

# Everything is Connected to Everything Else

101 stories about 21st century Geography

by

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## CHAPTER 3

# THE ENVIRONMENT

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## Been around the block a few times.

Talking about the beginning of time is possibly a job left to somebody more eminently qualified than I, Professor Brian Cox or Professor Stephen Hawking perhaps. I am more than a little wary as I struggled through – and failed to finish – Hawking's 'Brief History of Time' which, bearing in mind that it was pretty much meant to be the idiots' guide to cosmology, should not fill you with confidence.

I am confident that the earth is about 4.5 billion years old. Why? Because I believe the scientists who use radioactive dating based around the comparison of the observed abundance of naturally occurring radioactive isotopes and their decay products.<sup>1</sup> I do not understand how this is done as I am not a physicist but I trust the process of science through which such techniques have been shaped.

Yet even with this scientific validity I am probably no more confident of the age of the earth than Bishop James Ussher of Ireland who back in the 17<sup>th</sup> century calculated the exact date of the first day of Genesis as being Sunday 23<sup>rd</sup> October 4004BC. So about 6,000 years old.<sup>2</sup> He was wrong but I suspect that even if the mathematically diligent bishop had a whole lecture programme with Brian Cox outlining what we now know about the cosmos, the bishop would still stick with the 6,000 years. That's faith for you.

What should concern you more than my cosmological limitations is that according to Gallup in June 2012, 46% of US citizens believe in short history creationism.<sup>3</sup> That is to say, almost a majority of the most technologically advanced nation on earth hold the genuine conviction that God created the earth less than 10,000 years ago pretty much as described in the book of Genesis. The creationists differ on the exact calculation, not all of them follow Bishop Ussher's maths.

Wow! As Gallup themselves put it: "Thus, almost half of Americans today hold a belief...that is at odds with the preponderance of the scientific literature."

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<sup>1</sup> Dalrymple, G B (1991) 'The Age of the Earth'. Stanford University Press. California.

<sup>2</sup> The story of Bishop Ussher is told many pace on the Internet but Craig, G. Y. and Jones, E (1982) 'A Geological Miscellany'. Princeton University Press appears to be an original academic source.

<sup>3</sup> Gallup Politics June 1st 2012 Accessed 20/2/2013 at <http://www.gallup.com/poll/155003/Hold-Creationist-View-Human-Origins.aspx>

That also means that a great sweep of what we know today in geography to be broadly so is challenged by up to 150 million people in the most technocratic society in the world: plate tectonics, glaciation, volcano formation, the cause of earthquakes, ecological succession and multi-cellular atmospheric circulation. Geography teachers in the USA really earn their living.

In fact the earth had been around the block – well the sun – a few times before the beginnings of anything we might think to resemble biotic life started to appear about 3.8 billion years ago.

Professor Richard Dawkins has neat way of explaining how long ago all this is. He says this: find a picture of yourself and then place a picture of your father underneath it and then your grandfather underneath that, then your great grandfather and so on. If you keep doing that approximately 185 million times you would find yourself back at your earliest ancestor. A fish.<sup>4</sup>

This would be a bookcase of photographs 65 kilometres long. To go back to man's first foray out of Africa you would only have to walk about 2 metres down that line. There you would find a photograph of your 5,000th grandfather. He would look reasonably like you, although probably with worse hair and teeth and you could, technically speaking, mate with him (or her). As you can see humans have moved on pretty rapidly in that last couple of metres of evolution, particularly in the last 3cm when the Romans appeared on the scene and Jesus, it has been claimed, was born. For a short-earth creationist you would only clock up 260 generations of great grandparents – no ice ages, no dinosaurs, no fossils.

Whatever perspective you take – a scientific one based around critical reasoning and corroborative evidence or a faith based perspective built around the hermeneutic reading of texts of uncertain provenance with little in the way of corroborative evidence – the environment into which humans have grown into is the most precious of things. Whether a god-gifted sustaining life-giver or the intricate synergy of energy and matter that has become the portmanteau upon which humanity projects its consciousness upon – the environment is very important and has to be cared for if we want to add even a few more centimetres to that 65 kilometres of evolutionary hereditary.

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<sup>4</sup> Dawkins, R (2011) 'The Magic of Reality.' Transworld London: Chapter 2 'Who was the first person?'

## **And then those humans evolved and look what happened.**

One of the most significant aspects of the Neolithic Revolution – that epoch between 6,000 and 12,000 years ago when agriculture re-defined the human experience – was the ability of humans to manipulate the environment in which they lived. Whilst it is true that Homo Sapiens, and even Homo Erectus our earlier ancestors (about 5 to 25 metres further along our bookcase of evolution) had sussed out the controlled use of fire, this wasn't for landscape modification but simply to keep warm and to ward off animals with big teeth.

Once we started to settle down we began to turn our attention to making our immediate environment safer and more productive. We started to use fire and tools to clear land of natural vegetation. To grasp the impact of this landscape modification it is highly instructive to focus on the British Isles.

With the end of the last ice age 15,000 years ago the British landscape steadily evolved as warmer weather began to shape an ecology we might recognise. The retreating ice and tundra was increasingly colonised by pioneer tree species such as hazel, Scots pine and birch. This process reached a dynamic equilibrium about 6,000 years ago, in what is known as the Atlantic Period, when warm summers and mild wet winters defined the 'climatic climax vegetation' of the vast majority of the British Isles (apart from the very north of Scotland which

even in this period was dominated by tree-less tundra). What this means is that the 'optimum' vegetation type, given our climate at that time, was oak/ash/elm/lime woodland. This is what is stated to be the natural vegetation of the British Isles.

If you were a squirrel that had just made it across the newly created straits of Dover – which was when post ice age rising sea levels broke through the final land bridge and turned Great Britain into an island rather than an isthmus attached to Europe – you would have been able to leap from tree to tree right up into to the Scottish highlands. Not for long mind, this was the high point of the natural world in the British Isles. Since then it is a story of human adaption and change. Neolithic man was just getting going, attempting an 8th human attempt to colonise Britain: the others all beaten back by encroaching ice ages and climate hostility.

However that early Neolithic landscape would seem very familiar to us today. As Michael Williams, Professor of Geography at Oxford University asserts "by 4000BP the distribution of trees was looking remarkably like that of today."<sup>5</sup>

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<sup>5</sup> Williams M (2003) 'Deforesting The Earth' University of Chicago Press page 8

The modification of the landscape through fire and deforestation was according to Carl Sauer (the American often cited as being the father of cultural geography) leading the natural environment to be “deformed, as to biota, surface and soil, into unstable cultural landscapes.”<sup>6</sup> What Sauer is getting at is the way in which land was moulded to benefit human agency and how that left a legacy that remains with us today.

The clearance of the great ‘wildwood’ of Britain was accelerated by the development of ever more efficient tools. By 2,500 years ago agriculture was very well established with 25% of the land area of the British Isles being cereals, pasture or other crops and a further 20% untended grasslands and heaths.<sup>7</sup>

The Anthropocene is the name coined by some scientists for the modern history of the earth. This is the period when humans have made irreversible impacts on the environment in terms of biodiversity loss, climate change and the deposition of trace elements such as mercury.<sup>8</sup> William Ruddiman the US paleoclimatologist has argued that this was set off by changes in land-use during the early Neolithic period.<sup>9</sup> Yet most scientists point to the beginning of large-scale fossil fuel use from the 18<sup>th</sup> century as the beginning of the Anthropocene.

At present the Geological Society of London (who have the responsibility for naming and demarcating geological epochs) are debating whether this term can be official nomenclature. It will not be a rushed decision – geologically slow would be in keeping – and if anything is going to convince in this debate it is as likely to be the scale of biodiversity loss at present as it is climate change. Whatever is decided there is no doubt that once Neolithic man settled down and human populations and technology started to expand life was never the same again on this planet. The British Isles has mere scraps of its Atlantic period ‘wildwood’ for you to wander through to remind you of what this island ‘naturally’ looks like.

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<sup>6</sup> Sauer, C (1952) ‘Agricultural Origins and Dispersals’ American Geographical Society.

