



ECOLOGY AND SOCIALISM

Solutions to Capitalist Ecological Crisis

Chris Williams



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Ecology and Socialism

Chris Williams



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Introduction

“The American way of life is non-negotiable.”

—George H. W. Bush, Rio de Janeiro Earth Summit, 1992

“America is addicted to oil.”

—George W. Bush, State of the Union Address, 2008

“The world’s energy system is at a crossroads. Current global trends in energy supply and consumption are patently unsustainable—environmentally, economically, socially.”

—International Energy Agency, World Energy Outlook, Executive Summary, November 2008

There is a giant death sentence hanging over much of our world. The once majestic polar bear, reduced to starvation due to dwindling sea ice in the Arctic, is only the latest forlorn poster child for the coming global ecocide that human civilization is visiting upon the earth. With rates of extinction running at a hundred to a thousand times the geological statistical norm, it is a species sadly far from alone. Thousands of species sit on Extinction Death Row awaiting the coup de grace, to be administered by a mutually reinforcing set of human-induced conditions.

At the forefront of these conditions rank habitat destruction and rapid, human-induced climate change. The human species seems well on the way to creating the Sixth Great Extinction as we exterminate other species faster than they can be classified; scientists estimate that we have classified less than 10 percent of all the species on earth. According to the International Union for the Conservation of Nature (IUCN), the world’s largest coalition of environmental organizations, of the nearly 50,000 on its red list of endangered species up to 17,000 face the prospect of immediate extinction. If nothing is done, the IUCN predicts the demise over the course of the twenty-first century of 50 percent of amphibians, 70 percent of botanic life, 37 percent of freshwater fish, 28 percent of reptilians, 21 percent of mammals, and 12 percent of all birds.¹

Species extinction is natural and nothing new; 99.999 percent of all species that have ever existed have become extinct. Sentient life, as represented by humans, is one outcome of this turnover. Over a period spanning millions of years, from our immediate bipedal forebears, *Homo sapiens* have evolved on a planet of stunning biodiversity, breathtaking vistas, and awe-inspiring feats of evolutionary development as biotic and abiotic factors have intertwined in a spectacular and ever-changing dance of mesmerizing beauty.² However, we live within a social system intent on hacking, burning, and destroying the biosphere in a time period measured in mere hundreds. It is a social system predicated on endless expansion; one that sickeningly combines historic and gargantuan amounts of wealth alongside oceans of poverty and mountains of waste.

It is no exaggeration to state that without swift, dramatic and profound changes to societal

priorities, including a fundamental reorientation away from fossil-fuel-based energy and profit-driven capitalist economic growth, the generation growing up today will be, in all likelihood, the last to know about climate stability. Nor is it wild-eyed doom-mongering to argue that if humanity continues on its present course, effecting only minor technological changes over the next ten to twenty years, our civilization on anything like the current scale cannot be sustained. Capitalist society threatens the breakdown of the basic biogeochemical cycles of the biosphere as we have come to know them.

We are hurtling toward a series of ecological tipping points beyond which we will lose our ability to preserve a stable climate. Indeed, according to research published in 2009 in the journal *Ecology and Human Society*, we have already gone beyond three of nine planetary boundaries. A group of international, renowned environmental and earth-systems scientists delineated nine “planetary life support systems” that were critical to human survival, and the processes that put them under stress: climate change, ocean acidification, stratospheric ozone depletion, interference with global phosphorus and nitrogen cycles, rate of biodiversity loss, global freshwater use, land-system change, aerosol loading, and chemical pollution. While stressing that these are only rough estimates that need refining, the group quantified where we are in relation to keeping within boundaries in order to avoid “irreversible and abrupt environmental change.” By their calculations we have already surpassed boundaries for the nitrogen cycle, rate of biodiversity loss, and climate change. This doesn’t mean we can’t reverse them, but points to the extreme urgency of lowering the disruption that we are causing in these three sectors and making sure we do not pass through any of the other boundaries.³

A world economic system predicated on relentless growth, devouring increasing amounts of raw materials and energy and spewing out ever-larger amounts of toxic waste products, has produced a whole series of environmental threats: species extinction, air and water pollution, genetically modified organisms, desertification, deforestation, soil depletion, and the ever-present possibility of nuclear warfare,⁴ to name only a few.⁵ However, as it intersects with all other threats, and furthermore has a tendency to aggravate them, the most urgent and all-encompassing of these is global climate change.⁶

Among the problems scientists say climate change will bring over the next hundred years: rising sea levels submerging island and coastal areas, crop failures, droughts and floods, ocean acidification leading to the death of coral reefs, more extreme and frequent hurricanes, as well as a 20 to 50 percent reduction in planetary species. Indeed, even the most recent scientific estimates seem to be underrating the pace of change.⁷ Worldwide CO₂ emissions rose faster between 2000 and 2004 than in the worst-case scenario reported by the United Nations (UN) in the middle of 2007.⁸ And, despite all the rhetoric about implementing more benign and less polluting energy technologies and the hype about the 1997 Kyoto Protocol—the summit of world leaders that made a commitment to reduce greenhouse gasses—CO₂ emissions rose faster in the first years of the twenty-first century (3.1 percent per year) than they did in the 1990s (1.1 percent).⁹ This means that even some of the most alarming predictions about the effects of climate change may actually be underestimates.

