

## Introduction

# ONE WAY OR ANOTHER, EVERYTHING CHANGES

**“Most projections of climate change presume that future changes—greenhouse gas emissions, temperature increases and effects such as sea level rise—will happen incrementally. A given amount of emission will lead to a given amount of temperature increase that will lead to a given amount of smooth incremental sea level rise. However, the geological record for the climate reflects instances where a relatively small change in one element of climate led to abrupt changes in the system as a whole. In other words, pushing global temperatures past certain thresholds could trigger abrupt, unpredictable and potentially irreversible changes that have massively disruptive and large-scale impacts. At that point, even if we do not add any additional CO<sub>2</sub> to the atmosphere, potentially unstoppable processes are set in motion. We can think of this as sudden climate brake and steering failure where the problem and its consequences are no longer something we can control.”**

—Report by the American Association for the Advancement of Science, the world’s largest general scientific society, 2014 <sup>1</sup>

**“I love that smell of the emissions.”**

—Sarah Palin, 2011 <sup>2</sup>

A voice came over the intercom: would the passengers of Flight 3935, scheduled to depart Washington, D.C., for Charleston, South Carolina, kindly collect their carry-on luggage and get off the plane.

They went down the stairs and gathered on the hot tarmac. There they saw something unusual: the wheels of the US Airways jet had sunk into the black pavement as if it were wet cement. The wheels were lodged so deep, in fact, that the truck that came to tow the plane away couldn’t pry it loose. The airline had hoped that without the added weight of the flight’s thirty-five passengers, the aircraft would be light enough to pull. It wasn’t. Someone posted a picture: “Why is my flight cancelled? Because DC is so damn hot that our plane sank 4” into the pavement.” <sup>3</sup>

Eventually, a larger, more powerful vehicle was brought in to tow the plane and this time it worked; the plane finally took off, three hours behind schedule. A spokesperson for the airline blamed the incident on “very unusual temperatures.” <sup>4</sup>

The temperatures in the summer of 2012 were indeed unusually hot. (As they were the year before and the year after.) And it’s no mystery why this has been happening: the profligate burning of fossil fuels, the very thing that US Airways was bound and determined to do despite the inconvenience presented by a melting tarmac. This irony—the fact that the burning of fossil fuels is so radically changing our climate that it is getting in the way of our capacity to burn fossil fuels—did not stop the passengers of Flight 3935 from reembaring and continuing their journeys. Nor was climate change mentioned in any of the major news coverage of the incident.

I am in no position to judge these passengers. All of us who live high consumer lifestyles, wherever we happen to reside, are, metaphorically, passengers on Flight 3935. Faced with a crisis that threatens our survival as a species, our entire culture is continuing to do the very thing that caused the crisis, only with an extra dose of elbow grease behind it. Like the airline bringing in a truck with a more powerful engine to tow that plane, the global economy is upping the ante from conventional sources of fossil fuels to even dirtier and more dangerous versions—bitumen from the Alberta tar sands, oil from deepwater drilling, gas from hydraulic fracturing (fracking), coal from detonated mountains, and so on.

Meanwhile, each supercharged natural disaster produces new ironyladen snapshots of a climate increasingly inhospitable to the very industries most responsible for its warming. Like the 2013 historic floods in Calgary that forced the head offices of the oil companies mining the Alberta tar sands to go dark and send their employees home, while a train carrying flammable petroleum products teetered on the edge of a disintegrating rail bridge. Or the drought that hit the Mississippi River one year earlier, pushing water levels so low that barges loaded with oil and coal were unable to move for days, while they waited for the Army Corps of Engineers to dredge a channel (they had to appropriate funds allocated to rebuild from the previous year's historic flooding along the same waterway). Or the coal-fired power plants in other parts of the country that were temporarily shut down because the waterways that they draw on to cool their machinery were either too hot or too dry (or, in some cases, both).

Living with this kind of cognitive dissonance is simply part of being alive in this jarring moment in history, when a crisis we have been studiously ignoring is hitting us in the face—and yet we are doubling down on the stuff that is causing the crisis in the first place.

I denied climate change for longer than I care to admit. I knew it was happening, sure. Not like Donald Trump and the Tea Partiers going on about how the continued existence of winter proves it's all a hoax. But I stayed pretty hazy on the details and only skimmed most of the news stories, especially the really scary ones. I told myself the science was too complicated and that the environmentalists were dealing with it. And I continued to behave as if there was nothing wrong with the shiny card in my wallet attesting to my “elite” frequent flyer status.

A great many of us engage in this kind of climate change denial. We look for a split second and then we look away. Or we look but then turn it into a joke (“more signs of the Apocalypse!”). Which is another way of looking away.

Or we look but tell ourselves comforting stories about how humans are clever and will come up with a technological miracle that will safely suck the carbon out of the skies or magically turn down the heat of the sun. Which, I was to discover while researching this book, is yet another way of looking away.

Or we look but try to be hyper-rational about it (“dollar for dollar it's more efficient to focus on economic development than climate change, since wealth is the best protection from weather extremes”)—as if having a few more dollars will make much difference when your city is underwater. Which is a way of looking away if you happen to be a policy wonk. Or we look but tell ourselves we are too busy to care

about something so distant and abstract—even though we saw the water in the subways in New York City, and the people on their rooftops in New Orleans, and know that no one is safe, the most vulnerable least of all. And though perfectly understandable, this too is a way of looking away.

Or we look but tell ourselves that all we can do is focus on ourselves. Meditate and shop at farmers' markets and stop driving—but forget trying to actually change the systems that are making the crisis inevitable because that's too much "bad energy" and it will never work. And at first it may appear as if we are looking, because many of these lifestyle changes are indeed part of the solution, but we still have one eye tightly shut.

Or maybe we do look—really look—but then, inevitably, we seem to forget. Remember and then forget again. Climate change is like that; it's hard to keep it in your head for very long. We engage in this odd form of on-again-off-again ecological amnesia for perfectly rational reasons. We deny because we fear that letting in the full reality of this crisis will change everything. And we are right.<sup>5</sup>

We know that if we continue on our current path of allowing emissions to rise year after year, climate change will change everything about our world. Major cities will very likely drown, ancient cultures will be swallowed by the seas, and there is a very high chance that our children will spend a great deal of their lives fleeing and recovering from vicious storms and extreme droughts. And we don't have to do anything to bring about this future. All we have to do is nothing. Just continue to do what we are doing now, whether it's counting on a techno-fix or tending to our gardens or telling ourselves we're unfortunately too busy to deal with it.

All we have to do is *not* react as if this is a full-blown crisis. All we have to do is keep on denying how frightened we actually are. And then, bit by bit, we will have arrived at the place we most fear, the thing from which we have been averting our eyes. No additional effort required.

There are ways of preventing this grim future, or at least making it a lot less dire. But the catch is that these also involve changing everything. For us high consumers, it involves changing how we live, how our economies function, even the stories we tell about our place on earth. The good news is that many of these changes are distinctly un-catastrophic. Many are downright exciting. But I didn't discover this for a long while.

I remember the precise moment when I stopped averting my eyes to the reality of climate change, or at least when I first allowed my eyes to rest there for a good while. It was in Geneva, in April 2009, and I was meeting with Bolivia's ambassador to the World Trade Organization (WTO), who was then a surprisingly young woman named Angélica Navarro Llanos. Bolivia being a poor country with a small international budget, Navarro Llanos had recently taken on the climate portfolio in addition to her trade responsibilities. Over lunch in an empty Chinese restaurant, she explained to me (using chopsticks as props to make a graph of the global emission trajectory) that she saw climate change both as a terrible threat to her people—but also an opportunity.

A threat for the obvious reasons: Bolivia is extraordinarily dependent on glaciers for its drinking and irrigation water and those white-capped mountains that

tower over its capital were turning gray and brown at an alarming rate. The opportunity, Navarro Llanos said, was that since countries like hers had done almost nothing to send emissions soaring, they were in a position to declare themselves “climate creditors,” owed money and technology support from the large emitters to defray the hefty costs of coping with more climate-related disasters, as well as to help them develop on a green energy path.

