosomes known as a 'Karyotype' (18)

Delving into one of these avenues, there is a view in philosophy - Panpsychism (19), which challenges the notion and origins of consciousness within the universe, where it has been stated by many leading cosmologists and scientists that the universe itself could potentially have a consciousness (20). As stated by Philosopher Philip Goff:

“The basic commitment is that the fundamental constituents of reality—perhaps electrons and quarks—have incredibly simple forms of experience. And the very complex experience of the human or animal brain is somehow derived from the experience of the brain’s most basic parts.” (21)

The human body therefore, is in a sense a metaphor for a conscious universe - one that has a microcosm of life suspended within itself, experiencing itself. For example, if we take a living cell within the human body and it's purpose, whether that is to fight off an infection or deliver oxygen to other cells, this act is to help maintain a much larger life form - us. Is that cell really aware of itself or it's purpose? Although not likely, it has evolved and been motivated to perform its task, all to our benefit. Could we have been intentionally designed to perform functions we can't completely understand ourselves?

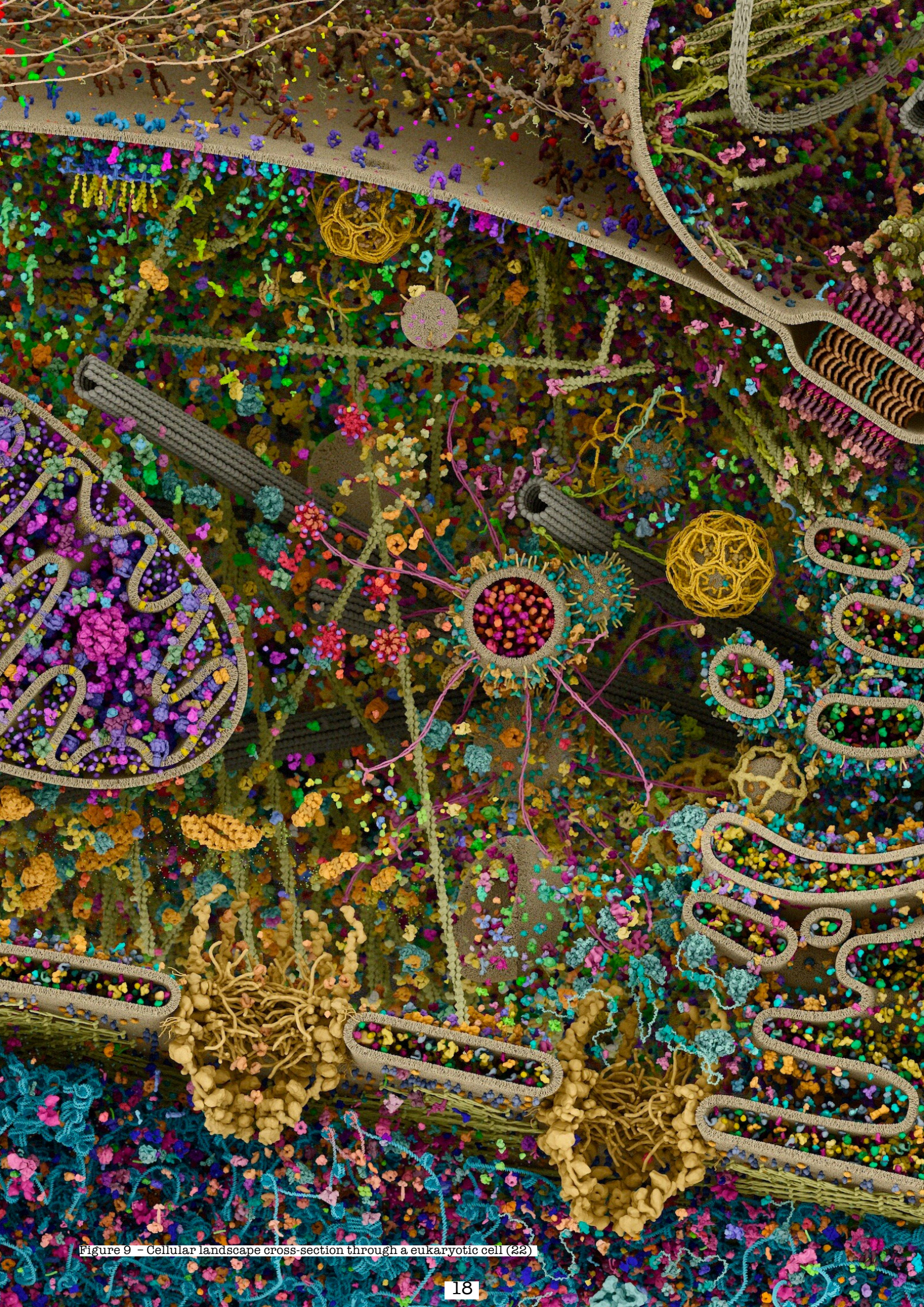


Figure 9 - Cellular landscape cross-section through a eukaryotic cell (22)

Through this idea of Panpsychism and the biological multiverse that dances between us and the outer world beyond, the body decentralises Anthropocentrism uncovering a wider deeper field to life and it's performance. A form which makes decisions, sustains itself and evolves from within. Therefore, it can be argued that this fragmentation of consciousness and humankind's view of itself as being supremacist in the natural world is in fact quite the opposite. We are one piece of an ever evolving puzzle where a continuum exists between living consciousness, awareness, and sensitivity, at a microscopic level and at a macroscopic level. Like a murmuration of birds (figure 10), our cells ebb and flow in unison undisrupted as we rely on their actions and labour.



Figure 10 - Murmuration at Sunset by Daniel Biber (23)

Furthermore, over the centuries we have come to realise tragedy and loss in the form of epidemics & pandemics, from the Bubonic plague (Black Death) in the mid-14th century (24) to Coronavirus which we are all too familiar with (25). Infinitesimal armies of viruses and diseases that have wiped millions of our species from the planet. How can it be that we perceive ourselves as the most significant entities in the world when we are in fact not a singularity and have a great deal of vulnerability when it comes to protecting ourselves from a world we can't even see. We have become so blindsided by the very make-up of what makes us who we are.

This idea of blindsiding is also found in what I have defined as 'blind spots in modern consumerist culture' where there is a hidden dimension linked to our behaviours and habits of consumption. For example, in the past a lot more of our food was produced locally (26) where any degradation and destruction of land would be more visible and recognised inciting preventative measures to be taken. At present we can order almost anything to our front door the next working day from all around the globe without having any idea of it's exact origin, the freedoms and state of the people behind the product and how exactly it was made and with what.

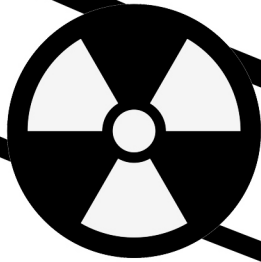
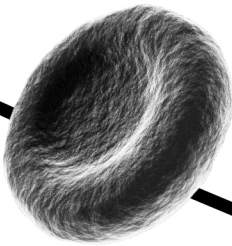
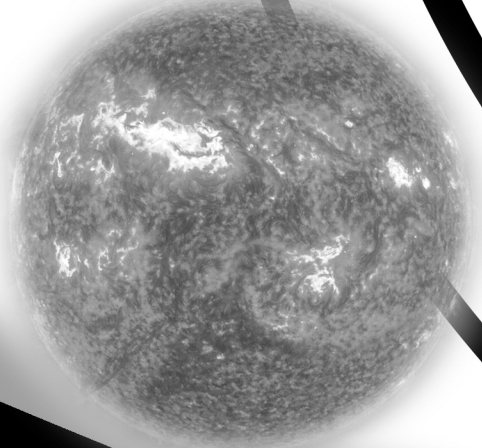
There is a sense of deception at play here which begs the question, what if we could have complete transparency behind every item we bought and consumed? Just like peeking into the energetic and chaotic world of cells making the invisible - visible, our needs and desires should not catalyse a culture of Anthropocentrism driving decisions to deplete the shared resources of the natural world.

At present, Soga & Gaston argue that people's accepted thresholds for environmental degradation are continually being lowered (27). Known as the 'Shifting Baseline Syndrome', our perceptions are out of sync with the actual damage and changes taking place and so there is a need to develop some form of 6th sense in order to properly gauge the destruction of the natural world in real time. An adaptable societal microscope to unveil truth and connect individuals to the point of origin.