A case in point: in November 2008, the International Energy Authority released their World Energy Outlook report saying that without significant policy changes, the world could be on track for net global mean temperature rise to an apocalyptic 6.0°C higher than today.¹⁰ The Massachusetts Institute of Technology (MIT) released a follow-up report to predictions on global climate made in 2003. The new report, released in January 2009, revised their earlier prediction of an average global temperature

rise from 2.4°C to 5.1°C.¹¹

But perhaps 2°C, or even 5°C, doesn't seem like much, after all people experience much larger seasonal and even daily temperature fluctuations than this. Johann Hari, columnist for the *Independent* (London) newspaper has put those numbers into useful perspective:

The world's climate scientists have shown that man-made global warming must not exceed 2°C. When you hear this, a natural reaction is—that's not much; how bad can it be if we overshoot? If I go out for a picnic and the temperature rises or falls by 2°C, I don't much notice. But this is the wrong analogy. If your body temperature rises by 2°C, you become feverish and feeble. If it doesn't go back down again, you die. The climate isn't like a picnic—it's more like your body.¹²

Solving the problem of global warming requires understanding the relationship between capitalism and the environment, examining the solutions on offer within the framework of the system, and determining whether those solutions are up to the task of preventing a runaway greenhouse effect. The world system of capitalism has been, and will continue to be, largely impotent in the face of climate change, not because there are evil, uneducated, backward individuals in power—though this is arguably true in many cases—but because capitalism's own social relations prevent effective solutions from being realized. The blind, unplanned drive to accumulate that is the hallmark of capitalist production—the profit motive—has created the problem of climate change, not individual profligate natures or overpopulation. The economic system needs to be transformed or we will surely be eking out a living on a much less hospitable planet.

This is not a common approach to the question. On one side, corporations and governments themselves have a direct interest in maintaining the current social setup and the prevailing power relations argue for nonsystem threatening solutions. Hence the push by governing elites for market-based mechanisms such as cap and trade. On the other side, many environmental organizations and ecologically concerned individuals focus on efforts to combat global warming via individual responsibility, changing personal lifestyles, consuming less, or population reduction. There is more than just overlap here; both approaches allow the system to clamber off the hook of responsibility.

It is rarely acknowledged that capitalism itself might be the problem. Rather, two kinds of growth are blamed—either economic or population. From this flows the following conclusion: we can continue with a market-based system as long as there are “limits to growth” placed on national economies and populations, perhaps with some regulatory restrictions alongside technological breakthroughs.

To retain the system more or less untouched, capitalists and their paid advocates are forced to argue that “sustainable development” is possible; many corporations and governments have substantial sustainable development departments, statements, and growth targets to promote just that. There is much seemingly heartfelt talk of the concept of “corporate social responsibility” (CSR). On the other side, many environmental groups argue for restrictions on population, air travel or general consumption, and a change in personal lifestyles. Some of these proposals do involve curbing industrial growth and regulating the activities of corporations—and deserve examination. For example, many consumer goods, as well as packaging, are superfluous, as is much of business travel. Short-haul flights could be better switched to trains without any loss of comfort (in fact quite the opposite). Many proposals, however, involve encouraging ordinary people—who are already facing

cuts in their living standards—to further tighten their belts or to spend time and money most of which we don't have to make a series of changes in our lifestyles while the life-destroying chaos of the market system rages around us unabated.

An oft-repeated mantra is that the developing world cannot have the same standard of living as the developed if we are to make any progress in slowing down environmental degradation. This statement rests on the patently false assumption that everyone in the Global South has one standard of living (very low) and everyone in the North another (very high). The truth is that while absolute poverty is much more serious and widespread in the South, and consumer goods are much less widely available in every country is divided into a tiny minority of rich and the vast majority of the less well-off and poor who actually do all the work.

It is true that less developed countries of the South cannot emulate the consumer lifestyles and types of development of the North to which everyone, without a hint of irony, North and South, nevertheless constantly taught to aspire. Further capitalist development of the North is quite enough to wreck the planet on its own; were the people of the southern hemisphere to join in and catch up, we would need the equivalent of five planets.¹³ The problem, this book will argue, is not economic growth per se or population growth, but profit-driven, unplanned growth that in many cases is either socially useless or actively detrimental to humans and the biosphere—the kind of growth that has brought us to the brink of social and ecological disaster. Development and growth must be fundamentally redefined to prioritize real human and ecological needs rather than the priorities of profit and the market.

Currently, development means more roads, more industry, more waste, more commodification of everything; in short: more profits. Development and progress are equated with capitalist modernity, “underdevelopment” or “less developed” with a lack of it. Modernization in turn is about increased technology and urbanization in the service of providing goods for a market to be bought and sold alongside “market democracy” to be accomplished via social and economic mobility and facilitated by education. Any aspects of “pre-modern” society such as traditional forms of knowledge, farming methods, collectivities or alternative kinship or organizational models are denigrated and actively uprooted. The only collective that is recognized and validated is that of the nation-state.

