

Chapter 3 **THE SIXTH EXTINCTION: ECOLOGICAL COLLAPSE**

Homo sapiens' is but one species among many, product of an intricate interplay between the creative processes of evolution and the sometimes capricious hand of extinction. Richard Leakey and Roger Lewin

Given such great sweeps of geological history, you'd have to be either very unlucky or very stupid to witness a mass-extinction event. It could be either, or both, because we are living through one right now. In newspapers or on television news, you are more likely to read about the movement of interest rates, political, financial, or sex scandals. But larger than all of those, a mass-extinction event is happening, let's call it what it is: an apocalypse of our own making.

Andrew Simms, *Cancel the Apocalypse*

Look, the world, in a swell
Of waves, is beating about my face.

Basavanna

The Sixth Extinction is the title of a book published in 1995 by the paleo-anthropologist, Richard Leakey and the award-winning science writer, Roger Lewin. They subtitled their book, *Biodiversity and its Survival*. They pointed out that over the last 530 million years there have been five mass extinctions of species, the fourth 65 million years ago, when the dinosaurs disappeared. Their book was at once a celebration of the biodiversity of animal and plant life on our planet – Darwin's "endless forms most beautiful" – and a severe warning, backed up by analysis of the science, that we may now be on the verge of a sixth extinction, caused this time, not by an asteroid collision, but by ourselves. Human beings, they contended – "with their relentless expansion and limitless appetites" – are now able to exert as much influence on life around the world as the calamity that caused the last great extinction.

They cited evidence to suggest that, whereas, during periods of normal, or background, extinction, species loss, calculated from the fossil record, occurs at the rate of one every four years, it is now happening at the rate of thirty-thousand species per year, which elevates the loss to 120,000 times above the background rate! More recent views confirm that we are losing up to 60,000 species a year. Leakey and Lewin believed that the “anecdotal” accounts of extinctions world-wide that ecologists are recording are “but the merest hint of a catastrophic reality that is unfolding silently and, for the most part, away from our sight” and that we need to be acutely sensitive to “these faint echoes on the wind” carrying, as they do, an important message. They were quite clear about the message:

Dominant as no other species has been in the history of life on Earth, Homo sapiens is in the throes of causing a major biological crisis, a mass extinction, the sixth event to have occurred in the past half billion years. And we, Homo sapiens, may also be among the living dead. ⁱ

The Ecological Vision

Natural disasters, such as the Indian Ocean Earthquake and Tsunami of 2004 and the earthquakes in North Western Pakistan and China are often viewed rightly as examples of Nature’s destructive power. But what they also reveal is the complex and miraculous ecological balance that otherwise continually protects us from these great destructive forces. In the last quarter of the twentieth century the ecological vision of such figures as Rachel Carson, James Lovelock, and Lynn Margulis, made us more aware of this balance, concerned, as they and others were, about what we were doing to the Earth. It was the time when we also caught sight of our first picture of the Earth from the moon - that “blue jewel”, luminous and floating in the black ocean of space. As we began to understand the damage that our industrial and technological way of life was wreaking on the Earth’s surface and in the atmosphere, we also came to appreciate the Earth as a celestial body of sublime beauty, and that we were an integral part of it.

Carson had made us aware of the toxic chain we were creating with the spraying of DDT which earthworms ingested and passed on to the bird population. Strontium 90 through fallout, she suggested, entered the corn and wheat “before taking up its abode in the bones of a human being, there to remain until his death.”ⁱⁱ But it was Lovelock’s “Gaia Hypothesis”, described by Scientific American as “a kind of geochemical myth for our time”, that captured the sense of a greater natural chain. Gaia, named after the Greek Goddess of the Earth, the name suggested to Lovelock by his neighbour William Golding, the Nobel laureate novelist, was an invitation to look at the Earth “from the top down”, as a system which was somehow capable of regulating itself.

As Lovelock pointed out, the heat from the sun during the Earth’s lifetime has increased by some 30 degrees but the Earth has maintained a steady temperature throughout that time. Our planet, it seemed, is capable of maintaining an equilibrium, an equilibrium which also governs the balance of its elements, such as the delicate combination of gases in the atmosphere conducive to life’s continuance. Lovelock had suggested that there is a homeostatic mechanism built into the Earth’s processes which works through complex and elegant feedback systems.ⁱⁱⁱ

Lovelock published his theory in 1979. It was regarded as eccentric, if not mystical, at the time and it only became acknowledged and respected by mainstream science at the turn of the century.^{iv} By way of tribute to Lovelock, academic disciplines, that used to be studied separately - such as geology, palaeontology, oceanography, and climatology - now recognise the interconnections between each other and have been collectively reframed as “the Earth sciences”. Lovelock has led the way in introducing a systemic perspective into our science.