<sup>7</sup> See diagrams in Waugh, D (1990) ‘Geography: An Integrated Approach’. Page 250-251: changes in Britain’s land surface, 10,000BC to the present (after G. Wilkinson)

<sup>8</sup> Revkin, A (2011) New York Times opinion piece with attached TED talk lecture by Will Steffen, Executive Director of Australian National University Climate Change Institute. Accessed 20/02/2013 at <http://dotearth.blogs.nytimes.com/2011/05/11/confronting-the-anthropocene/>

<sup>9</sup> Ruddiman, W (2005) ‘Plows, Plagues, and Petroleum: How Humans Took Control of Climate’. Princeton University Press. New Jersey.

## I've got this great idea, electricity.

The industrial revolution is often divided into two historical periods. The first industrial revolution, so the great – and recently – departed historian Eric Hobsbawm states “broke out in Britain in the 1780s” and consisted of new manufacturing processes, water power and the beginnings of the factory system.<sup>10</sup> In 1771 Richard Arkwright created a water-driven factory spinning yarn in the small Derbyshire town of Cromford. This town is now a World Heritage Site and is as good a location as any to be considered ‘ground zero’ for the dynamism that set in train the breakout a decade later of a full blown social and technological revolution.

Intriguingly Arkwright not only pioneered the factory system but he also attempted to establish a monopolistic command of the market through the use of patents: he also used venture capitalists for capital and took a wholly patrician outlook on his growing workforce of over 5,000 – an unheard size of business at that time, 1782.<sup>11</sup> He then built a powered spinning mill in Manchester and the rest as this great crucible of industrialisation testifies is history. Fifty-eight years later (in 1840) Friedrich Engels reflecting upon what Arkwright had helped set in motion described the ‘shock’ city of the industrial revolution thus:

**“On the lower right bank stands a long row of houses and mills; the second house stand so low that the lowest floor is uninhabitable, and therefore without windows or doors. Here the background embraces the pauper burial-ground, the station of the Liverpool and Leeds railway, and, in the rear of this, the Workhouse, the ‘Poor-Law Bastille’ of Manchester, which, like a citadel, looks threateningly down from behind its high walls and parapets on the hilltop, upon the working-people’s quarter below.”<sup>12</sup>**

The second industrial revolution, also known as the technological revolution, began in Sheffield in 1858. A bold claim. Let me attempt to justify this: 1858 is when Henry Bessemer’s invention – the Bessemer convertor – finally started the mass production of steel in a series of newly-built steelworks stretched along Sheffield’s Lower Don Valley. Vickers, Firth, Brown and Jessop all had the address of Carlisle Street East. One of the oldest of these steel mills – The River Don Works – remains in operation today over 150 years since it started production. The significance of this event is in that it led to a massive scaling up of the industrial process. Volume, uniformity and increasing mobility (courtesy of the railway tracks that spewed out of these steelworks) took the earlier industrial revolution to new technological heights and new places across the globe.

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<sup>10</sup> Hobsbawm, E ( 1995)The Age of Revolution: Europe 1789–1848’, Weidenfeld & Nicolson Ltd. London.

<sup>11</sup> An excellent on-line history of Richard Arkwright by Craig Thornber accessed at <http://www.thornber.net/cheshire/ideasmen/arkwright.html>

<sup>12</sup> I wish I had a copy of Freidrich Engel’s 1844 classic ‘The Condition of the Working Class in England ‘but I do not. Instead this quote comes from the Columbia University website on the history (modernism) course. Accessed at [http://www.columbia.edu/~lnp3/mydocs/modernism/engels\\_english.htm](http://www.columbia.edu/~lnp3/mydocs/modernism/engels_english.htm)

Yet what was launched in Sheffield did not fully come to fruition until the beginning of the 20th century. This was when a raft of co-joining technologies reached take off. As American writer and technology expert Jeremy Rifkin puts it “first-generation electrical forms of communication converged with the introduction of oil, the automobile and the mass-production of manufactured goods.”<sup>13</sup>

Of course such a momentous change was geographically uneven in its impact. A two-speed world that had been set in motion by the plunder of empire was henceforth accelerated. This is visually apparent when running Hans Rosling’s Gapminder graphics comparing health and wealth since 1810.<sup>14</sup> The pattern of the first half of the 20<sup>th</sup> century is one of European nations, North America, Japan and Australasia steaming ahead of a huge pack of colonised countries in Africa and Asia and moving towards the healthy-wealthy corner.

If one technological development could really be said to be the core mark of modernity it might be electricity. Undoubtedly the automobile and aviation have also been at the forefront of the march of modernity but both rely on electricity in some part. Yet it is the complex centralised networks – or grids – that distributed electricity that created the spatial architecture of modern societies.

When the London underground starting using electricity to power its trains it acted as the catalyst for a huge geographical expansion of the city and the creation of the idea of suburbia. When electrical-powered washing machines became widely available hundreds of millions of women were liberated from endless drudgery to part-time drudgery, and Hans Rosling’s mother had the time to teach her son to love books.<sup>15</sup>

Way back in the 1940s American anthropologist Leslie White posited that “culture evolves as the amount of energy harnessed per capita per year is increased or as the efficiency of the instrumental means of putting the energy to work is increased”.<sup>16</sup> That is to say it was the ability of electricity to transform our lives by doing work for us that gave humans the ability to engage in higher levels of technological development. Initially, we generated that electricity by burning stored hydrocarbons; today we are going to have to increasingly turn our attention to different sources. But whatever way we go about generating electricity, it is the electricity we crave – it is literally the spark in our lives.

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<sup>13</sup> Rifkin J (2009) ‘The Empathic Civilization’. Polity Press Bristol. pp36-37

<sup>14</sup> An excellent introduction to Hans Rosling’s work is in this short 4 minute video accessed at <http://www.gapminder.org/videos/200-years-that-changed-the-world-bbc/>

<sup>15</sup> Hans Rosling and his magic washing machine see above

<sup>16</sup> If I had a university library card I would try and ferret out an original copy of White’s 1949 treatise ‘The Evolution of Culture: The Development of Civilization to the Fall of Rome’ (1959) However this is a good primer. [http://en.wikipedia.org/wiki/White%27s\\_law](http://en.wikipedia.org/wiki/White%27s_law)

## How healthy now?

If it was possible to give our planet a comprehensive health check – the sort of thing you might consider at my age, to check that the antecedent conditions of an imminent demise are not lurking – now would be a good time. Plenty of organisations and scientists have had a go at such a task but like my health check – more exercise, give up this, less of that – the advice proffered has only slowly been taken up at best.

The best resource I have come across that sets out the multiple pressures placed by human activity upon the planet has come from the hand of David Attenborough. In 2000, Attenborough for once shifted his gaze away from natural history's visual panoramas towards examining, at the Millennium, the pressures that would face the earth in the 21st century. Attenborough was helped out on the three-part 'State of the Planet' documentary series by some of the biggest names in biology, environmental science and geography: Jared Diamond, E.O. Wilson, John Lawton, Steven Schneider and Sue Earle.<sup>17</sup>

He approached the challenge in a very structured way, something that for the past decade I have referred to as the 'Attenborough model of biodiversity decline'. It works a treat in the exam room because there are few clearer ways of outlining the interconnected pressures assaulting global biodiversity.

Let us start with over-harvesting. Whether it is squeezing every last drop of productivity out of arable land and grazing ranges, or whether it is the removal of forest to meet increasing demand for timber over-harvesting is a product of growing populations and growing economic development. A case in point is over-fishing. Over 115 million tonnes of aquatic biomass are removed from oceans and inland fisheries every year.<sup>18</sup> Obviously a preference is shown for large-bodied fish, higher up the trophic food chain, and this accentuates the impact of over-fishing – reducing the probability of fish reaching sustainable re-productive maturity.