She had recently given a speech at a United Nations climate conference in which she laid out the case for these kinds of wealth transfers, and she gave me a copy. “Millions of people,” it read, “in small islands, least developed countries, landlocked countries as well as vulnerable communities in Brazil, India and China, and all around the world—are suffering from the effects of a problem to which they did not contribute. . . . If we are to curb emissions in the next decade, we need a massive mobilization larger than any in history. We need a Marshall Plan for the Earth. This plan must mobilize financing and technology transfer on scales never seen before. It must get technology onto the ground in every country to ensure we reduce emissions while raising people’s quality of life. We have only a decade.”<sup>6</sup>

Of course a Marshall Plan for the Earth would be very costly—hundreds of billions if not trillions of dollars (Navarro Llanos was reluctant to name a figure). And one might have thought that the cost alone would make it a nonstarter—after all, this was 2009 and the global financial crisis was in full swing. Yet the grinding logic of austerity—passing on the bankers’ bills to the people in the form of public sector layoffs, school closures, and the like—had not yet been normalized. So rather than making Navarro Llanos’ ideas seem less plausible, the crisis had the opposite effect.

We had all just watched as trillions of dollars were marshaled in a moment when our elites decided to declare a crisis. If the banks were allowed to fail, we were told, the rest of the economy would collapse. It was a matter of collective survival, so the money had to be found. In the process, some rather large fictions at the heart of our economic system were exposed (Need more money? Print some!). A few years earlier, governments took a similar approach to public finances after the September 11 terrorist attacks. In many Western countries, when it came to constructing the security/surveillance state at home and waging war abroad, budgets never seemed to be an issue.

Climate change has never received the crisis treatment from our leaders, despite the fact that it carries the risk of destroying lives on a vastly greater scale than collapsed banks or collapsed buildings. The cuts to our greenhouse gas emissions that scientists tell us are necessary in order to greatly reduce the risk of catastrophe are treated as nothing more than gentle suggestions, actions that can be put off pretty much indefinitely. Clearly, what gets declared a crisis is an expression of power and priorities as much as hard facts. But we need not be spectators in all this: politicians aren’t the only ones with the power to declare a crisis. Mass movements of regular people can declare one too.

Slavery wasn’t a crisis for British and American elites until abolitionism turned it into one. Racial discrimination wasn’t a crisis until the civil rights movement turned it into one. Sex discrimination wasn’t a crisis until feminism

turned it into one. Apartheid wasn't a crisis until the anti-apartheid movement turned it into one.

In the very same way, if enough of us stop looking away and decide that climate change is a crisis worthy of Marshall Plan levels of response, then it will become one, and the political class will have to respond, both by making resources available and by bending the free market rules that have proven so pliable when elite interests are in peril. We occasionally catch glimpses of this potential when a crisis puts climate change at the front of our minds for a while. "Money is no object in this relief effort. Whatever money is needed for it will be spent," declared British prime minister David Cameron—Mr. Austerity himself—when large parts of his country were underwater from historic flooding in February 2014 and the public was enraged that his government was not doing more to help.<sup>7</sup>

Listening to Navarro Llanos describe Bolivia's perspective, I began to understand how climate change—if treated as a true planetary emergency akin to those rising flood waters—could become a galvanizing force for humanity, leaving us all not just safer from extreme weather, but with societies that are safer and fairer in all kinds of other ways as well. The resources required to rapidly move away from fossil fuels and prepare for the coming heavy weather could pull huge swaths of humanity out of poverty, providing services now sorely lacking, from clean water to electricity. This is a vision of the future that goes beyond just surviving or enduring climate change, beyond "mitigating" and "adapting" to it in the grim language of the United Nations. It is a vision in which we collectively use the crisis to leap somewhere that seems, frankly, better than where we are right now.

After that conversation, I found that I no longer feared immersing myself in the scientific reality of the climate threat. I stopped avoiding the articles and the scientific studies and read everything I could find. I also stopped outsourcing the problem to the environmentalists, stopped telling myself this was somebody else's issue, somebody else's job. And through conversations with others in the growing climate justice movement, I began to see all kinds of ways that climate change could become a catalyzing force for positive change—how it could be the best argument progressives have ever had to demand the rebuilding and reviving of local economies; to reclaim our democracies from corrosive corporate influence; to block harmful new free trade deals and rewrite old ones; to invest in starving public infrastructure like mass transit and affordable housing; to take back ownership of essential services like energy and water; to remake our sick agricultural system into something much healthier; to open borders to migrants whose displacement is linked to climate impacts; to finally respect Indigenous land rights—all of which would help to end grotesque levels of inequality within our nations and between them.

And I started to see signs—new coalitions and fresh arguments—hinting at how, if these various connections were more widely understood, the urgency of the climate crisis could form the basis of a powerful mass movement, one that would weave all these seemingly disparate issues into a coherent narrative about how to protect humanity from the ravages of both a savagely unjust economic system and a destabilized climate system. I have written this book because I came to the conclusion that climate action could provide just such a rare catalyst.

## A People's Shock

But I also wrote it because climate change can be a catalyst for a range of very different and far less desirable forms of social, political, and economic transformation.

I have spent the last fifteen years immersed in research about societies undergoing extreme shocks—caused by economic meltdowns, natural disasters, terrorist attacks, and wars. And I have looked deeply into how societies change in these periods of tremendous stress. How these events change the collective sense of what is possible, for better but mostly for worse. As I discussed in my last book, *The Shock Doctrine*, over the past four decades corporate interests have systematically exploited these various forms of crisis to ram through policies that enrich a small elite—by lifting regulations, cutting social spending, and forcing large-scale privatizations of the public sphere. They have also been the excuse for extreme crackdowns on civil liberties and chilling human rights violations.

And there are plenty of signs that climate change will be no exception—that, rather than sparking solutions that have a real chance of preventing catastrophic warming and protecting us from inevitable disasters, the crisis will once again be seized upon to hand over yet more resources to the 1 percent. You can see the early stages of this process already. Communal forests around the world are being turned into privatized tree farms and preserves so their owners can collect something called “carbon credits,” a lucrative scam I’ll explore later. There is a booming trade in “weather futures,” allowing companies and banks to gamble on changes in the weather as if deadly disasters were a game on a Vegas craps table (between 2005 and 2006 the weather derivatives market jumped nearly fivefold, from \$9.7 billion to \$45.2 billion). Global reinsurance companies are making billions in profits, in part by selling new kinds of protection schemes to developing countries that have done almost nothing to create the climate crisis, but whose infrastructure is intensely vulnerable to its impacts.<sup>8</sup>

And in a moment of candor, the weapons giant Raytheon explained, “Expanded business opportunities are likely to arise as consumer behavior and needs change in response to climate change.” Those opportunities include not just more demand for the company’s privatized disaster response services but also “demand for its military products and services as security concerns may arise as results of droughts, floods, and storm events occur as a result of climate change.”<sup>9</sup> This is worth remembering whenever doubts creep in about the urgency of this crisis: the private militias are already mobilizing.

Droughts and floods create all kinds of business opportunities besides a growing demand for men with guns. Between 2008 and 2010, at least 261 patents were filed related to growing “climate-ready” crops—seeds supposedly able to withstand extreme weather conditions; of these patents close to 80 percent were controlled by six agribusiness giants, including Monsanto and Syngenta. Superstorm Sandy, meanwhile, has been a windfall for New

Jersey real estate developers who have received millions for new construction in lightly damaged areas, while it continues to be a nightmare for those living in hard-hit public housing, much as the aftermath of Hurricane Katrina played out in New Orleans.<sup>10</sup>

None of this is surprising. Finding new ways to privatize the commons and profit from disaster is what our current system is built to do; left to its own devices, it is capable of nothing else. The shock doctrine, however, is not the only way societies respond to crises. We have all witnessed this in recent years as the financial meltdown that began on Wall Street in 2008 reverberated around the world. A sudden rise in food prices helped create the conditions for the Arab Spring. Austerity policies have inspired mass movements from Greece to Spain to Chile to the United States to Quebec. Many of us are getting a lot better at standing up to those who would cynically exploit crises to ransack the public sphere. And yet these protests have also shown that saying no is not enough. If opposition movements are to do more than burn bright and then burn out, they will need a comprehensive vision for what should emerge in the place of our failing system, as well as serious political strategies for how to achieve those goals.