Development needs to be about the enhancement of human life and culture in the context of co-evolution with nature that will require nothing less than a social, economic, political and cultural revolution. Important aspects of this will be technological, but the key dynamic is mass democratic decision-making based on the needs of the producers in conjunction with a long-term commitment to sustainable ecological living. As Vandana Shiva, the Indian physicist and world-renowned environmental activist and author, has argued—in strong echoes of Marx—while it's true that we need a change in our energy systems, this must be accompanied by a far more significant paradigm shift from:

- A reductionist to a holistic worldview based on interconnections
- A mechanistic, industrial paradigm to an ecological one
- A consumerist definition of being human to one that recognizes us as conservers of the earth's finite resources and co-creators of wealth with nature ¹⁴

Much of the environmental movement in the North is consumed by arguing for ordinary people to make sacrifices in order to save the planet. They then wonder why more people aren't on the

demonstrations against global warming and why the movement isn't more diverse. For those millions out of work in the North, the millions on part-time work and mired in debt, the millions losing their homes to foreclosure and the hundreds of thousands of already homeless or the forty-five million North Americans made sick each year from contaminated food and water,¹⁵ this argument rings particularly hollow. In reality the argument about sacrifice speaks to and for a very narrow segment of middle-class opinion formers. If we are to make environmental arguments meaningful to the vast majority of people in the developed world, let alone the Global South, the argument must focus on justice, jobs, equality, and improving the quality of life, not the need for more sacrifice. In other words, environmental activism must be about socio-ecological justice the world over.

Not only are some of the solutions proposed by the mainstream environmental movement misguided, but there is often an enormous chasm between the problems environmentalists describe and the solutions many of them propose. While there are many examples, Al Gore's Oscar-winning documentary, *An Inconvenient Truth*, is a prime case in point. After predicting planet-gone-within climate gyrations from the continued unsustainable production of greenhouse gases, Gore tells us to consume a bit less stuff, change our light-bulbs, make sure our car tires are properly inflated, and bike to work. The gap between ends and means is so absurd as to be laughable. More insidiously, in a move of political jujitsu, the film shifts the weight of change from corporate polluters to individuals.

Chapter one will demarcate the main contours of global warming and climate change and what the near- and longer-term future will potentially hold in store. Subsequent chapters will take up what can still be done to avert a calamitous and irreversible journey into global climate instability. Some prominent environmentalists, such as James Lovelock, author of *The Gaia Hypothesis* and *The Revenge of Gaia*, argue that it is already too late to make significant changes.¹⁶ Indeed, Lovelock now argues that people are "too stupid" to make the necessary changes as we are not sufficiently evolved. In an interview in March 2010, he goes on to say that one of the major impediments to effective action is "modern democracy" and what is required is more authoritarian rule by a select few as democracy needs to be put on hold in order to deal with climate change.¹⁷ Lovelock thus lays the blame entirely on ordinary people as if we are the ones really in charge of making the economic decisions that got us to this point.

Others, including myself, believe that there is still time to avoid planetary meltdown. However, we are at such a precipitous point, having done essentially nothing for so long, that swift, decisive action that ultimately challenges the continuance of the system itself is required. This cannot mean replacing oil, coal, and natural gas with nuclear energy, which has its own potentially catastrophic environmental problems and is in any case an expensive alternative that would take too long to implement. Nor can we accept the Pentagon's apocalyptic vision of Fortress United States vs. the Rest of the World.¹⁸

Neo-Malthusian arguments about population are resurfacing with a vengeance as explanations for the recent global food crisis and, even more so, amongst people genuinely concerned by the ongoing and indeed accelerating destabilization of planetary ecosystems. Population growth is inversely related to economic development and reductions in poverty levels; the higher the standard of living, the lower the rate of population growth.¹⁹ Chapter two takes up the argument about population by digging into the question of whether there is enough food to feed everyone, and argues that 6.7 billion people can live on the planet without irreparably degrading it and depleting resources at unsustainable rates.

The real question is: Would there be enough resources for *all* 6.7 billion people to have a decent standard of living that is at the same time environmentally sustainable if we got rid of unequal class by eradicating the profit motive that currently drives production? What if instead, production and distribution of goods and services were democratically planned using more environmentally benign technologies? One objective of the book is to sketch out an affirmative answer to those questions.

If the debacle at the climate summit in Copenhagen in December 2009 teaches us nothing else, it teaches this: world leaders are utterly incapable of negotiating real solutions to climate change. They are wired into the system of profit and competitive national development that brooks no alternatives. Hence they suggest, after suitable prodding from their corporate sponsors and notwithstanding the lofty rhetoric, solutions that pose the least interference with business as usual; indeed, obscenely allow for some of the biggest polluters to make even larger profits.

For example, it is impossible to maintain that cap and trade, the main negotiating plank pushed by conference attendees from the industrialized countries, is the most efficient method of reducing greenhouse gas emissions. Conversely, cap and trade can easily be explained as the most efficient method for continuing with a high-carbon, business-as-usual future that perversely rewards some of the most polluting entities on the planet and simultaneously justifies atmospheric pollution. Chapters three and four expose the many false solutions to climate change and make the case as to why there can be no such thing as sustainable or “environmentally friendly” capitalism.