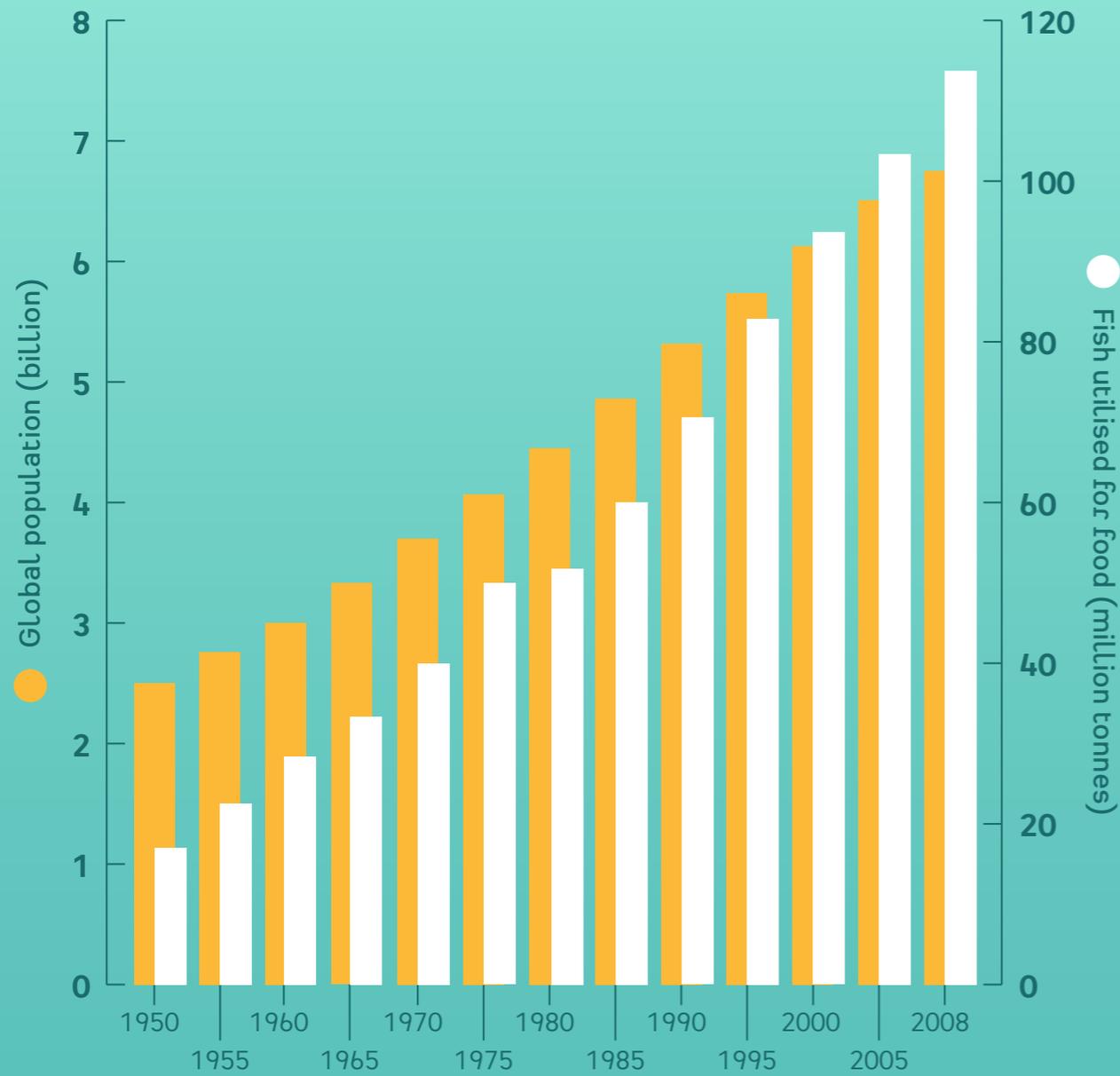
The image on the next page shows the growth of global fish harvesting. It doubled between 1980 and 2008. That is to say, it has grown faster than the rate of population growth over the same period. It is also notable that the amount of fish per capita that makes it into our food supply has also increased, from 9kg per person in 1960 to just under 17kg per person in 2008. More people are being better fed by fish. However, although that is a global figure it will of course be unevenly distributed. Those of us with a host of fresh fish counters adorning our supermarkets and 'bogoff' prawns on permanent offer are probably consuming fish at a rate far in excess of the mean. The value of fish exports from developing countries worldwide, primarily to developed countries – for example tuna from Indonesia to Japan – has risen from \$9billion in 1987 to \$25billion in 2007. Fish exports globally are worth more than the combined exports of coffee, bananas, cocoa and tea.

<sup>17</sup> Attenborough, D. (2000) State of the planet. BBC TV

<sup>18</sup> The State of the World's Fisheries and Aquaculture 2010. FAO. Table 2: reproduced in text.

Figure 3.1

# STATE OF THE WORLD'S FISHERIES AND AQUACULTURE



Source: Source 'The State of the World's Fisheries and Aquaculture 2010.' FAO. Rome.

Next up on the Attenborough model is habitat destruction – something he describes as the most impactful of all on global biodiversity. Habitat loss is occurring all over the world although the pressure to bring more and more wild habitat into productive use is greatest in those countries under most economic pressure.

Alienisation is one of the more over-looked of human impacts. At the start of the 21<sup>st</sup> century researchers estimated the economic impact of alien species on the United Kingdom to be \$6.57billion per year: the figure for the United States was a staggering \$58 billion.<sup>21</sup> It must also be borne in mind that alien species both plant and animal can confer economic benefits as well as negative environmental impacts. Attenborough visits Hawaii to make his point: he describes the loss of the vast majority of the islands indigenous species and clearly attributes this to the arrival of human beings and their introduction of a wide range of alien species.

The fragmentation of original ecosystems by farmland, urbanisation and transport networks is referred to as islandisation and is the fourth major impact on global biodiversity. This can be on a macro-scale such as the breaking up of large-scale species migrations across the tropical grasslands of Africa. On a micro-scale the expansion of agriculture on the

South Downs in Surrey, has marginalised the Silver Spotted Skipper Butterfly to a few disconnected sites leaving it exposed to a localised extinction in a poor weather year. No matter the scale islandisation challenges the resilience of species to survive other intervening pressures.

Finally Attenborough acknowledges the impact of pollution and particularly climate change, as having potentially catastrophic impacts on biodiversity. The combination of these five drivers of biodiversity loss is so great that Attenborough asserts we are on the cusp of an extinction event on a par with the last great extinction event that took out the dinosaurs some 65 million years ago. Such an outcome over the next century would significantly undermine the entire range of environmental services that human beings rely on to sustain themselves.

It appears that in the first decade of the 21st century, regardless of the scientific advice proffered, the on-the-ground action to address the impoverishing ecological health of our planet has been sketchy at best. In 2010 the UN Biodiversity conference at Nagoya tried to kick-start a more concerted effort at bio-diversity protection by the conference's 193 signatory countries. However, the conservation group WWF reported that up until 2012 a mere 14 countries had actually engaged in anything tangible to address the over-arching pledges made at Nagoya.<sup>22</sup>

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<sup>21</sup> Pimental, D et al (2000) 'Economic and environmental threats of alien plant, animal, and microbe invasions.' *Agriculture, Ecosystems and Environment* 84 (2001) 1–20

<sup>22</sup> Vaughan A (2012) 'Countries failing to act on Nagoya biodiversity promises,' *The Guardian* . Accessed at <http://www.guardian.co.uk/environment/2012/oct/08/nagoya-biodiversity>

Earlier in 2012 research scientists meeting in London at a conference which, un-reported by the BBC or any major newspaper in the UK, declared that: “research now demonstrates that the continued functioning of the Earth system as it has supported the wellbeing of human civilization in recent centuries is at risk.”<sup>23</sup> This, the first ‘State of the Planet’ conference, warned that we have a decade – tops – to avoid environmental tipping points that will lead us towards a complete environmental breakdown. Our track record on such warnings by the scientific community is pitiful as evidenced by the marginal impact even David Attenborough exerted in the first decade of this century. We remain like the twice, thrice warned smoker who fails to heed the advice of science in the face of an imminent, self-inflicted, demise. Surely we are smarter than that?

## How local?

The United Kingdom is a densely populated country – particularly the parts where most people live, obviously: that is to say, the south-east and the major urban conurbations. Research by CABE<sup>24</sup> in 2009, shows that the average accommodation size in the UK, within 1 hour of central London, is 76m<sup>2</sup>. This is less than half the size of homes in Australia or the United States and is even significantly below our neighbours Denmark (137m<sup>2</sup>) and France (113m<sup>2</sup>). An Englishman’s home is a little bijou to be his castle.

You can’t get more local than where you live: actually where you live. Your four walls, roof and hopefully patch of outdoor open space. This is your habitat, where you interact with or hide from the big bad environment out there.

I am fortunate – by design – in that I have quite a patch behind my terraced house. Palms, banana trees, a greenhouse, grape vines, half a dozen vegetable beds, berries, currants, birds, foxes, trees – nature both tamed and untamed. And I live in a relatively dense part of my city. It is a terraced house.

