

The Philosophical Roots of the Ecological Crisis

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*Descartes
and the Modern Worldview*

By

Joshtrom Isaac Kureethadam

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*The time is coming
when the struggle for dominion over the earth will be carried on.*

*It will be carried on
in the name of fundamental philosophical doctrines.*

—Friedrich Nietzsche

*We cannot solve a problem
with the same mind-set that created it in the first place.*

—Albert Einstein

CONTENTS

Preface	x
Abbreviations	xii
Acknowledgements	xiii
Introduction	1
Diagnosing the Root Causes of the Ecological Crisis	
Chapter I	9
The Philosophical Roots of the Ecological Crisis	
1. The Anthropogenic Character of the Contemporary Ecological Crisis	
2. Resistance in Looking for the Causes of the Ecological Crisis	
3. Going Beyond the Apparent Causes	
4. Past Attempts to Trace the Deeper Roots of the Crisis	
5. The Roots of the Ecological Crisis as 'Philosophical'	
Chapter II	47
Modernity as the Humus of the Philosophical Roots of the Ecological Crisis	
1. The Alleged Roots of the Ecological Crisis in Gnosticism and Greek Philosophy	
2. Christianity and the Supposed Depreciation of the Natural World	
3. Modernity as the Humus for the Philosophical Roots of the Ecological Crisis	
4. Bacon as a Possible <i>Accoucheur</i> of Modernity	
5. The Singular Contribution of Descartes towards the Creation of the Modern <i>Weltbild</i>	

Chapter III	85
Descartes' Unique Contribution towards the Modern <i>Weltbild</i>	
1. The Metamorphosis of Natural Philosophy into the Modern Mechanistic Science	
2. The Epistemological-Metaphysical Project of Descartes	
3. Descartes' New Epistemological Foundations	
4. Cartesian Epistemological Revolution and Its Ecological Implications	
5. Descartes' New Metaphysical Foundations	
6. Some Ecological Implications of Cartesian Metaphysics	
7. The Cartesian Modern <i>Weltbild</i> and the Philosophical Roots of the Ecological Crisis	
Chapter IV	124
Cartesian Ego, Modern Anthropocentrism, and the Ecological Crisis	
1. The Absolute Centrality of the Self in Modernity	
2. The <i>Cogito</i> and the Birth of the Modern Subject	
3. The Reduction and Exaltation of the Self as <i>Res Cogitans</i>	
4. Modern Anthropocentrism and the Roots of the Ecological Crisis	
5. A Philosophical Debate on Anthropocentrism	
6. Biocentrism as an Alternative to Anthropocentrism	
7. A Relational Perspective as the Only Viable Alternative	
Chapter V	163
The Modern Mechanistic Worldview and the Ecological Crisis	
1. Descartes' Substitution of Aristotelian Hylomorphism with Mechanism	
2. Knowledge of the Physical World: A New Epistemology for a New Physics	
3. Clear and Distinct Perception and the Geometrization of the Physical World	
4. The Metaphysical Foundations of Modern Mechanistic Physics	
5. The Ontological Reduction of the Physical World to <i>Res Extensa</i>	
6. A Reductive View of the Natural World	
7. The Mechanistic <i>Weltbild</i> and the Roots of the Ecological Crisis	

Chapter VI.....	205
The Modern Mechanistic Physiology and the World of the <i>Bête-Machines</i>	
1. Descartes Unique Contribution towards the Modern Mechanistic Physiology	
2. The Mechanistic Explanatory Scheme in Physiology	
3. From Mechanistic Description to Ontological Mechanism	
4. The Elimination of Teleology from the Natural World	
5. Ecological Implications of the Cartesian Mechanistic Physiology: Animals as <i>Bête-Machines</i>	
Chapter VII.....	248
Cartesian Metaphysical Dualism and the Human-Nature Divide	
1. The Uniqueness of Cartesian Dualism	
2. The Epistemic Route to the Human-Nature Divide	
3. The Metaphysical Dualism between the <i>res cogitans</i> and the <i>res extensa</i>	
4. Critique of the Cartesian Epistemological Dualistic Divide	
5. Critique of the Cartesian Metaphysical Dualism	
6. Cartesian Dualism and the Bifurcation of Nature	
7. Holism as an Alternative Paradigm to Cartesian Dualism	
Chapter VIII	292
The Enduring Modern <i>Weltbild</i> and the Contemporary Ecological Crisis	
1. The Long Shadow of Descartes over Modern Philosophy and Beyond	
2. Modern Science, Technology, and the Taming of Nature	
3. Modern Economy and the Exploitation of Nature	
4. Modern Politics and Educational Curricula for the Conquest of the Natural World	
5. The Enduring of the Modern Worldview and the Deterioration of Our Common Planetary Home	
Conclusion.....	331
New Wineskins for a New Worldview	
Bibliography	341
Index	382

PREFACE

While attempts to search for the deeper roots of the ecological crisis began nearly fifty years ago with Lynn White's celebrated essay, "The Historical Roots of Our Ecologic Crisis" (published in *Science*, 1967), the project has remained largely uncompleted to date. The fact that the crisis has only got worse in the meantime is a clear indication that we have not yet managed to diagnose and treat the real root causes of the problem. I believe that in order to overcome the contemporary ecological crisis, we need to unearth, in the first place, our fundamental beliefs and attitudes towards the physical world—the conglomerate of which constitutes a certain *Weltbild*—that have led to a voraciously exploitative and ruthlessly destructive relationship with nature. It is precisely the scope of the present book.