There is no time to waste, and so building a movement to fight for real reforms within the structure of capitalism is absolutely essential. It is imperative that we slow down the rate of climate change as quickly as possible by moving to less carbon-intensive energy alternatives and by taking energy conservation seriously. This means building the broadest possible movement arguing for increasing public investment in wind farms, solar arrays, and public transport together with strong government-mandated energy efficiency and conservation measures and a robust jobs program to go with it. We need to fight for real change in the here and now and make the pressure on our elected representatives from a broad-based movement against environmental destruction more politically damaging to ignore than the pressure from the corporations. Chapter five will outline what such a socio-ecological justice movement should argue for right now and provide arguments for how it is a practical alternative to the fossil-fuel-driven corporate agricultural and industrial system determined to cling to profits come what may. While we are constantly told there’s no money for hospitals, schools, or “saving the environment,” the multitrillion dollar global bailout of the banking system, centered in the United States, has shown people otherwise. To paraphrase author and activist Jonathan Neale, if the planet were a bank, governments would already have found the money; vast sums would be conjured up in a matter of days.²⁰

Chapter six examines the legacy of Marxist analysis and its continued relevance to ecological questions. It seeks to unearth the significant contributions Marx, Engels, and subsequent Marxists have made to ecological thought in the belief that a Marxist framework allows for the most coherent and useful modality for understanding the roots of the ecological crisis and plotting a way out of it. Marxism posits a dialectical interaction and an essential unity between society and nature that eludes mainstream capitalist and much radical Green thought. The dualism inherent to both, that nature is separate and opposite to society—either to be exploited for the benefit of humans or protected from them—is overcome by the holism central to Marxist historical materialism.

The economic crisis that began in 2008, as seemingly stable economies unraveled across the globe

and corporations collapsed under the weight of their own feckless gambling, has caused a profound ideological crisis of capitalist legitimacy. The ideological paradigm that has reigned supreme for thirty years—that the market knows best—has been exposed as the mirage it always was. The paradigm, that, to use Margaret Thatcher’s infamous phrase, “there is no alternative” to neoliberal privatization and market flexibility, alongside unrelenting hostility to governments having some responsibility for collective social provision, lies in tatters after the near-collapse of the system and its stabilization only through a massive, internationally coordinated government bailout. The notion of attaining social progress through individualized aspirations for self-advancement has been shattered on the rock of reality. Not since the 1960s have so many people begun to question the prevailing view of what is “normal” or “natural” in society and whether perhaps, after all, another world is possible.

The economic crisis has reawakened interest in investigating what socialism has to offer as an alternative world model and guide to action. The economic crisis broke out alongside the ecological crisis and both can trace their ancestry to the remorseless drive to accumulate characteristic of capitalism. Stating that capitalism must therefore be abolished and replaced with a democratic system of the “associated producers” (i.e., workers) no longer seems so outlandish a proposition to be dismissed as utopian dreaming by unreconstructed socialists still living in the late nineteenth century. Rather it evinces interest, conversation, and dialogue about what that might mean and look like, how it might be achieved. Chapters seven and eight outline some of the ways in which more fundamental change will have to be envisioned.

Our society is unrecognizable from fifty years ago, let alone one hundred. Imagine what we could do if we the people had the power to decide what it would look like fifty years from now. This book represents the beginning of a discussion of that vision—a contribution to the discussion of resolutions to climate change and ecological degradation and how they could be implemented via collective action for social equality and justice.

CHAPTER ONE

The Science of Climate Change

“Many of the new climates will include combinations of temperature, precipitation, seasonality, and day length that do not currently exist anywhere on Earth...Something will live in these non-analogue climates, but it is difficult to guess what.”

—Chris D. Thomas, *Climate Change and Biodiversity*, 2005

“There is a strategy to single out individuals, tarnish them and try to bring the whole of the science into disrepute.”

—Ben Santer, prominent climate scientist commenting on climate denial strategy, November 2006¹

“Even given the uncertainties of the geological record, it is difficult to state this point strongly enough: human releases of carbon dioxide are almost certainly happening faster than any natural carbon releases since the beginning of life on earth...It can hardly be a surprise either that the climate is changing rapidly: what would be a surprise were if everything continued as normal.”

—Mark Lynas, author, *Six Degrees: Our Future on a Hotter Planet*²

While there remain unreconstructed and powerful climate change deniers, the overwhelming scientific consensus has become harder and harder to ignore, as have new and unusual weather patterns and warming trends. To name only a small number, over the past few years major reports in *Time* magazine, the *Economist*, and the *Nation* have outlined the threats associated with climate change. Even the Pentagon has gotten in on the action; its 2003 report, *An Abrupt Climate Change Scenario and Its Implications for United States National Security*, foresees a fortress America with walls erected against a rising tide of Latin American migrants fleeing ecological disaster and stepped up policing of what it predicts will be a more war-prone world:

The United States and Australia are likely to build defensive fortresses around their countries because they have the resources and reserves to achieve self-sufficiency...Borders will be strengthened around the country to hold back unwanted starving immigrants from the

Caribbean islands (an especially severe problem), Mexico, and South America. Energy supply will be shored up through expensive (economically, politically, and morally) alternatives such as nuclear, renewables, hydrogen, and Middle Eastern contracts...Tension between the U.S. and Mexico rise as the U.S. reneges on the 1944 treaty that guarantees water flow from the Colorado River...Yet, even in this continuous state of emergency the U.S. will be positioned well compared to others. The intractable problem facing the nation will be calming the mounting military tension around the world.⁴

Several of the major corporations previously pumping enormous funds into organizations intent on denying climate change, such as the environmentally friendly sounding Global Climate Coalition have to some extent switched their millions to campaigns designed to “greenwash” even the most polluting industries.

In a tactical shift—borne of experience combating the environmental movement’s demands for government regulation in the 1970s and witnessing Philip Morris’s eventual failed efforts to deny the deleterious health effects of tobacco—many corporations have switched from a policy of outright denial to one of convincing us that they, too, can be green. However, this tactic goes on in parallel with continued efforts to sow doubt in the public mind and undermine any momentum for real change in energy production.