An example of how this can be achieved is through the use of blockchain, which is a chain of secure information that exists on a distributed ledger within a peer-to-peer network. In their article 'Blockchain and more - Algorithm driven food traceability', Fischer et al state that "blockchain algorithms incorporate a high potential, as data can be stored in an unmodifiable way enabling quick tracking across all process steps, so that stakeholders as well as commodities or semi-finished items can be identified much faster" (28). This would allow the origins of food to be traced a lot more accurately as well as shed light on any ethical concerns such as animal welfare surrounding the product or manufacturer.

Reminiscent of the evolutionary algorithmic genetic chain of code that connects all lifeforms on Earth, blockchain may not be the complete answer, but it can be leveraged to give a sense of truth just as our own curiosity has lent itself toward the discovery of new worlds within our own. Uncovering these truths will enable people to make better choices for the planet.

Given these points, we must be respectful of this microcosm of wonder and the power it truly yields but also shift our perceptions and behaviours of consumption by utilising the right technological tools in order to more accurately gauge public visibility of damage to the natural world and its resources.



Things That Were, Things That Are & Things That Will Be

“Consider the earth’s history as the old measure of the English yard, the distance from the king’s nose to the tip of his outstretched hand. One stroke of a nail file on his middle finger erases human history.” (29)

Time. A unifying constant. A currency of lived experience. An acute reminder of the awareness of humanities own mortality.

When considering the relative fractions of time experienced by different entities in life, human history is a mere blink within the Earth’s eyes. A mayflies ephemeral lifespan of 24 hours - the shortest of any living animal on Earth (30), a blink within our own. Whatever way we decide to live our lives - slow or fast, staring or blinking, sipping or gulping - time always catches up to us.

One thing that distinguishes humanity from it’s place within the natural world are these differing timescales of lived experience and the perception of time itself. If we consider a few examples of creation and decay, we soon come to realise just how wide the spectrum of time is in relation to lived experience when thinking of things that are, things that were, and things that will be.

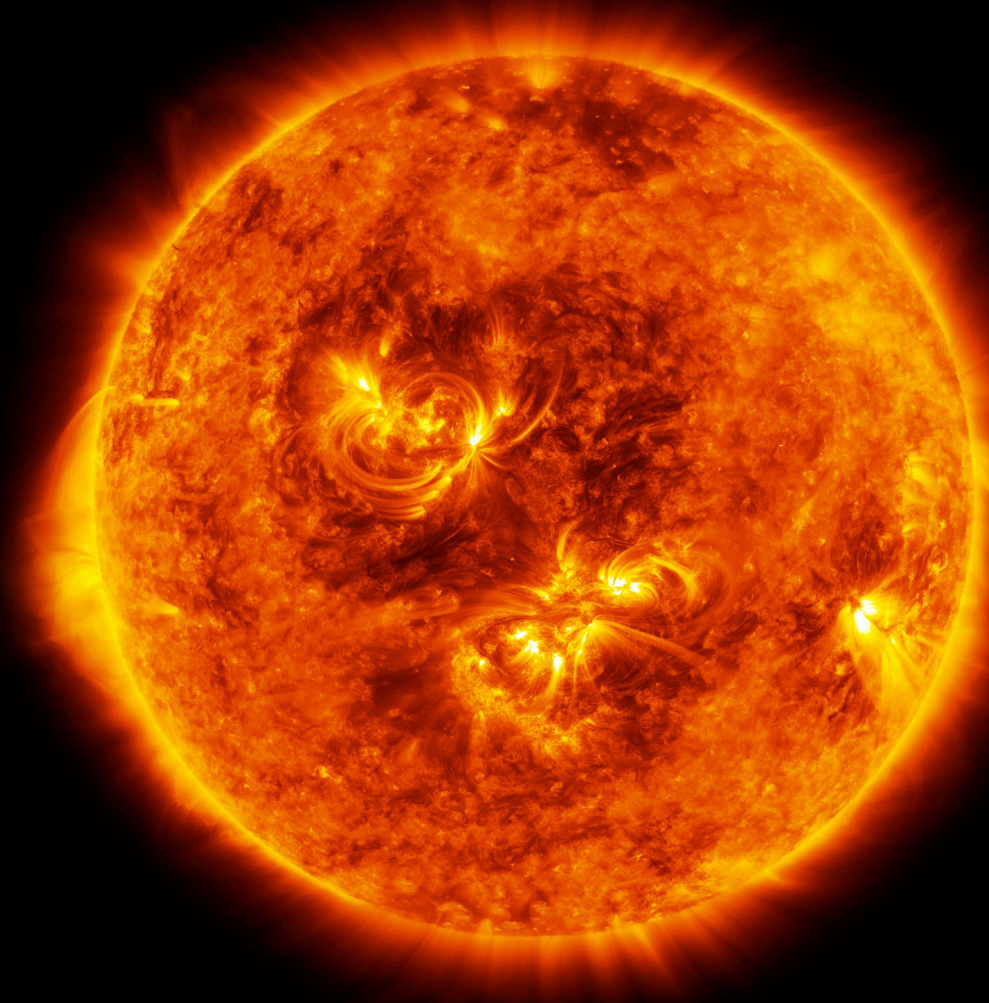


Figure 11 - The Sun: Around **4.5 billion** years old (31)



Figure 11 (top) -
The Himalayas: Around **50 million** years old (32)(33)



Figure 12 (left) -
The Bristlecone Pine Tree: Around **5000** years old (34)(35)

Figure 14 (below) - Galapagos Giant Tortoise: Around **100** years.
(36)(37)

Figure 15 (right) - Human: Around **72.6** years. (38)(39)





Figure 16 (top) – Bottlenose Dolphin: Around **40** years. (40)

Figure 17 (left) – Outer Intestinal Cells: Around **16** years. (41)(42)

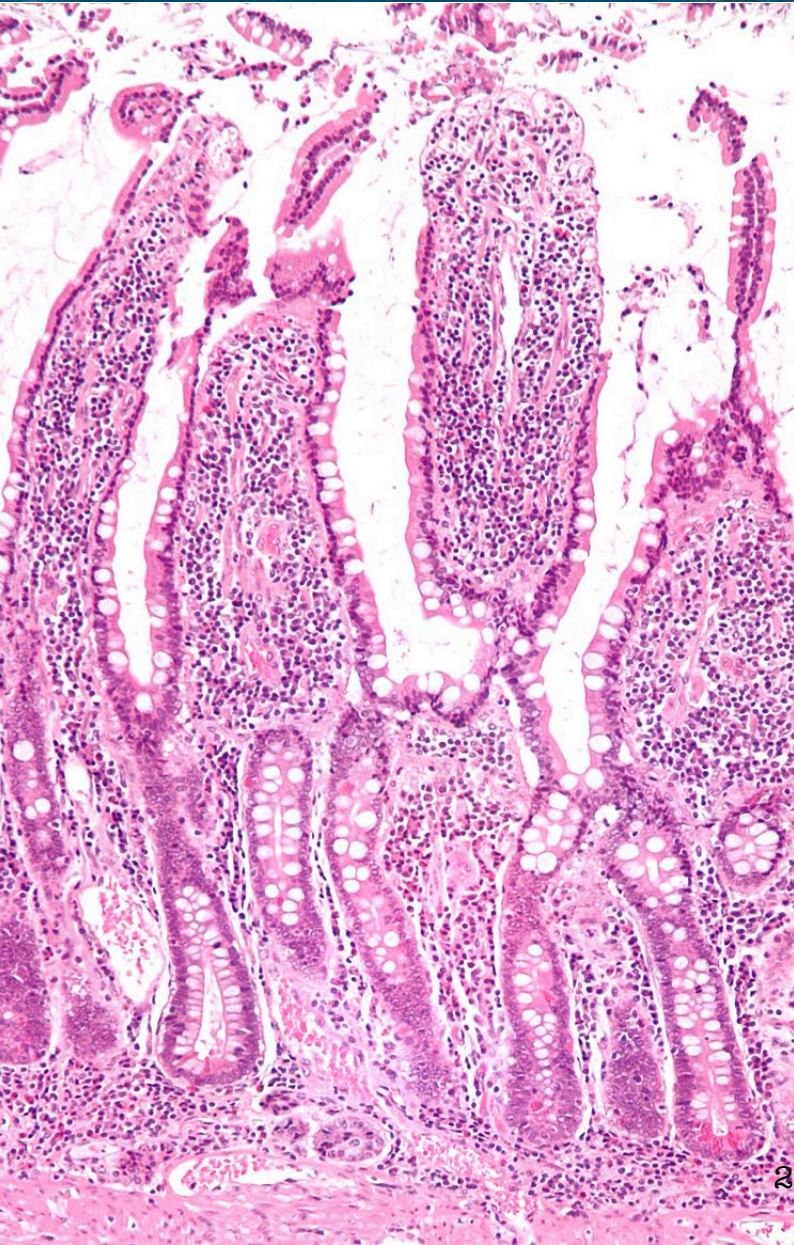




Figure 18 - Dog 'Cooper' (Chug Breed): Around **10-13** years. (43)(44)



Figure 19 - Red Blood Cells in Isotonic Solution:
Around **120** days. (45)(46)

Figure 20 - Yellow Apple Decomposing:
Around **30** days. (47)(48)



The chemical and biological architecture that makes up our own bodies and that of the natural world, were formed in stars originating from supernovas vast distances away from Earth (49) - it is truly wondrous how something so chaotic has managed to become a major part of us and live on within us - a binding constant working alongside time through billions of years. Stardust reconstructed into another cycle of performance and energy reliant on it's own cosmic brethren - the sun.

