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*Cofounder of DeSmogBlog.com*

with RICHARD LITTLEMORE



# CLIMATE COVER-UP

THE CRUSADE TO DENY  
GLOBAL WARMING



## PRAISE FOR CLIMATE COVER-UP

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“Absolutely superb—one of the best dissections of the climate information war I have ever seen. This is one terrific piece of work!”

ROSS GELBSPAN  
author of *The Heat Is On*

“Through impeccably documented analysis, *Climate Cover-Up* exposes the well-oiled propaganda campaign designed to manufacture dissent and uncertainty about the science of global warming. It is essential reading for anyone who cares about the future of democracy.”

ANDREW WEAVER  
author of *Keeping Our Cool: Canada in a Warming World*

“A clear and courageous battle cry against those who, for profit’s sake, would lead us to environmental and, ultimately, economic ruin.”

LESTER R. BROWN  
author of *Plan B 3.0: Mobilizing to Save Civilization*

“An important and disturbing book about the lies and corrupt language that government and industry still employ to dismiss the facts on global warming.”

ANDRE WNIKIFORUK  
author of *Tar Sands: Dirty Oil and the Future of a Continent*

“To those of us who have been unknowingly made to turn a blind eye to the terrifying and true facts about global warming, there’s no time left for ignorance. Please read this shocking and incredible book, learn how we’ve been manipulated, get angry, and take action.”

NEVE CAMPBELL  
actress and producer

“*Climate Cover-Up* reveals how strategic corporate public relations, an unwitting media, and feckless scientists have created a rhetoric-driven public conversation about climate change that defies logic and reason. If you are interested in positive social change on climate issues, this book is a must-read.”

FRANKLIND. GILLIAM JR.  
dean, School of Public Affairs, and professor of public policy and political science, University of California, Los Angeles

“Jim Hoggan in this essential book illuminates our folly, even as he points a way forward with hope.”

WADE DAVIS  
author of *The Serpent and the Rainbow*

“*Climate Cover-Up* clears the way for a new era of honesty and climate progress.”

TZEPORAH BERMAN  
campaign director and founder, Forest Ethics

# CLIMATE COVER-UP

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# **THE CRUSADE TO DENY GLOBAL WARMING**

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**JAME SHOGGAN**  
with **RICHARD LITLEMORE**

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**CLIMATE  
COVER-UP**



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In thanks and as a tribute to ROSS GELBSPAN,  

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whose early scoops and dedicated journalism exposed the  
climate change denial campaign and inspired this book.

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The whole community owes a vote of thanks to the scientists and advocates who have worked so hard to catch our attention and build our understanding on the topic of climate change. The Nobel Committee has already offered appropriate praise for former U.S. vice president Al Gore and the scientists of the Intergovernmental Panel on Climate Change. But some of those scientists have taken a particularly public position and have endured unconscionable abuse as a result. Brave and outspoken scientists such as NASA's James Hansen, Penn State's Michael Mann, UC San Diego's Naomi Oreskes, Stanford's Stephen Schneider, and the University of Victoria's Andrew Weaver are among those we know best and respect the most.

There are also scientists and journalists who deserve credit and acknowledgment. Ross Gelbspan, formerly of the *Boston Globe*, was among the first reporters in North America to uncover the extent of the climate cover-up. ABC's Bill Blake-more and the *New York Times*'s Andrew Revkin reported the climate change story accurately when many others were getting it wrong.

In the online world, John Stauber's SourceWatch.org is an encyclopedic font of information, as is Kert Davies's Exxon Secrets.org. Joe Romm has done great work at ClimateProgress.org, and the DeSmogBlog team has long been a fan of Australian online journalist and scientist Tim Lambert, whose Deltoid blog has been a solid source of scoops and thoughtful reporting on the science and politics of climate change.

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Given the rigors and distractions that are inevitable in putting together this kind of book, I want to extend a special thanks to some of the people who had to pick up the slack during the long process of research and writing. The whole Hoggan staff has been endlessly supportive, but the greatest thanks must be offered in return for the patience shown by my wife, Enid Marion, and by Richard Littlemore's whole family, including his wife, Elizabeth, and his three boys, Ted, Avery, and Llewellyn.