The 1970s and 80s witnessed the emergence of a generation of ecological writers and activists. Along with Carson and Lovelock, and following the original Club of Rome and Limits to Growth initiatives, other environmentalists, such as Paul Ehrlich, Petra Kelly, Jonathon Porritt, E.F. Schumacher, Barbara Ward and others, continued to warn of the ecological dangers. Society did not seem to take much notice then,

but the turn of the century saw another wave of green writers - a new generation that has emerged in greater numbers, but now backed by the voices of so many mainstream natural scientists. There is now unanimous consensus about the growing peril that awaits us and which Martin Rees encapsulates in his warning that this may be our last century. ^v

Johnathon Porritt, who brought many of his generation in Britain into awareness of Green politics in the eighties with his manifesto-like *Seeing Green*, ^{vi} and who wrote the forward to the recent *Planet Earth, the future*, the book which accompanied the spectacular BBC series *Planet Earth*, referred to the “window of time” we now have “to get things sorted out” before it is too late. Views vary, of course, on how wide or narrow this window is. Environmentalists may think they have achieved much since the initial UN Conference on the Environment and Human Development in Stockholm in 1972 but how much time we still have is very questionable. What is crucial is how we respond to the crisis:

If there is a tipping point (*when we grasp the enormity of the problem*) just around the corner, it must surely lie in the gathering realisation (to paraphrase Albert Einstein!) that we cannot fashion durable solutions to today’s problems based on the kind of mindsets that gave rise to those problems in the first place. ^{vii}

Clearly this implies a human transformation. It is time we realised that the environment is not just out there, it is within ourselves. Could it be that, if we change ourselves, we change the Earth?

The Implications of Global Warming

In their third report of 2001 The UN International Panel for Climate Change (IPCC), stated that there was clear evidence for a 0.6 degrees centigrade rise in global temperatures and 20 cm rise in sea level during the last century and they predicted that global temperatures could rise by between 1.4 and 5.8 degrees C and sea level by between 20 and 88 cm by 2100. ^{viii} That these changes are connected to our

output of Greenhouse gases in the last two hundred years, increasing dramatically in recent decades - now called “the Great Acceleration” - is beyond dispute in the scientific community ^{ix}.

The IPCC produced their fourth report in February 2007. The prognosis is worse even than they thought. “We are doing things that have not happened in 650,000 years”, declared Rajendra Pachauri, the Chair of the IPCC. ^x Mark Lynas, whose first book, *High Tide*, ^{xi} documented what is happening in those parts of the world that are already being affected by global warming, followed this up with *SIX DEGREES: Our Future on a Hotter Planet* ^{xii}, which, based on the current science, explained the unfolding consequences of each one degree rise in temperature from 2.4 degrees, which will render the coral reefs extinct, to 6.4 degrees, which will render us extinct. The fifth report of 2014 has only confirmed the urgency and further underlined the need for immediate action. It provided the spur for the work of the Paris Conference of the Parties of 2015.

The possible consequences are unthinkable as we know: clear water at the poles and the melting of the Greenland peninsular ice which could lead, according to James Lovelock, to a sea level rise of between seven and fourteen metres; the melting of the Russian permafrost and glaciers such as those in the Himalayas, which feed some of the important rivers of Asia; the possible reversal of the Gulf Stream with the implications for European weather; the potential release of vast quantities of methane, a far deadlier greenhouse gas than CO₂, from the warming oceans and the melting permafrost; and all of these changes could accelerate exponentially through circular and reflexive feedback loops.

With such developments we could experience alternating large-scale flooding world-wide on the one hand and extensive drought on the other; massive disruption of biospheric life cycles and human social, economic, and political institutions; environmental refugees on a huge scale; and planet-wide suffering and starvation with, as usual, the poor suffering most, as we already witness in sub-Saharan Africa, the Pacific Islands, and Delta countries like Bangladesh, and elsewhere. ^{xiii}

The changes could also spell our extinction if we have so altered the climate as to leave the biosphere unable to support human and animal life. Mother nature, whose ecosphere has offered us so much protection until now, is in major flux, and the Great Chain of Being, as it used to be called and of which we are an integral link, may, in the worst scenario, be about to break irreparably. While Darwin described “The Origin of the Species”, we are left to contemplate the prospect of its end. And these predictions are all the more alarming because they come from the empirical observations of our own natural scientists rather than from the pages of St John the Divine.

Lynas pulls no punches in *SIX DEGREES* and anyone would be well advised to keep taking deep breaths while reading his book. For instance, in his “Three Degrees” chapter, he discusses the concept of the “living dead”, a concept which ecologists use to refer to species which are on the way to extinction. We can already identify some of these, such as forest-dwelling frogs and the doomed polar bear we now see regularly on our television screens, as it swims desperately to find the rapidly melting ice flows which ensure its survival. ^{xiv} As Lynas remarks, many such species are preparing “to make a permanent exit from the world stage”. He quotes Chris Thomas and colleagues’ *Nature* paper from 2004 which suggests that “between a third and a half of all species alive today will have joined the ‘living dead’ category by 2050 if global warming is over two degrees by that date”. Lynas speculates:

It scarcely seems believable that life - in all its beauty, flamboyance and million-year resilience - could be under such a sudden and emotionless death sentence, that the world could never again witness the mating display of the bird of paradise or hear the haunting songs of the hump-backed whale. But the hard figures are there, compiled by experts working to rigorous scientific standards. Let no one doubt the consequences. The sixth mass distinction is well under way as global temperatures climb towards three degrees.