I have taught courses in Ecology for post-graduate students for several years. I am of the opinion that environmental philosophy so far has restricted its domain mostly to environmental ethics, often cogitating on nuanced issues like the intrinsic worth of non-human species, the rights of animals, etc. Environmental philosophers have not yet sufficiently grappled with foundational questions like the metaphysical grounds underpinning our distorted relationship with the natural world, as evident in the current ecological crisis. In the light of my own research and teaching, I am convinced that an important task of environmental philosophy is to trace the deeper conceptual roots of humanity's disharmonious relationship with the surrounding natural world.

The present book is the humble result of an explorative journey over many years to unearth the latent philosophical roots of the contemporary ecological crisis. I am indebted to several persons who have nurtured and sustained me in this process. I remember with profound gratitude Luis Caruana who was an attentive guide while he was at the Gregorian University in Rome and later at Heythrop College of the University of London, Fiona Ellis who acted as my tutor while I was a Research Scholar working on this project at the University of Oxford, Paul Gilbert who offered some constructively critical perspectives on the research project which have improved the quality of the final outcome, Gerard J. Hughes, former Master of Champion Hall, University of Oxford, my own colleagues in the Faculty of Philosophy of the Salesian University in Rome, particularly

Mauro Mantovani and Scaria Thuruthiyil, and last but not least, my own students over the years with whom several questions in this book were discussed and at times passionately debated.

I am deeply grateful to Liz Walmsley who meticulously proofread the entire manuscript and offered valuable corrections. I also thank Annabel Clarkson who corrected some chapters of the earlier drafts, and Banzelão Julio Teixeira for his attentive reading of the manuscript. I am also grateful to John Dickson and Vincent Castilino for their timely assistance.

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The state of our planetary home appears to be increasingly deteriorating. However, the silver lining in the clouds is that there has been a steady growth of ecological consciousness over recent years. Many people are increasingly aware of the grave challenge facing our common home and are disquieted about it, and want humanity to chart a way out of the crisis. I believe that an important step in this journey will be the accurate diagnosis of the root causes of the malaise. It is only after having understood the real and root causes of the contemporary ecological predicament that we can think of proposing ways and means to overcome it. This is what I have sought to do in this book. I hope that the book will appeal not only to academic philosophers and students of environmental disciplines, but also to all those concerned about the precarious state of our common home: environmental activists and grassroots movements, educationists and study-groups, religious leaders and faith communities, and many others.

I praise and thank God for enkindling a great zeal to care for our common home (cf. *Jn* 2:17) in the hearts of so many people around the globe.

I dedicate this book to everyone engaged in protecting and preserving our common planetary home for ourselves, for the rest of the biotic community, and for future generations.

ABBREVIATIONS

AT	<i>Oeuvres de Descartes</i> , eds. Charles Adam and Paul Tannery. 13 vols. Paris: CNRS/J. Vrin, 1964-74.
CSM	<i>The Philosophical Writings of Descartes</i> , tr. & ed. John Cottingham - Robert Stoothoff - Dugald Murdoch. 2 vols. Cambridge: Cambridge University Press, 1985.
CSMK	<i>The Philosophical Writings of Descartes</i> , tr. & ed. John Cottingham - Robert Stoothoff - Dugald Murdoch - Anthony Kenny. 3 vols. Cambridge: Cambridge University Press, 1991.
<i>Discourse</i>	<i>Discourse on the Method</i>
<i>Meditations</i>	<i>Meditations on First Philosophy</i>
<i>Principles</i>	<i>Principles of Philosophy</i>
<i>Passions</i>	<i>The Passions of the Soul</i>
<i>Rules</i>	<i>Rules for the Direction of the Mind</i>
<i>The World</i>	<i>The World or Treatise on Light</i>
EFA	Ecological Footprint Analysis
IPCC	Intergovernmental Panel on Climate Change
PETM	Palaeocene-Eocene Thermal Maximum

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All translations from non-English sources are my own, unless indicated otherwise.

INTRODUCTION

DIAGNOSING THE ROOT CAUSES OF THE ECOLOGICAL CRISIS

The contemporary ecological crisis points to the precarious state of Earth, our planetary home. The talk about the ecological crisis is, in fact, spurred by a profound concern for the alarming situation of our common home. It is evident in the etymological origin of the very term “ecology”, derived from two Greek words: *oikos* and *logos*, meaning “home” and “discourse” respectively. The ecological crisis is about our very home. It is not a mere environmental issue, or even a host of them, as it is often presented in the media and in academic discussions. The crisis is about the real threat to the survival and flourishing of life, including human life, on Earth, our common home. For the first time in human history, the very home that sustains and hosts myriad forms of life, including human life, appears to be on the verge of a possible collapse.