Finally, I would like to offer a more specific thanks to Richard Littlemore. I have said before that Richard has a knack for writing down the things I say in the way I wish I had said them. But his contribution to this book went much further. He brought passion, energy, and extensive knowledge of climate change, politics, and journalism. In the earliest days he was the lone pen on the DeSmogBlog and throughout he has been a tireless researcher and a conscientious reporter. Collaborations of this

scope are likely to either ruin friendships or cement them forever. In this case I am delighted to say that I have found and forged a good and lasting friendship.

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*Jim Hoggan*

## PREFACE

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This is a story of betrayal, a story of selfishness, greed, and irresponsibility on an epic scale. In its darkest chapters, it's a story of deceit, of poisoning public judgment—of an antidemocratic attack on our political structures and a strategic undermining of the journalistic watchdogs who keep our social institutions honest. It is ultimately a story that drove me and those closest to me to outrage and to activism. And although it is not my purpose to make you angry, I hope that you may, through the coming pages, come to understand the sense of indignation and injustice that brought me to write this book.

I didn't go looking for this trouble. I don't think of myself as an activist, and I don't fit the stereotypical description of an environmentalist. I have a decent wardrobe that doesn't include a single hair shirt. I spend too much money on art, fine wine, skis, and high-end bicycle parts, and I am in recovery from my habit of buying luxury cars.

Nor do I bear any grudges against “the establishment”—and particularly not the public relations industry. As the owner of a successful Vancouver public relations firm, I think that PR is a good thing. It connects people and builds understanding, and I generally have a high regard for my professional colleagues. It's true that there have always been bad actors in my business—the tobacco apologists and the partisan political spin doctors—but I have always regarded them as obvious exceptions. In my career, examples of spin-doctoring seemed episodic, not epidemic.

Or that's what I thought before I started looking closely at the climate file. That too began in relative innocence, and only three or four years ago. I was thinking about adding a community service element to the Hoggan & Associates Web site, and somebody suggested a public information section on climate change. I liked the idea immediately. I knew the topic was controversial, and I knew that in a controversy people sometimes oversell their position. I thought it would be useful to introduce an objective viewpoint.

I started doing a lot of reading and was surprised by what I discovered. Where I expected a blistering controversy, I found an overwhelming scientific consensus. Mainstream media had been reporting that doubt lurked in every report, that for every scientist warning of global warming there was another saying it was all bunk. But when I started reading reports from the world's leading science academies, I found that everyone seemed to be speaking with one voice. Every science academy in every major developed country in the world had stated clearly that the world's climate is changing dangerously and humans are to blame. Why, I wondered, were people so confused? Who had started this public debate?

The great U.S. journalist Ross Gelbspan had the answer. In two early books, *The Heat Is On* (1997) and *Boiling Point* (2004), Ross had uncovered the first hard evidence of an organized campaign, largely financed by the coal and oil industries, to make us think that climate science was somehow still controversial, climate change still unproven. I had always known about the potential for public manipulation, but I had never conceived of a campaign so huge, well-funded, and well-organized. Ross is anything but a conventional environmentalist. He's a reporter, skeptical to the bone. And when I flew to Boston to meet him, he told me that when he had started looking into climate change, he actually thought the “science skeptics” had it right. He thought the science was truly stuck in uncertainty. Then Harvard oceanographer Dr. James McCarthy showed Ross how the deniers were twisting the data to mislead people, and he posed what for Ross became an important question: where

were these purported skeptics getting their money?

The answer to that question formed the backbone of *The Heat Is On*, and what Ross found struck me as a revelation. Denier scientists were being paid well, not for conducting climate research, but for practicing public relations. As I looked around, I started to notice evidence of the campaign everywhere I looked. To a trained eye the unsavory public relations tactics and techniques and the strategic media manipulation became obvious. The more I thought about it, the more deeply offended I became.

I also found that the same sense of indignation was common among my friends and colleagues. For example, the senior writer at Hoggan & Associates and my collaborator on this book is Richard Littlemore. A veteran newspaper guy, Richard is like Ross Gelbspan, another ink-stained skeptic accustomed to steering a wide berth around anyone who is passionately committed to a cause. But he had been worrying about climate change since 1996, when he took a freelance contract to write a public education package on the topic for the David Suzuki Foundation, Canada's leading environmental organization. Even then, Richard says, reading through the material, "it was clear we were in trouble, and obvious that some people were trying to deny it." In 1998 Richard was selected to be a part of the Canadian government's Kyoto Implementation Process, which he describes now as "a sham," a "vast public relations exercise designed only to waste time—an effort that never had a chance of success."