The Age of loneliness has begun. ^{xv}

Time's gateways

Since 1995 the “faint echoes on the wind” have grown in volubility. Tim Flannery, a field zoologist and climate science writer, for instance, believes we may have reached a prospective “gateway in time” – an occasion when one era, and often one climate, gives way to another. Time’s gateways, he suggests, come in three sizes – small, medium and large.

A small gateway might occur when continents bump into each other or when land bridges form as seas rise and fall. On these occasions new species arrive as others become extinct. Medium-sized gateways separate geological periods – Quaternary, Tertiary, Cretaceous etc., lasting tens of millions of years - and are global in scale. There are world-wide patterns of extinction followed by the slow evolution of new life forms as they adapt to the changed conditions. ^{xvi}

Time’s greatest divisions are those separating Eras – Cenozoic, Mesozoic, Paleozoic, PreCambrian, stretching over hundreds of millions of years. These are times of massive upheaval, when as much as 95 per cent of all species vanish. They are the mass extinctions such as the one 65 million years ago, “when every living thing weighing more than 35 kilograms, and a vast number of smaller species, was destroyed”. CO₂ played a major part in this event. Paleobotanists have studied the fossil leaves and concluded that atmospheric CO₂ grew massively after the impact of the asteroid collision and, as a greenhouse gas, it would have caused an abrupt increase in temperature which led to the demise of many species.

Flannery refers to a further global event some ten million years later, 55 million years ago, when the Earth’s surface appears to have heated from five to ten degrees Centigrade in a very short time. Recent drilling below the floor of the north Pacific Ocean revealed that at that time the seas turned acidic as a result of absorbing large amounts of CO₂ – as is now known “a mind-boggling 1500 to 2000 gigatonnes of carbon” was injected into the atmosphere in a matter of decades and atmospheric concentrations of carbon rose from around 500 parts per million (twice the

concentration of the last ten thousand years in our time) to around 2000 parts per million. ^{xvii}

Flannery is of the view that this extinction event offers the best parallel with our current situation given that it was caused by a rapid increase in greenhouse gases, though there are significant differences too. Earth has now been in an icehouse phase for millions of years but it was already warm 55 million years ago. There were no ice-caps and presumably fewer cold-adapted species. Flannery's sobering conclusion is that Earth now stands to lose far more from rapid warming than the world of 55 million years ago. "Back then", he warns, "the warming closed a geological Period, while we might, through our activities, bring an end to an entire Era." ^{xviii}

Realism or Optimism

Books on climate change have proliferated in the last decade or so with ever increasing signals of alarm. *The Rough Guide to Climate Change* describes "global warming in a nutshell" and tells you pretty much all you need to know. ^{xix} For instance they list the "rogue's gallery of greenhouse gases" - carbon dioxide comprising 63%, methane 18%, CFCs and HFCs 12%, and Nitrous Oxide 6%. Carbon Dioxide, "the chief offender", accounts for about for about 380 of every million molecules of air - 380 parts per million (ppm) - but it has been rising steadily throughout the industrial age at the rate of 1-3 ppm per year from its pre-industrial level of 280 ppm and is set to rise further. In 2019 it reached and moved beyond 400 ppm.

Estimates are that when it has doubled its ppm the average temperature will have risen to a critical 3.0 degrees centigrade. Anyone who has seen Al Gore's film or read his book, *An Inconvenient Truth*, will recall his dramatisation of the now famous hockey stick graph where the measure of CO₂ concentration is already 100 ppm above anything in the previous 650,000 years, for which we have records, and set to reach 600 ppm, over double the pre-industrial concentration, in the next 45 years if we do nothing.

As we learn these facts we begin to appreciate both the gossamer quality of the atmosphere as a slender veil of air stretched around the Earth - no thicker than a coat of varnish covering a football-sized sphere - and the damage we are doing to it. It is becoming more difficult to be optimistic. James Lovelock argues that it is now very late and, controversially, recommends nuclear power as a “sticking plaster” for our predicament.^{xx} Martin Rees, as I have quoted before, thinks this could be this is our last century and Fred Pearce - in *The Last Generation* - points out that climate change could happen much more quickly than we imagine, lulled, as we are, by our belief in evolution as a purely gradual process, extending over long periods of time.^{xxi} These writers are not science-fiction authors. They all draw on hard-headed science and the latest research.

Many optimists would also subscribe to realism, but put more stress on the creative quality of hope. As *The Rough Guide* suggests in its chapter on “technological solutions”: “Human ingenuity got us into our greenhouse mess, and we’ll need to call on it again in order to find our way out”.^{xxii} It is not just about where we get our energy from but how effectively we use it. We have the technologies to raise efficiency and reduce energy waste. We apparently even have “geo-engineering plans” to pull greenhouse gases directly from the atmosphere or reduce the amount of sunlight reaching Earth, though these sort of plans are thought to be fanciful .