There is no doubt that the garden is a major part of British culture. As evidence you only have to visit those far-flung outposts of ex-empire such as Ooty in southern India or the Cameroon Highlands in Malaysia where pristine botanical

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<sup>23</sup> Reported at <http://www.scidev.net/en/agriculture-and-environment/planet-under-pressure-2012-2/news/planet-is-in-critical-state-warns-science-declaration.html> and very few other places.

<sup>24</sup> BBC News Magazine 15 August 2009 ‘Room to swing a cat? Hardly.’ Accessed at <http://news.bbc.co.uk/1/hi/magazine/8201900.stm>

gardens and personal plots surrounding old homes pay homage to privet and petunias. At home the garden is where most of us interact with what passes for the natural environment in the hyper-Anthropocene of our predominantly urban world.

Research by HSBC in 2012 revealed how the British use their gardens: 64% to grow plants, 46% to actively encourage wildlife, 38% to grow fruit and vegetables. We spent on average 95 days a year in our gardens, which, given the vagaries of British weather and the short days of winter is a significant part of our lives for those of us who have gardens. 89% of Britons think it is important that they have a garden.<sup>25</sup>

At the extreme end of urbanisation is a place like Dharavi in Mumbai, India. Here there are no gardens, no green space at all, and if there was it would probably be a toilet. Dharavi is the most densely populated part of one of the most densely populated cities in the world. Mumbai has an average population density of 34,269 people per km<sup>2</sup>, in Dharavi this rises to 101,660 per km<sup>2</sup>. The highest population densities in London are 17,200 per km<sup>2</sup>.<sup>26</sup>

Famed as the largest slum in Asia, Dharavi is an experiment in how many humans can be crammed into the smallest space possible and still survive. Life in such an environment will have nearly no references to the natural world beyond the animals that are slaughtered there, the swooping of Pariah Kites, the scuttling of rats and the whine of insects. Humanity lives cheek by jowl in a way that has never been achieved on the surface of the planet before. All space is public. Conviviality is high, because there is no choice but it to be so.

For the British, with their predilection for what anthropologist Kate Fox calls dis-ease – a certain social uncertainty and desire for personal space – the personal, private garden has always been a clear aspirational goal.<sup>27</sup> Gardens become the re-creation of facsimiles of an imagined rural idyll. Yet in so doing gardeners plunder resources from all over the planet. I am no different.

The Fynbos of South Africa for my Osteospermums, Yucca's from Mexico, Cabbage Palm and tree ferns from New Zealand, potatoes from South America, across my patch it is a snapshot of global biodiversity. Furthermore I've used peat from ancient bogs, limestone, sand and alluvium from goodness-knows-where but not locally sourced for sure. Except for a lot of manure from a farm on the outskirts of Sheffield.

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<sup>25</sup> HSBC press release 15th May 2012. Accessed at [http://www.newsroom.hsbc.co.uk/press/release/green-fingered\\_brits\\_ditch\\_out](http://www.newsroom.hsbc.co.uk/press/release/green-fingered_brits_ditch_out)

<sup>26</sup> Mumbai data from urbanisation report used in teaching Powerpoint. Source: UN Habitat; Nairobi. Kenya and Urban Age at London School of Economics.

<sup>27</sup> Fox, K. (2004) 'Watching the English' Hodder and Stoughton. London.

Our personal space – our extremely local environment – is therefore a minor incremental act in the human dance with the natural world. It covers overharvesting (think about that tropical hard wood decking), alienisation (damn that Japanese Knotweed), our awareness of climate change (did you try to grow anything through 2012's deluge?) and our ability to bring nature to heel in our sanitised idylls of leisure and pleasure.

## **Supermarket sweep.**

Where most people in Britain come into contact with the fruits of the earth is within the functional big barns that are their local super-markets. It wasn't always like this. Back in 1977 there were 63,000 independent grocery stores in the UK. Now there are around 23,000.<sup>28</sup> This is not surprising when you consider that in 2012 seven supermarket chains took a combined 86.3% of the UK market for food.<sup>29</sup> Of those businesses Tesco accounted for 29.7% with £60.9billion in sales from April 2011 to April 2012.

If you are able to cast your memory back to the embryonic supermarkets of the 1970s you will be able to appreciate the huge expansion in the range and choice of food goods that can be found in supermarkets today. Produce from all over the world fills the shelves. Seasons do not matter anymore as strawberries for example can be grown all over the world and air-freighted to the UK at any time of the year.

In 2005 the British government commissioned a report into the phenomenon known as 'food miles', the DEFRA produced *'The Validity of Food Miles as an Indicator of Sustainable Development'*. This report demonstrated that getting food from the producer to the consumer increasingly consumed more and more energy resources with consequential impacts upon the environment. It is often more complex than imagined with

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<sup>28</sup> Blythman, Joanna (2007)'Shopped: The Shocking Power of British supermarkets 2nd edition'

<sup>29</sup> Raw data aggregated from the source <http://grocerynews.org/2012-06-16-08-27-26/supermarkets-market-share/grocery-stores>

the increasing globalisation of food supply chains being one factor: another the centralised distribution systems of super-market chains and even the car journeys to supermarkets replacing what used to be pedestrian journeys to local shops. The report demonstrates the environmental and economic costs of such trends when it sets out these observations.

**“The direct social, environmental, and economic costs of food transport are estimated at over £9 billion each year, and are dominated by congestion. The social cost of congestion is estimated at £5 billion. Accidents lead to social costs of £2 billion per year, and greenhouse gas emissions, air pollution, noise and infrastructure cost a further £2 billion.”<sup>30</sup>**

That was 9 years ago. It will be more now.

Such patterns of food supply can have impacts on the environment to which the vast majority of consumers rarely give thought. In March 2013 The Guardian reported the death of a sperm whale off the southern coast of Spain. The cause of death was 17kg of plastic in the whale’s stomach. The source of the plastic was the plasti-culture greenhouses of Almeria that are one of the main areas that supplies the UK with out of season fruit and vegetables for UK dinner tables. It is estimated

that 96,000 tonnes of un-biodegradable plastic waste is produced a year from the 40,000 hectares of greenhouses on the Almeria coast.<sup>31</sup> So great is the scale of this plasti-culture in southern Spain that the proliferation of greenhouses is easily identifiable from space.

Unsurprisingly the idea of the geographic provenance of food is becoming an area of increasing interest for those with the economic resources and inclination to make such choices. Local farmers markets have grown to an estimated 800 in the UK<sup>32</sup> although many sell goods that do not necessarily have any local provenance or indeed have anything to do with food. I know this simply from visiting my local farmers market. However what they do lend credibility to is the idea that as the world has become increasingly globalised many have begun to re-accentuate the local in response to the less tangible global.

The idea that specific geographies can be attributed to the food we consume has become an interest of Professor Peter Jackson of the University of Sheffield. Peter’s work has focused on the anxieties that consumers feel about food provenance in an age of industrial supply chains. The horse-meat (non) labelling scandal of early 2013 demonstrates that his work is highly prescient.<sup>33</sup>

<sup>30</sup> DEFRA (2005) The Validity of Food Miles as an Indicator of Sustainable Development

<sup>31</sup> Tremlett, G (2013) Spanish sperm whale death linked to UK supermarkets supplies plastic. The Guardian 8/03/2013  
Accessed at <http://www.guardian.co.uk/world/2013/mar/08/spain-sperm-whale-death-swallowed-plastic>

<sup>32</sup> <http://www.farmersguardian.com/home/rural-life/country-view/farmers%E2%80%99-markets-%E2%80%93-21st-century-solution-to-local-sustainability?/31329.article>

<sup>33</sup> Jackson, P (2010) ‘Food Stories: Consumption in an Age of Anxieties. Cultural Geographies April 2010 vol. 17 no. 2 147-165.

One of the most bizarre examples of this dissonance between what we think food geographically is and what it geographically actually is can be illustrated by the story from February 2012 of the Asda supermarket supplier of 'Italian' tomato puree who simply repackaged Chinese tomato puree imported into his Italian warehouse.<sup>34</sup> If we are what we eat, as some people glibly assert, we are increasingly becoming an atlas – an atlas of environmental destruction. Our supermarkets are both the problem and potentially the solution. Supermarkets are where our relationship to the environment is most sharply commodified.