We live in a rather ironical situation. Today, we know much more about the contemporary ecological crisis than at any other time. There is no shortage of warnings about the precarious situation of our common planetary home. Report after report from the scientific community indicate in no uncertain terms that the state of our home planet is only deteriorating year after year, that many of the natural processes that sustain life on Earth are on the verge of a near collapse and that our common home is in danger. Some of the world’s most prestigious scientific bodies and leading academic institutions are on the frontline when it comes to the study of manifestations of the ecological crisis like climate change, biodiversity loss, pollution, desertification and resource depletion, to name a few. There is no dearth of proposals when it comes also to the possible solutions to the crisis which range from technological feats like geo-engineering to political proposals like cap-and-trade. At the same time, the crisis is decidedly getting worse, and looms large as a real threat to the future of Earth as an abode for humanity and other forms of life. In fact, what is at stake is not just the survival of many forms of life but the very future of human civilization.

At this juncture it is important to pause and ask as to why we find ourselves in such a paradoxical, outright schizophrenic situation with regard to the precarious state of our common planetary home. We know that our common home is in real peril, yet we are nowhere when it comes to responding to the crisis which only gets increasingly worse. One very plausible reason is that we have not yet devoted sufficient time and energy to “diagnosing” the deeper root causes of the problem. We have not attempted to do what any well-trained doctor would do while attending to a patient with a grave illness. Before trying to treat the patient, any physician will seek to find out the underlying causes of the illness. It is only after a proper and thorough diagnosis has been carried out that real and effective treatment can begin. Otherwise, one will only be responding to the apparent symptoms of the disease. In fact, the malaise can only get worse, if the deeper underlying causes are not addressed in the first place.

Faced with the contemporary ecological crisis, we stand in need of a real “diagnosis” of the underlying causes of the malaise. We need to ask ourselves some fundamental questions regarding the deeper causes of the crisis. How did we get here? Why do we pull down the very pillars of our common home? Why are we despoiling the very nest that shelters us? It is only after having rightly diagnosed and understood the real and root causes of the contemporary ecological predicament that we can think of proposing ways and means to overcome the very crisis.

The importance of diagnosing the deeper underlying root causes of a problem is only ancient and received wisdom. This was what Gautama Buddha, the Enlightened One, did thousands of years ago when faced with the universal problem of human suffering. Buddha’s path to enlightenment unfolded in four important stages which led him to the discovery of the corresponding four Noble Truths. Confronted with the predicament of human misery, Buddha sought, first of all, to understand what suffering really is. This led him to the first noble truth about human existence and suffering. Then followed a very important step, probably the most important of the entire process. It consisted in finding the deep and underlying root causes of the problem of suffering. Thus he arrived at the second noble truth about the causes of human suffering. The third and fourth noble truths concerning the elimination of suffering and the concrete way to achieve it, namely, the *Ashṭāṅga-marga* (the eight-fold path), were possible only after the deeper root causes of the problem of suffering had rightly been identified.

In the face of the contemporary ecological crisis, we appear not to have given sufficient importance to (or even skipped altogether) the second phase of diagnosing the deeper roots of the problem. We have sought to

understand and respond to the crisis. As we mentioned earlier, there is no dearth of studies which seek to describe the crisis as well as offer possible solutions to it. What has not taken place however, is a radical diagnosis of the deeper and underlying causes of the ecological crisis. In the meantime, we carry on responding to the mere symptoms of the problem, while the crisis itself is only getting worse.

At this critical juncture of unprecedented threats to the sustainability of our common planetary home, we need to pause and reflect in order to diagnose the real causes of our current ecological predicament. It is a fundamental step, a *sine qua non*, if we are to overcome the crisis. It is precisely the journey that awaits us in this book.

In the coming chapters, we shall seek to diagnose some of the underlying philosophical root causes of the contemporary ecological crisis. Of course, we are embarking on a very ambitious journey ridden with perils, blind alleys, and false leads. First of all, it may appear naïve on our part to presume that there exist direct and clear-cut causes for the complex and multi-faceted ecological predicament. The causes are indeed legion and they are hardly ever obvious! So we can only begin by advancing credible hypotheses—as physicians, scientists and others do while trying to arrive at the underlying causes of a malaise or unknown phenomena. The main hypothesis we advance in the present book is that the humus, where some of the underlying and most important philosophical root causes of the ecological crisis originate is the *Weltbild* of Modernity—the historical epoch which ushered a radical shift in the human perception and treatment of the natural world with detrimental consequences for the latter. We sharpen the hypothesis further by narrowing down the area of the humus for the conceptual roots of the ecological malaise more precisely in the philosophy of René Descartes, the father of modern philosophy, whose thought contributed significantly to the creation of the modern worldview.

We shall now sketch out in a few strokes, the journey that lies ahead of us in the verification of the hypothesis regarding the underlying philosophical root causes of the contemporary ecological crisis in the worldview of Modernity, shaped largely by thinkers like Descartes.

The first chapter will argue that the conceptual root causes of the contemporary ecological crisis are significantly philosophical. We will begin with a reflection on the anthropogenic character of the present ecological crisis, namely, that the crisis is caused by human activities. It is precisely for the human-induced origin of the crisis that we search for the deeper causes of the malaise in the distorted human-nature relationship. We will then go on to evidence how some of the factors often touted as the causes of the contemporary ecological crisis—like the indiscriminate

application of science and technology or the phenomenal explosion of human population—are only the apparent and not the real causes of the problem. The real causes need to be searched at a much deeper level, namely at the conceptual level of ideas that have moulded human attitudes towards the physical world and guided human treatment of nature. It needs to be admitted that there have been some attempts in this regard in the past. One may recall here the classical essay of Lynn White Jr. who sought to identify the roots of the contemporary ecological crisis in Christian theology, and especially in the biblical command to dominate over creatures found in the first chapter of the book of Genesis. Others have sought to trace the roots of the crisis in monotheistic beliefs and their attendant theological concepts of a transcendental God, with detrimental effects on the physical world considered as inferior and without intrinsic worth. Such proposals however, do not stand the razor of critical scrutiny as we will go on to evidence. The real roots of the ecological crisis are “philosophical”, as they emerge from a certain vision of the physical world and of humanity’s relationship with it.