To take one example, in response to public criticism and too harsh a public spotlight, ExxonMobil sought to burnish its public image and along with other corporations left the Global Climate Coalition in 2002 when it became too embarrassing, publishing on its website its devotion to corporate responsibility. However, a report by the Union of Concerned Scientists released in 2007 detailed the more recent activities of ExxonMobil that allowed the corporation to continue its activities behind the scenes. ExxonMobil set up, funded, and ran a highly successful disinformation campaign through a series of front organizations and individuals based on the tobacco lobby’s campaign to undermine the connection between smoking and negative health effects. According to the report, ExxonMobil has:

- *Manufactured uncertainty* by raising doubts about even the most indisputable scientific evidence
- Adopted a strategy of *information laundering* by using seemingly independent front organizations to publicly further its desired message and thereby confuse the public
- *Promoted scientific spokespeople* who misrepresent peer-reviewed scientific findings or cherry-pick facts in their attempts to persuade the media and the public that there is still serious debate among scientists that burning fossil fuels has contributed to global warming and that human-caused warming will have serious consequences
- *Attempted to shift the focus* away from meaningful action on global warming with misleading charges about the need for “sound science”⁶

Such was the effectiveness of the ExxonMobil campaign that the British Royal Society, the oldest scientific academy in the world, in 2006 took the unprecedented step of writing to ExxonMobil asking them to desist in their efforts to undermine climate change science.⁷ Generally speaking, corporations play both games. They attempt to water down or otherwise alter any potential legislation that they see as hostile to their ability to make money through a veritable army of lobbyists and right-wing conservative think tanks. Simultaneously they crow about their green credentials and newfound concern for the environment.

The destructive power of the climate change lobbyists has become a disturbingly serious business in its own right. Since 2003, the number of climate change lobbyists has risen by more than 400 percent from 525 in 2003 to 2,349 in 2009. That's a somewhat mind-boggling five lobbyists for every single member of Congress.

It's not possible to understand the well-orchestrated and successful "swift-boating" of such well-established science that has consumed the media pre- and post-Copenhagen without acknowledging the role of corporate finance, which has allowed conservative think tanks and foundations to spend millions getting the message out that climate change science is not to be trusted.⁸

As a case in point, a March 2010 report by Greenpeace details the activities of U.S. corporate giant Koch Industries. Though most people have probably never heard of Koch, it is the second-largest privately held corporation in the United States after the huge food-processing conglomerate Cargill. Koch has an oil and related business of \$100 billion per year and seventy thousand employees operating in sixty countries. The Koch brothers who own the business are the joint ninth richest Americans and nineteenth richest in the world.⁹ Between 2005 and 2008, Koch ploughed \$25 million into climate opposition groups, outdoing ExxonMobil nearly three to one. It gave money to thirty-five different groups hostile to climate science. Some of the high-profile organizations that Koch gave money to, all of whom have strong public stances attacking climate science, the need to do something about global warming, or the need to change energy policy are: The Heritage Foundation, Americans for Prosperity, the Cato Institute, the Manhattan Institute, the Foundation for Research on Economics and the Environment, Institute for Humane Studies, and the American Council on Science and Health (which claims that reducing greenhouse gases would have detrimental health effects).¹⁰ For those who want to delve deeper into the murky waters of corporate irresponsibility, the extent to which climate change denial has been a fully fledged and rapidly expanding business for years is well documented in James Hoggan's book *Climate Cover-Up*.¹¹

It would be hard to find a more pro-business bill than the Waxman-Markey ACES Bill, which passed the House of Representatives in the summer of 2009. It gives billions of dollars in handouts to fossil fuel companies and practically a license to print money from carbon offsets and credits. Despite the pro-business slant of the legislation, some corporate entities and Republicans were nevertheless outraged at the idea of any restrictions placed on their right to freely pollute.

But the lobbyists' efforts at subverting the democratic process couldn't be as effective as they so clearly are without reaching the ear of an already receptive audience in Washington.

Millions of people around the world have seen Al Gore's Oscar-winning documentary, *An Inconvenient Truth*, and been shocked by the climate demons called forth by humanity's reckless and relentless burning of fossil fuels. Yet trying to pick apart all the controversies swirling around the science-based yet highly political debate is complicated enough without having to put up with the shameless self-promotion of Al Gore as the latter-day reincarnation of Rachel Carson or the corporate media taking climate denial arguments on face value as a legitimate counterargument to those of the scientists.¹²

Basics of Global Warming Science

It is important to state from the outset that without global warming the earth would not have been able to evolve complex life—it would be far too cold and prone to wild swings in temperature. The atmosphere acts as a blanket that keeps the earth at an average temperature of 15°C. Without this insulating layer, heat from the sun would simply bounce off the surface of the earth and immediately re-radiate to space. This atmospheric insulating blanket wrapped around the earth regulates global temperature and makes life possible. In the current context, however, an increase in average global temperatures is being caused by an increase in atmospheric concentrations of one gas in particular: carbon dioxide. Though water, natural gas (methane), and a few other compounds also contribute, CO₂ is the most significant because of its longevity in the atmosphere (around one hundred years) and because we are augmenting its increased atmospheric concentration by burning fossil fuels and cutting down forests. Methane is twenty times more powerful as a greenhouse gas, and there are significant and extremely serious threats from the possibility of hundreds of millions of tons of it being released from Siberian permafrost and underwater deposits, but it has a much shorter atmospheric lifetime due to its higher reactivity.