Richard found himself distraught and disillusioned at the scope and nature of the big lie (in this case, that the Canadian government was serious about reducing national greenhouse gas emissions). It was, he says, built on a foundation of what he came to think of as little insults to democracy, incremental efforts to ensure that government did nothing to disrupt the profitable status quo.

My own gathering horror probably came to a head one day when I started sharing my newfound knowledge with my old friend John Lefebvre, a burly lawyer turned musician who along the way had made his fortune by helping to build an Internet banking empire. John has the kind of money that makes the worries of the world drift into the distance, but he also has a conscience. We were chatting during the summer of 2005 about this corruption of the public conversation when John said, flatly and urgently, "What can we do about it?"

That's how DeSmogBlog was born. We decided to start doing this research in a more organized way and share it with everyone we could find. With a generous stake from John we launched [www.DeSmogBlog.com](http://www.DeSmogBlog.com), an unfamiliar but promising Internet platform that we hoped would give us access to a larger audience. Richard started collecting information. He identified people who seemed to be making a living by denying climate change, and he asked a few obvious questions: Were these climate "skeptics" qualified? Were they doing any research in the climate change field? Were they accepting money, directly or indirectly, from the fossil fuel industry? Finding that the most vocal skeptics were *not* qualified, were *not* working in the field, and all too frequently *were* on one or another oily payroll, we started publishing our results online.

From that modest beginning we have built a popular Web site and an active team of researchers and collaborators. We hired Kevin Grandia as a manager early in 2006 and began attracting volunteers such as Emily Murgatroyd—a woman who proved so passionate and determined that we made her part of the team. We engaged brilliant contributors, including the authors Ross Gelbspan, Bill McKibben (*Deep Economy*), and Chris Mooney (*The Republican War on Science* and *Stormworld: Hurricanes, Politics and the Battle over Global Warming*). We found established journalists like Mitch Anderson and hot up-and-comers like Jeremy Jacquot and Nathanael Baker.

More to the point, we assembled the body of research that we share with you here. This is more, however, than a collection of posts or a greatest hits album. We have tried to pull together the whole story, to give you a complete sense of how the public climate change conversation was pushed so badly off the rails.

I suspect that you will find the results offensive, even infuriating. We are at a critical juncture in human history. By mastering technology and by (so far) outperforming every other species on the planet, we humans have achieved global domination. We can remake landscapes, defeat diseases, extend life spans, and expand the scope and scale of human wealth by almost every measure. We can also trash whole countries, pollute streams, rivers, lakes, and perhaps ultimately whole oceans, to a disastrous extent. We can kill one another more quickly than ever in human history, and we can change the world's climate in a way that scientists say is threatening our ability to survive on Earth.

The question, as yet unanswered, is whether we can stop. Can we as a species rescue ourselves from a threat of our own making? To do so will take personal restraint, political courage, and a degree of global cooperation unprecedented in human history. Even more, it will take a clear understanding of the risks—an understanding that we will only achieve if we expose the climate cover-up. That's been our goal, and you may judge our success in your own time. After which, I hope that you will join us in our effort to restore integrity to the public conversation about science, about governance, and about saving the world.

That sounds melodramatic, but I believe two things absolutely. First, I believe that scientists have been telling us the truth when they've said that the world is at risk. And second, even if countering the risk will be difficult, even if the tasks seem overwhelming or the solutions are dismissed by the deniers as impractical, I believe, absolutely, that the world is worth saving.

## LEMMINGS AND LIFE GUARDS

### Keeping humankind from crashing on the rocks

**W**e are standing at the edge of a cliff. Behind us is a considerable crowd, 6.7 billion people and counting, and below is a beckoning pool. Some people say that you can jump into that pool without risk. They say that humans have been doing so for ages without any problems. But others say that waves have been eating away at the foot of the cliff, causing big rocks to fall into the water. They say that the risk of jumping grows more frightening by the day. Whom do you trust?

That's a tricky question because here, on the climate change cliff, some of the lifeguards are just not that qualified, some have forgotten entirely whose interests they are supposed to protect, and some seem quite willing to sacrifice the odd swimmer (or the whole swim team) if they think there is a good profit to be made in the process. That's what this book is about: lousy lifeguards—people whose lack of training, conflicts of interest, or general disregard have put us all at risk of storming off the cliff like so many apocryphal lemmings.