In the second chapter, we will seek to find out where exactly the deeper philosophical roots of the ecological crisis originate. We argue that the conceptual roots of the ecological crisis can be traced to Modernity rather than any other era of human history. Attempts to indict Greek philosophy or early and Medieval Christian spirituality for the contemporary ecological woes appear to be hollow on closer examination. Instead, Modernity reveals itself as a unique period that witnessed a radical transformation of humanity’s understanding of itself, the human perception of the physical world, and especially humanity’s relationship with the physical world. Such a worldview radically changed human-nature relationship, to the detriment of the latter. While it is possible to identify Modernity as the humus for the philosophical roots of the contemporary ecological crisis, there remains a knotty problem. The difficulty is to ascertain which modern thinker has contributed most to the creation of the modern *Weltbild* and the transformation of human-nature relationship in terms of dominion and exploitation. Carolyn Merchant, for example, has suggested that Francis Bacon, the father of modern experimental science, contributed most to a distorted human-nature relationship in the wake of Modernity. Others have suggested that the roots of the ecological crisis are to be sought in the modern mechanistic scientific method ushered in by Galileo, Gassendi and Newton. While the modern worldview was put in place by the collective efforts of many such stalwarts of Modernity, the contribution of René Descartes, universally acclaimed as the father of modern philosophy, appears singular in this regard.

The third chapter will examine the unique contribution of Descartes in the creation of the modern worldview, especially from the philosophical point of view. Descartes sought to renew philosophy radically, providing it with altogether new foundations. The Cartesian approach has been both epistemological—in terms of a new theory of knowledge, as well as metaphysical—in terms of a new conception of the *ens* of beings. It is such a profound overhauling of the traditional philosophical categories of knowing and of the very nature of reality that makes Descartes stand out unique, head and shoulders above, among the accoucheurs of Modernity. The significant contribution of Descartes in the moulding of the modern worldview was acknowledged by a philosopher like Martin Heidegger in his incisive critique of Modernity in *Sein und Zeit* and in later writings. Other critics of Modernity like Hans Jonas and Maurice Merleau-Ponty have also pointed out Descartes' singular contribution in the creation of the modern worldview and its attendant ecological implications.

The principal elements of the modern *Weltbild* in terms of the emergence of the Archimedean modern Subject, the conception of the physical world, including animate beings, as reduced to pure extended matter, and the thorough dualistic divide between humans and the rest of the physical world trace their origin in Cartesian philosophy. The core of the present project is precisely to make explicit how the triple foundations of the Modern worldview—in terms of an exaggerated anthropocentrism, a mechanistic conception of the natural world, and the metaphysical dualism between humanity and the rest of the physical world—can all be largely traced back to the Cartesian thought with direct ecological consequences. This will be the programme undertaken from chapters four to seven.

In chapter four, we will examine the link between modern anthropocentrism and the current ecological crisis. The turn to the Subject which becomes the Archimedean centre of reality takes place in Modernity and precisely with the emergence of the Cartesian ego, the *res cogitans*. Descartes brings about such a radical revolution through a clever epistemological-metaphysical strategy. From the epistemological perspective, Descartes proposes a new theory of knowledge in which certainty is arrived at in terms of the clear and distinct perception from the part of the subject, who represents physical reality according to its own categories. From the metaphysical perspective, Descartes reduces the identity of the human subject in terms of rationality alone, conceived as diametrically opposed to, and as superior to the physical world, the *res extensa*. Modern anthropocentrism thus begins with Descartes, with direct and evident ecological consequences. We will also discuss how biocentrism, the

alternative proposed against anthropocentrism by deep ecologists and others, is not a viable choice.

In chapters five and six, we will deal with the modern mechanistic worldview ushered in by Descartes and other protagonists of Modernity. In chapter five, we will examine Descartes' unique contribution towards the mechanistic understanding of the physical world which dethroned and replaced the Aristotelian-Scholastic hylomorphic conception of matter. Descartes' strategy was to argue that physical entities have mechanistic properties alone which render the physical world purely inert, extended matter, and bereft of any element of teleology whatsoever. The Cartesian and modern mechanistic conception of the inanimate physical world, while possessing great heuristic value and pragmatic success, ultimately led to the creation of a one-dimensional perception of the natural world. We will go on to argue how such a reductive view of the natural world has contributed significantly to an instrumental and disenchanting conception of the physical world in terms of utility alone, and reduced to a mere storehouse of resources for human consumption.

Modernity came up not only with a mechanistic physics but also with a mechanistic physiology, wherein the animal world also comes to be subsumed under the category of the *res extensa*. In chapter six, we will examine Descartes' original contribution towards the mechanization not only of the inanimate world but also of the animate world. Within the Cartesian system, all non-human entities ultimately get reduced to mechanistic beings that exhibit machine-like properties alone, while all rational and intellectual properties are possessed solely by humans, who alone are the *res cogitans*. Modern mechanistic physiology is best evident in the infamous Cartesian doctrine of the *bête-machines* which has conspicuously manifest ecological implications.