Progressives used to know how to do this. There is a rich populist history of winning big victories for social and economic justice in the midst of large-scale crises. These include, most notably, the policies of the New Deal after the market crash of 1929 and the birth of countless social programs after World War II. These policies were so popular with voters that getting them passed into law did not require the kind of authoritarian trickery that I documented in *The Shock Doctrine*. What was essential was building muscular mass movements capable of standing up to those defending a failing status quo, and that demanded a significantly fairer share of the economic pie for everyone. A few of the lasting (though embattled) legacies of these exceptional historical moments include: public health insurance in many countries, old age pensions, subsidized housing, and public funding for the arts.

I am convinced that climate change represents a historic opportunity on an even greater scale. As part of the project of getting our emissions down to the levels many scientists recommend, we once again have the chance to advance policies that dramatically improve lives, close the gap between rich and poor, create huge numbers of good jobs, and reinvigorate democracy from the ground up. Rather than the ultimate expression of the shock doctrine—a frenzy of new resource grabs and repression—climate change can be a People's Shock, a blow from below. It can disperse power into the hands of the many rather than consolidating it in the hands of the few, and radically expand the commons, rather than auctioning it off in pieces. And where right-wing shock doctors exploit emergencies (both real and manufactured) in order to push through policies that make us even more crisis prone, the kinds of transformations discussed in these pages would do the exact opposite: they would get to the root of why we are facing serial crises in the first place, and would leave us with both a more habitable climate than the one we are headed for and a far more just economy than the one we have right now.

But before any of these changes can happen—before we can believe that climate change can change us—we first have to stop looking away.

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“You have been negotiating all my life.” So said Canadian college student Anjali Appadurai, as she stared down the assembled government negotiators at the 2011 United Nations climate conference in Durban, South Africa. She was not exaggerating. The world’s governments have been talking about preventing climate change for more than two decades; they began negotiating the year that Anjali, then twenty-one years old, was born. And yet as she pointed out in her memorable speech on the convention floor, delivered on behalf of all of the assembled young people: “In that time, you’ve failed to meet pledges, you’ve missed targets, and you’ve broken promises.”<sup>11</sup>

In truth, the intergovernmental body entrusted to prevent “dangerous” levels of climate change has not only failed to make progress over its twenty-odd years of work (and more than ninety official negotiation meetings since the agreement was adopted), it has overseen a process of virtually uninterrupted backsliding. Our governments wasted years fudging numbers and squabbling over start dates, perpetually trying to get extensions like undergrads with late term papers.

The catastrophic result of all this obfuscation and procrastination is now undeniable. Preliminary data shows that in 2013, global carbon dioxide emissions were **61 percent** higher than they were in 1990, when negotiations toward a climate treaty began in earnest. As MIT economist John Reilly puts it: “The more we talk about the need to control emissions, the more they are growing.” Indeed the only thing rising faster than our emissions is the output of words pledging to lower them. Meanwhile, the annual U.N. climate summit, which remains the best hope for a political breakthrough on climate action, has started to seem less like a forum for serious negotiation than a very costly and high-carbon group therapy session, a place for the representatives of the most vulnerable countries in the world to vent their grief and rage while low-level representatives of the nations largely responsible for their tragedies stare at their shoes.<sup>12</sup>

This has been the mood ever since the collapse of the much-hyped 2009 U.N. climate summit in Copenhagen. On the last night of that massive gathering, I found myself with a group of climate justice activists, including one of the most prominent campaigners in Britain. Throughout the summit, this young man had been the picture of confidence and composure, briefing dozens of journalists a day on what had gone on during each round of negotiations and what the various emission targets meant in the real world. Despite the challenges, his optimism about the summit’s prospects never flagged. Once it was all over, however, and the pitiful deal was done, he fell apart before our eyes. Sitting in an overlit Italian restaurant, he began to sob uncontrollably. “I really thought Obama understood,” he kept repeating.

I have come to think of that night as the climate movement’s coming of age: it was the moment when the realization truly sank in that no one was coming to save us. The British psychoanalyst and climate specialist Sally Weintrobe describes this as the summit’s “fundamental legacy” –the acute and painful realization that our “leaders are not looking after us . . . we are not cared for at the level of our very survival.”<sup>13</sup> No matter how many times we have been disappointed by the failings



of our politicians, this realization still comes as a blow. It really is the case that we are on our own and any credible source of hope in this crisis will have to come from below.

In Copenhagen, the major polluting governments—including the United States and China—signed a nonbinding agreement pledging to keep temperatures from increasing more than 2 degrees Celsius above where they were before we started powering our economies with coal. (That converts to an increase of 3.6 degrees Fahrenheit.) This well-known target, which supposedly represents the “safe” limit of climate change, has always been a highly political choice that has more to do with minimizing economic disruption than with protecting the greatest number of people. When the 2 degrees target was made official in Copenhagen, there were impassioned objections from many delegates who said the goal amounted to a “death sentence” for some low-lying island states, as well as for large parts of Sub-Saharan Africa. In fact it is a very risky target for all of us: so far, temperatures have increased by just .8 degree Celsius and we are already experiencing many alarming impacts, including the unprecedented melting of the Greenland ice sheet in the summer of 2012 and the acidification of oceans far more rapidly than expected. Allowing temperatures to warm by more than twice that amount will unquestionably have perilous consequences.<sup>14</sup>

In a 2012 report, the World Bank laid out the gamble implied by that target. “As global warming approaches and exceeds 2-degrees Celsius, there is a risk of triggering nonlinear tipping elements. Examples include the disintegration of the West Antarctic ice sheet leading to more rapid sea-level rise, or large-scale Amazon dieback drastically affecting ecosystems, rivers, agriculture, energy production, and livelihoods. This would further add to 21st-century global warming and impact entire continents.”<sup>15</sup> In other words, once we allow temperatures to climb past a certain point, where the mercury stops is not in our control.

But the bigger problem—and the reason Copenhagen caused such great despair—is that because governments did not agree to binding targets, they are free to pretty much ignore their commitments. Which is precisely what is happening. Indeed, emissions are rising so rapidly that unless something radical changes within our economic structure, 2 degrees now looks like a utopian dream. And it’s not just environmentalists who are raising the alarm. The World Bank also warned when it released its report that “we’re on track for a 4° C warmer world [by century’s end] marked by extreme heat waves, declining global food stocks, loss of ecosystems and biodiversity, and life-threatening sea level rise.” And the report cautioned that, “there is also no certainty that adaptation to a 4° C world is possible.” Kevin Anderson, former director (now deputy director) of the Tyndall Centre for Climate Change Research, which has quickly established itself as one of the U.K.’s premier climate research institutions, is even blunter; he says 4 degrees Celsius warming—7.2 degrees Fahrenheit—is “incompatible with any reasonable characterization of an organized, equitable and civilized global community.”<sup>16</sup>

We don’t know exactly what a 4 degrees Celsius world would look like, but even the best-case scenario is likely to be calamitous. Four degrees of warming could raise global sea levels by 1 or possibly even 2 meters by 2100 (and would lock in at least a few additional meters over future centuries). This would drown some island

nations such as the Maldives and Tuvalu, and inundate many coastal areas from Ecuador and Brazil to the Netherlands to much of California and the northeastern United States, as well as huge swaths of South and Southeast Asia. Major cities likely in jeopardy include Boston, New York, greater Los Angeles, Vancouver, London, Mumbai, Hong Kong, and Shanghai.<sup>17</sup>

Meanwhile, brutal heat waves that can kill tens of thousands of people, even in wealthy countries, would become entirely unremarkable summer events on every continent but Antarctica. The heat would also cause staple crops to suffer dramatic yield losses across the globe (it is possible that Indian wheat and U.S. corn could plummet by as much as 60 percent), this at a time when demand will be surging due to population growth and a growing demand for meat. And since crops will be facing not just heat stress but also extreme events such as wide-ranging droughts, flooding, or pest outbreaks, the losses could easily turn out to be more severe than the models have predicted. When you add ruinous hurricanes, raging wildfires, fisheries collapses, widespread disruptions to water supplies, extinctions, and globetrotting diseases to the mix, it indeed becomes difficult to imagine that a peaceful, ordered society could be sustained (that is, where such a thing exists in the first place).<sup>18</sup>

