The Uninhabitable Earth

INTRODUCTION

BRIEF BIOGRAPHY OF DAVID WALLACE-WELLS

David Wallace-Wells is a journalist and deputy editor of *New York* magazine. His work as a journalist is largely focused on the climate crisis and the near future of science and technology, especially as they relate to global warming. He was a 2019 New America Foundation National Fellow, and his debut work of book-length nonfiction, *The Uninhabitable Earth: Life After Warming*, was a #1 *New York Times* bestseller and a finalist for the PEN/E.O. Wilson Literary Science Writing Award.

HISTORICAL CONTEXT

The Uninhabitable Earth is a book both tied to history and unbound from it. Wallace-Wells swings from the Earth's past—12,000 years ago, when humans first began farming and cultivating lands—to its future. He looks as far ahead as 2100 as he offers data-driven, climatologist-backed projections of what the Earth will look like at the end of the century if climate change continues to ravage the planet at its current rate. Along the way, Wallace-Wells closely examines many major record-setting weather events, such as 1988's Hurricane Mitch, 2005's Hurricane Katrina, and 2017's Thomas Fire in Southern California. By examining these massive natural disasters decade by decade, Wallace-Wells charts the rapidly worsening effects of warming on everyday life. While it may seem that a certain storm, like 2017's Hurricane Harvey, is a once-in-a-lifetime event, the reality is that the globe is warmer right now than it has been at any point in all of human history—and it's only getting hotter. Just as climate change's many cascades threaten to multiply and compound as they wash away the infrastructure of our society on any level, Wallace-Wells offers a barrage of data that offers an unflinching and terrifying look at how industrialization and the idea of the Anthropocene, or an era of human domination, has forever changed the course of our planet's history.

RELATED LITERARY WORKS

Throughout *The Uninhabitable Earth*, David Wallace-Wells engages with several seminal, important books by other journalists as well as scientists and climatologists. Among the books he mentions are Naomi Klein's *The Shock Doctrine: The Rise of Disaster Capitalism* and *This Changes Everything: Capitalism vs. the Climate*, two books about how climate change stands to affect our global economy (and vice versa). He also cites the work of famed biologist E.O. Wilson, most notably Wilson's *Half-Earth: Our Planet's Fight for Life*, a book that outlines a warming scenario in which the southern hemisphere (and parts of the northern one, too) become uninhabitable, forcing humanity to migrate to and sequester themselves on small, habitable parts of the planet's far north. Wallace-Wells also draws quotations from non-scientific works, such as the novelist Amitav Ghosh's *The Great Derangement*, Joan Didion's essay "Los Angeles Notebook" from her book *Slouching Towards Bethlehem*, and Upton Sinclair's cautionary fable *The Jungle*.

KEY FACTS

- **Full Title:** *The Uninhabitable Earth: Life After Warming*
- **When Written:** 2017-2018
- **Where Written:** New York, NY
- **When Published:** 2019
- **Literary Period:** Contemporary
- **Genre:** Nonfiction, Science Writing, Climate Studies
- **Protagonist/Antagonist**: Though *The Uninhabitable Earth*, as a nonfiction book, doesn't have a traditional literary narrative structure, humanity is arguably the dual protagonist and antagonist of the book.
- **Point of View:** First Person

EXTRA CREDIT

Misleading Bees. *The Uninhabitable Earth*'s spare, plain cover features only a single image: a dead bee. In the book, Wallace-Wells calls attention to recent panics over mass bee death, or colony collapse disorder—but he reframes the panic as another way for humanity to wring its hands over a red herring rather than take decisive action and deal directly with the larger effects of climate change.

PLOT SUMMARY

In *The Uninhabitable Earth: Life After Warming*, author David Wallace-Wells draws on climate data, reports form the United Nations' Intergovernmental Panel on Climate Change, and conversations and interviews with politicians, scientists, climatologists, and everyday people to craft a portrait of what our rapidly warming Earth will soon begin to look like. The book begins with a section called "**Cascades**," in which Wallace-Wells asserts that climate change is "much worse than you think." The book charts the course the Earth is currently set on—four degrees Celsius in warming by the year 2100—and outlines the irreparable damages such an increase in temperature would do to the planet and all things that call it home. The earth has already warmed one degree Celsius, and already frequent

Category 5 hurricanes, devastating wildfires and tornadoes, shifting climate maps, and migrating tropical disease are a normalized part of daily life. If humanity stays the course, prioritizing economic growth (and the unending carbon emissions needed to keep the global economy running,) the "cascading violence" of warming will trigger inescapable feedback loops of devastation from which humanity may never be able to recover.