Carbon dioxide is the gas that animals breathe out as a waste product of respiration and plants absorb in order to grow. It exists as a very small percentage of the air—0.03 percent. However, when it comes to absorbing infrared radiation (heat energy) reflected from the surface of the earth and preventing it from escaping back out to space, this particular molecule is so effective that even small percentage changes in atmospheric concentration have large effects.¹³ What is commonly known as the greenhouse effect is CO₂ performing the same function as the glass of a greenhouse by trapping heat inside earth's atmosphere, the process that is leading to global warming and global climate change.

The greenhouse effect is not to be confused with the hole discovered in the ozone layer in the upper atmosphere that became big news in the 1980s. Ozone (O₃) is concentrated in an upper layer of the atmosphere and is responsible for blocking damaging ultraviolet radiation from the sun from reaching the earth's surface. The ozone layer was found to be degraded by chemical compounds called CFCs (chlorofluorocarbons), which destroy ozone and were being produced in large quantities for use as refrigerants and propellants for aerosols. Two massive, seasonally fluctuating holes in this protective layer over the Arctic and Antarctic were confirmed by scientific observation in the 1980s. Professor Paul Crutzen, a world-renowned atmospheric chemist, posited a link between ozone depletion and industrialized manufacturing processes in the 1970s and eventually won the Nobel Prize for Chemistry in 1995 for his work in this area. His research, along with growing concerns about the impact of the hole getting even bigger, led to the international treaty known as the Montreal Protocol, which came into effect in 1989 and sought to phase out the use of CFCs. While some of the causes of the ozone hole are similar and CFCs are partially responsible for trapping heat, the hole in the ozone is not causally linked to global climate change.

Carbon dioxide is generated whenever a substance containing the element carbon is burned. We react some carbon-containing compound with oxygen (i.e., burn it) in order to release the large amounts of energy stored in the chemical bonds. In the process, one of the guaranteed waste products of this process is the colorless, odorless, and poisonous gas carbon dioxide. Eighty percent of the energy generated on the planet—mostly for the production of electricity—and virtually all the fuel used for land, air, or sea transportation (98 percent) depends on the burning of one or another of three types of carbon-containing substances: coal, oil, or natural gas.

These three substances are collectively known as fossil fuels due to their common origin. Fossil fuels are the partially decomposed remains of plants and animals that have been cooked at high temperature and pressure in the earth's crust and accumulated over tens of millions of years. By tapping these vast deposits of buried energy we are drawing down the earth's balance of concentrated energy accrued over many millions of years. This is what makes fossil fuels an essentially finite, nonrenewable source of energy.

While the developed world has gone through two energy transitions from wood to coal and from coal to oil, much of the world's poor, in excess of two billion people, depend for their heating, lighting, and cooking on another carbon-containing compound: biomass in the form of wood, animal dung, or other plant material.

Another 17 percent of our energy is generated from nuclear power, with the remainder, 3 to 4 percent, coming from renewable sources, mostly in the form of hydroelectric dams. Transportation accounts for more than 25 percent of global energy demand. Industrial processes count for a third of energy consumption.¹⁴ Heating and cooling of buildings in the North and deforestation in the South are among the other major contributors.

Evidence for Global Warming

To the extent that a debate around global warming existed among scientists, that debate has now definitively closed. The evidence is overwhelming and incontrovertible. The most recent summary report for policy makers by the Inter-Governmental Panel on Climate Change (IPCC), released in November 2007, begins thus: "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."¹⁵

The report goes on to document that eleven of the last twelve years (1995 to 2006) have been in the top twelve warmest since accurate temperature recording began in 1850. From 1961 to 1990, sea levels rose 1.8 mm/yr while since 1993 that rate has increased to 3.1 mm/yr. Satellite data going back to 1978 show annual Arctic sea ice has decreased by 2.7 percent per decade (and three times that percentage in the summer months). In the language of a scientific paper, the IPCC goes on to document other changes: it is "very likely" (90 to 95 percent certain) that, over the last fifty years, cold days, cold nights, and frosts have become less frequent, with the converse true for hot days and nights. It is "likely" (66 to 90 percent certain) that heat waves have become more frequent and that the intensity of tropical cyclones in the North Atlantic has increased since 1970. Average northern hemisphere temperatures are "very likely" higher than any other fifty-year period in the last 500 years and "likely" higher than any period in the last 1,300 years.

All these alterations in climate are leading to other changes: changes in spring runoff from glaciers affecting water availability, earlier springs, and shifts in migratory patterns and ranges to higher latitudes or altitudes for plants and animals. Because the planet is an interconnected whole, climate change negatively impacts sea life as the oceans warm and become more acidic (CO₂ is an acidic compound), leads to an increase in forest fires and agricultural and other pests, and precipitates

changes to the geographical spread of disease vectors such as malaria-carrying mosquitoes.

The IPCC report is the fourth compiled by more than two thousand of the foremost scientists investigating climate change; the first was published in 1990. Each study has been more definitive than the last. These reports have been criticized in the past because they are produced by consensus and have to be supported by all the governments that have signed on to the IPCC process. This means that they can hardly be taken as the wild-eyed musings of some fringe scientist with an ideological anticapitalist grudge, nor can they be simply dismissed as the work of a group self-serving people on the lookout for more research funding.