In chapter seven, we discuss the most important heritage of Cartesian thought in the creation of the modern *Weltbild*, namely his metaphysical dualism. In philosophical circles, Cartesian dualism is often reduced to anthropological dualism, namely, the question of the union of body and soul. But it is important to remember that Cartesian dualism is much deeper and is ultimately metaphysical in character. It is an ontological dualism in which all reality is divided into the two inseparable segments of the *res cogitans* and the *res extensa*—the human beings and the rest of the physical world—conceived in terms of diametric opposition and exclusion. On account of such a dualistic divide, humanity and the physical world stand in total separation within the Cartesian and largely modern worldview. Some of the most significant roots of the contemporary ecological crisis can be traced precisely within the humus of the

metaphysical dualism introduced by Descartes at the dawn of Modernity. It is such an ontological divide between humans and the rest of the physical world, shorn of any element of continuity and relationship whatsoever between them, that has sanctioned the domination and exploitation of the natural world at the hands of humans, as the latter came to be considered as totally separate from and hierarchically superior to nature.

In chapter eight, the very last of the book, we will seek to further verify the hypothesis advanced, namely, that the contemporary ecological crisis is intricately linked to the modern and Cartesian *Weltbild*. We do this by examining how the modern worldview, considered as the humus for the deeper philosophical roots of the current ecological crisis, endures to our present day, and continues to contribute to the distorted human-nature relationship and spoliation of the natural world. We continue to relate to and treat the physical world within the modern and Cartesian philosophical framework, in spite of the emergence of contemporary physics and post-modern philosophical categories. The long shadow of the modern philosophical *Weltbild* continues to serve as the foundation and the encompassing horizon of much of contemporary philosophical thought, science and technology, neo-liberal economy and political and educational institutions. This situation also explains why the domination and exploitation of the natural world has only been intensified in the recent decades with the “globalization” of the western modern worldview around the globe.

Since the deeper conceptual roots of the contemporary ecological crisis lie within such an ideological paradigm, it is evident that the very crisis will not be overcome without a conscious attempt to surpass the underlying worldview inherited from Modernity. We will conclude therefore arguing for a new philosophical worldview that can provide a new orientation to human living in our common planetary home which appears to be on the verge of a possible collapse.

We have briefly sketched out the intellectual journey awaiting us in this book that seeks to trace the deeper philosophical roots of the contemporary ecological crisis in Modernity and in Cartesian thought. We will be helped in this journey by the insights of some of the major thinkers who have sought to offer incisive critiques of Modernity and of the ecological impact of the Cartesian philosophical system on the natural world. We will refer especially to the philosophical critique from the part of Martin Heidegger towards Modernity and to Cartesian philosophy, in particular. We will also occasionally make mention of other critics of Modernity and Descartes like Hans Jonas, Maurice Merleau-Ponty, Alfred

North Whitehead, Charles Taylor and others. We will also avail ourselves of the contributions from the various schools of eco-philosophy like deep ecology, ecofeminism and social ecology that are openly critical of Modernity and the Cartesian philosophical heritage in the context of the contemporary ecological crisis. But above all, we will undertake a direct and in-depth analysis of the major writings of Descartes, the father of modern philosophy, who has contributed more than anyone else towards the creation of the modern *Weltbild*, and indirectly also towards the moulding of human-nature relationship ever since.

CHAPTER I

THE PHILOSOPHICAL ROOTS OF THE ECOLOGICAL CRISIS

Introduction

What stands out about the contemporary ecological crisis is its conspicuously “anthropogenic” character. The crisis is caused by the humans themselves. So we will begin our opening chapter by considering to what extent the contemporary ecological crisis can be attributed to human activities. It is precisely the anthropogenic origin of the contemporary ecological crisis which motivates the search for the deeper causes of the malaise in the distorted human-nature relationship. If the crisis is caused by human activities, and is rather recent in origin, it is important to ask what are the factors that lead humanity to engage in an antagonistic relationship with the natural world. The thesis advanced in this book, namely, that the root causes of the contemporary ecological crisis are largely philosophical in nature, and can be traced largely in the modern *Weltbild*, makes sense only against such a background. The first three chapters of the book will frame the boundaries of our discussion in this regard. In the first chapter, we will argue that the deeper causes of the ecological crisis are ultimately philosophical. In the second chapter, we will demonstrate how these root causes can be found in Modernity rather than in any other epoch of human history. In the third chapter, we will evidence the unique contribution of Descartes towards the creation of the modern worldview that is the humus for the philosophical roots of the ecological crisis.

Our claim in the first chapter regarding the philosophical root causes of the contemporary ecological crisis needs to be proved against some initial objections. A first obstacle to overcome is a certain resistance to get to the deeper and underlying root causes of the problem. Some authors like Robert Kirkman have argued that the ecological crisis is merely endemic to human nature and that humanity needs to take it in its stride. There are others who dismiss any attempt to look for the root causes of the problem and argue that science and technology will eventually solve the problem.

We will demonstrate how both these assumptions are rather unfounded and why it is important to search for the deeper causes of the ecological malaise.