Ironically the sun is a necessity to all of life on Earth radiating it's solar energy so plants can grow, providing food and oxygen to other forms of life which have originated from the stars. There is a reciprocated act of care and companionship, both obvious and discreet, between these different elements of nature even though life is experienced on completely different timescales by many different elements in the natural world.

This magical act of care and way of companionship between humanity and other elements in nature is one that can also be recounted by the memoirs of 19th century French romanticist writer François-René de Chateaubriand in Sebald's classic book 'The Rings of Saturn':

"It is there that he begins to write his memoirs, on the first pages of which he speaks of the trees he has planted and tended with his own hands. Now, he says, they are still so small that I provide them with shade whenever I step between them and the sun. But one day, when they have grown, they will give shade to me, and look after me in my old age much as I looked after them in my youth. I feel a bond unites me with these trees; I write sonnets, elegies and odes to them; they are like children, I know them all by name and my only desire is that I should end my days amongst them." (50)

Figure 21 - Sebald standing under a Lebanese Cedar tree (50)



This act of planting something that will outlive us brings an awareness of how time exists within us and beyond us. It's an act that forms a bond between the human and non-human where there is a shared sense of companionship and care in the natural world. A bi-directional agreement and acknowledgement through foresight and action.

Even when we consider the ancient forests of the Amazon which have existed for around 55 million years (51), they continue to give back to humanity in the form of medicinal plants such as Vincristine and Vinblastine (52) which are used to treat different types of cancer and can be found on the World Health Organization's list of essential medicines (53). As well as being regarded as the world's largest medicine cabinet, the Amazon rainforests provide a powerful set of lungs to the world producing 28% of it's oxygen (51), yet they are continually being suffocated by fires and decimated everyday (54), lacking the protection they so desperately need.

Humanities own widely adopted concept and linear perception of time coupled with the acceleration of modern life, has unfortunately lead us to become detached, distracted and misguided from this very notion of stillness, care and companionship that other elements of nature exhibit ever so dearly. So how do we really perceive time and what way can we shift our perceptions of it in relation to action and consequence in the natural world?

Roman Krznaric, a public philosopher, argues in his book 'The Good Ancestor' that "We live in the age of the tyranny of the now, driven by 24/7 news, the latest tweet, and the buy-now button" and that "frenetic short-termism is at the root of contemporary crises" (28). He proposes that if we are to truly restore balance within the world we must begin by starting to think more long term, adopting "Deep-Time Humility" where our decisions consider multiple generations ahead of us and the wider consequences upon the natural world at large. He further states that nature's clock work's on a vastly wider scale, and so we must be willing to think about our actions for the long time, where some things require care and nurturing over many, many millennia.

The non-human eco-systems of the natural world reign superiority over time when considering how they negotiate environmental damage in the absence of human beings. For example, after the Chernobyl Nuclear Disaster in Ukraine of 1986, the once bustling modern city of 50,000 people had to be abandoned with people leaving their routines and livelihoods behind. Nature then began to slowly but fiercely completely engulf the once heavily dominated space.

After a few decades, Chernobyl had completely transformed itself into a 'jungletropolis' (55) (figure 22) offering a stark contrasting unification between rejuvenation, beauty and decay as whole buildings became wrapped in nature's cloth and wild animals such as elk, bears and lynxes played amongst offices, homes and schools. This event particularly demonstrated that humanity can't repair itself as easily and that in the end nature will always persevere.



Figure 22 - Chernobyl Exclusion Zone (55)

This form of decay and rejuvenation is one that should humble humanity and allow us to shift our perspective. To pause and think about the temporal nature of ideas, being and that nothing lasts forever - especially when considering human lifetimes in comparison with the rest of the natural world. The long reigning elements of nature such as our mountains, forests and oceans, act as silent and concerned parents as we run around curious and lost trying to find our way.

When we are invited to think long term through these humbling experiences, we can start to share the perspective of mountains, forests and oceans, enabling us to really understand **their** lives and **their** experiences. It therefore brings the question of how might we create a sense of empathy between the human and non-human as to engage us in long term thinking for restoration and preservation of the natural world - especially so when there is such a high degree of momentum in modernised and industrialised societies?

An approach would be to blur the lines and create a synthesis between the man-made and biological. For example, what if we were able to design our built environments so buildings and spaces can become more alive and reactive, or rather more informative about the natural environment? In 2019 at the Dutch Design week a pop up pavilion made from mushrooms gave a glimpse of what this would look like (56)(figure 23).

Figure 23 - 'The Growing Pavilion' (56)



“The Growing Pavilion also includes circular building materials - materials that can be recycled or reused again. The roof is one of them. The pavilion has a reverse peak on its roof, so that rainwater can be collected in a basin where plants can grow. It is a dynamic, living space, where mushrooms grow out of tables and can be eaten on the spot.” (56)

Additionally, an even stronger bridge between both worlds can be imagined through buildings that literally grow and form over time made from natural materials and recycled waste. London based architecture firm Agence Chatier Cobasson gives a glimpse of what this would look like in the form of an ‘organic skyscraper’ which grows over time as residents recycle. The façade will also provide a home to a diverse range of flora (57)(figure 24).

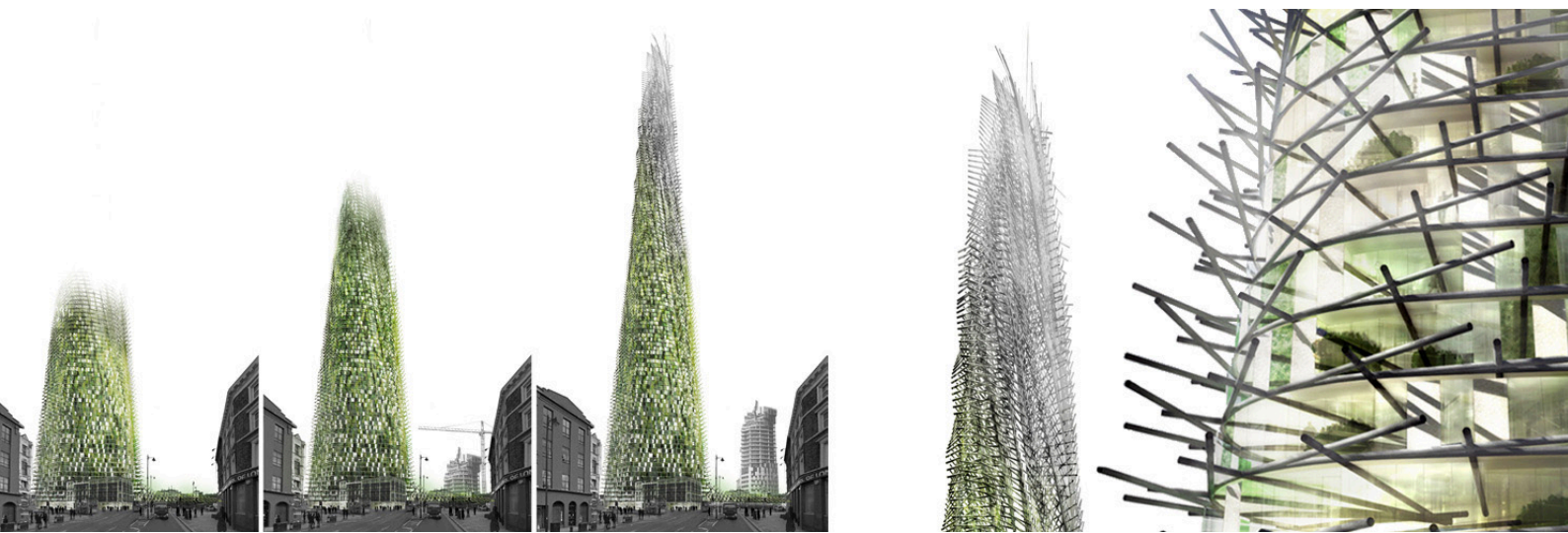


Figure 24 - ‘London Organic Skyscraper’ (57)

On a smaller scale, another example could include bio-based textiles that change their aesthetic based on their environment. Suzanne Lee, founder of ‘BioCouture’ envisions microbes being the ‘factories of the future’ where she has managed to create clothing by growing bacteria (58)(figure 25).