Some argue that warming patterns are not due primarily to anthropogenic (human) sources, but are the result of natural changes in the orbit of the earth and the cycles of the sun. It is true that, in the 4 billion years that the earth has been around, the earth's climate has gone through some extremely dramatic climatic changes. In fact, the climate stability of the last 12,000 years, enabling the prediction of annual weather patterns and a shift to farming concomitant with the rise of civilization since the last ice age, is more of an anomaly than the norm.¹⁶ However—and the IPCC report is quite definitive on this—left to nature, the sum of solar and volcanic activity over the last fifty years would “likely” have produced cooling. So the warming that has occurred can only be laid at the door of greenhouse gas emissions that result from human activity.

Since 1750, levels of CO₂ in the atmosphere have grown from 280 parts per million (ppm) to today's level of 387 ppm, with an increase of 70 percent between 1970 and 2004, precisely mirroring the vast global economic expansion that occurred during those years.¹⁷

CO₂ and CH₄ concentrations in the atmosphere are now *higher than at any time in the last 650,000 years*.¹⁸ In the last 250 years 1,100 billion tons of CO₂ have been released into the atmosphere through industrial processes, mostly due to the burning of fossil fuels. *Half* of these emissions occurred after the mid-1970s.¹⁹ As the CO₂ that we put into the air is from partly decomposed organic matter laid down millions of years ago, using radiological dating, it is possible to distinguish between CO₂ put into the atmosphere by us and the CO₂ that cycles through from natural causes. The evidence is unequivocal that industrial processes are responsible for the resulting increase.

How Bad Can It Get?

Scientists predict that global greenhouse gas emissions will continue to increase over the next few decades by 25 to 90 percent. The range of possibilities depends on the extent to which governments adopt “lower carbon” programs. As the graphic below illustrates, based on available data and likely changes to the current global energy mix, the authoritative U.S. Energy Information Agency projections predict continued growth in CO₂ emissions by fuel type to 2030, rather than their decline. While the bulk of this increase will come from non-OECD (Organization of Economic Cooperation and Development) countries, per capita, they will remain far lower emissions than the OECD per capita average.

Climate scientists project a warming of 0.2°C/decade for various possible scenarios and state that

even if emissions had been stabilized at 2000 levels (which they were not), a warming of 0.1°C/decade would still occur. The 2007 report goes on to state:

Sea level rise under warming is inevitable. Thermal expansion would continue for many centuries after GHG concentrations have stabilized, for any of the stabilization assessments causing an eventual sea level rise much larger than projected for the 21st century. The eventual contributions from Greenland ice sheet loss could be several meters, and larger than from thermal expansion, should warming in excess of 1.9-4.6°C above pre-industrial levels be sustained over many centuries. The long time scales of thermal expansion and ice sheet response to warming imply that stabilization of GHG concentrations at or above present levels would not stabilize sea level for many centuries.²⁰

In other words, regardless of what we do now, the world is locked into a warming of between 1.5 and 2.0°C by 2050, a date that is within the lifetime of 70 percent of the people currently living on the planet. We can no longer avoid increasing CO₂ concentrations, nor can we prevent the CO₂ already in the atmosphere from setting in motion much slower changes, such as thermal expansion of the oceans, which will continue for hundreds of years. However, if we continue on our present path of increasing emissions rather than reducing emissions of greenhouse gases, primarily CO₂, a much larger temperature increase is the almost certain outcome. If we go above a 2°C average temperature rise—which will absolutely happen without radical economic and social changes in the next decade or so—future scenarios for the environmental consequences become increasingly apocalyptic. They are outlined very clearly in Mark Lynas's *Six Degrees: Our Future on a Hotter Planet*, a book that is notable as a popular science book because it takes its data entirely from peer-reviewed scientific journals.²¹

It's important to state that the increase of average global temperatures is a trend, not an absolute. This means two things: first, that there is no relentless march to higher temperatures every year (some temporary cooling is predicted for the next twenty years or so), and second, that not everywhere on the planet will experience heating equally. Some areas, such as the Arctic, are predicted to be worst affected due to positive feedback loops, and could see a rise of 6°C even if the rest of the planet only sees two; other regions will see increased rainfall and floods rather than drought. A large part of the problem will be that yearly weather patterns will become unpredictable, making agriculture—the basis of human sustenance—increasingly difficult to plan.

Now that we are already at a CO₂ concentration of almost 400ppm, what is urgently required is that we stay below 450ppm and as quickly as possible reduce that back to 350ppm in order to limit warming to 2°C. We need to actually reduce CO₂ in the atmosphere to 350ppm as highlighted by the environmental activist Bill McKibben with his organization, 350.org. Once we go above 450ppm, much historical evidence, as well as recent research, points to the possibility of an unstoppable increase in global temperatures that would eventually make human civilization virtually untenable across large swathes of the planet.²² As this will occur simultaneously with the decline of traditional energy resources and water shortages, the potential for warfare between nuclear-armed states is terrifyingly real.

If two degrees of warming is indeed a planetary “critical threshold,” then once we have passed it we head inexorably for three degrees of warming, then four, five, and six. What would a world five or six degrees warmer look like? A glance back millions of years, to when crocodiles flourished in what is now Canada, gives us some idea. The Amazon will have disappeared and turned into a desert. The

collapse of the Greenland ice sheet and the Antarctic ice shelf will produce sea-level rises of 2 meters, inundating coastal cities and placing large areas of land far underwater. Coral reefs will be dead from ocean acidification. Fish stocks will plunge due to acidity and decreased dissolved oxygen as oceans warm. Searing heat, the extreme violence of “hypercanes” caused by warmer oceans and greater kinetic energy in the atmosphere, and flash flooding will make growing crops impossible across large areas of formerly fertile continents. Southern Europe, the Southwestern U.S., and Central America, along with Central Asia and Africa and almost the whole of Australia will become deserts. Humans will be constrained to “zones of habitability” near the poles to escape the twin extremes of drought and flood.