In order to get to the real root causes of the contemporary ecological crisis, it is also important to go beyond some of the apparent causes, often touted as the real causes of the current environmental degradation. We will discuss here the argument from Paul Ehrlich and others that the population explosion of the recent decades is the main driver of the current ecological crisis. Others tend to lay the blame for the crisis on modern science and technology. They argue that the ecological crisis results from the indiscriminate use and application of science and technology for the exploitation of the natural world. We will briefly discuss these positions and will show that these are only the apparent and not the real causes of the problem. The latter need to be plumbed much deeper, namely, at the conceptual level of ideas that have created and moulded human attitudes towards the natural world and have eventually led to an exploitative relationship with it.

There have been attempts in the past to trace the deeper conceptual roots of the contemporary ecological crisis. The most well-known proposal in this regard was advanced by Lynn White Jr. way back in 1967. White sought to trace the historical roots of the ecological crisis within the Judeo-Christian tradition. His thesis was centred around the particular verse in the book of *Genesis* on the theme of domination (*Gen* 1:28) which he argued served as a licence and motivation for Christians to exploit the natural world. We will demonstrate how White's argument, which led to much discussion in Christian theological circles, crumbles under critical scrutiny. The same fate also awaits similar claims that seek to identify the causes of the ecological crisis within the monotheistic religious traditions with their insistence on the transcendence of God and their alleged concomitant depreciation and negation of the intrinsic worth of the natural world.

We will conclude the chapter by arguing how the real root causes of the contemporary ecological crisis are clearly "philosophical". Such roots are basically ideological or conceptual, as they emerge from a certain vision of reality, a certain *Weltanschauung* of humanity's understanding of themselves, of the physical world, and above all, of the relationship between humanity and the natural world.

1. The Anthropogenic Character of the Contemporary Ecological Crisis

The project to look for the philosophical roots of the current ecological crisis is based on the fundamental assumption that the crisis is anthropogenic in origin, and that behind human activities that have brought about the ecological predicament, it is possible to identify some deeply antagonistic human attitudes in the perception and treatment of the natural world. However, this starting point regarding the anthropogenic character of the ecological crisis is itself strongly contested in environmental scepticism. So it is important to deal with this crucial objection before embarking on the very project.

Environmental scepticism raises serious objections regarding both the existence of the ecological crisis and of its causes.¹ Scepticism regarding

¹ Environmental scepticism has kept pace with the spread of ecological consciousness in the last few decades. Such scepticism is reflected clearly in the reluctance of mainstream economics and politics, to date, to come to grips adequately with the ecological crisis. Some of the notable works in environmental scepticism include: Julian Simon, *The Ultimate Resource* (Princeton, N.J.: Princeton University Press, 1981); Robert Jastrow – William Nierenberg – Frederick Seitz, *Global Warming: What Does the Science Tell Us?* (Washington, D.C.: George C. Marshall Institute, 1989); Julian Simon – Norman Myers, *Scarcity or Abundance?: A Debate on the Environment* (New York: W.W. Norton & Co, 1994); Ronald Bailey, *Eco-Scam: The False Prophets of Ecological Apocalypse* (New York: St. Martin's Press, 1993); Gregg Easterbrook, *A Moment on the Earth: The Coming Age of Environmental Optimism* (New York: Viking, 1995); Bjørn Lomborg, *The Skeptical Environmentalist: Measuring the Real State of the World* (Cambridge: Cambridge University Press, 2001); Michael Crichton, *State of Fear* (New York: HarperCollins, 2004); J.E. de Steiguer, *The Origins of Modern Environmental Thought* (Tucson: The University of Arizona Press, 2006); James Inhofe, *The Greatest Hoax: How the Global Warming Conspiracy Threatens Your Future* (Washington, DC: WND Books, 2012); Jone Fone, *Climate Change: Natural or Manmade?* (London: Stacey International, 2013), etc. For a good and extensive critique of environmental scepticism see: James Hoggan – Richard Littlemore, *Climate Cover-Up: The Crusade to Deny Global Warming* (Vancouver: Greystone Books, 2009); Wendy Wagner – Thomas O. McGarity, *Bending Science: How Special Interests Corrupt Public Health Research* (Cambridge, M.A.: Harvard University Press, 2010); Clive Hamilton, *Requiem for a Species: Why We Resist the Truth about Climate Change* (London – Washington: Earthscan, 2010); Naomi Oreskes – Erik Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York – Berlin – London: Bloomsbury Press, 2010); James Lawrence Powell, *The Inquisition of Climate Science* (New York, NY: Columbia

the existence of the ecological crisis is hard to sustain in our day as the multiple manifestations of the crisis have become too conspicuously evident. Today, hardly anyone doubts the existence of the ecological crisis. Instead, environmental scepticism regarding the causes of the contemporary ecological crisis lingers on despite mounting scientific evidence to the contrary. It is important to respond to this brand of scepticism which argues that the real causes of the crisis are attributable to natural factors rather than to human activities, before we can begin the enquiry about the causes of the crisis in human attitudes and behaviour. We shall limit ourselves to making evident how two of the most conspicuous manifestations of the ecological crisis, namely, climate change and species extinction are caused by human activities.