I'm not saying that all of the lousy lifeguards are evil or ill-intentioned, although some may shake your faith in humanity. Rather, the whole lifeguarding institution seems to be failing, and not necessarily by accident. In the past two decades, and particularly on the issue of climate change, there has been an attack on public trust and a corresponding collapse in the integrity of the public conversation. The great institutions of science and government seem to have lost their credibility, and the watchdogs in media have lost their focus. Here we are, standing on the most dangerous environmental precipice that the human race has ever encountered, and we suddenly have to take a fresh and frightening look at the lifeguards in our midst.

The view is not reassuring. Take, for example, the case of Freeman Dyson. Dyson is an incredibly impressive character, a physicist who many people believe should have been given a Nobel Prize for his early work in quantum field theory. Later in his career he also distinguished himself as a good writer with a talent for simplifying and popularizing science. His 1984 antinuclear analysis, *Weapons and Hope*, won a National Book Critics Circle Award. Dyson was always a contrarian, but at age eighty-five (he was born on December 15, 1923), he has become fully argumentative. He is, for example, an outspoken skeptic of many aspects of modern climate science, and he has become a popular expert among those who would like to ignore or deny the risks of global warming.

That's all well and good. It makes sense that skeptics would seek out other skeptics to try to bolster their—perhaps delusional but perhaps sincere—opinions about climate change. It's also entirely reasonable that Dyson should want to keep up his profile and keep commenting on issues of scientific interest. But it doesn't explain why, on March 25, 2009, the *New York Times Magazine* would have presented an eight-thousand-word cover story on Dyson, lauding him as “the Civil Heretic.” Neither does it explain why the *Times*, certainly one of the most respected sources of journalistic information on the continent, sent a sportswriter (Nicholas Dawidoff) to write the story. No criticism of Dawidoff—he's a wonderful writer, the author of some particularly excellent baseball books. But it's reasonable to ask why the *Times* would choose someone with no expertise, no education, and no background in climate science to interview a man apparently dedicated to undermining public confidence in the majority view about the risks of global warming.

As a lifeguard, the last time Freeman Dyson went down to the bottom of the cliff to check on the rock pile was, well, never. He too has no background in climate science, having done no research whatever—ever—on atmospheric physics or on climate modelling. Even in theoretical physics, his area of expertise, his greatest contributions date to the late 1940s and early 1950s. So again, in a free society Dyson has every right to stand at the top of the cliff and shout, “Jump!” But it’s reasonable to wonder why the *New York Times Magazine* would give him the soapbox, especially when most of the time the magazine pays relatively little attention to this, the most urgent environmental issue humankind has ever faced.

Here’s another fairly current example: the *Globe and Mail*, Canada’s answer to the *New York Times* and arguably the most influential newspaper north of the 49th parallel, carried an opinion piece on April 16, 2009, by Bjørn Lomborg, the famously self-described *Skeptical Environmentalist* (per the title of his best-selling 2001 book). Under the headline “Forget the Scary Eco-Crunch: This Earth is Enough,” the article sets out to dismiss the concern that humans are currently consuming global resources at a pace that cannot be sustained.

Lomborg begins by criticizing the concept of an ecological footprint, in which scientists try to estimate actual human impact on the environment rather than counting only the land we cover with roads and houses. As Lomborg says, scientists working on behalf of the World Wildlife Foundation have calculated that when you add up all the land affected by human consumption habits—the land where we live, the land used to grow our food, the land that is destroyed by mining or polluted by industries that produce our consumables—“each American uses 9.4 hectares of the globe, each European 4.7 hectares, and those in low-income countries one hectare. Adding it all up, we collectively use 17.5 billion hectares. Unfortunately, there are only 13.4 billion hectares available. So according to the W WF, we’re already living beyond Earth’s means, using around 30 percent too much.”

Complaining that these calculations oversimplify the situation and don’t factor in potential future changes, Lomborg goes on to say, “. . . it is clear that areas we use for roads cannot be used for growing food, and that using areas to build our houses takes away from forests. This part of the ecological footprint is a convenient measure of our literal footprint on Earth. Here, we live far inside the available area, using some 60 percent of the world’s available space, and this proportion is likely to drop because the rate at which the Earth’s population is increasing is now slowing, while technological progress continues. So no ecological collapse.”