In the book's second section, "Elements of Chaos," Wallace-Wells devotes one chapter to each of these cascades, or climate systems, in order to show how while they may seem distinct and independent from one another at first, each wildfire, hurricane, and microplastic leaked into the atmosphere feed one another's viciousness. By exploring phenomena like the albedo effect and examining how natural disasters, refugee crises, psychological trauma, and food shortages promise to define humanity's future, Wallace-Wells suggests that humanity will need to come up with a many-armed solution to climate change that addresses its many manifestations at once.

In the book's third section, "The Climate Kaleidoscope," Wallace-Wells examines the social, political, economic, and psychological effects of life under climate change. He examines humanity's complicated relationship with the idea of warming, suggesting that we love consuming apocalyptic stories in our media because it helps us to envision the apocalypse as something sudden and beyond our control—when really, climate change is entirely humanity's doing, and thus entirely humanity's responsibility to fight back against. Examining the effects of neoliberal economics, the halting of nuclear power solutions, and climate denialism in the forms of "eco-nihilism" and "climate despair," Wallace Wells suggests that in order to mount an offensive against climate change's many cascades, humanity must first resist the impulse to "crumbl[e] collectively in despair."

In the book's final section, "The Anthropic Principle," Wallace-Wells considers the Fermi paradox: if the universe is so big, why hasn't humanity located any other intelligent life forms? The idea that humanity is alone in the universe is perhaps a narcissistic point of view, but Wallace-Wells offers a counterpoint to that characterization. He suggests that the narrow set of circumstances that have allowed human life to thrive on Earth is a gift that shouldn't be taken for granted. Civilizations could have sprung up on Earth alone thousands of times before—and been erased or annihilated themselves each time. Wallace-Wells suggests that humanity should feel empowered by its singularity—and that we should all commit to doing whatever it takes to protect our one precious "Pale Blue Dot." We have only one Earth, and only one chance to save it.

In a brief afterword written to accompany the book's paperback edition, Wallace-Wells charts his own journey since the book's publication. In just the year since the book's initial publication, carbon emissions have only worsened. Yet Wallace-Wells asserts that he is still perhaps naively optimistic about humanity's capacity to choose hope, collective action, and a reinvigorated, recommitted stewardship of the Earth over despair and inaction.

CHARACTERS

MAJOR CHARACTERS

David Wallace-Wells – David Wallace-Wells is the author of the 2019 book *The Uninhabitable Earth: Life After Warming*. A journalist who published an essay called "The Uninhabitable Earth" to great acclaim in 2017, Wallace-Wells expanded the piece into a book-length investigation of how human industry has greatly hastened the Earth's warming patterns. Throughout the book, he narrates climate change's ravages and "**cascades**," or interconnected systems and feedback loops. However, Wallace-Wells is a self-described optimist who believes that, in spite of the bleak forecast ahead, there are still clear, actionable steps humanity can take in order to protect itself from the worst warming has to offer. Throughout the book, Wallace-Wells adopts a direct and uncompromising tone. In spite of his belief that there's still hope for combating climate change, he is aware that global warming is already worse than most people are willing to acknowledge. With his data-driven approach, Wallace-Wells paints a portrait of what will become not just of planet Earth, but of its human, animal, and plant inhabitants, at several different degrees of warming. Each degree Celsius warmer the planet grows threatens life on Earth more and more exponentially—and yet Wallace-Wells unflinchingly lays out exactly what will be lost, in some cases forever, at each stage of warming. Even after invoking images of mass exoduses of refugees from the world's most vulnerable countries, raging droughts consuming the planet's last remaining arable land, and natural disasters like storms and fires incurring mass damages that will cost more to repair than there is currently wealth in the world today, Wallace-Wells characterizes himself as someone with great hope that humanity will pursue collective action and curb the ravages of warming. Despair, Wallace-Wells asserts, only leads to inaction and inertia, thus sealing humanity's fate to fade into nothingness.