And keep in mind that these are the optimistic scenarios in which warming is more or less stabilized at 4 degrees Celsius and does not trigger tipping points beyond which runaway warming would occur. Based on the latest modeling, it is becoming safer to assume that 4 degrees could bring about a number of extremely dangerous feedback loops—an Arctic that is regularly ice-free in September, for instance, or, according to one recent study, global vegetation that is too saturated to act as a reliable “sink,” leading to more carbon being emitted rather than stored. Once this happens, any hope of predicting impacts pretty much goes out the window. And this process may be starting sooner than anyone predicted. In May 2014, NASA and University of California, Irvine scientists revealed that glacier melt in a section of West Antarctica roughly the size of France now “appears unstoppable.” This likely spells doom for the entire West Antarctic ice sheet, which according to lead study author Eric Rignot “comes with a sea level rise of between three and five metres. Such an event will displace millions of people worldwide.” The disintegration, however, could unfold over centuries and there is still time for emission reductions to slow down the process and prevent the worst.<sup>19</sup>

Much more frightening than any of this is the fact that plenty of mainstream analysts think that on our current emissions trajectory, we are headed for even more than 4 degrees of warming. In 2011, the usually staid International Energy Agency (IEA) issued a report projecting that we are actually on track for 6 degrees Celsius—10.8 degrees Fahrenheit—of warming. And as the IEA’s chief economist put it: “Everybody, even the school children, knows that this will have catastrophic implications for all of us.” (The evidence indicates that 6 degrees of warming is likely to set in motion several major tipping points—not only slower ones such as the aforementioned breakdown of the West Antarctic ice sheet, but possibly more abrupt ones, like massive releases of methane from Arctic permafrost.) The accounting giant PricewaterhouseCoopers has also published a report warning businesses that we are headed for “4° C, or even 6° C” of warming.<sup>20</sup>

These various projections are the equivalent of every alarm in your house going off simultaneously. And then every alarm on your street going off as well, one by one by one. They mean, quite simply, that climate change has become an existential crisis for the human species. The only historical precedent for a crisis of this depth and scale was the Cold War fear that we were heading toward nuclear holocaust, which would have made much of the planet uninhabitable. But that was (and remains) a threat; a slim possibility, should geopolitics spiral out of control. The vast majority of nuclear scientists never told us that we were almost certainly going to put our civilization in peril if we kept going about our daily lives as usual, doing exactly what we were already doing, which is what the climate scientists have been telling us for years.

As the Ohio State University climatologist Lonnie G. Thompson, a world-renowned specialist on glacier melt, explained in 2010, “Climatologists, like other scientists, tend to be a stolid group. We are not given to theatrical rantings about falling skies. Most of us are far more comfortable in our laboratories or gathering data in the field than we are giving interviews to journalists or speaking before Congressional committees. Why then are climatologists speaking out about the dangers of global warming? The answer is that virtually all of us are now convinced that global warming poses a clear and present danger to civilization.”<sup>21</sup>

It doesn't get much clearer than that. And yet rather than responding with alarm and doing everything in our power to change course, large parts of humanity are, quite consciously, continuing down the same road. Only, like the passengers aboard Flight 3935, aided by a more powerful, dirtier engine.

What is wrong with us?

## Really Bad Timing

Many answers to that question have been offered, ranging from the extreme difficulty of getting all the governments in the world to agree on anything, to an absence of real technological solutions, to something deep in our human nature that keeps us from acting in the face of seemingly remote threats, to—more recently—the claim that we have blown it anyway and there is no point in even trying to do much more than enjoy the scenery on the way down.

Some of these explanations are valid, but all are ultimately inadequate. Take the claim that it's just too hard for so many countries to agree on a course of action. It is hard. But many times in the past, the United Nations has helped governments to come together to tackle tough cross-border challenges, from ozone depletion to nuclear proliferation. The deals produced weren't perfect, but they represented real progress. Moreover, during the same years that our governments failed to enact a tough and binding legal architecture requiring emission reductions, supposedly because cooperation was too complex, they managed to create the World Trade Organization—an intricate global system that regulates the flow of goods and services around the planet, under which the rules are clear and violations are harshly penalized.

The assertion that we have been held back by a lack of technological solutions is no more compelling. Power from renewable sources like wind and water predates the use of fossil fuels and is becoming cheaper, more efficient, and easier to store every year. The past two decades have seen an explosion of ingenious zero-waste design, as well as green urban planning. Not only do we have the technical tools to get off fossil fuels, we also have no end of small pockets where these low carbon lifestyles have been tested with tremendous success. And yet the kind of large-scale transition that would give us a collective chance of averting catastrophe eludes us.

Is it just human nature that holds us back then? In fact we humans have shown ourselves willing to collectively sacrifice in the face of threats many times, most famously in the embrace of rationing, victory gardens, and victory bonds during World Wars I and II. Indeed to support fuel conservation during World War II, pleasure driving was virtually eliminated in the U.K., and between 1938 and 1944, use of public transit went up by 87 percent in the U.S. and by 95 percent in Canada. Twenty million U.S. households—representing three fifths of the population—were growing victory gardens in 1943, and their yields accounted for 42 percent of the fresh vegetables consumed that year. Interestingly, all of these activities together dramatically reduce carbon emissions.<sup>22</sup>

Yes, the threat of war seemed immediate and concrete but so too is the threat posed by the climate crisis that has already likely been a substantial contributor to massive disasters in some of the world's major cities. Still, we've gone soft since those days of wartime sacrifice, haven't we? Contemporary humans are too self-centered, too addicted to gratification to live without the full freedom to satisfy our every whim—or so our culture tells us every day. And yet the truth is that we continue to make collective sacrifices in the name of an abstract greater good all the time. We sacrifice our pensions, our hard-won labor rights, our arts and after-school programs. We send our kids to learn in ever more crowded classrooms, led by ever more harried teachers. We accept that we have to pay dramatically more for the destructive energy sources that power our transportation and our lives. We accept that bus and subway fares go up and up while service fails to improve or degenerates. We accept that a public university education should result in a debt that will take half a lifetime to pay off when such a thing was unheard of a generation ago. In Canada, where I live, we are in the midst of accepting that our mail can no longer be delivered to our homes.

The past thirty years have been a steady process of getting less and less in the public sphere. This is all defended in the name of austerity, the current justification for these never-ending demands for collective sacrifice. In the past, other words and phrases, equally abstracted from daily life, have served a similar purpose: balanced budgets, increased efficiency, fostering economic growth.

It seems to me that if humans are capable of sacrificing this much collective benefit in the name of stabilizing an economic system that makes daily life so much more expensive and precarious, then surely humans should be capable of making some important lifestyle changes in the interest of stabilizing the physical systems upon which all of life depends. Especially

because many of the changes that need to be made to dramatically cut emissions would also materially improve the quality of life for the majority of people on the planet—from allowing kids in Beijing to play outside without wearing pollution masks to creating good jobs in clean energy sectors for millions. There seems to be no shortage of both short-term and medium-term incentives to do the right thing for our climate.

Time is tight, to be sure. But we could commit ourselves, tomorrow, to radically cutting our fossil fuel emissions and beginning the shift to zero-carbon sources of energy based on renewable technology, with a full-blown transition underway within the decade. We have the tools to do that. And if we did, the seas would still rise and the storms would still come, but we would stand a much greater chance of preventing truly catastrophic warming. Indeed, entire nations could be saved from the waves. As Pablo Solón, Bolivia's former ambassador to the United Nations, puts it: "If I burned your house the least I can do is welcome you into my house . . . and if I'm burning it right now I should try to stop the fire now."<sup>23</sup>

But we are not stopping the fire. In fact we are dousing it with gasoline. After a rare decline in 2009 due to the financial crisis, global emissions surged by a whopping 5.9 percent in 2010—the largest absolute increase since the Industrial Revolution.<sup>24</sup>

So my mind keeps coming back to the question: what is wrong with us? What is really preventing us from putting out the fire that is threatening to burn down our collective house?