## Migrating birds.

Since my teenage years I have always been interested in birds. They appear in our highly controlled and subservient 'natural' world as free spirits that we have failed to quell. They are excellent indicators of our seasonality and many come to us after truly amazing migrations that link our back gardens, parks and fields with the deserts, forests and grasslands of Africa and the frozen tundra of the Arctic Circle.

These connections can be both fascinating and instructive. The Swallow is a beautiful bird, a harbinger of the arrival of Spring and in that a tangible way of understanding the impact of climate change. Evidence collated by the UK Environmental Change Network clearly indicates that Swallows have been arriving earlier in the UK as a result of an earlier onset of spring warmth.<sup>35</sup>

The writer Horatio Clare set out to chart the remarkable journey that bring Swallows to Britain from southern Africa. His book 'A Single Swallow' is a travelogue rather than scientific investigation but he captures the fascination that many – myself included – have about our summer visitors from Africa.<sup>36</sup> To the eves in your house from across the mighty Sahara and the wilds of the Congolese rainforest a bird weighing but a few grams returns again and again. In such events we are connected to a wider world than we sometimes imagine.

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<sup>34</sup> Anesi, C (2013) 'Pulp Fiction: Asda's 'made in Italy' tomato puree hails from China'. In The Guardian 27/02/2013. Accessed at <http://www.guardian.co.uk/world/2013/feb/27/asda-italy-tomato-puree-china>

<sup>35</sup> UK Environmental Change Network report 29 (Arrival date of Swallow) Accessed at <http://www.ecn.ac.uk/iccuk/indicators/29.htm>

<sup>36</sup> Clare, H (2009) 'A Single Swallow'. Chatto and Windus

The British Trust for Ornithology has taken a more scientific approach and has started a project attaching micro-geolocators to Swifts captured and released in the UK. One individual named A320 has provided a snapshot of the migration process. Tagged in Cambridgeshire on the 21<sup>st</sup> July 2010 within 5 days this bird found itself in central Spain: a further week was required to make it to Northern Senegal, on the edge of the Sahara desert. Eventually A320 found itself spending most of the winter in the forests of central Democratic Republic of Congo (DRC) with a sojourn to coastal Mozambique. On the 6th April Africa was paling and A320 set off north, first crossing the Gulf of Guinea to rest up in Liberia before an epic 5-day journey across the Sahara. The doughty fellow was back in Cambridgeshire by the 8th of May 2011, just over a month since leaving the DRC.<sup>37</sup>

The latest appraisal of Swallow numbers in Britain is provided by the Royal Society for the Protection of Birds (RSPB). The estimated number of 860,000 has seen a 35% increase since 1995. Not a bird that is endangered but the patterns of arrival and dispersal as well as breeding success give us indicators about the wider health of the environment. Swallow numbers fluctuate according to farming practice, their numbers being greatest in areas of cattle pastoralism. They can also be impacted upon by predation, not just by other birds but also by humans. It is thought that changes in rainfall patterns in Africa may also influence migration numbers.<sup>38</sup>

Birds can also adapt to changes in underlying environmental conditions. Blackcap numbers that have seen a 100% increase in population in the UK between 1995 and 2010 have been partly responding to a change in migration habits of central European birds that have taken to over-wintering in Britain rather than make the more arduous journey south to Africa. The shorter migration offsets the less favourable climatic conditions in the British Isles. Increasing food put out in gardens is also believed to be an influence on this fairly recent change.

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<sup>37</sup> Details of the amazing journey of A320 can be found at [http://www.bto.org/sites/default/files/u49/BTO\\_299\\_16-17Swifts.pdf](http://www.bto.org/sites/default/files/u49/BTO_299_16-17Swifts.pdf)

<sup>38</sup> Robinson, R, Crick H and Peach W (2003) 'Population trends of Swallows *Hirundo Rustica* breeding in Britain'. *Bird Study* 50, 1-7. Accessed at [http://www.academia.edu/846024/Population\\_trends\\_of\\_Swallows\\_Hirundo\\_rustica\\_breeding\\_in\\_Britain](http://www.academia.edu/846024/Population_trends_of_Swallows_Hirundo_rustica_breeding_in_Britain)

Not all birds are equally adaptive. Furthermore not all human behaviours are as beneficial as putting out food to attract birds to our gardens. In the UK research by scientists at Reading University has shown that domestic cat populations can have an impact upon bird populations<sup>39</sup> and other scientists at Sheffield University can confirm that even the stress of breeding in proximity to cats can lead to a lower breeding success for birds.<sup>40</sup> In the USA recent estimates suggest 3.7 million birds are predated by domestic cats a year and in the USA it is more common for cats to be kept in at night than in the UK.<sup>41</sup>

On occasion the Herculean efforts of migrating birds literally collide with modernity. Back in 2008 an American Common Nighthawk inadvertently found itself on the Isles of Scilly after being blown off its normal migratory track by a factor of 3,000 miles. Normally such birds migrate between North and South America. Relieved to find land after crossing the Atlantic Ocean the Nighthawk settled down on one of the few roads that bisect these islands – the most westerly of Britain. It was promptly run-over.<sup>42</sup>

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<sup>39</sup> Birkhead, Tim (2008). 'Disappearing fantasies: The emergence of migration'. *The Wisdom of Birds*. London: Bloomsbury Publishing

<sup>40</sup> Bonnington, C, Gaston K and Evans K (2013), 'Fearing the feline: domestic cats reduce avian fecundity through trait-mediated indirect effects that increase nest predation by other species', *Journal of Applied Ecology* 2013, 50, 15-24, doi: 10.1111/1365-2664.12025

<sup>41</sup> Thomas, R, Fellowes, M and Baker P (2012) 'Spatio-temporal variation in predation by urban domestic cats (*Felis catus*) and the acceptability of possible management actions in the UK'. *PLoS ONE*, 7 (11). e49369

<sup>42</sup> This sad story was covered by The Daily Mail. Access at <http://www.dailymail.co.uk/news/article-1078211/Whoops-Rare-American-bird-touches-England-time--gets-run-killed-car.html>

## How global? Footprints.

We all leave our imprint on the world. Some of us tread very lightly; others make the ground reverberate with their stamp. Most of the world's poor consume very little – hardly surprising when 1.3 billion people live on \$1.25 dollars a day or less. However it is not entirely straightforward to consider an individual's impact on the global environment just in monetary terms and especially with a broadly meaningless measure such as \$1.25 dollars a day. If only the economics of poverty were that simple.

It also isn't a simple task to calculate the impact an individual has on the whole environment. That is to say the sum total of all the environmental goods and services that we utilise throughout our lives. However that doesn't stop us trying.

The first to try were a couple of academics working out of the University of British Columbia in Vancouver, Swiss-born Mathias Wackernagel and Canadian William Rees. Their 1996 book 'Our Ecological Footprint' started the complex and forever-evolving debate about the efficacy and accuracy of such measures.<sup>43</sup> Wackernagel remains a major influence on this debate with a major role in the Global Footprint Network.

The ideas that swirl around ecological footprints have held me up, research wise, more than any section of this book to date. I'm surprised as footprints are a concept I have been using in teaching since the start of the century. However the key issue is easy to highlight. Try a few of the websites that, after you complete a questionnaire of varying lengths and complexity, will calculate your environmental footprint. I use the WWF site normally in class.<sup>44</sup> They are affiliated with the Global Footprint Network who have attempted to universalise and add rigour to ecological footprint procedures and methodology. They adhere to the 2009 'Ecological Footprint Standards' from The Global Footprint Standards Committee.<sup>45</sup>

My personal 'footprint' according to WWF's calculator is 2.29. That is to say that we would need 2.29 planets if everybody – all 7.1 billion people on earth at present – lived like me. By UK standards that is a relatively average measure. This equates to 4.05 hectares of land being required to provide me with the food, material resources and to absorb the carbon attributed to my energy use – assuming it is not carbon-neutral energy generation. That is 40,500 square metres, or the land area of 5.4 average sized football pitches. Personally I have found the football pitch analogy better as who knows what a hectare actually looks like?