Thomas Malthus – Thomas Malthus was an economist born in the 18th century who predicted that long-term economic growth would be impossible in the face of long-term population growth. Malthus suggested people should reproduce less in order to ensure that there would be enough resources to go around. His controversial predictions have long been considered extreme and bleak, but given the rate of warming on Earth today, many climatologists now find themselves wondering about Earth's "carrying capacity," or just how much larger of a population the planet can realistically support.

MINOR CHARACTERS

David Buckel – David Buckel was an environmental activist who, in 2018, committed a protest suicide by self-immolation in Brooklyn's Prospect Park in order to bring awareness to the climate crisis.

Guy McPherson – Guy McPherson is a controversial figure in American environmental science whose constant doomsday predictions are, according to David Wallace-Wells, a perfect example of the drawbacks of "climate nihilism" and "climate despair."

Enrico Fermi – Enrico Fermi was a physicist known for Fermi's paradox: the question of why, if the universe is so big, humanity has not yet been visited by (or been able to locate) any alien life.

Eric Garcetti – Eric Garcetti is the 42nd mayor of Los Angeles. First elected in 2013, Garcetti won his bid for reelection in 2017. During his tenure, Los Angeles and its surrounding areas have seen some of the worst wildfires on record.

TERMS

The Albedo Effect – The albedo effect refers to when white space on planet Earth—represented by polar ice caps and other large ice sheets—reflects the Sun's rays back into the atmosphere. The word *albedo* is taken from the Latin term for "whiteness." As the ice sheets melt, less white space on the planet is available to reflect these rays back into the atmosphere, so the Earth absorbs heat and radiation faster—and thus warms faster.

The Anthropocene – The Anthropocene is the 20th-century term that scientists and academics have given to our present geological era, which is defined by humankind's "conquest" of the planet.

Eco-nihilism – Eco-nihilism refers to modern consumers' environmental indifference. Eco-nihilism, which is essentially a "who-cares" or "carpe diem" attitude about climate change and carbon footprints, contributes directly to humanity's collective inability to take any meaningful action against carbon emissions.

The Fermi Paradox – The Fermi Paradox refers to a question posed by physicist **Enrico Fermi** in the middle of the 20th century: if the universe is so big, then why hasn't humanity encountered (or been visited by) any other intelligent life?

Neoliberalism – Neoliberalism refers to market-oriented reform policies around the globe. Neoliberal capitalism is concerned only with growth, wealth, and increased power in the private economic sector. Neoliberalism, the book asserts, is one of the reasons why societies around the world struggle to divest from fossil fuels and carbon emissions: because our global society is only centered on profit and expansion rather than conscious consumption or stewardship of nature.

The Paris Agreement/Accord – In December of 2015, 196 nations agreed to enter into the Parris Agreement: a legally binding landmark international treaty to limit global warming to well below 2 degrees Celsius by reducing greenhouse gas emissions as soon as possible.

The United Nations' Intergovernmental Panel on Climate Change (IPCC) – The IPCC is an international panel that offers gold-standard assessments of the state of the planet and the likely trajectory for climate change. According to the IPCC's website, the IPCC was created in order "to provide policymakers with regular scientific assessments on climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation options." Unfortunately, the IPCC's very real warnings—including a landmark "Doomsday" report—often go unheeded by the very governments they serve.

THEMES

In LitCharts literature guides, each theme gets its own color-coded icon. These icons make it easy to track where the themes occur most prominently throughout the work. If you don't have a color printer, you can still use the icons to track themes in black and white.

CASCADES, SYSTEMS CRISES, AND INTERCONNECTEDNESS

Throughout *The Uninhabitable Earth*, author David Wallace-Wells describes the "**cascades**," or cascading effects of interconnected climate and weather systems, that "form a latticework of climate crisis" beneath which humans live. From floods to wildfires to pollution to disease, the consequences of global warming may seem distinct—but in reality, they are all interconnected, and as one crisis cascades into another, the face of the Earth will change forever. The book suggests that humanity must first accept the interconnectedness of our climatological and social systems in order to recognize how damaging the collapse of one system is to the rest.