I think the answer is far more simple than many have led us to believe: we have not done the things that are necessary to lower emissions because those things fundamentally conflict with deregulated capitalism, the reigning ideology for the entire period we have been struggling to find a way out of this crisis. We are stuck because the actions that would give us the best chance of averting catastrophe—and would benefit the vast majority—are extremely threatening to an elite minority that has a stranglehold over our economy, our political process, and most of our major media outlets. That problem might not have been insurmountable had it presented itself at another point in our history. But it is our great collective misfortune that the scientific community made its decisive diagnosis of the climate threat at the precise moment when those elites were enjoying more unfettered political, cultural, and intellectual power than at any point since the 1920s. Indeed, governments and scientists began talking seriously about radical cuts to greenhouse gas emissions in 1988—the exact year that marked the dawning of what came to be called "globalization," with the signing of the agreement representing the world's largest bilateral trade relationship between Canada and the United States, later to be expanded into the North American Free Trade Agreement (NAFTA) with the inclusion of Mexico.<sup>25</sup>

When historians look back on the past quarter century of international negotiations, two defining processes will stand out. There will be the climate process: struggling, sputtering, failing utterly to achieve its goals. And there will be the corporate globalization process, zooming from victory to victory: from that first free trade deal to the creation of the World Trade Organization to the mass

privatization of the former Soviet economies to the transformation of large parts of Asia into sprawling free-trade zones to the “structural adjusting” of Africa. There were setbacks to that process, to be sure—for example, popular pushback that stalled trade rounds and free trade deals. But what remained successful were the ideological underpinnings of the entire project, which was never really about trading goods across borders—selling French wine in Brazil, for instance, or U.S. software in China. It was always about using these sweeping deals, as well as a range of other tools, to lock in a global policy framework that provided maximum freedom to multinational corporations to produce their goods as cheaply as possible and sell them with as few regulations as possible—while paying as little in taxes as possible. Granting this corporate wishlist, we were told, would fuel economic growth, which would trickle down to the rest of us, eventually. The trade deals mattered only in so far as they stood in for, and plainly articulated, this far broader agenda.

The three policy pillars of this new era are familiar to us all: privatization of the public sphere, deregulation of the corporate sector, and lower corporate taxation, paid for with cuts to public spending. Much has been written about the real-world costs of these policies—the instability of financial markets, the excesses of the super-rich, and the desperation of the increasingly disposable poor, as well as the failing state of public infrastructure and services. Very little, however, has been written about how market fundamentalism has, from the very first moments, systematically sabotaged our collective response to climate change, a threat that came knocking just as this ideology was reaching its zenith.

The core problem was that the stranglehold that market logic secured over public life in this period made the most direct and obvious climate responses seem politically heretical. How, for instance, could societies invest massively in zero-carbon public services and infrastructure at a time when the public sphere was being systematically dismantled and auctioned off? How could governments heavily regulate, tax, and penalize fossil fuel companies when all such measures were being dismissed as relics of “command and control” communism? And how could the renewable energy sector receive the supports and protections it needed to replace fossil fuels when “protectionism” had been made a dirty word?

A different kind of climate movement would have tried to challenge the extreme ideology that was blocking so much sensible action, joining with other sectors to show how unfettered corporate power posed a grave threat to the habitability of the planet. Instead, large parts of the climate movement wasted precious decades attempting to make the square peg of the climate crisis fit into the round hole of deregulated capitalism, forever touting ways for the problem to be solved by the market itself. (Though it was only years into this project that I discovered the depths of collusion between big polluters and Big Green.)

But blocking strong climate action wasn't the only way that the triumph of market fundamentalism acted to deepen the crisis in this period. Even more directly, the policies that so successfully freed multinational corporations from virtually all constraints also contributed significantly to the underlying cause of global warming—rising greenhouse gas emissions.

The numbers are striking: in the 1990s, as the market integration project ramped up, global emissions were going up an average of 1 percent a year; by the 2000s, with “emerging markets” like China now fully integrated into the world economy, emissions growth had sped up disastrously, with the annual rate of increase reaching 3.4 percent a year for much of the decade. That rapid growth rate continues to this day, interrupted only briefly in 2009 by the world financial crisis.<sup>26</sup>

With hindsight, it’s hard to see how it could have turned out otherwise. The twin signatures of this era have been the mass export of products across vast distances (relentlessly burning carbon all the way), and the import of a uniquely wasteful model of production, consumption, and agriculture to every corner of the world (also based on the profligate burning of fossil fuels). Put differently, the liberation of world markets, a process powered by the liberation of unprecedented amounts of fossil fuels from the earth, has dramatically sped up the same process that is liberating Arctic ice from existence.

As a result, we now find ourselves in a very difficult and slightly ironic position. Because of those decades of hardcore emitting exactly when we were supposed to be cutting back, the things we must do to avoid catastrophic warming are no longer just in conflict with the particular strain of deregulated capitalism that triumphed in the 1980s. They are now in conflict with the fundamental imperative at the heart of our economic model: grow or die.

Once carbon has been emitted into the atmosphere, it sticks around for hundreds of years, some of it even longer, trapping heat. The effects are cumulative, growing more severe with time. And according to emissions specialists like the Tyndall Centre’s Kevin Anderson (as well as others), so much carbon has been allowed to accumulate in the atmosphere over the past two decades that now our only hope of keeping warming below the internationally agreed-upon target of 2 degrees Celsius is for wealthy countries to cut their emissions by somewhere in the neighborhood of 8-10 percent a year.<sup>27</sup> The “free” market simply cannot accomplish this task. Indeed, this level of emission reduction has happened only in the context of economic collapse or deep depressions.

I’ll be delving deeper into those numbers in Chapter 2, but the bottom line is what matters here: our economic system and our planetary system are now at war. Or, more accurately, our economy is at war with many forms of life on earth, including human life. What the climate needs to avoid collapse is a contraction in humanity’s use of resources; what our economic model demands to avoid collapse is unfettered expansion. Only one of these sets of rules can be changed, and it’s not the laws of nature.

Fortunately, it is eminently possible to transform our economy so that it is less resource-intensive, and to do it in ways that are equitable, with the most vulnerable protected and the most responsible bearing the bulk of the burden. Low-carbon sectors of our economies can be encouraged to expand and create jobs, while high-carbon sectors are encouraged to contract. The problem, however, is that this scale of economic planning and management is entirely outside the boundaries of our reigning ideology. The only kind of contraction our current system can manage is a brutal crash, in which the most vulnerable will suffer most of all.

So we are left with a stark choice: allow climate disruption to change everything about our world, or change pretty much everything about our economy to avoid that fate. But we need to be very clear: because of our decades of collective denial, no gradual, incremental options are now available to us. Gentle tweaks to the status quo stopped being a climate option when we supersized the American Dream in the 1990s, and then proceeded to take it global. And it's no longer just radicals who see the need for radical change. In 2012, twenty-one past winners of the prestigious Blue Planet Prize—a group that includes James Hansen, former director of NASA's Goddard Institute for Space Studies, and Gro Harlem Brundtland, former prime minister of Norway—authored a landmark report. It stated that, “In the face of an absolutely unprecedented emergency, society has no choice but to take dramatic action to avert a collapse of civilization. Either we will change our ways and build an entirely new kind of global society, or they will be changed for us.”<sup>28</sup>

That's tough for a lot of people in important positions to accept, since it challenges something that might be even more powerful than capitalism, and that is the fetish of centrism—of reasonableness, seriousness, splitting the difference, and generally not getting overly excited about anything. This is the habit of thought that truly rules our era, far more among the liberals who concern themselves with matters of climate policy than among conservatives, many of whom simply deny the existence of the crisis. Climate change presents a profound challenge to this cautious centrism because half measures won't cut it: “all of the above energy” programs, as U.S. President Barack Obama describes his approach, has about as much chance of success as an all of the above diet, and the firm deadlines imposed by science require that we get very worked up indeed.

