

Introduction

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The Earth is on fire. Our world is getting warmer, and the climate is changing. There is a lot to suggest that this is due to how we are using the Earth's resources. Also, it is a matter of urgency if we want to be able to exercise just a modicum of control over what the future will bring. So, in a manner of speaking, the Earth is getting too hot under our feet. We need to find out what is behind the climate change, but we also need to find a solution – fast.

At least that is how things stand at the moment. Just a few years ago, however, many scientists, politicians and laymen still questioned whether the climate was in fact changing, let alone whether human activities had any role to play. How could it be that all this doubt evaporated, and that everyone suddenly started talking about the climate and marketing themselves on low CO₂ emissions? A significant shift has occurred. Today, very few people question that climate change is happening and that it is largely due to human activity. Have we arrived at a new scientific certainty, or is it the result of a less transparent process where ethical values and political considerations have come to influence the scientific agenda? How definite actually are the climate models on which we are basing our actions, and how much of the discussion about them is science and how much relates to the ethical and philosophical considerations which have shaped them?

It is not absolutely clear what will happen with the climate in the coming years, but there is general agreement that the world will change. And man has started to prepare for these changes. This gives rise to important ethical questions. What must we do, who must we consider, and what does the natural world mean in an ethical sense? Should we save endangered species for their own sakes or for ours? Should we help the people who will benefit most from our help or those that most need the help – and do we in fact have a duty to help anybody apart from ourselves? Major changes threaten – and the solutions risk being rushed through without careful consideration. That's what happens when the Earth suddenly gets too hot under one's feet.

This book is about climate change, one which will contribute to our understanding of what is happening and why it is happening. The objective is to show how climate change raises not only a number of questions to do with natural science, but also many questions of a more universal nature

that are based on philosophical, political, ethical and religious assumptions about how the world is and how it should be. We hope that this book will encourage critical reflection and ethical consideration of what is happening, why it is happening and what we ought to do. Because something is happening:

James A. Hansen, as head of NASA's Goddard Institute for Space Studies and one of the world's leading climate researchers, is one of those who repeatedly points out that the situation is far more serious than we are willing to acknowledge. According to him, the targets for CO₂ reductions which have been set in the international agreements which applied for 2008 already exceed what is necessary to stabilise the situation. According to Hansen we must act far more effectively and radically – and we must take action now. In a speech given to *The National Press Club* in Washington DC on 23 June 2008, he said:

Changes needed to preserve creation, the planet on which civilisation developed, are clear. But the changes have been blocked by special interests, focused on short-term profits, who hold sway in Washington and other capitals. I argue that a path yielding energy independence and a healthier environment is, barely, still possible. It requires a transformative change of direction in Washington in the next year.

(Hansen, 2008)

Research published in winter 2008 by the Canadian geophysicist David Barber suggests that, by 2015, the Arctic will be ice-free during the summer. Whether this happens in 2015, 2025 or 2035 is, in this context, fairly irrelevant. What is important is that the temperature increases on the planet seem to be having quite an impact and that things are developing at a pace which, time and again, takes the scientists by surprise. The climate and the factors which have a bearing on it are complex. Often, individual scientists only see part of the picture, but when the various factors start reinforcing each other, the whole picture suddenly changes. In the past eight to ten years, the possible climate changes have led to worried minds and international agreements which have not really put the big players under any sort of obligation and to the setting of national targets which have basically been ignored in practical politics. The general consensus is that we can no longer afford such procrastination. Things are hotting up now – really hotting up. So we need to both act fast and think carefully about what we are doing.

This book is primarily intended as a textbook in ethics and science theory at university level, where it can be used on all study programmes to provide

recurrent case material. The more technical chapters can be used depending on the field of study. The book can also be used as a source of background information for upper-secondary school teachers and other teachers in the educational system and as a study book by reading groups, or simply by readers who want to understand what the climate debate is all about. The book is the result of scientists from many different fields and institutions collaborating together, which is evident from the author presentations at the back of the book. The breadth of expertise clearly reflects the radical significance of climate change for the future. Climate change literally cuts across all boundaries. It is the hope of the editors that this broad approach will contribute to understanding the complexity of the problems and a healthy level of scepticism towards any over-simplified messages in the climate debate.