In a lengthy section titled "Elements of Chaos," the book lays out the climate systems already cascading into one another as warming seizes the planet in order to show how interconnected the consequences of climate change truly are. The book devotes a single chapter to each threatening cascade: a chapter about famine, a chapter about flooding, a chapter about freshwater shortages, a chapter about the effect of global heat waves on increases in armed conflict the world over. Taken separately, each chapter describes a symptom of a larger disease: global warming. But when read together, in quick succession, it becomes clear that these many cascades fold into one another, compounding to create complex, rapidly

worsening crises that don't have one clear solution. For instance, Wallace-Wells describes how melting ice sheets are one example of a cascade that has reverberations throughout other climate systems. As the Earth's temperature warms, its ice caps melt. As the bright white ice sloughs off into the sea, there is less white surface area on the planet to reflect the sun's harsh rays back into the atmosphere (called the albedo effect). Not only do sea levels begin to rise due to the extra water in the oceans—but also the direct heat traveling to the planet is absorbed more widely, creating a dangerous feedback loop. Another example of a dangerous cascade is the example of warming's effects on the proliferation of extant diseases in new regions—and even the resurfacing of long-extinct plagues in unexpected places. As carbon emissions and the albedo effect warm the planet, tropical climates will expand northward—taking with them bugs that carry diseases that have, until now, been confined to certain regions of the world. And while malaria and Zika spread northward, affecting populations that are poorly equipped to combat them, thawing permafrost can uncover strains of old plagues like the Black Death and dormant bacteria such as anthrax. Once again, the book shows how one falling domino sets off another until the whole world is entrenched in new, terrible battles.

It's easy for humanity to see these cascades as separate or discrete—but if we don't heed their warnings, the literal (and metaphorical) deluges from these cascades will pile up irreparably. By establishing how intertwined the various aspects of climate change are, the book suggests that there is no single solution to the problem of warming. Wildfires create air pollution, air pollution creates higher temperatures, higher temperatures lead to the proliferation of tropical diseases in new regions of the world—and so on. By laying out just how dependent the many aspects of life on Earth are upon one another, the book suggests that the response to climate change will need to be as complex and many-armed as the problem of warming itself. If humanity doesn't pay attention to the cascades happening right now—disease-breeding, crop-destroying floods in the wake of hurricanes; cognition-impairing and lung-straining pollution from drought-induced wildfires—these systems crises will only continue to expand and take over more and more of the globe. The worse things get and the greater the financial toll in helping affected communities to recover, the more impossible it will be to stay ahead of warming and make the changes that must be made. There are solutions—carbon capture plants and legislation in favor of emissions reductions among them—but without an understanding of how the systems of the world are connected, the book suggests, humanity will only continue standing by as these cascades grow more and more "un-compartmentalizable." By committing ourselves to discerning how these systems are connected now, the book posits, we may be able to head off rapid, intertwined feedback loops that could be triggered in the near future.

HUMAN RESPONSIBILITY AND THE NATURAL WORLD

Many people consider humanity to be distinct from the natural world and believe that climate change will only affect nature. This is one of the most destructive "fairy tales" about climate change around. Since the advent of industry, humanity has played a huge role in the destruction of the natural world and the warming of the planet. Humanity has seen this destruction as a necessary casualty in order for the human world to conquer the natural one. But in reality, the human world is not distinct from the natural one: humans are "inescapably within and literally overwhelmed by" nature. The natural world and the human one intimately connected, and they depend on one another for survival. Thus, *The Uninhabitable Earth* suggests that because humans have been responsible for the destruction of the natural world, humanity is responsible for halting that destruction. If the natural world is destroyed, after all, so too will the human one.