By posing climate change as a battle between capitalism and the planet, I am not saying anything that we don't already know. The battle is already under way, but right now capitalism is winning hands down. It wins every time the need for economic growth is used as the excuse for putting off climate action yet again, or for breaking emission reduction commitments already made. It wins when Greeks are told that their only path out of economic crisis is to open up their beautiful seas to high-risk oil and gas drilling. It wins when Canadians are told our only hope of not ending up like Greece is to allow our boreal forests to be flayed so we can access the semisolid bitumen from the Alberta tar sands. It wins when a park in Istanbul is slotted for demolition to make way for yet another shopping mall. It wins when parents in Beijing are told that sending their wheezing kids to school in pollution masks decorated to look like cute cartoon characters is an acceptable price for economic progress. It wins every time we accept that we have only bad choices available to us: austerity or extraction, poisoning or poverty.

The challenge, then, is not simply that we need to spend a lot of money and change a lot of policies; it's that we need to think differently, radically differently, for those changes to be remotely possible. Right now, the triumph of market logic, with its ethos of domination and fierce competition, is paralyzing almost all serious efforts to respond to climate change. Cutthroat competition between nations has deadlocked U.N. climate negotiations for decades: rich countries dig in their heels and declare that they won't cut emissions and risk losing their



vaulted position in the global hierarchy; poorer countries declare that they won't give up their right to pollute as much as rich countries did on their way to wealth, even if that means deepening a disaster that hurts the poor most of all. For any of this to change, a worldview will need to rise to the fore that sees nature, other nations, and our own neighbors not as adversaries, but rather as partners in a grand project of mutual reinvention.

That's a big ask. But it gets bigger. Because of our endless delays, we also have to pull off this massive transformation without delay. The International Energy Agency warns that if we do not get our emissions under control by a rather terrifying 2017, our fossil fuel economy will "lock-in" extremely dangerous warming. "The energy-related infrastructure then in place will generate all the CO<sub>2</sub> emissions allowed" in our carbon budget for limiting warming to 2 degrees Celsius— "leaving no room for additional power plants, factories and other infrastructure unless they are zero-carbon, which would be extremely costly." This assumes, probably accurately, that governments would be unwilling to force the closure of still-profitable power plants and factories. As Fatih Birol, the IEA's chief economist, bluntly put it: "The door to reach two degrees is about to close. In 2017 it will be closed forever." In short, we have reached what some activists have started calling "Decade Zero" of the climate crisis: we either change now or we lose our chance.<sup>29</sup>

All this means that the usual free market assurances—A techno-fix is around the corner! Dirty development is just a phase on the way to a clean environment, look at nineteenth-century London!—simply don't add up. We don't have a century to spare for China and India to move past their Dickensian phases. Because of our lost decades, it is time to turn this around now. Is it possible? Absolutely. Is it possible without challenging the fundamental logic of deregulated capitalism? Not a chance.

One of the people I met on this journey and who you will meet in these pages is Henry Red Cloud, a Lakota educator and entrepreneur who trains young Native people to become solar engineers. He tells his students that there are times when we must accept small steps forward—and there are other times "when you need to run like a buffalo."<sup>30</sup> Now is one of those times when we must run.

## Power, Not Just Energy

I was struck recently by a mea culpa of sorts, written by Gary Stix, a senior editor of *Scientific American*. Back in 2006, he edited a special issue on responses to climate change and, like most such efforts, the articles were narrowly focused on showcasing exciting low-carbon technologies. But in 2012 Stix wrote that he had overlooked a much larger and more important part of the story—the need to create the social and political context in which these technological shifts stand a chance of displacing the all too profitable status quo. "If we are ever to cope with climate change in any fundamental way, radical solutions on the social side are where we must focus, though. The relative efficiency of the next generation of solar cells is trivial by comparison."<sup>31</sup>

This book is about those radical changes on the social side, as well as on the political, economic, and cultural sides. What concerns me is less the mechanics of the transition—the shift from brown to green energy, from sole-rider cars to mass transit, from sprawling exurbs to dense and walkable cities—than the power and ideological roadblocks that have so far prevented any of these long understood solutions from taking hold on anything close to the scale required.

It seems to me that our problem has a lot less to do with the mechanics of solar power than the politics of human power—specifically whether there can be a shift in who wields it, a shift away from corporations and toward communities, which in turn depends on whether or not the great many people who are getting a rotten deal under our current system can build a determined and diverse enough social force to change the balance of power. I have also come to understand, over the course of researching this book, that the shift will require rethinking the very nature of humanity's power—our right to extract ever more without facing consequences, our capacity to bend complex natural systems to our will. This is a shift that challenges not only capitalism, but also the building blocks of materialism that preceded modern capitalism, a mentality some call “extractivism.”

Because, underneath all of this is the real truth we have been avoiding: climate change isn't an “issue” to add to the list of things to worry about, next to health care and taxes. It is a civilizational wake-up call. A powerful message—spoken in the language of fires, floods, droughts, and extinctions—telling us that we need an entirely new economic model and a new way of sharing this planet. Telling us that we need to evolve.

## Coming Out of Denial

Some say there is no time for this transformation; the crisis is too pressing and the clock is ticking. I agree that it would be reckless to claim that the only solution to this crisis is to revolutionize our economy and revamp our worldview from the bottom up—and anything short of that is not worth doing. There are all kinds of measures that would lower emissions substantively that could and should be done right now. But we aren't taking those measures, are we? The reason is that by failing to fight these big battles that stand to shift our ideological direction and change the balance of who holds power in our societies, a context has been slowly created in which any muscular response to climate change seems politically impossible, especially during times of economic crisis (which lately seems to be all the time).

So this book proposes a different strategy: think big, go deep, and move the ideological pole far away from the stifling market fundamentalism that has become the greatest enemy to planetary health. If we can shift the cultural context even a little, then there will be some breathing room for those sensible reformist policies that will at least get the atmospheric carbon numbers moving in the right direction. And winning is contagious so, who knows? Maybe within a few years, some of the ideas highlighted in these pages that sound impossibly radical today—like a basic income for all, or a rewriting of trade law, or real recognition of the rights of Indigenous

people to protect huge parts of the world from polluting extraction—will start to seem reasonable, even essential.

For a quarter of a century, we have tried the approach of polite incremental change, attempting to bend the physical needs of the planet to our economic model's need for constant growth and new profit-making opportunities. The results have been disastrous, leaving us all in a great deal more danger than when the experiment began.

There are, of course, no guarantees that a more systemic approach will be any more successful—though there are, as will be explored later on, historical precedents that are grounds for hope. The truth is that this is the hardest book I have ever written, precisely because the research has led me to search out such radical responses. I have no doubt of their necessity, but I question their political feasibility every day, especially given that climate change puts us on such a tight and unforgiving deadline.

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It's been a harder book to write for personal reasons too.

What gets me most are not the scary scientific studies about melting glaciers, the ones I used to avoid. It's the books I read to my two-year-old. *Have You Ever Seen a Moose?* is one of his favorites. It's about a bunch of kids that really, really, really want to see a moose. They search high and low—through a forest, a swamp, in brambly bushes and up a mountain, for “a long legged, bulgy nosed, branchy antlered moose.” The joke is that there are moose hiding on each page. In the end, the animals all come out of hiding and the ecstatic kids proclaim: “We've never ever seen so many moose!”

On about the seventy-fifth reading, it suddenly hit me: he might never see a moose. I tried to hold it together. I went back to my computer and began to write about my time in northern Alberta, tar sands country, where members of the Beaver Lake Cree Nation told me about how the moose had changed—one woman described killing a moose on a hunting trip only to find that the flesh had already turned green. I heard a lot about strange tumors too, which locals assumed had to do with the animals drinking water contaminated by tar sands toxins. But mostly I heard about how the moose were simply gone.

And not just in Alberta. “Rapid Climate Changes Turn North Woods into Moose Graveyard,” reads a May 2012 headline in *Scientific American*. A year and a half later, *The New York Times* was reporting that one of Minnesota's two moose populations had declined from four thousand in the 1990s to just one hundred today.<sup>32</sup>

Will he ever see a moose?