It is in the area of climate change that the anthropogenic origin of the contemporary ecological crisis is most contested. A rather widespread argument advanced by climate sceptics is that it is unwarranted to toll bells of alarm regarding the present state of the earth because the planet has itself gone through numerous natural variations of climate during its geological history stretching into millions and millions of years. According to the sceptics, the claim that recent climate change is caused by human-induced carbon emission is an exaggeration on the part of the scientific community.² According to the sceptics when it comes to climate change, natural variability and possible solar influence are more significant than the human induced greenhouse gas emission.³ Accordingly, the environmental sceptics claim that the alarm about the ecological crisis is not only overstated but also misplaced, because it is part of the natural cycles of the life of the planet and has nothing to do with human activities. It is also argued that seen from the millennial geological perspective, the so-called ecological crisis is no crisis at all because the earth has remarkably coped

University Press, 2011); Andrew J. Hoffman, "Climate Science as Culture War," *Stanford Social Innovation Review* 10 (2012), 30-37; Riley E. Dunlap, "Climate Change Skepticism and Denial: An Introduction," *American Behavioural Scientist* 57 (2013), 691-98.

² Cf. Tim Ball, *The Deliberate Corruption of Climate Science* (Mount Vernon: Stairway Press, 2014), 7; Richard S. Lindzen, "Global Warming, Models and Language," in *Climate Change: The Facts*, ed. Alan Moran (New Hampshire: Stockade Books, 2015), 38; Robert M. Carter, "The Scientific Context," in *Climate Change: The Facts*, ed. Alan Moran (New Hampshire: Stockade Books, 2015), 67-82.

³ Nigel Lawson, "Cool It: An Essay on Climate Change" in *Climate Change: The Facts*, ed. Alan Moran (New Hampshire: Stockade Books, 2015), 100.

with such challenges in the past, and the planet is bound to display equal resilience in the future too.

Such a contention about the causes of climate change—which can be called the lay man’s version of environmental scepticism because one comes across it often in casual discussions and in popular media—appears to be rather well embedded in the public psyche. This line of thinking, however, reveals itself to be too simplistic when critically examined. The weakness of this argument lies mainly in its consideration of the time scale and intensity of climatic changes.

It is true that Earth has gone through periods of global warming in the past. But the most recent global warming episode, similar to what our planetary home is bound to incur in the near future if no precautionary measures are adopted by the global community, dates back to millions of years ago when humans were not around. The anatomically modern humans, the *Homo sapiens sapiens*, emerged nearly 195,000 years ago⁴, and the Holocene epoch during which our current civilizations rose began just around 12,000 years ago.⁵ The arrival and flourishing of modern humans in our planetary home is indeed very recent when compared to the long geological history of the earth. In fact, the last time that our home planet experienced a similar rise in the global average temperatures as could occur in the current century without mitigation efforts, was a period named by scientists as the Palaeocene-Eocene Thermal Maximum (PETM) which occurred as far back as 55 million years ago when a massive amount of carbon in the form of methane—about 4.5 trillion tons—entered the atmosphere, causing temperatures to shoot up by 5C (9F).⁶ The big difference is that while the previous episode was caused by natural factors and stretched over a period of 10,000 years, today human activities are releasing greenhouse gases 30 times faster than the rate of emissions that triggered a period of extreme global warming in the Earth’s past, capable of achieving the same effect in just 300 years.⁷ Besides, one needs to remember that it took 100,000 years after the PETM for carbon dioxide levels in the air and water to return to normal,⁸ with disastrous

⁴ See Paul Mellars, “Why Did Modern Human Populations Disperse from Africa ca. 60,000 Years Ago? A New Model,” *Proceedings of the National Academy of Sciences* 103 (2006), 9381.

⁵ See Brian Fagan, *The Long Summer: How Climate Changed Civilization* (New York: Basic Books, 2004).

⁶ Cf. James C. Zachos et al., “Rapid Acidification of the Ocean during the Paleocene-Eocene Thermal Maximum,” *Science* 308 (2005), 1611-14.

⁷ *Ibid.*, 1614.

⁸ *Ibid.*, 1611.

consequences for the species that swamped the waters and the land, a situation which presents a very bleak picture of the challenges facing humanity today.

There exists a strong, credible and substantial body of evidence, based on multiple lines of research, documenting that Earth is warming precisely due to increased greenhouse gas emissions from human activities. Measurements show a rise close to 0.8°C in the average surface air temperature of Earth over the last century with greater increase in the recent decades. At the same time, the common conclusion of a wide range of studies conducted over the past years is that the observed climate changes cannot be explained by natural factors alone. The perceived changes can be explained only by having recourse to a substantial anthropogenic influence in terms of human activities.⁹

Today there exists a nearly unanimous consensus in the scientific community about the anthropogenic effect on climate change.¹⁰ The periodical Assessment Reports from the Intergovernmental Panel on Climate Change (IPCC) reveal a progressive trend in this regard. The first definitive statement that humans are responsible for climate change is to be found in the Second Assessment Report of IPCC published in 1995. The Report concluded that the balance of evidence suggests “a discernible

⁹ H. Le Treut et al, “Historical Overview of Climate Change” in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. S. Solomon et al. (Cambridge – New York: Cambridge University Press, 2007), 103; Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. T.F. Stocker et al. (Cambridge – New York: Cambridge University Press, 2013), 12. See also Charles Fletcher, *Climate Change: What the Science Tells Us* (Danvers: John Wiley and Son, 2013), 7; Kevin E. Trenberth - John T. Fasullo, “Earth’s Energy Imbalance,” *Journal of Climate* 27 (2014), 3144.