The tireless environmental campaigner, George Monbiot, a columnist in the British Press, writes fervently about what we can do, on a more practical level, to cut our carbon emissions “without bringing civilisation to an end”. In his book, *Heat*, he shows how we can transform our homes, our power and our transport systems. This would involve a massive programme of action and also depends on the will of politicians and governments to implement it. Monbiot’s increasing exasperation shows in his columns as he comes up against what he feels is the lack of political understanding, or will. And, of course, the technological solutions depend on political solutions.^{xxiii} He puts his faith in the power of our inherent altruism and interdependency as essential features in our psychological make-up rather than the

bare instincts of the possessive individualism and selfishness that drives modern capitalism and current neoliberal economic ideology.

Political Will

Jonathan Porritt understands the need for a political solution. He acknowledges the importance of Lovelock and Rees' warnings, but takes the view that we have no alternative but to work for "sustainable development". Drawing on the work of many colleagues at Forum for the Future, a research team he chairs, Porritt builds a detailed case for *Capitalism as if the World Matters* in his book with that title. Capitalism, he argues, is "the only game in town" but it is a game which is capable of adjusting creatively to a sustainable mode of development.^{xxiv} Eco-socialists understandably take the view that "eco-capitalism" is just not possible.

Porritt's book, however, focuses the work of many who now argue for an expanded view of what constitutes growth. For too long we have confined "growth" to the fetish of economic growth, as though economics operated in a world of its own, separate from the other domains of society, and where GNP is measured merely in money and material terms, taking no account of human well-being as a whole. *Homo sapiens* has become *homo economicus*. Purely economic values are premised on the false assumption – the myth - that the capital of nature – the Earth's material resources – are infinite and inexhaustible. It fails to see the truth that nature has absolute limits and that we have reached those limits.^{xxv}

Another creative example of the combination of technological, economic, and political solutions to the current crisis is Oliver Tickell's *Kyoto2*.^{xxvi} Tickell analyses the reasons why the Kyoto Protocol of 2005 failed and suggested how it might be made to work. He based his argument on market economics and introduced the crucial principle that "the polluter pays". He suggested the energy corporations" should be taxed "upstream" on the carbon producing level at which energy is produced and that an incentive be built into their capacity to develop carbon-neutral energy sources. In this way the market, as the most dynamic mechanism going, could be utilised in line with our ethical concerns about the well-being of the

biosphere. He suggested, for instance, that we look upon the Earth's atmosphere as, to use Garret Harding's concept, "a global commons" belonging to all peoples, irrespective of national boundaries. We all have an interest in keeping this "commons" clean. The carbon emissions we put into the atmosphere affect everyone alike, since the atmosphere is a dynamic and circulating life which we all breathe and which forms the basis of our lives. As Flannery suggests, the atmosphere is "a great aerial ocean", an ocean that we all "swim", or float, in and which we need to steward responsibly if we are not to drown.

'The Death of Environmentalism'

"Environmentalism" is now some fifty years old and there is a feeling among some that, despite its many successes, it has failed to catch the public imagination sufficiently. Adam Werbach, a former director of the Sierra Club, spoke in 2004 of "the signs of environmentalism's death" and Porritt himself concedes that there is "some justification of the *demise* of conventional environmentalism in the face of 20 years of unreconstructed, neo-conservative economic liberalisation". xxvii

Environmentalists have thought that it was sufficient to point out the dangers we face and the technological solutions which we could deploy, and then we could simply put things right. But there is one problem with that and it concerns the question of human nature. Human beings, it seems, for all their centuries of Enlightenment thinking, do not respond to simple reason and Greens, for all their admirable intentions, are sometimes lacking in their understanding of human psychology.

The point is explored by Porritt where he suggests that the Green appeal is often "too narrow, too technical, too anti-business, too depressing, often too dowdy, and too 'heard it all before'". His argument is that environmentalism needs to reposition itself within the more progressive and radical frame that sustainable development provides. The "inevitable" – the need for change - must be made "desirable". It is a debate that has been "fizzing away" in the United States for some five years ever since the declaration, echoing Werbach, by Michael Schellenberger and Ted Norhaus in their 2005 article about environmentalism's demise. They wonder, for

instance, what would have been the effect of Martin Luther's famous "I Have a Dream" speech if he had made it an "I Have a Nightmare" speech". History might have turned out quite differently. They conclude:

In the absence of a bold vision and a reconsideration of the problem, environmental leaders are effectively giving the "I Have a Nightmare" speech, not just in our press interviews but also in the way we make our proposals. The world's most effective leaders are not issue-identified, but rather vision and value identified. These leaders distinguish themselves by inspiring hope against fear, love against injustice and power against powerlessness. A positive, transformative vision doesn't just inspire, it also creates the cognitive space for assumptions to be challenged and new ideas to surface. ^{xxviii}

Any crisis is, of course, an opportunity, a point that Porritt continues to make in his Foreword to *Planet Earth – the Future*. He suggests that the biggest shift of all in our understanding of ourselves "lies in our *total* dependence on the Earth's natural systems and services." We may have once thought that we were created to assert our dominance over the rest of life but, in making war on nature, we have discovered we are making war on ourselves. As he concludes:

...the combined weight of, on the one hand, nearly fifty years of authoritative scientific research revealing the intimate workings of the natural world, and, on the other hand, of new (or rediscovered) philosophical insights about the unfolding of life on Earth over 4.5 billion years, is overwhelming. It's time for us to grow up, to become truly ourselves. ^{xxix}

Instead of "making war" on nature we might consider how we could begin to learn from her again. Beeley's discussions with biologists and environmentalists suggests many ways in which we might do this. There are two themes in particular which we might do well to think about - the topics of biodiversity and the wilderness experience. That we are beginning to think more about the importance of these may

be an indication that we are now looking for alternatives to the compulsive war we make on ourselves.

Biodiversity – the infinite

One of Darwin's great achievements was to question the Biblical notion of a literal finite number of species created by God and to open our imaginations to consider the variety of nature's forms were potentially infinite. Creation is capable of an inexhaustible, continuous inventiveness with its infinite variety of forms all interweaved seamlessly. Life, the naturalist, Richard Mabey, suggests, "has evolved on Earth by a massive profusion of creatures....over thousands of millions of years". It is as though "the evolved solution to life was to invent as many organisms as possible to exploit the great variety of climates and geological niches, and to buffer against change." At the same time change is "one of the great stimulants to the evolution of life." xxx

Change and diversity, Mabey continues, are at the heart of life's resilience and if we diminish that diversity we weaken Earth's resilience. We, as it were, stop in its tracks evolution's "beautiful solutions to the problems of living". Life is infinitely creative. We might wonder, for instance, how life forms survive hundreds of feet under water in the toxic gases and hot sulphur issuing from an undersea volcano. Life has invented a way of doing that, just as it invented birds that can fly at heights that we could not cope with through lack of oxygen. For Mabey, these are wonderful things:

These intricate solutions to "how do you exist on the planet?" are wonderful to me, not only aesthetically but ethically as well. So biodiversity is a thing to be preserved, not just because of its astonishing beauty, but because it underpins life on Earth. xxxi

To the life scientist biological diversity is a measure of species richness and natural genetic variation which can apply either within or between species of

wildlife”.^{xxxii} Diversity within ecosystems is essential to the stability of the system, vital to its proper functioning, and forms the basis of biological wealth and adaptability. Human society is founded on that wealth and rich variety and, insofar as our activities contribute to loss of habitat and overexploitation of nature’s resources, we destroy and diminish the wildlife and genetic diversity which sustains us.

Biodiversity signifies the omnipresence of life, which finds its habitat everywhere. It was Thomas Lovejoy, Walter Rosenberg, and Edward Wilson who first introduced the concept into the biological sciences in the 1980s. Biodiversity, they considered, encompasses the huge variety of life. It is the totality of all variation in life forms. Wilson identified three levels of biological organisation - the ecosystems, such as the shallow marine environment, the savannahs, the forest patches, and the ponds; the specific plant and animal species and microorganisms in each ecosystem; and the genes that prescribe the species and make up the ecosystems. How these all fit together is the subject of modern biodiversity studies.

Wilson points out that we know little about the world of diversity that is vanishing, and have lost touch with the spirit of infinite possibility that nature represents. What we also fail to appreciate is that we are, ourselves, a part of that infinite diversity. We are not separate from it. The human species was the one life form, as a cultural and not just a biological phenomenon, which Darwin omitted from his tree of life. Cultural diversity is surely as much the product of evolution as biological diversity. But we limit our culture. We live in an anthropocentric, self-referential world imagined to be separate from the Earth and the Universe which has fashioned us.

Could it be that we are now beginning to realise this, to learn from nature, and to awaken to our essential interdependency with it? Wilson suggests, for instance, that we should keep in mind the ways in which nature sustains us. Firstly we live off its diversity and the more that diversity is threatened the more diminished our life is. Secondly the life that ecosystems give us comes scot free. We crassly try to put a cash value on it but the work that nature’s ecosystems do for us is far beyond the

entire domestic product of the world. Economics is not the science that sustains the world as we think it is.

Thirdly the knowledge that is embodied in millions and millions of years of development is an irreplaceable treasure and should be valued for that reason. It also has high aesthetic value for humanity. Much of our culture emerges from the emotional response we have to living forms in nature. If only we also realised it, we carry the DNA of four and a half billion years of the Earth's evolution within us. It is time we awoke to our heritage. The genetic bank of nature is not just all around us, it is also within us. xxxiii

But there is one major lesson to be re-learnt from nature. For centuries we have considered it “red in tooth and claw”, as a struggle for ‘survival of the fittest’. This conception is now being questioned. Richard Mabey, for instance, draws our attention to the research on canopy, “the most exciting field of ecology – showing just to what extent plants live in really quite unexpected relationships, one with another and with other creatures.”