‘Biogarmentry’ is another example of clothing which is made from algae that turns carbon dioxide into oxygen via photosynthesis, literally turning a clothing garment into another form of plant (59) (figure 26). It’s original designer Roya Aghighi notes “Wearers would need to take care of their garment as they would a plant in order to keep them alive, rather than engaging in the environmentally destructive practice of making synthetic clothes and discarding them after a few uses.”



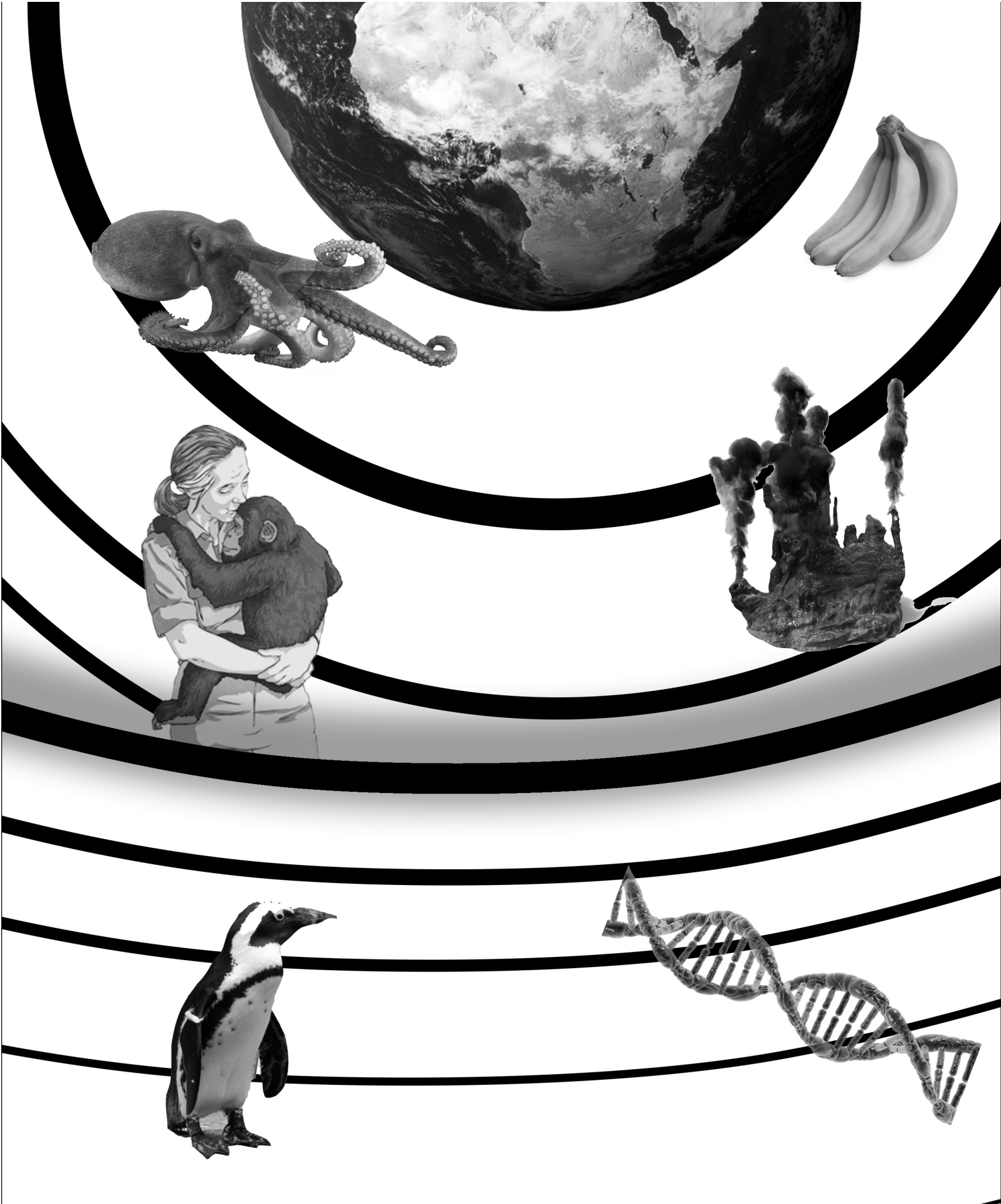
Figure 25 - ‘Bio-Bomber Jacket’ made from bacterial cellulose (58)

This intersection of design, biology and technology could give humanity an opportunity to forge deeper connections with the natural world and to re-engage us in it's protection allowing us to sync our clocks together and reignite the care and companionship within us toward something grander than ourselves.

We must therefore be respectful to the varying timescales of life that different aspects of the natural world undergoes and have deep foresight in our decisions, by knowing not to foul the nest, and lay safe havens for generations of - not just humans, but animals, oceans, forests and mountains to come.

Figure 26 - Roya's 'biogarment' (59)





I See You as You See Me

“We need another and a wiser and perhaps a more mystical concept of animals. Remote from universal nature and living by complicated artifice, man in civilization surveys the creature through the glass of his knowledge and sees thereby a feather magnified and the whole image in distortion. We patronize them for their incompleteness, for their tragic fate for having taken form so far below ourselves. For the animal shall not be measured by man. In a world older and more complete than ours, they move finished and complete, gifted with the extension of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings: they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.” - Henry Beston (60)

When we think of the origins of the ‘human’ and our ancestral tree we often discuss great-grandparents, 3rd cousins and very distant relatives beyond our time, but what about an evolutionary starting point which goes beyond the homo-sapien and even our closest relatives in the animal kingdom – apes? An ancient organism from which all modern life descended?

Known as LUCA which stands for ‘Last Universal Common Ancestor’, there is evidence to show that there was a microbe that lived 4 billion years ago hidden away deep underground in iron-sulfur rich hydrothermal vents within the ocean (figure 27) and was the beginning of a long ancestry that encapsulates all life on Earth - including us (61).

Figure 27 - A hydrothermal vent in the north-east Pacific Ocean (62)