First, the book explores how the human world depends on the natural world for survival—and how the natural one's health is dependent on the human one—in order to show how interconnected the two worlds are. The set of circumstances that allowed human life to begin—let alone to flourish—are almost impossibly narrow. Life is only sustainable due to the "Goldilocks range of temperatures that enclosed all of human evolution"—in other words, humanity would not have evolved were it not for nurturing conditions within the world around us. But now, the book suggests, humans have left that perfect range behind—probably for good. For just 12,000 years of our 200,000-year-long presence on Earth, humans have been farming. In other words, we have been living off of the land. By harnessing the power to sow, cultivate, and reap, human industry was born. People moved from the countryside to cities, formed political structures, and, eventually, created technological advancements. Living off the land allowed social, political, and economic structures to expand and advance—but industrialization and the unimaginable amounts of carbon it's released has now come to have deeply adverse effects on the very land on which humans depend.

Next, the book outlines how humanity has failed to uphold its end of this symbiotic relationship, directly contributing to the destruction of the natural world and its delicate systems. Just as humans depend on the land to grow the crops that feed us (such as grain and corn) and to feed the animals humans consume as a source of protein, the earth, too, is dependent on what humans do. Increased carbon in the atmosphere and the incessant burning of fossil fuels has forever changed the face of the Earth—and the planet is continuing to warm quickly. As hurricanes flood farmlands and wildfires burn up arable acres across the world, the very regions in which crops can be grown shifts. More and more land is turning to barren desert—the effect, indisputably, of human activity and industry. The oceans,

too, are complex symbiotic systems: humans fish in the oceans and depend on deep-sea currents to cool the air. But as humans pollute the atmosphere with particulates and the seas with microplastics, waters warm and sea life dies off, expelling more methane and other toxic gases into the air. Humans cannot survive without the fruits we real from land and sea, but the land and sea cannot survive without human stewardship. This stewardship, care, and healthy cultivation is a duty that humans have long neglected—and some sociologists even go so far as to suggest that the Neolithic Revolution, which eventually led to industrialization, was "the worst mistake in the history of the human race."

Finally, the book suggests that it is humanity's responsibility to check this unmitigated destruction—only human action can spare the natural world from descending into chaos via feedback loops engineered by human industry. Industrialization and the truly lethal amount of carbon and other pollution it's released into the atmosphere has triggered a **cascading** series of climate systems in crises. From unprecedented natural disasters to irreversible shifts in the delicate climates of various regions around the world, it's clear that the effects of human-hastened climate change are only getting worse. While many would like to fall back on the only thing that will stop climate change is "when the Earth, probably long after we're gone, relaxes," the reality is that the plants and animals with which we share our planet will be casualties of warming, too. Thus, it is humanity's responsibility, the book posits, to take swift, decisive, overwhelming action to stop emissions, end the normalization of climate disaster, and do all that can be done to preserve what remains of the natural world. The planet's feedback loops, such as extreme weather events and the albedo effect, are interconnected and ever-compounding—but they wouldn't be unfolding so quickly or dramatically had human industry not sped up how quickly global temperatures are rising. Nothing at this point, the book suggests, can halt these cycles entirely—but with collective dedication to recognizing our symbiosis with the natural world, humanity can still reclaim the duty of stewardship to this unique, impossible "Pale Blue Dot."

OPTIMISM AND ACTION VS. DESPAIR AND NIHILISM

When faced with the "toxic knowledge" of global warming, there are two avenues available to humanity: swift and optimistic action, or despair and inertia. Only one of these routes will actually do anything to combat climate change. As *The Uninhabitable Earth* unfolds, offering unflinching looks at the impending ravages of climate change, the book suggests that despair in the face of warming is inexcusable. As difficult as optimism may seem, optimism is the only path that allows for the salvation not just of humanity but of the Earth as we know it.

After laying out the painful and destructive forecast for life on a warming planet, the book acknowledges that, for many, despair and nihilism seem to be the only reaction to such dread. The most acute sufferers of climate despair are, of course, those who have dedicated their lives to studying the effects of warming: scientists and climatologists. Many of these experts, the book says, have already "pass[ed] through many dark nights of the soul"—and realized that when the rest of the planet realizes the scale and scope of what is happening, they, too, will have to reckon with deep existential despair. But to many of these experts, "alarm is not the same as fatalism"—and in many cases, hope is a more motivating emotion than fear. Still, "climate fatalism" and "ecocide" are the feelings and affects that many professionals and laymen alike embody when faced with the realities of climate change. "Political depression" and the internalized rhetoric of humanity as an already "undead species" threaten to stop the fight against climate change in its tracks. With so many uncertain of how the earth can still be salvaged, it's easy to see how many people feel there's nothing to do but wait for the worst to come.