Canopy scientists, for instance, seem to have made a discovery which challenges the idea of the constant battles that early thinkers had about the jungle. They discovered that, at the growing tips of rainforest trees, far from the twigs lashing each other and competing for light, they were actually moving away from each other, allowing growing space, a phenomenon to which they gave the term “crown shyness”, or crown respect. To Mabey this seems “to give a corrective to some of the glib Victorian assumptions we have about the way life is lived in the wild – “the struggle for survival” - and he suggests that “there are more solutions, which are made by accommodation, by partnership, by symbiosis, by association, than by outright violent struggle”. xxxiv

In other words nature is a universal act of cooperation rather than competition. It only appears to be competitive because we read our own cultural preoccupations into it. Perhaps we are now beginning to read it differently because we have also begun to think about ourselves differently. Perhaps we are beginning to appreciate

the importance of living more harmoniously with each other, as well as with the habitat that creates, and sustains, us.

Wilderness

Although all forms are dynamic,
And we all grow and transform,
Each of us is compelled
to return to our root.
Our root is quietude. Lao Tzu

Nature – which many associate with wilderness - can have a calming effect on us. The sense of space experienced on a mountain top, walking along a beach, or just looking into the sky seems for many people to put things into a different perspective. Nature also puts us in touch with what the poets call “the sublime” by way of the vastness, beauty, or destructive grandeur of the landscape. We may feel ourselves to be physically small in relation to the world and universe but, by contrast, something within us responds to the immensity of nature as though that sublime immensity is as much inside us as without. The Romantics caught this at the end of the Eighteenth century when more and more people began to have a different relationship with the natural world but it is especially evident today in a host of inspired nature writers, including Tim Dee, Jay Griffiths, Kathleen Jamie, Richard Mabey, or Robert MacFarlane. ^{xxxv}

All human cultures have derived inspiration from the sense of wilderness, whether it is imagined as a special relationship with nature or the spiritual experience of being away from human society in a forest or a desert region. These places connect us with something primordial in life. As Robert Macfarlane writes, wilderness has traditionally been perceived as a dangerous and chaotic force to be kept under control but at the same time it has

an alternative history: one that tells of wilderness as an energy both exemplary and exquisite, and of wild places as realms of miracle, diversity and

abundance. At the same time that the *Beowulf*-poet was writing his parable of the conquest of the wild, the monks of Enlii, Rona, the Skelligs and elsewhere were praising its beauty and its riotous fecundity”. xxxvi

Of course, the modern bustling city is commonly thought of as the last place for a wilderness experience, though this notion is increasingly in question. Not only is the urban landscape increasingly a habitat for wildlife but people also realise that “wilderness” is a state of mind rather than a physical location. Solitude can be experienced in the noisy metropolis as well as on a mountain top, in a desert or a forest.

“Returning to our root” is the true wilderness experience. To contemplate the cosmic emptiness of space - which our science has opened us to – from the teeming world of a tropical rainforest or the streets of a modern global city is to wonder how the one came from the other. How did such infinite diversity of form come from such a vast nothingness, except in the understanding that form must somehow come from formlessness? The formless is where everything originates. There is something in us all which is prior to the Earth, prior even to the Universe. Not only is it formless but it is also timeless. It is beyond sense, beyond even mind. It cannot be described for it is nameless and “without words” yet it is, say all the sages, the source of all life and truth.

NOTES

i Richard Leakin and Roger Lewin, *The Sixth Extinction. Biodiversity and its Survival*. London: Weidenfeld and Nicholson, 1996, p 245.

ii Rachel Carson, *Silent Spring* London: Penguin, 1965. P 23.

iii J.E. Lovelock *Gaia. A New Look at Life on Earth*. Oxford University Press, 1979. A new edition by ‘James Lovelock’ (OUP 2000) has a new preface by the author.

iv See Jon Turney, *Lovelock and Gaia. Signs of Life*. Cambridge: Icon Books, 2002.

v Martin Rees *Our Final Century. Will Civilisation Survive the Twenty-First Century?* London: Arrow Books 2003.

vi Jonathon Porritt, *Seeing Green. The Politics of Ecology Explained*. Foreword by Petra Kelly. Oxford: Blackwell, 1984.

vii Fergus Beeley, *planet earth, the future. What the experts say. Environmentalists and biologists, commentators and natural philosophers in conversation with Fergus Beeley, Mary Colwell and Joanne Stevens.* Foreword by Jonathon Porritt. BBC Books, 2006. P 7. This is an excellent, very readable, and thought-provoking anthology. To quote Richard Mabey on the back cover: 'What the planet has produced as a kind of flush of cards is astonishing, and at any point where we diminish that diversity or allow it to diminish, we are weakening the whole resilience of the system of life on Earth as well as stopping in their tracks those beautiful solutions to the challenge of living.' What we tend to forget is that we are also to be included in that flush of cards and our ignorance of that is a major part of the problem. We neglect our own resilience and our own potential contributions to the beautiful solutions.

viii Quoted in Mark Maslin, *Global Warming* Oxford University Press, 2004. P 1

ix D. Peat 'The Saving of Planet Gaia', *New Scientist* 18 March, 2006

x Quoted in Mark Lynas 'Final Warning' *The Independent* 3.2.2007, p 1.