This logic is impenetrable. Lomborg implies, first of all, that we can disregard the ecological aspect of our footprint because it’s tricky to tally with absolute certainty. Then he says our literal footprint is actually going to get smaller because the population is rising, but at a slightly reduced rate. (Lomborg alone understands how more humans will take up less space.) Then, the skeptical environmentalist reassures us with this: “Due to technology, the individual demand on the planet has already dropped 35 percent over the past half-decade, and the collective requirement will reach its upper limit before 2020 without any overdraft.”

That’s wonderful, or it would be if it could be proven. But if Lomborg has some secret source of information for this contention, he is not sharing it with readers. Instead, he throws these assertions out without attribution or substantiation. He runs to the cliff, grabs the *Globe and Mail* megaphone, and shouts, “Jump!”

Again, that is his right. But why is Canada’s leading newspaper promoting this as a reliable viewpoint? Lomborg is not a scientist (his Ph.D., in *political* science, concentrated on game theory),

and his previous work has been widely and publicly criticized for its inaccuracy. (See Chapter 10 for more on Lomborg's checkered track record.) Why, even under the guise of "opinion," would a serious newspaper present this unsourced and inexperienced argument as worthy of public attention?

It's not as though the true state of the world's environment is a mystery—or that it is left unstudied by leading and highly qualified scientists. For example, a collection of 1,360 such experts completed the Millennium Ecosystem Assessment in 2005. Those scientists, all leaders in their fields, conclude that, "over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth."

"Substantial and largely irreversible." That sounds more dramatic than Lomborg's reassuring promise of "no ecological collapse." The whole Millennium Ecosystem Assessment report suggests very specifically that humankind is destroying the environment at a frightening pace. We are burning down forests, trashing the ocean, and changing global climate in a way that is making it extremely difficult for other species to survive—substantial and irreversible. In a way, we have to hope that Lomborg is right: we have to hope that this Earth is enough—and it may be, especially if humans pay attention to the warning signs and start behaving differently. But Lomborg is mounting a transparently fatuous argument to convince us that we don't have to pay attention to our ecological footprint. While more than thirteen hundred of the world's leading scientists try in good faith to back us away from the cliff, Lomborg grabs a soiled lifeguard T-shirt from a bin at the nearest thrift shop and tells us to keep jumping, ignore the risks. And the *Globe and Mail* cheers him on.

A third story broke in the early spring of 2009 that cast light on the weakness of modern lifeguard recruitment. On April 23, 2009, the *New York Times*'s excellent science writer Andrew Revkin reported on a now-defunct organization called the Global Climate Coalition, primarily a group of companies whose operations or products are heavy producers of greenhouse gases. For more than a decade, ending in 2002, the coalition spent millions of dollars on advertising and lobbying campaigns aimed at convincing public officials specifically and the public generally that climate change was not proven and that mitigating action was unnecessary. Yet, as Revkin reported, recently released court documents show that the Global Climate Coalition's own scientists had said in their 1995 report *Predicting Future Climate Change*, "The scientific basis for the Greenhouse Effect and the potential impact of human emissions of greenhouse gases such as CO<sub>2</sub> on climate is well established and cannot be denied."

It seems clear from the record that the Global Climate Coalition wasn't really interested in the science of climate change. Revkin reports that someone within the organization deleted the above reference and, even then, never distributed the report. And the group didn't actually invest in any climate change research. Instead it spent a fortune (the 1997 budget alone amounted to US\$1.68 million) sowing confusion and lobbying against climate change policies, a gesture that, coincidentally or not, would serve the financial interests of the coalition's major funders: ExxonMobil, Royal Dutch Shell, British Petroleum (now BP), Texaco, General Motors, Ford, DaimlerChrysler, the Aluminum Association, the National Association of Manufacturers, the American Petroleum Institute, and others.

To take the crowded-cliff analogy one step further, it was as if some of the lifeguards had been charging thrill-seekers money to jump into the water, and they didn't want to give up the income. Not only did they pass up the opportunity to check the rocky bottom themselves, but when they hired someone to check, and that someone (in this case, a Mobil Corporation chemical engineer and climatologist)

expert named Leonard S. Bernstein) came back and said there was trouble below, they buried the report—and kept selling tickets.