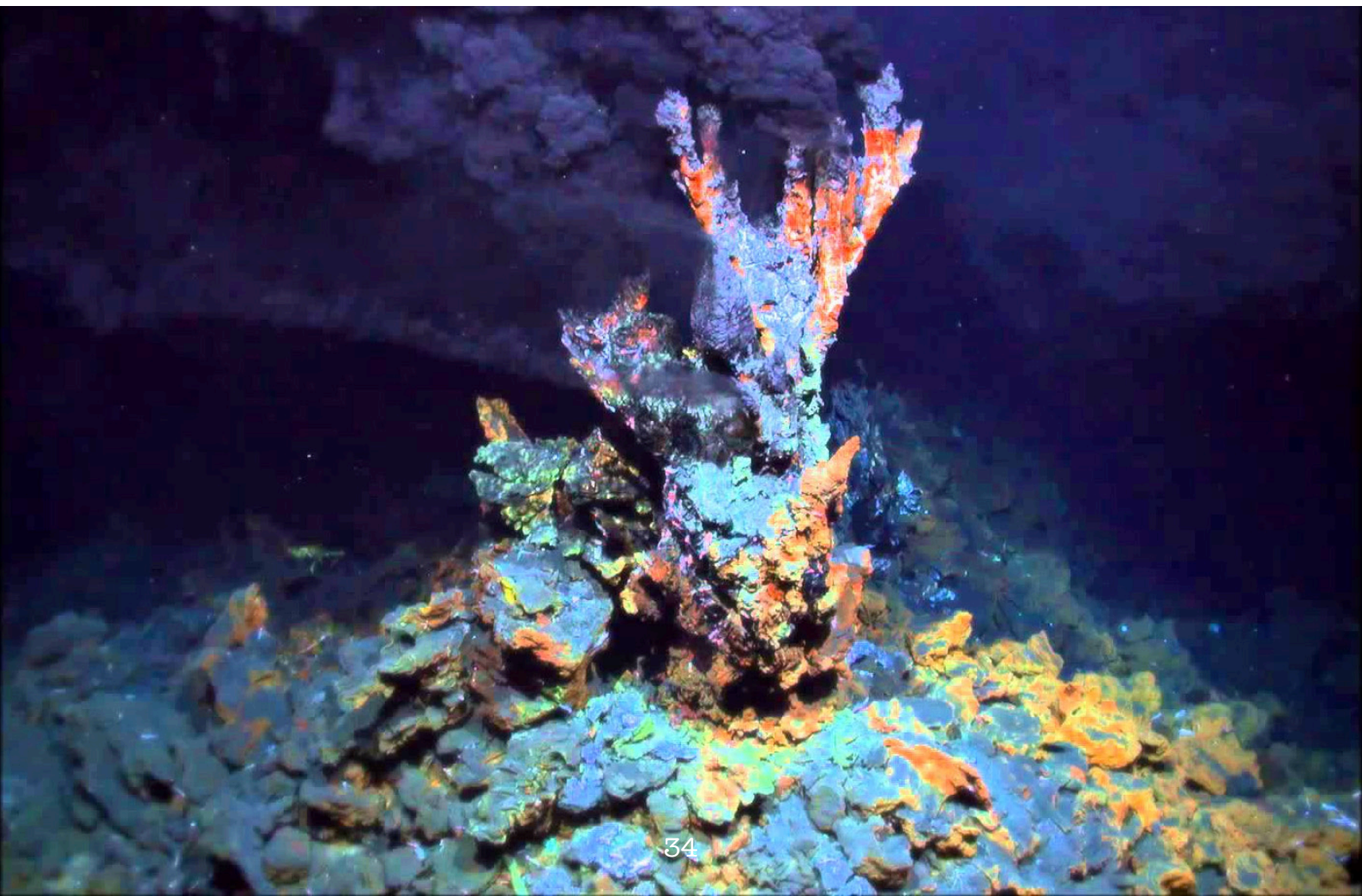




Figure 28 - Gombe, Tanzania - Jane Goodall and infant chimpanzee Flint reach out to touch each other's hands. (64)

The tale of phylogenetics is one which tells us of where we have been and what we have become as well as other species of plants and animals. How DNA has taken it's own temporal residency within many forms of life leaving messages and hereditary traits along the way. A silently disruptive visitor within all living organisms on Earth.

As humans, we have lived through many facets of nature in our evolutionary journey with an ancestry that is blended into a messy bustling canvas of biodiversity, refinement and divergence. For example, "mice and humans on average share about 85%" of their DNA. In fact, we share more than 50% of our genetic information with plants and animals in general where roughly 80% is with cows, 61% with bugs such as fruit flies and around 60% with bananas (63). However, what else connects us other than DNA?

British ethologist Jane Goodall (figure 28), made ground breaking discoveries through her long term research about the behaviour of chimpanzees who lived in the Gombe Stream National Park in Tanzania during the 1960s (64). She discovered that chimpanzees "make tools, eat and hunt for meat, and have similar social behaviours to humans" completely transforming our understanding of our closest relative in the animal kingdom. Her discoveries were instrumental in showing an inter-species connection and came to be completely revolutionary regarding perspectives surrounding the natural world and our relationship with it.

Additionally, a Netflix documentary 'My Octopus Teacher' (65) shared the story of Craig Foster, a free diver and filmmaker from Cape Town, South Africa, where he forms a friendship and bond with an Octopus in a kelp forest. Their connection reaches a peak when the octopus swims up to Foster and lands on his chest, in a display of affection and trust (figure 29).



Figure 29 - Craig Foster & the Octopus. The most majestic friendship. (65)

Another example of a profound inter-species connection was demonstrated when retired brick layer, João Pereira de Souza, from Ilha Grande in Brazil rescued a Magellanic penguin covered in oil from the local surf. He cleaned and nursed the bird eventually returning him to the water but instead of swimming back to where it had come from, it opted to stay with João for over a year, sleeping in his backyard and relaxing in his living room. Apparently, the penguin visits him every year without fail sometimes staying for months on end! (66)(figure 30).

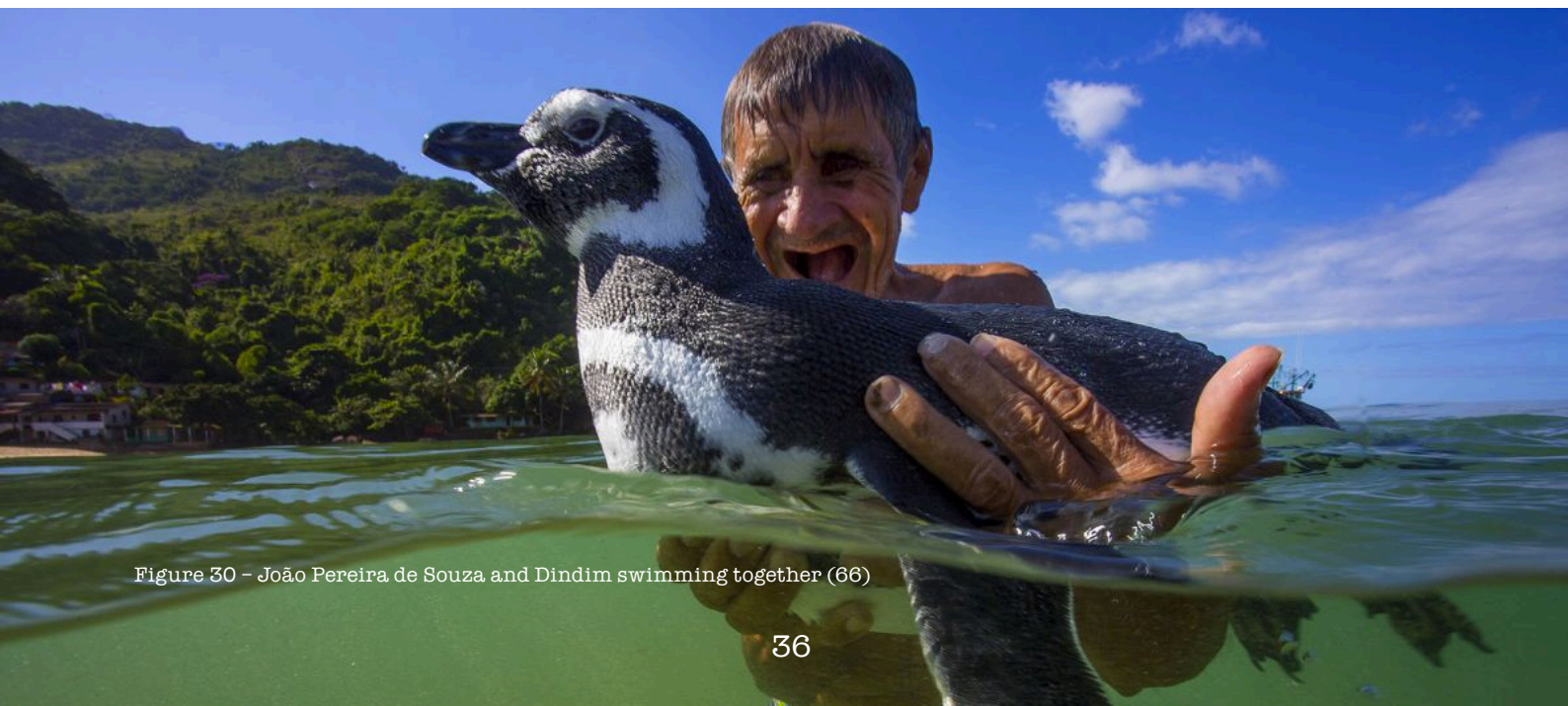


Figure 30 - João Pereira de Souza and Dindim swimming together (66)

These relationships are a mentorship on the fragility of life and man's connection to nature. Khramkova writes that Erich Fromm, a German social psychologist, "considered the desire to seek connection with nature as an inherent human capability as a reflection of 'love for all living' or 'biophilia'"(67). In Fromm's book 'The Anatomy of Human Destructiveness' he writes (68):

"Biophilia is the passionate love of life and of all that is alive; it is the wish to further growth, whether in a person, a plant, an idea, or a social group. The biophilic person prefers to construct rather than to retain. He wants to be more rather than to have more. He is capable of wondering, and he prefers to see something new rather than to find confirmation of the old. He loves the adventure of living more than he does certainty. He sees the whole rather than only the parts, structures rather than summations. He wants to mold and to influence by love, reason, and example."