xi Mark Lynas, *High Tide.* London: Harper Perennial, 2005.

xii Mark Lynas, 2007a op.cit, and *SIX DEGREES. Our Future on a Hotter Planet.* London: Fourth Estate, 2007b.

xiii See Maslin, 2004 op cit.

xiv We are becoming much more aware of these living dead. See, for instance, the 2009 BBC series *Last Chance To See* where Stephen Fry and Mark Cawardine search out and film examples of rare and threatened species.

xv Lynas 2007b op cit pp 188-9

xvi Tim Flannery *The Weather Makers. The History and Future Impact of Climate Change.* London: Allen Lane, 2006a pp 45-55. And Tim Flannery *We Are the Weather Makers. The Story of Global Warming.* London: Penguin, 2006b. Flannery's is one of the most readable and exciting books on climate change. It provides clear evidence that, even as we may be terrified at the possible changes that are to come, we are at the same time given insight into the magnificent, breath-taking, and inspiring diversity of nature's phenomena. Flannery writes regularly for the *New York Review of Books.*

xvii Flannery suggests that the climate change of 55 million years ago 'seems to have been driven by a vast natural gas-driven equivalent of a barbecue.' Scientists believe that the gas may have come from craters below the sea off the Norwegian coast fuelled by great accumulations of hydrogen in the form of methane gas under the sea bed which pushed its way to the sea floor causing 'a massive submarine explosion the likes of which the world had never seen'. The methane never reached the earth's atmosphere combining with Oxygen in the sea water and leaving only CO₂ to arrive at the surface. This had a profound affect both on life in the sea and land and it took at least 20,000 years for the Earth to reabsorb all of the additional carbon.

xviii Flannery, 2006a p 53 but see the whole chapter five.

- xi Robert Henson *The Rough Guide to Climate Change*. London 2008. See pp 20-31.
- xx James Lovelock *The Revenge of Gaia. Why the Earth is fighting Back – and How We Can Still Save Humanity*. Foreword by Sir Crispin Tickell. London: Allen Lane, 2006.
- xxi Fred Pearce, *The Last Generation. How Nature Will Take Her Revenge for Climate Change*. London: Eden Project Books, 2007.
- xxii Henson 2008 op cit p 206.
- xxiii George Monbiot *Heat. How to Stop the Planet Burning*. With research assistance from Dr Matthew Prescott. London: Allen Lane, 2006
- xxiv Jonathan Porritt *Capitalism as if the World Matters*. London: Earthscan, 2006
- xxv *Capitalism as if the World Matters* is a serious, detailed, and many-levelled analysis of the current state of things and what we must do about it. It deserves the attention of our political leaders. Firstly it is a detailed and creative example of a pragmatic problem-solving approach to the immense challenges we face. Secondly it bases its arguments on the one global political system we now have and thereby avoids the charge of utopianism. Thirdly it reinterprets 'capital' in more than purely economic terms, including 'human' and 'social' capital as essential ingredients in any redefinition and regeneration of capitalism. Fourthly it is forward-looking and brings together the thinking and creative ideas of Forum for the Future, a dynamic research team, chaired by Porritt, whose work offers hope and possibility for this next century.
- xxvi Oliver Tickell, *Kyoto2. How to manage the Global Greenhouse*. London: Zed Books. 2008.
- xxvii Adam Werbach, 'Is Environmentalism Dead?', speech at The Commonwealth Club, San Francisco, 8 December, 2004. Text available at www.grist.org/news/maindish/2005/01/13/werbach-reprint/ See Porritt 2006 op.cit p 37 where he quotes from Werbach's speech: *'The signs of environmentalism's death are all around us; we speak in terms of technical policies, not vision and values: we propose 20th century solutions to 21st-century problems; we are failing to attract young people, the physical embodiment of the future, to our cause; we're failing to attract the disenfranchised, the disempowered, the dispossessed and the disengaged; we treat our mental categories, ourselves, and other elements of nature as things; most of all environmentalism is no longer capable of generating the power it needs to deal with the world's most serious ecological problems.'*
- xxviii Michael Schellenberger and Ted Norhaus, 'The death of environmentalism: Global warming politics in a post-environmental world' in *Grist Magazine* www.grist.org, quoted again in Porritt 2006 ibid. p.39.
- xxix Beeley 2006 op cit. P 7.
- xxx Ibid. p 28. See chapter 2, 'Biodiversity Matters', for further contributions and discussion from Mabey, Wilson, Lovejoy, Attenborough et al. on this important topic and which I draw on in this section.
- xxxi Ibid. p 29

xxxii Andy Crump, *Dictionary of Environment and Development. People, Places. Ideas and Organisations*. London: Earthscan, 1991. See entry for 'Biodiversity (Biological diversity)' p 32.

xxxiii Beeley op.cit. pp 29-30

xxxiv Ibid. pp 37-39.