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You will in the coming pages meet a cast of lifeguards that in some instances may shake your faith in humanity. You will read about industry associations (the Western Fuels Association, the American Petroleum Institute) that commissioned strategy documents aimed at confusing people about climate science. You will see specific efforts to deny the gathering consensus that humans are endangering the planet—and you'll see how a group of think tanks and political operatives helped to implement the strategy, polluting the public conversation in North America and, increasingly, in Europe as well. You will read about “scientists” who strayed casually outside their field of expertise and then collected guest-speaker fees for also denying the advanced state of climate science understanding. You'll see a matter of well-established science skillfully recast as a subject for debate, as something that was primarily and hotly political and—until the intervention of admirable Republican leaders like John McCain and Arnold Schwarzenegger—destructively partisan. You will read about lobbyists like Steven “The Junkman” Milloy, who took money from companies like Philip Morris, Monsanto, and ExxonMobil and then promoted himself as an expert commentator. Perhaps worst of all, you will see the great (and sometimes not-so-great) journalistic bastions of free speech employ or feature Milloy and others like him without ever telling the audience about the strained credentials or the conflicts of interest that might have affected the credibility of these wannabe lifeguards.

You may conclude from all this that reputable newspapers and magazines are today acting in a confused and confusing manner because a great number of people have worked very hard and spent a great deal of money in an effort to establish and spread that confusion. You will also see that their efforts have been disastrously successful. We have lost two decades—two critical decades—during which we could have taken action on climate change but didn't, because we were relying on bad advice. We were listening to lifeguards whose primary agenda had nothing to do with protecting our safety.

It's possible that when you see the full extent of the sometimes strategic, sometimes accidental campaign of confusion, you will drift into irritation, even into anger. You may want to blame the bad advisors—the freelance lifeguards whose real goal was often something other than swimmer safety. You may, especially, lose faith in mainstream media as a reliable source of credible information. After all, we rely on them for their judgment as well as for the accuracy of what they present in their newspapers and broadcasts, and on so many occasions they have let us down.

Finally, you might begin to lose hope. You might come to question our ability to have a credible public conversation about science and to arrive at a reasonable set of policies to address climate change. You might be tempted to throw up your hands in despair.

That would be the worst possible result. Just by picking up this book, you have made the first, critical step toward being part of the solution. The information that follows will at least help to inoculate you against the public relations spin, the confusion and misinformation that has led us through two decades of inaction. At best, it will inspire you to learn more about climate change and more about the practical, affordable, and essential things that we all need to do to conquer the problem.

Our species has proved itself capable of great stupidity and palpable evil. Human history is too full of pogroms and holocausts, of wars, genocides, and societal collapses. Equally, however, we have proved ourselves intelligent and adaptable. When we stepped back from the brink of global nuclear annihilation, we showed that when the conversation is open and accurate, we can make good, even

altruistic decisions. It's time for such a decision now. It's time for good people to inform themselves to help lead and guide their families, their friends, and their neighbors back from a path that threatens the habitability of planet Earth to one that will be sensible and sustainable. We don't have to jump off the cliff, and if someone tells you that we do, the message of this book is this: check his credentials. You may be surprised (and disappointed) by what you find.

## THE INCONVENIENT TRUTH

### Who says climate change is a scientific certainty?

**N**o one, really. Certainties are rare in science. Even the reappearance of the sun over the horizon tomorrow morning can be reduced to a question of probability. On the question of climate change, scientists say they are more than 90 percent sure that it's happening and that humans are responsible, but you just never know.

Scientists embrace that kind of skepticism. It is through doubting the certainties of the world (the flatness of the Earth, the usefulness of bloodletting) that scientists advance human knowledge. But no serious scientist will stand up and denounce a widely accepted scientific theory without making a verifiable argument to the contrary. Scientists—real scientists—bind themselves to a strict discipline setting out their theories and experiments carefully, subjecting them to review by other credible scholars who are knowledgeable in their field, and publishing them in reputable journals, such as *Science* and *Nature*.

The people who approach the science of climate change with that kind of integrity have agreed on its underlying components for years. The greenhouse effect, by which gases such as carbon dioxide absorb heat, setting up a warming blanket around the world, was first postulated by the French mathematician and physicist Joseph Fourier in 1824. Fourier understood that solar energy heated the Earth, which then reflected that heat back into space in the form of infrared radiation. In effect, the sun's heat bounced off the Earth's surface. But Earth's atmosphere seemed to be blocking or slowing the release of that infrared energy, warming the planet. In the 1850s the Irish physicist John Tyndall figured out a way to actually test and measure the capacity of various gases, including nitrogen, oxygen, water vapour, carbon dioxide, and ozone, to absorb and transmit radiant energy. By 1858 he had effectively proved Fourier's theory.