The book consists of seven chapters which show how the climate changes are rooted in our scientific, philosophical, political, ethical and religious understanding of the world. Chapters 1 and 2 are written by the climate scientist and member of the UN climate panel Professor Jørgen E. Olesen from Aarhus University. The first chapter describes the changes which the climate is undergoing, which physical, chemical and biological mechanisms are interacting to cause climate change, and what is driving the changes. The second chapter looks at the consequences of climate change for life on Earth both generally and specifically for a number of areas such as agriculture, infrastructure and urban planning. The book's third chapter is written by the science historian Matthias Heymann from Aarhus University. This chapter puts the present discussion about climate research into a historical perspective and shows how climate research has always been embedded in philosophical and political discussions.

Matthias Heymann has also been involved in Chapter 4, this time with the philosopher Peter Sandøe from the University of Copenhagen and the science theorist Hanne Andersen from Aarhus University. Together they describe the science-theoretical challenges raised by the use of computer models in climate research, and seek to show how scientific uncertainty also becomes a political issue. Chapter 5 is written by the ethicist Mickey Gjerris and the natural resource ethics researcher Christian Gamborg, both from the University of Copenhagen. The chapter focuses on the ethical dilemmas presented by climate change as far as mankind is concerned as well as in relation to the natural world in general. In Chapter 6, the theologian Jakob Wolf, also from the University of Copenhagen, looks at climate change from a religious perspective, and offers his views on how religion, broadly speaking, can help to fight climate change. Finally, in Chapter 7, senior lecturer

and journalist Gitte Meyer from the University of Copenhagen and professor in media management Anker Brink Lund from Copenhagen Business School write about the political discussion about the climate which has dominated the media over the past twenty years, and put this discussion into a broader context concerning the role of science in the current debate.

The seven chapters can be read independently of each other, but as they each have something to offer, reading them all will provide a solid foundation from which to relate to climate change. The chapters are written as textbook chapters, and thus provide a general introduction to the issues from what is hopefully a neutral perspective. Nonetheless, it is important to note that the chapters are written by different researchers, each of whom possesses expertise within their particular field. The various chapters are therefore, unavoidably, coloured by their respective views. This basic condition for all communication should make the reader take a critical approach to the chapters and not be seduced by what is presented as obvious conclusions. These chapters are not the final answer to anything, but invite the reader to participate in a broader discussion about climate change.

At the end of the book, three actual cases from the climate debate are discussed: CO₂ trading, GM crops and biofuels. These cases are addressed by experts who have played a prominent role in the public debate of these topics. What all three cases have in common is that they describe controversial solutions to problems resulting from climate change. The purpose of these cases is partly to present some of the more controversial strategies for countering climate change to the reader, and partly to show how the ethical and philosophical issues on which the seven main chapters centre can be used as 'keys' to understanding the disagreements that arise when discussing some of the most important issues currently faced by mankind. Each case is preceded by various working questions which can be used as a starting point for a discussion of the case and as a way of focusing on the ordinary problems that lie behind the specific differences of opinion.

Each chapter is followed by a list of the references which have been used as background material. These can be used as inspiration for further reading. There is also a list at the back of the book of commented suggestions for further reading, organised by chapter. The intention is that students and others will easily be able to find further literature for project work, studies etc.

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The changes we face are both alarming and far-reaching. They will have a major impact on our lives. In order to meet this challenge, it is necessary that we understand both the scientific details and the broader contexts of the different problems. Technical solutions detached from the social reality into which they must be incorporated cannot solve these problems, just as theoretical musings on background, causes and values are of no use in the present situation. However, if we gather the threads and endeavour to tackle the task based on a high level of expertise and sound knowledge about the context of the problems, we believe there is every possibility that the huge challenges we face can be resolved. We hope that this book will make a small contribution to this task.

References

Hansen JA: *Global Warming Twenty Years Later: Tipping Points Near* (2008). http://www.columbia.edu/ffjeh1/2008/TwentyYearsLater_20080623.pdf