Then, the other day, I was slain by a miniature board book called *Snuggle Wuggle*. It involves different animals cuddling, with each posture given a ridiculously silly name: “How does a bat hug?” it asks. “Topsy turvy, topsy turvy.” For some reason my son reliably cracks up at this page. I explain that it means upside down, because that's the way bats sleep. But all I could think about was the report of some 100,000 dead and dying bats raining down from the sky in the midst of record-breaking heat across part of Queensland, Australia. Whole colonies devastated.<sup>33</sup>

Will he ever see a bat?

I knew I was in trouble when the other day I found myself bargaining with starfish. Red and purple ones are ubiquitous on the rocky coast of British Columbia where my parents live, where my son was born, and where I have spent about half of my adult life. They are always the biggest kid pleasers, because you can gently pick one up and give it a really good look. “This is the best day of my life!” my seven-year-old niece Miriam, visiting from Chicago, proclaimed after a long afternoon spent in the tide pools.

But in the fall of 2013, stories began to appear about a strange wasting disease that was causing starfish along the Pacific Coast to die by the tens of thousands. Termed the “sea star wasting syndrome,” multiple species were disintegrating alive, their vibrant bodies melting into distorted globs, with legs falling off and bodies caving in. Scientists were mystified.<sup>34</sup>

As I read these stories, I caught myself praying for the invertebrates to hang in for just one more year—long enough for my son to be amazed by them. Then I doubted myself: maybe it’s better if he never sees a starfish at all—certainly not like this . . . .

When fear like that used to creep through my armor of climate change denial, I would do my utmost to stuff it away, change the channel, click past it. Now I try to feel it. It seems to me that I owe it to my son, just as we all owe it to ourselves and one another.

But what should we do with this fear that comes from living on a planet that is dying, made less alive every day? First, accept that it won’t go away. That it is a fully rational response to the unbearable reality that we are living in a dying world, a world that a great many of us are helping to kill, by doing things like making tea and driving to the grocery store and yes, okay, having kids.

Next, use it. Fear is a survival response. Fear makes us run, it makes us leap, it can make us act superhuman. But we need somewhere to run *to*. Without that, the fear is only paralyzing. So the real trick, the only hope, really, is to allow the terror of an unlivable future to be balanced and soothed by the prospect of building something much better than many of us have previously dared hope.

Yes, there will be things we will lose, luxuries some of us will have to give up, whole industries that will disappear. And it’s too late to stop climate change from coming; it is already here, and increasingly brutal disasters are headed our way no matter what we do. But it’s not too late to avert the worst, and there is still time to change ourselves so that we are far less brutal to one another when those disasters strike. And that, it seems to me, is worth a great deal.

Because the thing about a crisis this big, this all-encompassing, is that it changes everything. It changes what we can do, what we can hope for, what we can demand from ourselves and our leaders. It means there is a whole lot of stuff that we have been told is inevitable that simply cannot stand. And it means that a whole lot of stuff we have been told is impossible has to start happening right away.

Can we pull it off? All I know is that nothing is inevitable. Nothing except that climate change changes everything. And for a very brief time, the nature of that change is still up to us.

## Introduction endnotes:

1. Mario Malina et al., "What We Know: The Reality, Risks and Response to Climate Change," AAAS Climate Science Panel, American Association for the Advancement of Science, 2014, pp. 15-16.
2. "Sarah Palin Rolls Out at Rolling Thunder Motorcycle Ride," Fox News, May 29, 2011.
3. Martin Weil, "US Airways Plane Gets Stuck in 'Soft Spot' on Pavement at Reagan National," *Washington Post*, July 7, 2012; "Why Is My Flight Cancelled?" Imgur, <http://imgur.com>.
4. Weil, "US Airways Plane Gets Stuck in 'Soft Spot' on Pavement at Reagan National."
5. For important sociological and psychological perspectives on the everyday denial of climate change, see: Kari Marie Norgaard, *Living in Denial: Climate Change, Emotions, and Everyday Life* (Cambridge, MA: MIT Press, 2011); Rosemary Randall, "Loss and Climate Change: The Cost of Parallel Narratives," *Ecopsychology* 1.3 (2009): 118-29; and the essays in Sally Weintrobe, ed., *Engaging with Climate Change* (East Sussex: Routledge, 2013).
6. Angelica Navarro Llanos, "Climate Debt: The Basis of a Fair and Effective Solution to Climate Change," presentation to Technical Briefing on Historical Responsibility, Ad Hoc Working Group on Long-term Cooperative Action, United Nations Framework Convention on Climate Change, Bonn, Germany, June 4, 2009.
7. "British PM Warns of Worsening Floods Crisis," Agence France-Presse, February 11, 2014.
8. "Exponential Growth in Weather Risk Management Contracts," Weather Risk Management Association, press release, June 2006; Eric Reguly, "No Climate-Change Deniers to Be Found in the Reinsurance Business," *Globe and Mail*, November 28, 2013.
9. "Investor CDP 2012 Information Request: Raytheon Company," Carbon Disclosure Project, 2012, <https://www.cdp.net>.
10. "Who Will Control the Green Economy?" ETC Group, 2011, p. 23; Chris Glorioso, "Sandy Funds Went to NJ Town with Little Storm Damage," NBC News, February 2, 2014.
11. "'Get It Done: Urging Climate Justice, Youth Delegate Anjali Appadurai Mic-Checks UN Summit," Democracy Now!, December 9, 2011.
12. Corinne Le Quere et al., "Global Carbon Budget 2013," *Earth System Science Data* 6 (2014): 253; "Greenhouse Gases Rise by Record Amount," Associated Press, November 3, 2011.
13. Sally Weintrobe, "The Difficult Problem of Anxiety in Thinking About Climate Change," in *Engaging with Climate Change*, ed. Sally Weintrobe (East Sussex: Routledge, 2013). 43.
14. For critical scholarship on the history and politics of the 2 degree target, see: Joni Seager, "Death By Degrees: Taking a Feminist Hard Look at the 2 Degrees Climate Policy," *Kvinder, Køn og Forskning* (Denmark) 18 (2009): 11-22; Christopher Shaw, "Choosing a Dangerous Limit for Climate Change: An Investigation into How the Decision Making Process Is Constructed in Public Discourses," PhD thesis, University of Sussex, 2011, available at <http://www.notar.gets.org.uk>; Christopher Shaw, "Choosing a Dangerous Limit for Climate Change: Public Representations of the Decision Making Process," *Global Environmental Change* 23 (2013): 563-571. COPENHAGEN: Copenhagen Accord, United Nations Framework Convention on Climate Change, December 18, 2009, p. 1; "DEATH SENTENCE" : "CJN CMP Agenda Item 5 Intervention," speech delivered by activist Sylvia Wachira at Copenhagen climate conference, Climate Justice Now!, December 10, 2009, <http://www.climate-justice-now.org>; GREENLAND: J. E. Box et al., "Greenland Ice Sheet," Arctic Report Card 2012, National Oceanic and Atmospheric Administration, January 14, 2013; ACIDIFICATION: Barbel Honisch et al., "The Geological Record of Ocean Acidification," *Science* 335 (2012): 1058-1063; Adrienne J. Sutton et al., "Natural Variability and Anthropogenic Change in Equatorial Pacific Surface Ocean  $pCO_2$  and pH," *Global Biogeochemical Cycles* 28 (2014): 131-145; PERILOUS IMPACTS: James Hansen et al., "Assessing 'Dangerous Climate Change': Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature," *PLOS ONE* 8 (2013): e81648.
15. "Climate Change Report Warns of Dramatically Warmer World This Century," World Bank, press release, November 18, 2012.
16. *Ibid.*; Hans Joachim Schellnhuber et al., "Turn Down the Heat: Why a 4° C Warmer World Must Be Avoided," A Report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics, November 2012, p. xviii; Kevin Anderson, "Climate Change Going Beyond Dangerous-Brutal Numbers and Tenuous Hope," *Development Dialogue* no. 61, September 2012, p. 29.
17. For general overviews synthesizing scientific research on the likely impacts of a 4 degrees C world, refer to Schellnhuber et al., "Turn Down the Heat," as well as the special theme issue entitled "Four Degrees and Beyond: the Potential for a Global Temperature Increase of Four Degrees and its Implications," compiled and edited by Mark G. New et al., *Philosophical Transactions of The Royal Society A* 369 (2011): 1-241. In 2013, the World Bank released a follow up report exploring the regional impacts of a 4 degree temperature rise, with a focus on Africa and Asia: Hans Joachim Schellnhuber et al., "Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience," A Report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics, June 2013. Even for the most emissionsintensive scenarios that could lead to 4 degrees of warming, IPCC global sea level rise projections are lower than those cited here, but many experts regard them as too conservative. For examples of research informing this passage, see