At the end of the century—the 19th century—the Swedish scientist Svante Arrhenius advanced the theory even further. Arrhenius, who is considered the founder of physical chemistry, was the first person to predict that humans might actually increase the temperature of the Earth by burning fossil fuels and, in the process, increasing the amount of carbon dioxide in the atmosphere. Fossil fuels themselves represent millions of years of stored carbon. Every living thing on Earth is composed of carbon in one form or another. Plants inhale carbon dioxide, which comprises one molecule of carbon and two of oxygen, then convert the carbon to carbohydrates and release the oxygen back into the atmosphere. Animals eat the plants. Over hundreds of millions of years these plants and animals have fallen dead into swamps or drifted lifeless to the bottom of the ocean, there to be covered up by layers and layers of other carboniferous matter. Under the right conditions—heat and pressure—those massive carbon piles have been converted to coal, oil, or natural gas. And over the last two centuries humans have been digging up those fossil fuels and setting fire to them, reintroducing the carbon to oxygen and releasing the resulting carbon dioxide back into the atmosphere. When Arrhenius considered the effect of this trend, he tried to calculate the effect of that increased carbon dioxide. He estimated that a doubling of atmospheric carbon dioxide would increase Earth's temperature by 3.8 degrees Fahrenheit. This was a stunning bit of science for the time, given that the most recent report of the Intergovernmental Panel on Climate Change estimates that a doubling of carbon dioxide will

increase the global average temperature by between 3.6 and 8.1 degrees Fahrenheit. It's also unnerving, in that the concentration of carbon dioxide in the atmosphere has risen since 1850 by more than one-third, from 280 parts per million (ppm) to 385 ppm, and we are on track to hit Arrhenius's feared doubling by sometime near the middle of this century.

The next scientist to ring the climate change alarm was the American oceanographer Roger Revelle, the man who explained the greenhouse effect to former U.S. vice president and Nobel laureate Al Gore when both men were at Harvard in the late 1960s. In 1957 Revelle published a paper with the chemist Hans Suess in which they predicted a global warming. At the time Revelle suggested that such warming might even be a good thing, but he and Suess prescribed caution in their paper, saying that humans were conducting "a great geophysical experiment" with almost no conception of the consequences.

Befitting a society in which scientific understanding guides important social decisions, concern about this issue began to crop up in the political sphere as early as the 1960s. Then-president Lyndon Johnson said in a special message to Congress in February 1965 that "this generation has altered the composition of the atmosphere on a global scale through . . . a steady increase in carbon dioxide from the burning of fossil fuels."

By the late 1970s scientists were beginning to get twitchy, starting to speak with one increasingly concerned voice. A National Academy of Sciences report authored in 1979 by the scientist Jule Charney said, "A plethora of studies from diverse sources indicates a consensus that climate changes will result from man's combustion of fossil fuels and changes in land use." It also was becoming apparent that global warming was not as benign as it sounded. Scientists were beginning to understand that even a small increase in global average temperature could throw off a balance that had existed in Earth's climate since long before the time of humans. They began warning of melting glaciers and collapsing ice caps, of floods and droughts and rising tides. They began to contemplate a change in world living conditions that was more dramatic than anything in human history and more sudden than anything that had happened in hundreds of thousands of years.

The American political establishment joined the discussion in 1988, led by presidential candidate George H.W. Bush. Running against Democratic contender Michael Dukakis, then-vice president Bush said, "Those who think we are powerless to do anything about the greenhouse effect forget about the 'White House effect'; as president, I intend to do something about it." Bush promised, if elected, to convene an international conference on the environment: "We will talk about global warming and we will act."<sup>1</sup>

The newly elected president was, at first, as good as his word. Later the same year, after the world community gathered to create the Intergovernmental Panel on Climate Change (IPCC), Bush signed into law the National Energy Policy Act "to establish a national energy policy that will quickly reduce the generation of carbon dioxide and trace gases as quickly as is feasible in order to slow the pace and degree of atmospheric warming . . . to protect the global environment."