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<sup>43</sup> Wackernagel, M & Rees, W (1996) 'Our Ecological Footprint' (New Society Press)

<sup>44</sup> The WWF footprint calculator is one of the simplest to use, and thus possibly less accurate than some others but the core data sets used are verified by the Global Footprint Network. Access the calculator at this site and see how your footprint compares to mine. <http://footprint.wwf.org.uk/>

<sup>45</sup> Global Footprint Network, (2009). 'Ecological Footprint Standards 2009'. Oakland: Global Footprint Network. Available at [www.footprintstandards.org](http://www.footprintstandards.org)

However if I try the US-based ‘*Centre for Sustainable Economy*’ questionnaire<sup>46</sup>, with broadly a more complex and detailed set of questions I descend to new levels of relative smugness as my footprint comes out as 1.82 planets. That is a saving of 1.1 football pitches. At the ‘*Bioregional Solutions for Sustainability*’ website my footprint is enlarged back to 2.3 planets with questions which also enquire how often I visit my local library.<sup>47</sup> Confused? Well, not too much, as the reality is that no matter how rigorous each calculator’s algorithms are they will always be broadly indicative rather than a nailed down ‘fact’. It is worth keeping in mind that relative measures may be more useful than absolute measures in the same way that relative inequality is more important than absolute per capita levels of wealth. It is the differences that matter most. The future is about greater equality.

The key value of ecological footprints is that they provide a clear way to communicate that certain lifestyle patterns of consumption are unsustainable. That we haven’t fallen off an ecological cliff is a consequence of the reality that so many of the world’s population are so poor and consume so very little. We can be ‘rich’ because these billions are so poor.

A glance at global numbers of national aggregate ecological footprints only serves to confirm what we can see through plain observation.<sup>48</sup> Countries like Australia (6.68 hectares per person), The United States (7.19) and the United Arab Emirates (8.88) basically suck up resources way beyond the earth’s ability to maintain their consumption patterns. They take much of their consumption from other territories in the form of trade and in the case of carbon-dioxide emissions from other countries biomass. Alternatively, countries like Bangladesh (0.66), Pakistan (0.75) and India (0.87) have very low average resource consumption.

Of course it would be remiss to not refer to a nation’s biocapacity: the capacity of a nation’s ecosystems to produce useful biological materials and to absorb waste materials generated by humans using current management schemes and extraction technologies. This obviously varies between nations. For Australia a mighty 14.57 hectares of biocapacity per person exists, clearly more than their current rate of consumption. At the other end of the scale Pakistan only has 0.4 hectares per person so does not even cover its relatively low consumption pattern.

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<sup>46</sup> Access at <http://myfootprint.org/en/>

<sup>47</sup> Access at <http://calculator.bioregional.com/final.php>

<sup>48</sup> All the numbers quoted come from the Global Footprint Network where nearly all nations have their own individual national profile. Access at [http://www.footprintnetwork.org/en/index.php/GFN/page/footprint\\_for\\_nations/](http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_for_nations/)

My brief overview of ecological footprints barely scratches the surface of this fascinating tool of environmental evaluation. Of course we could get sniffy about the maths of foot-printing, haggle over methodologies, debate the impact of trade off-setting, consider the quality of data that feeds into the calculations: some researchers have.<sup>49</sup>

Such criticisms serve a good purpose as they lead to a constant refinement and re-appraisal of methodologies. Critical evaluation is the backbone of evolving science. The Global Footprint Network, broadly the custodians of ecological footprints, have as their 'tag-line' 'advancing the science of sustainability'. They accept that they have not reached a definitive endpoint.

However the debate about ecological footprints may evolve, the fundamental idea has caught on. We now also have water footprints<sup>50</sup> that show how much fresh water is required to maintain specific lifestyles. The same can also be done for carbon that is used as a proxy to indicate the impact consumer behaviours have on climate change.<sup>51</sup>

The ability to quantify our actions in respect to environmental impacts is starting to reach a level of detail that is mind-boggling. Mike Berners-Lee, an expert in this area, has produced a highly entertaining exploration of carbon footprints entitled 'How Bad Are Bananas?' Well a kilo of bananas come with a 480g of carbon 'price'. That I can grasp, yet how can you work out the carbon footprint of the football World Cup in South Africa as coming in at 2.8 million tonnes of CO<sub>2</sub>? Now that is a punt, an educated punt no doubt, but a punt nonetheless.<sup>52</sup> Still it is only the same as 3 quiet years for Mount Etna in Sicily. As I said it is the relative position of these measures that is probably of most use.

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<sup>49</sup> For example; van den Bergh C and Verbruggen, H (1999) 'Spatial Sustainability, Trade and Indicators: An Evaluation of the "Ecological Footprint. Or Fiala, N (2008) Measuring sustainability: Why the ecological footprint is bad economics and bad environmental science. In Ecological Economics 67

<sup>50</sup> The Water Footprint Network. Access at <http://www.waterfootprint.org/?page=files/home>

<sup>51</sup> Carbon Footprint Limited are a UK based world leader in calculating carbon footprints for business and individuals. Access at <http://www.carbonfootprint.com/>

<sup>52</sup> Berners-Lee, M (2010) 'How Bad Are Bananas? The Carbon Footprint of Everything' Profile. London.

## Remember when it was wild?

The world was a much wilder place when I was born. 50% less people were squeezed into the same land area. Huge tracts of rainforest remained broadly unexploited in Africa, South America and Asia. The great deserts of the world had not been transformed by resource exploration and the frozen tundra was a no-go area for all but the hardiest of Inuit tribal groups.

Yet where I was actually born, in Bedfordshire, very little was wild. In the true sense of 'wild' nothing was wholly natural. Everything had been mediated by human interaction. I am a child of the Anthropocene. The British Isles has but scraps of what might be considered original habitat. That is to say what we might have expected to find covering the land about 8,000 years ago before Neolithic man got flint and discovered an interest in lumber-jacking. Today about 3,000km<sup>2</sup> of semi-ancient woodland remain in Britain.<sup>53</sup> That is semi-ancient meaning that although its history as woodland goes back over 400 years it is highly likely to have had a degree of active management over that time – coppicing for example. In Britain all land pretty much has a history of utility and the palimpsest of human sweat overlays everything.

There are a few woodlands in Britain that can truly be seen as essentially the same as the ancient wildwood that covered Britain post the last ice age. Ben Eighe in the Torridon range in Northern Scotland has woodland on its lower slopes that would fit the bill of wild wood. Walking through the pines and dwarf shrub heath it is not too difficult to imagine that the wolves and bears that populated this world even as recently as 500 years ago could still be eyeing you as a potential snack from behind the under-growth.

There are those who hanker after such times: re-wilding as it sometimes called. This idea has been articulated as a manifesto,<sup>54</sup> considered by government departments<sup>55</sup> and acted upon in a number of projects across the UK.<sup>56</sup> The biologist E. O. Wilson, in his book 'the Future of Life', has stated in reference to how much of the world should be left to be 'wild' areas for nature that: "at the risk of being called an extremist, which on this topic I freely admit I am, let me suggest 50 percent."<sup>57</sup>

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<sup>53</sup> The Woodland Trust. Information accessed at <http://www.woodlandtrust.org.uk/en/why-woods-matter/what-are-they/decline/Pages/decline.aspx#.UUTVhTele5J>

<sup>54</sup> Dr Mark Fisher runs a website called self-willed land which contains a self-styled manifesto for the re-wilding of the British Isles. [http://www.self-willed-land.org.uk/rep\\_res/SELF.pdf](http://www.self-willed-land.org.uk/rep_res/SELF.pdf)

<sup>55</sup> Natural England has produced a report examining the feasibility of re-introducing the beaver back to the UK. A pilot project in Scotland has been running in Tayside since 2006.

A recent census found 140 beavers now living 'unofficially' wild in this area. See <http://www.wildlifeextra.com/go/news/tayside-beavers.html#cr>

<sup>56</sup> The Ennerdale Valley in Cumbria is England's longest running project for re-wilding although it doesn't include the re-introduction of large mammals. See <http://www.wildennerdale.co.uk/> for details

<sup>57</sup> Wilson E O (2002) 'The Future of Life.' Alfred A. Knopf New York.

Well in a densely populated country like Britain clearly 50% of the land area being wild areas hasn't been a reality for centuries. However there is a reasonable argument that a bit of wild nature here and a bit of wild nature there wouldn't be amiss. There are all sorts of mutterings and intentions both good and bad to re-introduce a number of the large mammals that intense human utility of land put pay to in the British Isles – the wolf for instance.