xxxv See for instance Tim Dee, *The Running Sky. A Birdwatching Life* (Vintage 2010). Jay Griffiths, *Wild. An Elemental Journey* (Penguin 2006), Kathleen Jamie *The Tree House* (Picador 2004), *Findings* (Sort of Books, 2005), *Waterlight: Selected Poems* (Graywolf Press, 2007) and *Sightlines* (Sort of Books, 2012), Richard Mabey, *Nature Cure* (Vintage 2008, 2005) and *Beechcombings. The Narratives of Trees* (Vintage 2008, 2007), Robert MacFarlane, *Mountains of the Mind. A History of a Fascination* (Granta 2008, 2003), *The Wild Places* (Granta 2008, 2007) and *The Old Ways. A Journey on Foot* (Hamish Hamilton, 2012) .

xxxvi Robert Macfarlane *The Wild Places* London: Granta Books, 2007. P 31.

The assessment estimates that current extinction rates could be up to hundreds of times higher than at any other point in the past 10 million years. At sea, a third of marine mammals, reef-forming corals, sharks, and shark relatives are on the brink. Life on land isn't faring any better. A million pending extinctions is a huge threat to our own quality of life on this planet and our continued existence on it. But don't despair! Conservation laws work if we let them. The Endangered Species Act has a success rate of 99 percent. Meaning, once listed, 99 percent of species have so far avoided extinction. Strengthening the ESA and similar international laws can curb poaching, trophy hunting, overfishing, and habitat destruction. The Holocene extinction, otherwise referred to as the sixth mass extinction or Anthropocene extinction, is an ongoing extinction event of species during the present Holocene epoch (with the more recent time sometimes called Anthropocene) as a result of human activity. The included extinctions span numerous families of plants and animals, including mammals, birds, reptiles, amphibians, fishes and invertebrates. With widespread degradation of highly biodiverse habitats such as coral reefs and Much of our recent ecological turn, in the arts and human sciences, has struggled to grapple with the immensity of the problem we have caused. One historical way to make sense of this is through Romantic-era theories about the sublime, which attended to our estrangement from nature and the feeling of ecstatic terror we derive from being in the presence of its fury. In the context of climate destruction, representations of the ecological or technological sublime, such as the massive formats of Edward Byrtnksy or the videos of visual artist Rachel Rose, have come, for me, to seem increasingly escapist, suffering from what the cultural critic Sianne Ngai theorises as "stuplimity": the sublime plus "whatever". Discussion regarding the potential collapse of global civilization, defined as a significant decrease in human population and/or political/economic/social complexity over a considerable area, for an extended time. We seek to deepen our understanding of collapse while providing mutual support, not to document every detail of our demise. Overindulging in this sub may be detrimental to your mental health. The Sixth Extinction: An Unnatural History is a 2014 non-fiction book written by Elizabeth Kolbert and published by Henry Holt & Company. The book argues that the Earth is in the midst of a modern, man-made, sixth extinction. In the book, Kolbert chronicles previous mass extinction events, and compares them to the accelerated, widespread extinctions during our present time.

Literature suggests that the Permian-Triassic (P-Tr) extinction event was initiated by rapid volcanism that led to substantial shifts in oceanic dissolved oxygen and acidification promoting ecological collapse while the Cretaceous-Tertiary (K-T) extinction event is studied to have been initiated by an asteroidal impact (Chicxulub asteroid) with volcanism as a by-product of the impact further shifting ecological dynamics. This chapter deals with biodiversity conservation efforts aimed at facing “the Big Sixth” the new mass extinction we could be entering, the first one involving our own species as a primary cause. Discussion regarding the potential collapse of global civilization, defined as a significant decrease in human population and/or political/economic/social complexity over a considerable area, for an extended time. We seek to deepen our understanding of collapse while providing mutual support, not to document every detail of our demise. Overindulging in this sub may be detrimental to your mental health. The Sixth Extinction: An Unnatural History is a 2014 non-fiction book written by Elizabeth Kolbert and published by Henry Holt & Company. The book argues that the Earth is in the midst of a modern, man-made, sixth extinction. In the book, Kolbert chronicles previous mass extinction events, and compares them to the accelerated, widespread extinctions during our present time. The ongoing sixth mass species extinction is the result of the destruction of component populations leading to eventual extirpation of entire species. Populations and species extinctions have severe implications for society through the degradation of ecosystem services. Third, close ecological interactions of species on the brink tend to move other species toward annihilation when they disappear—extinction breeds extinctions. Finally, human pressures on the biosphere are growing rapidly, and a recent example is the current coronavirus disease 2019 (Covid-19) pandemic, linked to wildlife trade. Second, documenting so many species on the verge of collapse has led us to suggest that future rates of extinction are probably underestimated. , The sixth extinction crisis: Loss of animal populations and species. *J. Cosmology* 8, 1821–1831 (2010). [OpenUrl](#). You are going to email the following Accelerated modern human-induced species losses: Entering the sixth mass extinction. Message Subject (Your Name) has forwarded a page to you from Science Advances. Message Body (Your Name) thought you would like to see this page from the Science Advances web site.