I offer all of the foregoing for context. I am neither a scientist nor a historian, and I have no intention in this book of jumping into the actual science "debate." For an in-depth overview, you can go online and read the Fourth Assessment Report of the IPCC, a scientific collaboration of unprecedented breadth, depth, and reputation. You can google Elizabeth Kolbert's brilliant *New Yorker* series, *The Climate of Man*. Or you can pick up one of the great populist science books on the subject: Canadian scientist Andrew Weaver's *Keeping Our Cool*; Australian scientist Tim Flannery's *The Weathermakers*; Kolbert's later book *Field Notes from a Catastrophe*; or Al Gore's book version

of *An Inconvenient Truth*. Any one of these will give you a solid enough grasp of the science to leave you nervous about the state of our world.

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My point, however, is that no one seemed to be confused about climate change in 1988. The great scientific bodies of the world were concerned, and the foremost political leaders were engaged. So what happened between then and now?

Well, here's what happened in science: with each new experiment, with each new report of the IPCC, with each new article published in legitimate peer-reviewed scientific journals, the science community became more certain that they were on the right track. Naomi Oreskes, a professor of history and science studies at the University of California, San Diego, tested that question in a paper she published in the journal *Science* in 2005. Oreskes searched the exhaustive ISI Web of Knowledge for refereed scientific journal articles on global climate change that were published between 1993 and 2003, and she analyzed them on the basis of whether they supported, contradicted, or took no position on the consensus that the human release of greenhouse gases was causing climate change. She found 928 articles—and not a single one took exception with the consensus position.

Clear enough. But what was happening in the mainstream media during the same period? The best answer to that question comes from the brothers Jules and Max Boykoff, who published an article in the peer-reviewed *Journal of Environmental Change* in 2003 titled “Balance as Bias: Global Warming and the U.S. Prestige Press.” The brothers had searched the libraries of four “prestige” dailies in the United States—the *New York Times*, the *Wall Street Journal*, the *Washington Post*, and the *Los Angeles Times*—and had analyzed their coverage of climate change between 1998 and 2002. They found that while the scientific press was coming down 928 to zero in accepting or, at the very least, not denying climate change, in 53 percent of their stories these four newspapers quoted a scientist on “one side” of the issue and a spokesperson on the other. I say spokesperson rather than scientist for two reasons. First, the deniers were very often not scientists, but rather political ideologues or self-appointed “experts” from think tanks. Second, even when the experts had scientific credentials, in most cases those credentials were not relevant to the topic at hand. The experts were geologists or economists commenting outside their field of expertise, not climate scientists reporting on up-to-date peer-reviewed science.

Boykoff and Boykoff telegraphed their point about the mainstream media in the title of their paper “Balance as Bias.” Journalists in the modern age find it all but impossible to stay up to speed on every issue, especially every issue of science. To protect themselves, they very frequently fall back on the notion of balance: they interview one person on one side of an issue and one person on the other. There is even a fairly common conceit in North American newsrooms that if both sides wind up angry about the coverage, the reporter in question probably got the story about right.

This has a degree of legitimacy when the subject matter is political, economic, or even moral. There are legitimate differences of opinion on the correct way to handle many political issues, and few economists agree on the right response to a specific economic event. And on a highly emotional issue such as abortion—one in which people are just as likely to be bringing forth points that are based in religion as they are to be talking about science—it is completely appropriate to canvas a range of opinions.

But science is a discipline in which there are legitimate subject experts, people whose knowledge is weighed and measured by their scientific peers. This is the process people use to decide, for example, on a new surgical method or on the structural strength of a new metal alloy. If a doctor recommended that you undergo an innovative new surgical procedure, you might seek a second opinion, but you'd

probably ask another surgeon. You wouldn't check with your local carpenter, and you certainly wouldn't ask a representative of the drug company whose product would be rendered irrelevant if you had the operation. If you were building an apartment block or a bridge and someone offered a "state-of-the-art" new girder that was lighter and cheaper than the conventional alternative, you wouldn't accept the recommendation on the basis of the salesman's promises or even on the latest feature in *Reader's Digest*. You would insist on a testimonial from scientific sources.

That's not what's been happening in the public conversation about global warming. For most of the last two decades, while scientists were growing more convinced about the proof and more concerned about the risks of climate change, members of the general public were drifting into confusion, led there by conflicting stories that minimized the state of the problem and exaggerated the cost of solutions. Somehow, we have been spun.

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