So given we share the same building blocks of life and that we have the ability to truly connect with different species, how are humans really different from other species? You could argue that reason, language, morality, civilization, technology and free will are key distinctions to state a few, all of which drive Anthropocentrism. However, this very distinction constructs a hierarchical order of dominance and drives a culture of estrangement from nature. It is evident that **we perceive our differences as disproportionately more important than our similarities** - not just between ourselves in society, but also with the natural world. This thereby gives an inherent opportunity to explore and experience our similarities together. To understand nature on a deeper level and discover new dimensions between beings.

Polish portrait photographer Alicia Brodowicz, hunted for similarities between the human body and nature creating diptychs (figure 31) of her findings stating that "by re-tracing the unity of formal elements, compositions, lines and shapes in the form of diptychs, the inter-relation of the human body and nature becomes apparent." (69):

Figure 31 - Brodowicz's series of diptychs (69)



Furthermore, nature offers a sense of mastery when it comes to the art of self-expression, with many examples ranging from the goosebump inducing songs of whales (70)(figure 32) to the wondrous spectacle of birds of paradise courtship dancing (71)(figure 33). Several tree species have also demonstrated what is known as 'crown shyness' (73)(figure 34) where neighbouring trees give room to each other as so light can penetrate the canopy and photosynthesis can continue.



Figure 32 (left) - Spotify link to the sounds of whales in the wild (70)

Figure 33 (below) - bird of paradise *Lophorina superba* performing a courtship dance (71)(72)





Figure 34 - An example of 'crown shyness' amongst a group of trees (73)

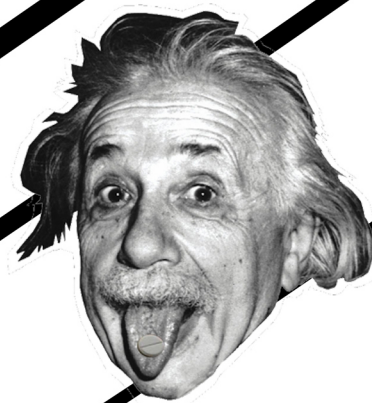
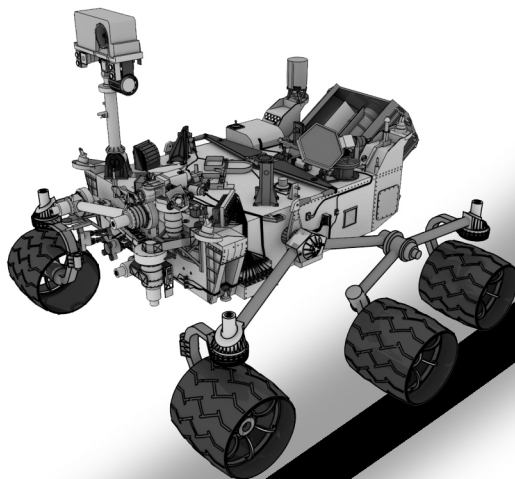
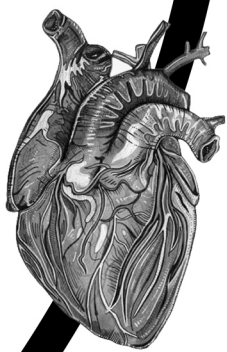
Given these examples, it begs the question, what makes us feel estranged and different from the natural world and how do we close this gap? It can be argued that our relentless conquest for materiality, industrialisation and the hunger for convenience & efficiency has lent itself to create such a disparity between the natural and unnatural, overshadowing and placing a veil over the core essence of our being. We have become in sync with machines and out of sync with nature.

Kirstin & Katsis argue in their essay, 'The Choice Between Destruction or Mediation' (74), that "There are two outcomes to humans seeing themselves as separate from nature: destruction and mediation." and that the only way to overcome the issue is to "no longer have two polarized perspectives regarding human obligations to the Earth."

Therefore, we need to learn new ways to communicate and connect with nature in order to build a stronger sense of ecological awareness and inter-species connection, ultimately creating a shift in perspective towards it. When we make a new friend, we make room to understand who they are, where they are from and what aspects of life they enjoy and don't enjoy. Nature too has needs, family, friends, language, joys, fears, talents, displays, jobs, emotion and struggle as much as we do.

There is clearly a part of us that lives within the 'other' - not only in our DNA, but in our struggles and experiences in life. When we catch ourselves in that moment looking into the eyes of another species, what do we really see? Or rather, what should we start seeing? Anthropocentrism regards humans as separate from nature (75), which is not only ethically problematic, but dangerous. The truth is we are more than just a part of it, and it is more than just a part of us. We are notes that share a resonance in a grand symphony of life. When one note is missed, there is no longer a symphony. The conductor stands silent.

Concluding, I would like to offer a final thought. When we cut ourselves and start to bleed, there is an immediate desire to remedy it, cleaning the wound and placing a plaster over the tear in our skin. When we see a friend or family member hurt emotionally or physically it is our instinct to comfort and protect them. The love for ourselves and each-other should not only be confined to human relationships but in how we treat animals and our surroundings. We are a catalyst to nature repairing itself and if we look close enough - a whole new world of connection lies before us.



The Shift

Throughout this collection of essays, I have offered four unique perspectives. I offer them not to belittle humanity, nor to blame the other, but rather to challenge the idea of Anthropocentrism and shed fresh light on the very notion of our being and our place with the natural world.

Humankind seeks to return to nature. To find it's "naturalness" in existence once again. Not only being a matter of survival, but of the environment, the planet, and human nature itself. There is now a great opportunity to reflect on the principles of existence and how we perceive ourselves in relation to the rest of the natural world given such a threat exists to life on Earth. It's time to re-define and re-envision our relationship with the natural world through the power of perspective. To create a **shift in perspective...**

Curious about curiosity, I searched for answers, and I found perspective. A fresh and humbling way to think, understand and dream. Perspective can lead us to uncover other worlds within our own. Worlds that teach us significance, compassion, connection and respect. Crist & Kopnina ask "What possibilities of thought and life open beyond Anthropocentrism?" stating there can be "an ignited human desire to live in the open within a diverse world." (76).

Whilst we excel into a new technological era on Earth, it is crucial we remember these perspectives and let them guide us in our progress. Matt Ridley writes in his book "How Innovation Works" that "growth increasingly means getting more benefits from fewer resources, as exemplified by the dematerialisation of the economy" (77) where we can do more with less. Humanity has the potential to harness the power of science, design & technology to give back to nature and to reaffirm the bidirectional agreement and acknowledgment of care and companionship.

So, what way do you perceive this world now? - this truly wonderful existence and your place within it? Alone, but not alone, we exist collectively, bonded in more ways than one could ever possibly imagine.

Our family and home are calling - **and they need us.**

I must go now.

"The important thing is not to stop questioning. Curiosity has its own reason for existence."

- Albert Einstein (78)

An Ode to Nature

Unknown to be known,
a furnace of life amongst the stars,
forging mercilessly and hidden until grown,
you lay bare and presented your scars.

The offshoots sang and broke a silent universe,
whispering and echoing into time,
a curious conductor, a caring nurse,
taking their position to begin life's new verse.

You became neither here nor there,
but rather everywhere.
Found inside and outside, above and below,
A world made visible, by your outstretched bow.

An arrow was released and sprung beyond the nest,
where we all but wished for the very best.
Looking out and back - as to look within and forward,
I gazed upon you from afar and then stared into myself.

As we looked side by side, through present and past,
we started to really see each other at last,
I came to see you, as you saw me,
being all part of the same family tree.

I saw things that were, and things that are,
remembering about that day we shared in the star.
My mind awakened, My perspective shifted,
I came to see you were truly gifted.