There would be an immediately practical reason for re-introducing the wolf to the British countryside: a burgeoning population of deer. Conservative estimates of up to one and a half million deer in the British countryside have led Dr Paul Dolman from the University of East Anglia to propose a cull of up to 60% of the population just to keep it in check.<sup>58</sup>

Of course to let wolves roam entirely unchecked is unfeasible and even then it is doubtful that they could bring the deer population under check anytime soon because a smorgasbord of other prey items would be on offer. Blackbirds would cheep excitedly as Tiddles the cat was converted into prey rather than predator. But there are options. Remote Britain is upland Britain and already the Cairngorms National Park has given it some thought.<sup>59</sup>

As much as such thinking is an attractive and somewhat romantic notion it also has a practical and feasible side to it. The big sticking point is our mentality. Unlike many of our European neighbours we have sanitised our countryside to such a degree that the idea that anything within it could potentially push human beings a notch down the food chain is disconcerting for many. For centuries we battled against the fears that nature enacted upon us until we reached a landscape brought to heel. Amazingly much energy is spent in Britain attempting to persuade other countries to preserve what dwindling stock of wild landscape remains there whilst at the same time encouraging such developing countries to pursue policies that create the demand for resources that denudes the stock of wild areas. We are worse than wolves; they only take prey when they need to.

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<sup>58</sup> Deer culling on a massive scale backed by expert. The Guardian 7/03/13. Access at <http://www.guardian.co.uk/environment/2013/mar/07/deer-culling-massive-scale-expert?INTCMP=SRCH>

<sup>59</sup> Gray, R, (2010) 'Bears, lynx, wolves and elk considered for reintroduction into British countryside.'

The Daily Telegraph 27/2/2010 Accessed at <http://www.telegraph.co.uk/earth/wildlife/7330504/Bears-lynx-wolves-and-elk-considered-for-reintroduction-into-British-countryside.html>

## I miss the tiger.

As an icy blast of late winter swept over Britain in March 2013, Jae Jae and Melati, a pair of endangered Sumatran tigers, took up residence in their new £3.6 million enclosure within London Zoo. It was a long way from their only known habitat, the rainforest on the Indonesian island of Sumatra. Yet neither of these magnificent beasts had ever been near Sumatra; both had been born in zoos. Jae Jae the male was American and Melati his mate was a feisty Australian.

There may now be more Sumatran tigers in captivity (approximately 480 according to the Sumatran Tiger Trust)<sup>60</sup>, than there are in the wild. As a low density species requiring extensive habitat the Sumatran Tiger is harder to census than many large mammals. Estimates of the numbers of Sumatran Tigers in the wild have varied throughout the first decade of the 21<sup>st</sup> century. They range from 342 to 509.<sup>61</sup> Not only are these animals elusive in dense jungle but they also have low recruitment rates. That is, few cubs survive to reach breeding maturity. They are a critically endangered species and could, this century, be lost just like their cousins the Balinese Tiger (last seen in 1937) and the Javanese Tiger (last seen in 1976).

What are the pressures on the Sumatran tiger? What is driving them towards extinction? The answer: humans. It is surprisingly simple to explain but beguilingly difficult to address.

Population pressure is a good place to start. It isn't quite the same shape but if you imagine Sumatra as being about the same size as Spain – actually it is a little smaller (473,481km<sup>2</sup> compared to Spain's 505,992km<sup>2</sup>) and also having broadly the same size population: 45 million in Sumatra and 47 million in Spain. Now try to imagine fitting a sizeable population of tigers into Spain without them falling out every now and then with the human population. Even given the fact Sumatra has far wilder habitat than Spain it is probably surprising that there is not more tiger-human conflict although that is probably accounted for by the highly reclusive nature of the Sumatran Tiger. Figure 3.1 demonstrates the reduction in forest cover over twenty years in Sumatra itself, a consequence of expanding agriculture and human population.

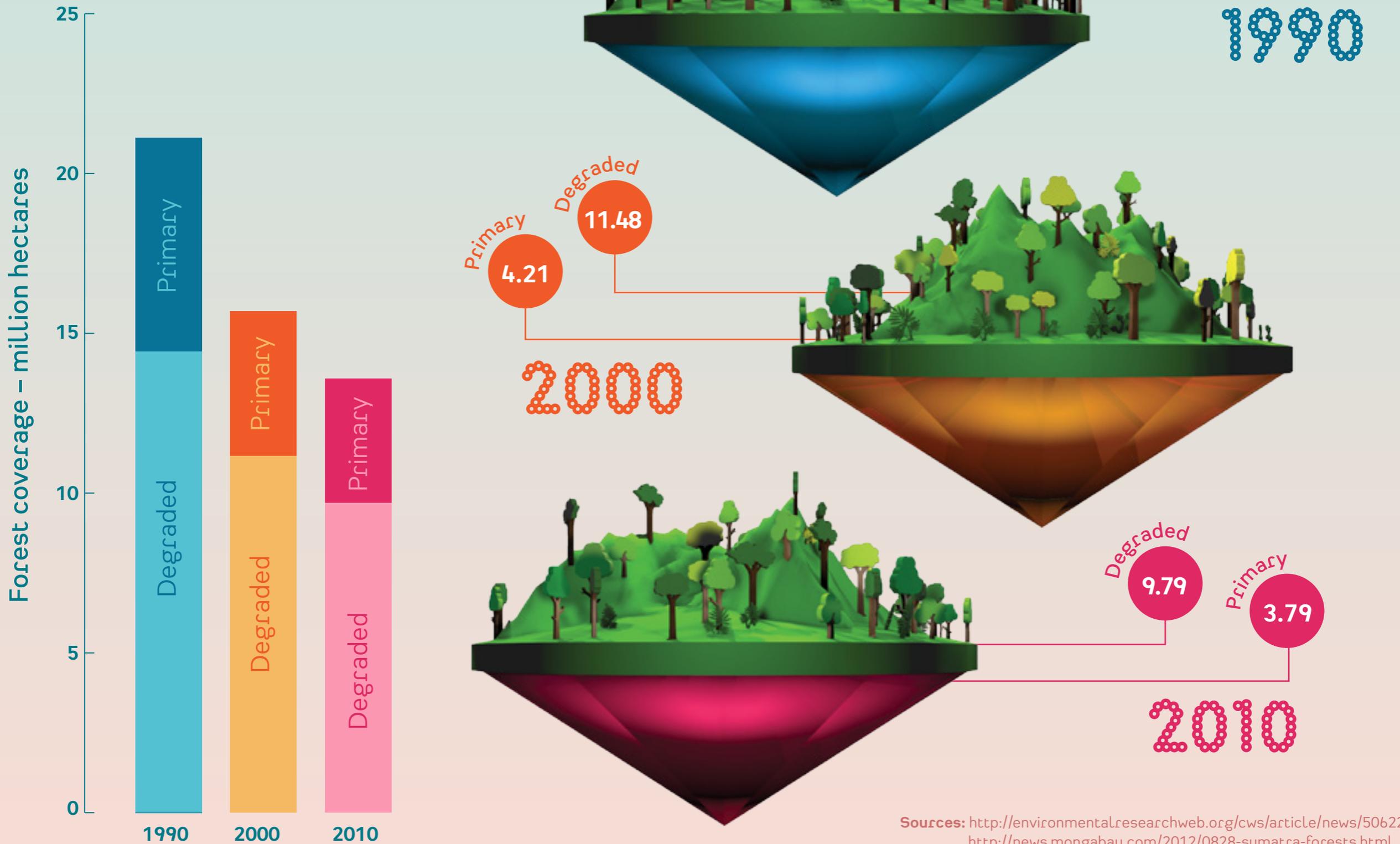
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<sup>60</sup> Estimates sourced at The Tiger Trust Access at [http://www.tigertrust.info/sumatran\\_tiger\\_tiger.asp](http://www.tigertrust.info/sumatran_tiger_tiger.asp)

<sup>61</sup> The IUCN Red List of Threatened Species. *Panthera tigris ssp sumatrae*. Access at <http://www.iucnredlist.org/details/15966/0>

Figure 3.1

# FOREST COVER IN SUMATRA



Sources: <http://environmentalresearchweb.org/cws/article/news/50622>  
<http://news.mongabay.com/2012/0828-sumatra-forests.html>

Such a collision occurred in the same month as the opening of the new tiger enclosure at London Zoo. A tiger killed Yudi Santoso, a worker on a rubber plantation next to the Batang Gadis national park in central Sumatra. It was claimed that the same tiger had hospitalised a further five locals and helped itself to a range of the local livestock. The locals requested a quick slaughter, national park officials favoured re-location.<sup>62</sup>

Yet it is not difficult to see the fundamental problem of humans and tigers treading on each other's toes. Using data on Google Earth it is possible to clearly see that the pattern of deforestation around the edge of Batang Gadis National Park. The park is part of a wider attempt to have a more continuous and less fragmented habitat to support species such as tiger. The latest aerial images show clear erosion of the forest edges by rubber and palm oil plantations. Similar thinking prevails in India where tiger corridors linking up disparate national parks are being strived for in order to sustain tiger populations.