¹⁰ See John Cook et al, “Consensus on Consensus: A Synthesis of Consensus Estimates on Human-caused Global Warming,” *Environmental Research Letters* 11 (2016), 048002; Naomi Oreskes, “The Scientific Consensus on Climate Change: How do we know We’re not Wrong?” in *Climate Change: What it means for Us, Our Children, and Grandchildren*, eds. Joseph F. C. Dimento - Pamela Doughman (Cambridge, MA: MIT Press, 2014), 105-148; John Cook et al., “Quantifying the Consensus on Anthropogenic Global Warming in the Scientific Literature,” *Environmental Research Letters* 8 (2013), 024024; Naomi Oreskes, “Beyond the Ivory Tower: The Scientific Consensus on Climate Change,” *Science* 306 (2004), 1686; National Academy of Sciences Committee on the Science of Climate Change, *Climate Change Science: An Analysis of Some Key Questions* (Washington, DC: National Academy Press, 2001), 3.

human influence” on the earth’s climate. In the Third Assessment Report of 2001, the IPCC pointed to the human fingerprint of climate change stating that there is strong evidence that most of the warming observed is attributable to human activities. According to the Report “detection and attribution studies consistently find evidence for *an anthropogenic signal* in the climate record.”¹¹ These positions were reiterated in the Fourth Assessment Report of the IPCC of 2007, which provided multiple lines of evidence that human-induced climate change is indeed happening. The 2007 Report showed a jump with regard to certitude that changes are down to human activities—from >66% of the 2001 Report to >90%.¹² According to this Report, human activities are responsible for about 13 times as much of the warming as changes in the Sun’s output. The most recent Fifth Assessment Report from the IPCC awards the highest margin of certainty to the human-induced factor of climate change, i.e., >95%. We may quote from the Summary for Policy Makers which was released in September 2013.

Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions of snow and ice, in global mean sea level rise, and in changes in some climate extremes. This evidence for human influence has grown since the Fourth Assessment Report. It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.¹³

The anthropogenic character of climate change was reiterated in the statements of some of the world’s premier scientific academies recently. The Royal Society—the oldest scientific academy in continuous existence—concluded its 2010 document *Climate Change: A Summary of the Science* by affirming that “there is strong evidence that changes in greenhouse gas concentrations due to human activity are the dominant cause of the global warming that has taken place over the last half

¹¹ Intergovernmental Panel on Climate Change, *Climate Change 2001: Synthesis Report. A Contribution of Working Groups I, II, and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, eds. R.T. Watson et al. (Cambridge – New York: Cambridge University Press, 2001), 5. The italics are mine. See also p. 51.

¹² Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report. Contribution of Working Group I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. R. K. Pachauri – A. Reisinger (Geneva: IPCC, 2007), 38–41.

¹³ Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis*, 12.

century.”¹⁴ The document is explicit when it states: “Various lines of evidence point strongly to human activity being the main reason for the recent increase [of CO₂ concentrations in atmosphere], mainly due to the burning of fossil fuels (coal, oil, gas) with smaller contributions from land-use changes and cement manufacture.”¹⁵ The ground-breaking document of the US National Academies of Sciences in 2010, entitled *Advancing the Science of Climate Change* states: “there is a strong, credible body of evidence, based on multiple lines of research, documenting that climate is changing and that these changes are in large part caused by human activities.”¹⁶ The 2014 joint report by the Royal Society and the United States National Academy of Sciences reaffirms the scientific consensus that recent climate change is largely caused by human activities.¹⁷

Human responsibility for the current ecological crisis is equally evident when it comes to the problem of the mass extinction of species. Environmental sceptics often claim that the current wave of extinctions is only the normal turnover in the history of life. The underlying argument here is that life on Earth has experienced myriad of extinction events over billions of years, and it will continue to thrive, irrespective of the current extinction spasms, offering new opportunities for new better-adapted species.¹⁸ However, the naked truth is that the current rates of species extinction exceed those of the historical past by several orders of magnitude and is bound to accelerate. It is estimated that the normal background rates of extinction is roughly 0.1-1.0 extinctions per million species per year.¹⁹ But, as per the *Millennium Ecosystem Assessment* “over the past few hundred years, humans have increased species extinction rates by as much as 1,000 times the background rates that were typical over Earth’s history.”²⁰ According to the same report the current extinction rate is up to one thousand times higher than the fossil record when it comes to

¹⁴ The Royal Society, *Climate Change: A Summary of the Science* (September 2010), n. 57.

¹⁵ *Ibid.*, n. 25.

¹⁶ The National Academy of Sciences, *Advancing the Science of Climate Change*, 1. See also pp. 3 and 20ff.

¹⁷ National Academy of Sciences – The Royal Society, *Climate Change: Evidences and Causes. An Overview from the Royal Society and the US National Academy of Sciences* (February 2014), 5.

¹⁸ See Michael J. Novacek, “Engaging the Public in Biodiversity Issues,” *Proceedings of the National Academy of Sciences* 105 (2008), 11752.

¹⁹ Millennium Ecosystem Assessment, *Ecosystems and Human Well-being: Biodiversity Synthesis* (Washington: World Resources Institute, 2005), 21.

²⁰ *Ibid.*, 3.