Schellnhuber et al., “Turn Down the Heat,” p. 29; Anders Levermann et al., “The Multimillennial Sea-Level Commitment of Global Warming,” *Proceedings of the National Academy of Sciences* 110 (2013): 13748; Benjamin P. Horton et al., “Expert Assessment of Sea-level Rise by AD 2100 and AD 2300,” *Quaternary Science Reviews* 84 (2014): 1–6. For more information about the vulnerability of small island nations and coastal areas of Latin America and South and Southeast Asia to sea level rise under “business as usual” and other emissions scenarios (including more optimistic ones), refer to the Working Group II contributions to the 4th and 5th Assessment Reports of the IPCC, both available at <http://www.ipcc.ch>. See chapters 10, 13, and 16 of M.L. Perry et al., ed., *Climate Change 2007: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2007); and chapters 24, 27, and 29 of V.R. Barros et al., ed., *Climate Change 2014: Impacts, Adaptation, and Vulnerability, Part B: Regional Aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press, 2014). On California and the northeastern United States, see Matthew Heberger et al., “Potential Impacts of Increased Coastal Flooding in California Due to Sea-Level Rise,” *ClimaticChange* 109, Issue 1 Supplement (2011): 229–249; and Asbury H. Sallenger Jr., Kara S. Doran, and Peter A. Howd, “Hotspot of Accelerated Sea-Level Rise on the Atlantic Coast of North America,” *Nature Climate Change* 2 (2012): 884–888. For a recent analysis of major cities that may be particularly threatened by sea level rise, see: Stephane Hallegatte et al., “Future Flood Losses in Major Coastal Cities,” *Nature Climate Change* 3 (2013): 802–806.

18. For an overview of regional temperature increases associated with a global rise of 4 degrees C or more, see: M.G. Sanderson, D.L. Hemming and R.A. Betts, “Regional Temperature and Precipitation Changes Under High-end ( $\geq 4^\circ$  C) Global Warming,” *Philosophical Transactions of the Royal Society A* 369 (2011): 85–98. See also: “Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia,” Committee on Stabilization Targets for Atmospheric Greenhouse Gas Concentrations, National Research Council, National Academy of Sciences, 2011, p. 31; Schellnhuber et al., “Turn Down the Heat,” pp. 37–41. TENS OF THOUSANDS: Jean-Marie Robine et al., “Death Toll Exceeded 70,000 in Europe During the Summer of 2003,” *Comptes Rendus Biologies* 331 (2008): 171–78; CROP LOSSES: “Climate Stabilization Targets,” National Academy of Sciences, pp. 160–63.

19. ICE -FREE ARCTIC: *Ibid.*, pp. 132–36. VEGETATION: Andrew D. Friend et al., “Carbon Residence Time Dominates Uncertainty in Terrestrial Vegetation Responses to Future Climate and Atmospheric CO<sub>2</sub>,” *Proceedings of the National Academy of Sciences* 111 (2014): 3280; “4 Degree Temperature Rise Will End Vegetation ‘Carbon Sink,’ ” University of Cambridge, press release, December 17, 2013; WEST ANTARCTICA STUDY: E. Rignot et al., “Widespread, Rapid Grounding Line Retreat of Pine Island, Thwaites, Smith, and Kohler Glaciers, West Antarctica, from 1992 to 2011,” *Geophysical Research Letters* 41 (2014): 3502–3509; “APPEARS UNSTOPPABLE” : “West Antarctic Glacier Loss Appears Unstoppable,” Jet Propulsion Laboratory, NASA, press release, May 12, 2014; “DISPLACE MILLIONS” AND STILL TIME: Eric Rignot, “Global Warming: It’s a Point of No Return in West Antarctica. What Happens Next?” *Observer*, May 17, 2014.

20. “World Energy Outlook 2011,” International Energy Agency, 2011, p. 40; “World Energy Outlook 2011” (video), Carnegie Endowment for International Peace, November 28, 2011; Timothy M. Lenton et al., “Tipping Elements in the Earth’s Climate System,” *Proceedings of the National Academy of Sciences* 105 (2008): 1788; “Too Late for Two Degrees?” Low Carbon Economy Index 2012, PricewaterhouseCoopers, November 2012, p. 1.

21. Lonnie G. Thompson, “Climate Change: The Evidence and Our Options,” *The Behavior Analyst* 33 (2010): 153.

22. In the U.S., Britain, and Canada, terms for “victory gardens” and “victory bonds” differed between countries and from World War I to World War II; other terms used included “war gardens” and “defense bonds,” for example. Ina Zweiniger-Bargielowska, *Austerity in Britain: Rationing, Controls, and Consumption, 1939–1955* (Oxford: Oxford University Press, 2000), 54–55; Amy Bentley, *Eating for Victory: Food Rationing and the Politics of Domesticity* (Chicago: University of Illinois Press, 1998), 138–39; Franklin D. Roosevelt, “Statement Encouraging Victory Gardens,” April 1, 1944, The American Presidency Project, <http://www.presidency.ucsb.edu>.

23. Pablo Solón, “Climate Change: We Need to Guarantee the Right to Not Migrate,” Focus on the Global South, <http://focusweb.org>.

24. Glen P. Peters et al., “Rapid Growth in CO<sub>2</sub> Emissions After the 2008–2009 Global Financial Crisis,” *Nature Climate Change* 2 (2012): 2. 25. Spencer Weart, *The Discovery of Global Warming* (Cambridge, MA: Harvard University Press, 2008), 149.

26. Corrine Le Quééré et al., “Trends in the Sources and Sinks of Carbon Dioxide,” *Nature Geoscience* 2 (2009): 831, as cited in Andreas Malm, “China as Chimney of the World: The Fossil Capital Hypothesis,” *Organization & Environment* 25 (2012): 146; Glen P. Peters et al., “Rapid Growth in CO<sub>2</sub> Emissions After the 2008–2009 Global Financial Crisis,” *Nature Climate Change* 2 (2012): 2.

27. Kevin Anderson and Alice Bows, “Beyond ‘Dangerous’ Climate Change: Emission Scenarios for a New World,” *Philosophical Transactions of the Royal Society A* 369 (2011): 35; Kevin Anderson, “EU 2030 Decarbonisation Targets and UK Carbon Budgets: Why So Little Science?” Kevin Anderson.info, June 14, 2013, <http://kevinanderson.info>.

28. Gro Harlem Brundtland et al., “Environment and Development Challenges: The Imperative to Act,” joint paper by the Blue Planet Prize laureates, The Asahi Glass Foundation, February 20, 2012, p. 7.

29. “World Energy Outlook 2011,” IEA, p. 40; James Herron, “Energy Agency Warns Governments to Take Action Against Global Warming,” *Wall Street Journal*, November 10, 2011.

30. Personal interview with Henry Red Cloud, June 22, 2011.

31. Gary Stix, "Effective World Government Will Be Needed to Stave Off Climate Catastrophe," *Scientific American*, March 17, 2012.
32. Daniel Cusick, "Rapid Climate Changes Turn North Woods into Moose Graveyard," *Scientific American*, May 18, 2012; Jim Robbins, "Moose Die-Off Alarms Scientists," *New York Times*, October 14, 2013.
33. Josh Bavas, "About 100,000 Bats Dead After Heatwave in Southern Queensland," ABC News (Australia), January 8, 2014.
34. Darryl Fears, "Sea Stars Are Wasting Away in Larger Numbers on a Wider Scale in Two Oceans," *Washington Post*, November 22, 2013; Amanda Stupi, "What We Know—And Don't Know—About the Sea Star Die-Off," KQED, March 7, 2014.