- Ryan McClure

References

- (1) 'On This Day in Space History, the First Photo Is Taken from Space' <<https://spacecenter.org/first-photo-taken-from-space/>> [accessed 26 January 2021]
- (2) Administrator, NASA Content, 'Earthrise', NASA, 2015 <http://www.nasa.gov/multimedia/imagegallery/image_feature_1249.html> [accessed 26 January 2021]
- (3) 'This Photo Marks the First Time Humanity Could See Its Place in the Universe', 100 Photographs | The Most Influential Images of All Time <<http://100photos.time.com/photos/nasa-earthrise-apollo-8>> [accessed 26 January 2021]
- (4) "Earthrise," the Photo That Propelled the Environmental Movement and Led to Earth Day', WTTW News <<https://news.wttw.com/2020/04/22/earthrise-photo-propelled-environmental-movement-and-led-earth-day>> [accessed 26 January 2021]
- (5) 'The Blue Marble from Apollo 17' <<https://visibleearth.nasa.gov/images/55418/the-blue-marble-from-apollo-17>> [accessed 26 January 2021]
- (6) 'Voyager 1's Pale Blue Dot | NASA Solar System Exploration' <<https://solarsystem.nasa.gov/resources/536/voyager-1s-pale-blue-dot/>> [accessed 26 January 2021]
- (7) Sagan, C. (1997). Pale blue dot : a vision of the human future in space. New York: Ballantine Books. [accessed 26 January 2021]
- (8) White, F. (2014). The Overview Effect: Space Exploration and Human Evolution, Third Edition. American Institute Of Aeronautics And Astronautics.
- (9) Smithsonian Institution (2016). The Great Inka Road: Engineering an Empire. [online] americanindian.si.edu. Available at: <https://americanindian.si.edu/inkaroad/ancestors/creationstories/milky-way.html>.
- (10) Garnett, S.T., Burgess, N.D., Fa, J.E., Fernández-Llamazares, Á., Molnár, Z., Robinson, C.J., Watson, J.E.M., Zander, K.K., Austin, B., Brondizio, E.S., Collier, N.F., Duncan, T., Ellis, E., Geyle, H., Jackson, M.V., Jonas, H., Malmer, P., McGowan, B., Sivongxay, A. and Leiper, I. (2018). A spatial overview of the global importance of Indigenous lands for conservation. *Nature Sustainability*, 1(?), pp.369-374.
- (11) Purser, R.E., Park, C. and Montuori, A. (1995). Limits to Anthropocentrism: Toward an Ecocentric Organization Paradigm? *Academy of Management Review*, 20(4), pp.1053-1089.
- (12) Colomina, B. and Wigley, M. (2016). Are we human? : notes on an archaeology of design. Zürich, Switzerland: Lars Müller.

- (13) Ball, P. (2011). In retrospect: On the Six-Cornered Snowflake. *Nature*, 480(7378), pp.455–455.
- (14) Ball, C.S. (1966). The Early History of the Compound Microscope. *BIOS: A Quarterly Journal of the Beta Beta Beta Biological Society*, 37(2), pp.51–60.
- (15) The Editors of *Encyclopedia Britannica* (2018). Antonie van Leeuwenhoek | Biography, Discoveries, & Facts. In: *Encyclopædia Britannica*. [online] Available at: <https://www.britannica.com/biography/Antonie-van-Leeuwenhoek>.
- (16) Famous Scientists (2014). Antonie van Leeuwenhoek. [online] [Famousscientists.org](https://www.famousscientists.org). Available at: <https://www.famousscientists.org/antonie-van-leeuwenhoek/>.
- (17) National Human Genome Research Institute (2018). Human Genome Project Timeline of Events. [online] [Genome.gov](https://www.genome.gov). Available at: <https://www.genome.gov/human-genome-project/Timeline-of-Events>.
- (18) National Human Genome Research Institute (n.d.). Karyotype. [online] [Genome.gov](https://www.genome.gov). Available at: <https://www.genome.gov/genetics-glossary/Karyotype>.
- (19) Goff, P., Seager, W. and Allen-Hermanson, S. (2020). Panpsychism. Summer 2020 ed. [online] *Stanford Encyclopedia of Philosophy*. Available at: <https://plato.stanford.edu/entries/panpsychism/#:~:text=Panpsychism%20is%20the%20view%20that> [Accessed 03 Feb. 2021].
- (20) Perry, P. (2017). The universe may be conscious, say prominent scientists. [online] *Big Think*. Available at: <https://bigthink.com/philip-perry/the-universe-may-be-conscious-prominent-scientists-state> [Accessed 03 Feb. 2021].
- (21) Gareth Cook (2020). Does Consciousness Pervade the Universe? [online] *Scientific American*. Available at: <https://www.scientificamerican.com/article/does-consciousness-pervade-the-universe/>.
- (22) Ingersoll, E. and McGill, G. (n.d.). Cellular landscape. [online] *Gael McGill*. Available at: <https://gaelmcgill.artstation.com/projects/PmOJL1> [Accessed 03 Feb. 2021].
- (23) World Photography Organisation (2018). “Very Impressive Starling Murmurations” by Daniel Biber. [online] *World Photography Organisation*. Available at: <https://www.worldphoto.org/sony-world-photography-awards/winners-galleries/2018/professional/shortlisted/natural-world/very> [Accessed 04 Feb. 2021].
- (24) Editors, H. com (2010). Black Death. [online] *HISTORY*. Available at: <https://www.history.com/topics/middle-ages/black-death#:~:text=The%20plague%20is%20thought%20to>.
- (25) World Health Organization (2020). Coronavirus. [online] *World Health Organisation*. Available at: https://www.who.int/health-topics/coronavirus#tab=tab_1.

- (26) Johns Hopkins (n.d.). History of Agriculture. [online] Available at: <http://www.foodsystemprimer.org/food-production/history-of-agriculture/>.
- (27) Soga, M. and Gaston, K.J. (2018). Shifting baseline syndrome: causes, consequences, and implications. *Frontiers in Ecology and the Environment*, 16(4), pp.222–230.
- (28) Creydt, M. and Fischer, M. (2019). Blockchain and more - Algorithm driven food traceability. *Food Control*, 105(1), pp.45–51.
- (29) Krznaric, R. (2020). *The Good Ancestor : How to Think Long-Term in a Short-Term World*. 1st ed. New York: The Experiment, pp.4–5.
- (30) Sweeney, B.W. and Vannote, R.L. (1982). Population Synchrony in Mayflies: A Predator Satiation Hypothesis. *Evolution*, 36(4), p.810.
- (31) NASA (2019). Sun 3D Model. [online] NASA Solar System Exploration. Available at: <https://solarsystem.nasa.gov/solar-system/sun/in-depth/>.
- (32) United States Geographical Service (2015). The Himalayas [This Dynamic Earth, USGS]. [online] pubs.usgs.gov. Available at: <https://pubs.usgs.gov/gip/dynamic/himalaya.html#:~:text=In%20just%2050%20million%20years> [Accessed 15 Apr. 2021].
- (33) Chatterjee, S.P. and Bishop, B.C. (2017). Himalayas | History, Map, & Facts. In: *Encyclopædia Britannica*. [online] Available at: <https://www.britannica.com/place/Himalayas>.
- (34) Manual, B. (2014). Bristlecone Pines: Photos Reveal Some of Earth’s Oldest Organisms. [online] *Live Science*. Available at: <https://www.livescience.com/48344-bristlecone-pines-photos.html>.
- (35) The Editors of Encyclopaedia Britannica (n.d.). bristlecone pine | Facts, Oldest, & Lifespan. [online] *Encyclopedia Britannica*. Available at: <https://www.britannica.com/plant/bristlecone-pine>.
- (36) Galapagos Conservation Trust (2014). Galapagos Giant Tortoise - Galapagos Conservation Trust. [online] Galapagos Conservation Trust. Available at: <https://galapagosconservation.org.uk/wildlife/galapagos-giant-tortoise/>.
- (37) SARTORE, J. (2010). Galápagos Tortoise | National Geographic. [online] *Animals*. Available at: <https://www.nationalgeographic.com/animals/reptiles/facts/galapagos-tortoise#:~:text=Giant%20tortoises%20are%20the%20longest> [Accessed 15 Apr. 2021].
- (38) Roser, M., Ortiz-Ospina, E. and Ritchie, H. (2013). Life Expectancy. *Our World in Data*. [online] Available at: <https://ourworldindata.org/life-expectancy#:~:text=The%20United%20Nations%20estimate%20a>.

