Simply wrong

The Long Thaw: How humans are changing the next 100,000 years of Earth's climate

By David Archer

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In this short book, David Archer presents what is now a well-recognized paradigm: human-induced climate changes will last for millennia, and future generations will bear the consequences of decisions made by society concerning fossil-fuel consumption and land use. Much of the discussion in this book is based on Archer's own research, and he skilfully and clearly interweaves his findings into the pattern of history and causes of climate change emerging from the work of such notables as Svante Arrhenius (1859–1927) and Milutin Milankovitch (1879–1958), and more recently the reports of the Intergovernmental Panel on Climate Change.

Most books on anthropogenic climate change deal with the relatively short timescale of the past 300 years and the outlook for the twenty-first century. Archer's book is an exception in that it looks at the consequences of such climate change well beyond the present century — about 10% of the carbon dioxide from coal combustion could still be affecting the climate one hundred thousand years in the future. Archer convincingly demonstrates that humankind can overpower the natural climatic forcing due to changes in Earth's orbit, which has operated for millions of years, and take over the reins of the climate system.

The Long Thaw is written for anyone who wishes to know what cutting-edge science tells us about the modern issue of global warming and its effects on the pathways of atmospheric chemistry, as well as global and regional temperatures, rainfall, sea level, Arctic sea-ice coverage, melting of the continental ice sheets, cyclonic storm frequency and intensity and ocean acidification. This book will also appeal to scientists who want a clear and unbiased picture of the global-warming problem and how it may progress in the future. It encapsulates Archer's own efforts in the field of climate research, which I found invaluable.

The first section of the book is a snapshot of global warming — focusing on changes in climate that began in the twentieth century, and are continuing in the present one. It relies here (and elsewhere to some extent) on the 2007 Scientific Assessment of the Intergovernmental Panel on Climate Change. Next, Archer discusses past climatic changes and their causes, following the geological paradigm that was formulated by James Hutton (1726–1797) — the "present is the key to the past". Finally, the third section focuses on the long-term effects of modern global warming. Although the book is structured chronologically, each of these chapters stands on its own.

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Archer also attempts to deal with the economic and ethical issues related to carbon, our burning of fossil fuels and the resultant warming of the planet. He recognizes the fact that carbon dioxide emissions are closely tied to economic and military supremacy in our world, and that the task of weaning ourselves from fossil fuels is daunting: 85% of US commercial energy supplies and 90% of world commercial energy supplies come from coal, gas and oil. Oil production in the US peaked in the 1970s and will do so in the rest of the world early this century — unless this peak in oil production has already occurred, as proposed by some authors. Of course, the price for global warming, resulting from the accumulation of carbon dioxide and other greenhouse gases in the atmosphere, is paid by every person on the surface of the Earth.

In addition, the costs and benefits of fossil-fuel use are shared neither equally nor fairly. Whereas the industrialized nations of the world have been responsible for a disproportionately large part of the carbon dioxide emissions to the atmosphere, it will be mainly the developing and non-industrialized countries — 75% of the world's population — that will suffer most through the effects of global warming. Weather changes will affect subsistence farming, and sea-level rise will result in major flooding of low coastal areas such as in Bangladesh. Low-lying nations of the Pacific will face threats from salt intrusion into subsurface groundwater supplies and enhanced damage from storm surges.

Burning of just one gallon of gasoline ultimately traps one hundred thousand million kilocalories of useless and unwanted heat through the greenhouse effect. This is forty million times the usable energy of 2,500 kilocalories represented by the burning of the gallon of gasoline. After all is said and done about the science and the economics of global warming, the issue may come down to a matter of ethics, as Archer suggests by using an analogy to slavery in the US and its abolishment: "Ultimately it didn't matter whether it was economically beneficial or costly to give up. It was simply wrong". ❐

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