All these changes will occur far too rapidly to allow for adaptation on the part of upwards of 50-60 percent of plant and animal species, which will cease to exist. The level of mass extinction could rival the climate-change-induced Permian-Triassic (P-T) mass extinction of 251 million years ago, which saw planetary life hanging by a thread as 95 percent of all species, plant and animal became extinct; it took 50 million years for the earth to return to its pre P-T level of biodiversity. Human population will drop by the billions even as mass migrations and civilizational breakdown become continuous features of life for those who survive. More worrisome still— if that’s possible—is that, while in the past such “rapid” climate swings generally occurred over thousands or hundreds of years, continuing on our present course could produce a similar swing in a matter of decades.²³

CHAPTER TWO

Is Population the Problem?

“The idea that developing countries should feed themselves is an anachronism from a bygone era. They could better ensure their food security by relying on U.S. agricultural products, which are available, in most cases at lower cost.”

—John Block, U.S. Agriculture Secretary, Uruguay Round of trade negotiations, 1986¹

“The biggest threat to global stability is the potential for food crises in poor countries to cause government collapse. Those crises are brought on by ever worsening environmental degradation.”

—Lester Brown

The second of the above quotes begins the article titled, “Could Food Shortages Bring Down Civilization?” in the May 2009 edition of the magazine *Scientific American*.² Lester Brown is no fringe character; he has won numerous environmental awards and authored more than fifty books addressing various aspects of the environmental crisis. Until 2000 he was president of the Worldwatch Institute, which publishes the influential and authoritative *State of the World* annual reports as well as the annual publication *Vital Signs*. A major preoccupation of Brown for more than three decades has been the idea that the world is perennially on the brink of running out of food because increases in human population are outstripping food supply. Now he is equally concerned that overpopulation is a major driver of ecological devastation. While Brown has been a resource-depletion doomsayer for decades, he is echoed by many others.

A growing number of liberal writers and publications have raised the specter of growing population as an unpleasant yet necessary topic of conversation as it relates to environmental degradation. Johan Hari, writer for the *Independent*, who has written some excellent pieces on climate change, posed the question in one of his 2008 columns, “Are There Just Too Many People in the World?”

While noting that Malthusian predictions have consistently been wrong and often used as arguments against the poor, he nevertheless concludes that, “After studying the evidence, I am left in a position I didn’t expect. Yes, the argument about overpopulation is distasteful, often discussed inappropriately, and far from being a panacea-solution—but it can’t be dismissed entirely. It will be easier for 6 billion people to cope on a heaving, boiling planet than for nine or 10 billion.”³ An editorial in the *Guardian* newspaper from March of 2009, entitled “The Malthusian Question,” even while rejecting the mo-

outrageous population-reduction arguments and overt Malthusianism of organizations such as the Optimum Population Trust, confirms in alarmist terms the relevance of population-based arguments to environmental decay:

Yet human numbers continue to swell, at more than 9,000 an hour, 80 million a year, a rate that threatens a doubling in less than 50 years. Land for cultivation is dwindling. Wind and rain erode fertile soils. Water supplies are increasingly precarious. Once-fertile regions are threatened with sterility. The yield from the oceans has begun to fall. To make matters potentially worse, human numbers threaten the survival of other species of plant and animal. Humans depend not just on what they can extract from the soil, but what they can grow in it, and this yield is driven by an intricate ecological network of organisms. Even at the most conservative estimate, other species are being extinguished at 100 to 1,000 times the background rate observable in the fossil record.⁴

It is clear that population is reemerging as a major question for the environmental movement. Any book talking about solutions to environmental degradation must therefore address the issue in a forthright manner. The argument that overpopulation is the cause of poverty has been around since before Marx's time, when Thomas Malthus addressed it in a series of influential essays (hence these arguments have come to be known as "Malthusian"). Therefore, going back to examine some of the arguments made by Marx and Engels will be instructive for examining today's situation. More recently, it's not just poverty that is blamed on overpopulation, but ecological breakdown as well.

In relation to the argument about population growth, the fundamental questions that need to be answered are twofold: first, does population growth explain food shortages and second, can population growth explain environmental degradation. Whether population growth is outpacing food production and so causing widespread famine or running up against the "natural" ecological limits of the earth are critical ones to answer for three interrelated reasons.

First, many people committed to fighting for a better world answer these questions with a unequivocal yes. It seems commonsense that more people must mean more resource use, therefore fewer resources for everyone and concomitantly greater demands placed on ecological limits.

Second, if the answer is yes, all of us committed to fighting for a more humane world need to adopt radically different emphases for our activism. If population growth is the main danger, then the solution is to pour resources and activism into tackling it as the single most important task to avoid many millions more people descending into starvation and unleashing further environmental damage on the planet.

This leads to the third important reason for taking up the question of population: by arguing that population growth is the main cause of mass starvation and environmental ruin we play into the hands of ruling elites who want to blame the victims; logic that has historically led to some highly unsavory arguments and policy decisions.

The Return of Malthus

The notion that population growth is the foremost cause of environmental degradation and societal

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