- (39) McClure, R. (2021). Picture of Myself. Ryan McClure's Personal Collection.
- (40) Oceana (2019). Common Bottlenose Dolphin. [online] Oceana. Available at: <https://oceana.org/marine-life/marine-mammals/common-bottlenose-dolphin>.
- (41) Spalding, K.L., Bhardwaj, R.D., Buchholz, B.A., Druid, H. and Frisén, J. (2005). Retrospective Birth Dating of Cells in Humans. *Cell*, 122(1), pp.133–143.
- (42) Wikipedia (2020). Intestinal gland. [online] Wikipedia. Available at: https://en.wikipedia.org/wiki/Intestinal_gland [Accessed 15 Apr. 2021].
- (43) Pet Guide (2020). Chug Dog Breed Health, Grooming, Feeding, Temperament and Puppies. [online] PetGuide. Available at: <https://www.petguide.com/breeds/dog/chug/> [Accessed 15 Apr. 2021].
- (44) McClure, R. (2018). Picture of Cooper, a Chihuahua & Pug Cross breed of dog. Ryan McClure's Personal Collection.
- (45) Arias, C.F. and Arias, C.F. (2017). How do red blood cells know when to die? *Royal Society Open Science*, 4(4), p.160850.
- (46) Kunkel, D. (2018). Red Blood Cells In Isotonic Solution by Dennis Kunkel Microscopy/science Photo Library. [online] Pixels. Available at: <https://pixels.com/featured/2-red-blood-cells-in-isotonic-solution-dennis-kunkel-microscopy-science-photo-library.html> [Accessed 16 Apr. 2021].
- (47) shaileshpatel80 (2018). What constitutes food waste? [online] design / infrastructures / inclusion. Available at: <https://designinfrastructuresinclusion.wordpress.com/2018/11/28/what-constitutes-food-waste/> [Accessed 16 Apr. 2021].
- (48) Geronimo (2019). Is Biodegradable Littering Okay? It's Definitely Not and Here's Why. [online] Earth Buddies. Available at: <https://earthbuddies.net/biodegradable-littering/#:~:text=The%20rule%20of%20thumb%20is> [Accessed 16 Apr. 2021].
- (49) Hamilton, D.D. (2020). David R Hamilton PhD | You are made of stardust. [online] David R Hamilton PhD. Available at: <https://drdavidhamilton.com/you-are-made-of-stardust/> [Accessed 16 Apr. 2021].
- (50) Sebald, W.G. and Hulse, M. (2002). *The rings of Saturn*. 1st ed. London: Vintage Classics, p.263.
- (51) Morley, R.J. (2000). *Origin and evolution of tropical rain forests*. 1st ed. Chichester ; New York: Wiley.
- (52) Carver, C. (2017). 4 medicines with roots in the rainforest. [online] Global Citizen. Available at: <https://www.globalcitizen.org/en/content/4-medicines-with-roots-in-the-rainforest/> [Accessed 16 Apr. 2021].

- (53) World Health Organization - Health Product Policy and Standards Team (2019). WHO Model List of Essential Medicines - 21st list, 2019. World Health Organization.
- (54) Umair Irfan (2019). Amazon rainforest: deforestation at highest rate in more than a decade. [online] Vox. Available at: <https://www.vox.com/science-and-health/2019/11/18/20970604/amazon-rainforest-2019-brazil-burning-deforestation-bolsonaro>.
- (55) Vandette, K. (2019). Chernobyl's exclusion zone is now a wildlife refuge and biodiversity hotspot • Earth.com. [online] www.earth.com. Available at: <https://www.earth.com/news/chernobyls-exclusion-zone-wildlife-refuge/>.
- (56) Pownall, A. (2019). Pavilion grown from mycelium acts as pop-up performance space at Dutch Design Week. [online] Dezeen. Available at: <https://www.dezeen.com/2019/10/29/growing-pavilion-mycelium-dutch-design-week/>.
- (57) Chartier-Corbasson (2014). london organic skyscraper. [online] chartcorb.free.fr. Available at: <http://chartcorb.free.fr/london1.html> [Accessed 16 Apr. 2021].
- (58) Fairs, M. (2014). Microbes are “the factories of the future.” [online] Dezeen. Available at: <https://www.dezeen.com/2014/02/12/movie-biocouture-microbes-clothing-wearable-futures/>.
- (59) Aghigh, R. (2019). biogarmentry. [online] www.royaaghghi.com. Available at: <https://www.royaaghghi.com/biogarmentry.html>.
- (60) Beston, H. and Hoare, P. (2003). The outermost house : a year of life on the great beach of Cape Cod. London: One, An Imprint Of Pushkin Press.
- (61) Cooper, K. (2017). NASA Astrobiology. [online] [Nasa.gov](http://nasa.gov). Available at: <https://astrobiology.nasa.gov/news/looking-for-luca-the-last-universal-common-ancestor/>.
- (62) Sci News (2019). Life Originated in Hydrothermal Vents, New Study Suggests | Biology | Sci-News.com. [online] Breaking Science News | [Sci-News.com](http://www.sci-news.com). Available at: <http://www.sci-news.com/biology/life-hydrothermal-vents-07772.html> [Accessed 16 Apr. 2021].
- (63) Deziel, C. (2018). Animals That Share Human DNA Sequences. [online] Sciencing. Available at: <https://sciencing.com/animals-share-human-dna-sequences-8628167.html>.
- (64) Gerber, T. (2017). How Jane Goodall Changed What We Know About Chimps. [online] Magazine. Available at: <https://www.nationalgeographic.com/magazine/article/becoming-jane-goodall> [Accessed 16 Apr. 2021].
- (65) My Octopus Teacher. (2020). Netflix Original Production.

- (66) CNN, A.J. (2016). Penguin reunites with his best human friend. [online] CNN. Available at: <https://edition.cnn.com/2016/03/12/world/migrating-penguin-south-america-irpt/index.html> [Accessed 16 Apr. 2021].
- (67) PhD, E.K. (2020). Biophilic Culture and its Nuances. [online] Medium. Available at: <https://medium.com/qu%81lis/biophilic-culture-and-its-nuances-54339a15a6f3> [Accessed 16 Apr. 2021].
- (68) Fromm, E. (1997). *The anatomy of human destructiveness*. 1st ed. London Pimlico, p.366.
- (69) Brodowicz, A. (2018). Alicja Brodowicz | Photo. [online] Alicja Brodowicz Portfolio. Available at: <http://alicjabrodowicz.com/>.
- (70) Memorable (2021). North Atlantic Whales. [Streamed] Spotify. Available at: <https://open.spotify.com/track/43RXQFu2Iu62DWhpBXvSOY?si=-AilKULJTJS8R4wOocnvMA> [Accessed 25 Apr. 2021].
- (71) Frith, D.W. and Frith, C.B. (1988). Courtship Display and Mating of the Superb Bird of Paradise *Lophorina superb*. *Emu - Austral Ornithology*, 88(3), pp.183–188.
- (72) PATOWARY, K. (2016). Watch The Superb Bird-of-Paradise’s Courtship Dance. [online] www.amusingplanet.com. Available at: <https://www.amusingplanet.com/2016/11/watch-superb-bird-of-paradises.html> [Accessed 16 Apr. 2021].
- (73) Ernest (2020). Crown shyness. [online] Ernest journal. Available at: <https://www.ernestjournal.co.uk/blog/2020/4/10/crown-shyness> [Accessed 16 Apr. 2021].
- (74) Kerstein, A. and Katsis, J. (2017). THE CHOICE BETWEEN DESTRUCTION OR MEDIATION. [online] Available at: <https://www.humansandnature.org/what-happens-when-we-see-ourselves-as-separate-from-or-as-a-part-of-nature-the-choice-between-destruction-or-mediation> [Accessed 17 Apr. 2021].
- (75) Boslaugh, S.E. (2019). Anthropocentrism | philosophy. In: *Encyclopædia Britannica*. [online] Available at: <https://www.britannica.com/topic/anthropocentrism>.
- (76) Crist, E. and Kopnina, H. (2014). Unsettling anthropocentrism. *Dialectical Anthropology*, 38(4), pp.387–396.
- (77) Matt Ridley (2020). *How innovation works*. Éditeur: London 4th Estate.
- (78) Miller, W. (1955). Old Man’s Advice to Youth: “Never Lose a Holy Curiosity.” *LIFE Magazine*, 2 May, p.64.

The birds are singing - it's a new day.