It was in India that I could have fallen foul to the same fate as Yudi Santoso. Once I foolishly took an unguided stroll around Mudumalai National Park in Tamil Nadu, reputedly the haunt of tigers. A mile or so from the main road an almighty roar rippled across the scattered forest. I turned and fled but in the back of mind I was sure that such beasts were so rare that the noise was probably a stricken vegetarian mammal of some sort. However more recently on a forest track deep in the same forest, but across the border in the state of Kerala, a series of fresh tiger tracks made their way across the road. I scanned the forest, this time safe in the knowledge that a Mahindra Jeep with its engine running stood at my back. The tiger was out there, watching. Who really should be more frightened of whom? I would miss tigers. If they find that they cannot co-exist with humans it would not be their fault, it would be ours entirely.

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<sup>62</sup> Rare Sumatran tiger mauls farmer to death in western Indonesia. Fox News March 13th 2013.  
Access at <http://www.foxnews.com/world/2013/03/13/rare-sumatran-tiger-mauls-farmer-to-death-in-western-indonesia-villagers-call/>

## Better visit that coral reef sometime soon.

When, in 2013 Michael Palin returned to his old school – Birkdale, in Sheffield – to unveil a portrait of his old geography teacher, who went on to become the school’s head teacher, he recounted that it was the field trips out into the Rivelin valley on Sheffield’s northern fringe that set in train his wanderlust. The consequence has been one of the best travelled of all modern TV presenters, snapping at the exceptionally well-travelled heels of David Attenborough. Where hasn’t the President of The Royal Geographical Society (2009-2012) been? From North to South Pole, across the Sahara, traversing the Himalayas and through a myriad of islands that encircle the Pacific Ocean. This is just an incomplete and provisional list of Mr Palin’s travels.

I’m a little jealous. Like Michael I enjoyed geography at school although my teachers were far from inspiring. It was my parents to whom I owe my spatial inquisitiveness to, and their dedicated membership of the Camping Club of Great Britain and Northern Ireland. For me the vast cereal fields of Cambridgeshire, little rivers caught in a meander in Oxfordshire, the tulips of Spalding and Nottingham’s Goose Fair were my early adventures. On occasion we squeezed into a Mini Traveller and burnt out clutches across Europe – Germany being a favourite country of my father.

I dreamed, still do dream, of a multitude of places and spaces across the world that I want to ease my mind into. I have been fortunate to visit many of the places of my dreams: the ethereal Borabudur perched across the valley from smoking Mount Merapi on the Indonesian island of Java – it looks just like the volcanoes you drew as a kid at primary school, smouldering with menace: the imposing scale of the Himalayas stretched out along the Indus Valley of Ladakh in northern India: I have ventured into the edges of rainforest throughout Asia, once meeting a friendly mother and baby orang-utan on a forest trail in Sumatra. But these wonderful experiences only just keep up with the magic that is a healthy coral reef.

I want to take my children to experience the dazzle and awe of the abundance and teeming life within the reefs’ polyps. Afterwards they’ll never throw litter in the sea again. But I have a dilemma or two: one of the most dramatic of the impacts of global climate change is the potential for the loss of many, perhaps most, perhaps even *all* of the world’s coral reefs. Assailed by increasing ocean acidification and rising water temperatures, coral reefs are struggling to keep their heads below water.<sup>63</sup> They have evolved to survive in a very narrow habitat window, determined by light and water temperature. This is increasingly under pressure. Already major coral bleaching events have occurred worldwide in 1998 and 2002.

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<sup>63</sup> Hoegh-Guldberg, O (2009) ‘Climate Change, coral bleaching and the future of the world’s coral reefs’. Accessed at <http://www.reef.edu.au/ohg/res-pic/HG%20papers/Hoegh-Guldberg%201999.pdf>

Of course in all these things contrarian points of view exist, hopefully keeping the science honest and providing some intellectual ballast to those libertarian right-wingers who see all environmental concerns as part of an over-arching conspiracy to tax them more. In the case of coral reefs step forward Australian Dr Jennifer Marohasy. Commenting on the 2012 Coral Reef Conference at Cairns, a gathering of some 2,000 marine scientists from 80 countries, Dr Marohasy described their concerns about coral bleaching as ‘all a put on: they are crying wolf’. I’d like to check the good doctor’s assertions but as usual, whilst berating the marine scientists for “rather than reporting their research findings in a scientifically meaningful way they behave as political activists and propagandists and talk nonsense”, she fails to provide any peer review material to back up her claims.<sup>64</sup> That is 2,000 of the world’s most accomplished marine biologists talking nonsense and one doughty Australian defender of the free market talking scientific sense. I suspect not.

Whatever transpires in the debate about the future of coral reefs they remain near the top of my bucket list: ‘snorkel with the kids in shimmering tropical waters’. I would really like to show my children how exceptionally transcendental and beautiful the natural world can be.

The Red Sea off the Egyptian coast beckons. Except I have rarely flown anywhere in the last decade, once to India and a couple of Mediterranean hops aside. Mainly I can’t afford to fly but also in the back of my mind is the fact that it would take 22 tonnes of CO<sub>2</sub> to transport my family to Australia’s Great Barrier Reef, over a half of our CO<sub>2</sub> output for a normal year’s living as a family.<sup>65</sup> It is all that flying that contributes significantly to the pollution that leads to the increased impact of climate change on coral reefs. What to do?

Inspiration is at hand in the form of Judith Schalansky’s *Pocket Atlas of Remote Islands*.<sup>66</sup> The subtitle of this, my favourite geography book of the last couple of years, is ‘Fifty Islands I have not visited and never will’. Judith employs her trusty German atlas and a surfeit of imagination then co-joins it with some sensible research to tell haunting stories of the world all discovered from her Berlin sitting room.

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<sup>64</sup> Have a look through this website that is long on claims and short on evidence; <http://jennifermarohasy.com/2012/07/activist-scientists-crying-wolf-on-coral-bleaching-and-climate-change/>

<sup>65</sup> This calculation is based upon figures in Mike Berners-Lee’s book ‘How Bad Are Bananas?’. It assumes that 5.44 tonnes of CO<sub>2</sub> are used flying economy the 30,248km round journey from London to Cairns. How accurate is this? Well, assuming Mike’s methods are sound, reasonably so, but it is all relative. ie what it compares to such as a normal UK lifestyle being a 10 tonne lifestyle.

<sup>66</sup> Schalansky, J (2009) ‘*Pocket Atlas of Remote Islands*’. Penguin Books. London

The coral reefs surrounding Fangataufa Island deep in the Pacific Ocean were probably a hubbub of biodiversity. Judith describes events once the French came and tested a 2.6 megatonne bomb on the island in 1968:

**“The shock waves extend outwards, casting ringed shadows on the lagoon, the atoll and the sea, pushing the ocean to flood towards the horizon. Afterwards nothing remains.”**

It is now many decades that man has had within his ‘gift’ the ability to eliminate nearly all life on earth. The cataclysmic nuclear conflagration for which the French rehearsed in the Pacific Ocean appears further away today than it did three decades ago. Today environmental destruction is steady and sustained. All of the wonders of the natural world that enraptured me as a teenager broadly remain, albeit in a more denuded form. Like Judith Schalansky I had knowledge of such wonders from the books and atlases that I pored over. Later I did visit many of the places that fired my imagination.

Yet will any coral reefs remain for my grandchildren to be amazed by as we approach the end of the 21st century? Put it on your ‘bucket list’ – better visit a coral reef soon before all we have of them is the memories ensconced within the endless re-runs of old Michael Palin travels and David Attenborough documentaries on nostalgia TV channels like ‘Dave’.

## **Everything is Connected to Everything Else Project.**

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