At the same time, the book warns that phenomena like "climate despair" and "eco-nihilism" represent a kind of detachment that allows for more inaction—thus worsening, unmitigated effects of climate change. "Climate change could become not a spur to change but an alibi, a cover, for inaction and irresponsibility," the book warns. In other words, it would be very easy, at this point in our warming journey, for humanity to claim that there's nothing that can be done to reverse our mistakes. This would only lead to greater consumption—a sort of "carpe diem," seize-the-day attitude, and the direct opposite of what the planet (and humanity) needs to survive. "Doom [eats] away at the infrastructure of things like termites or carpenter bees." The more that humanity feels its own doom, the less likely we are to seek for alternative ways of living. But rather than throw our hands up at the disasters overtaking the planet, the book suggests, humanity must collectively agree to fight back against the eroding force of existential doom. If humanity lets itself despair, business as usual will continue—and many countries may even up their carbon outputs in the years to come. Running itself into the ground isn't the right path for humanity, the book suggests—self-pitying inaction would be an unconscionable response to the call to action that warming represents.

The only way to pull ourselves out of this mess, the book suggests, is to commit to the optimistic hope that things still can be changed—and to take the necessary, radical, collective action needed to make that change possible. As author David Wallace-Wells states: "Global warming is, after all, a human invention. And the flip side of our real-time guilt is that we remain in command. [...] We are all its authors. And still writing." So while many scientists and sociologists themselves are alarmed and perturbed by the rapid changes taking place

across the planet, almost all of them still stress that some version of optimism is needed. Whether this new optimism takes the shape of courage, rage, or protest doesn't matter—but what is important is that humans collectively commit to a belief in meaningful change. At this point, the difference between arriving at an inhospitable world and a "relatively livable" one by the end of the century comes down to collective hope and faith. While such thinking may be "naïve" or "crazy" in the face of so many setbacks and obstacles, the book stresses that the emotion of hope isn't the point. What matters is the will to create action out of fear—to continue collectively imagine a future rather than resigning ourselves to desolation. In other words, believing destruction is inevitable makes it inevitable; envisioning and working toward a new world makes that new world possible. "If we do nothing about carbon emissions [...] whole regions will become unlivable by any standard we have today as soon as the end of this century," writes author David Wallace-Wells—but at the same time, he notes that "[these] horrors are not yet scripted. We are staging them by inaction." In other words, what happens to the planet—and to humanity—is up to our own ability to locate and commit to hope.

THE EFFECTS OF CLIMATE CHANGE ON HUMANITY

For the last several decades, academics and scientists have called the current geologic era the "Anthropocene" to reflect how humanity has conquered the Earth. But the belief that humans have conquered the planet is a fallacy: what we have done since industrialization is more akin to arming a violent "war machine" (metaphorically, the planet) with all the tools needed to assure its own destruction. In other words, the hotter and more toxic the planet and its atmosphere become, the readier it is to annihilate humanity through climate system feedback loops. As the planet warms, the natural world won't just suffer—the human one will, too, and the reverberations throughout our lives will be resounding. *The Uninhabitable Earth* outlines the social, political, and economic consequences of the Anthropocene, suggesting that as the physical world is remade through warming, the society we've built upon it will transform radically, too.

Climate change and rising temperatures have already been shown to have an effect on humans as individuals and as social creatures—no arena of human experience is spared from the effects of warming. Studies show that already, zones where pollution is more rife—the areas around toll plazas, for example, and parts of countries like China and India where smog blankets entire cities—produce citizens with lower test scores, more cognitive and developmental problems, and worse prospects for long term employment well into adulthood and middle age. Because carbon pollution directly affects the brain, psychological, emotional, cognitive, and behavioral issues in highly polluted areas are much more common than in areas with clean, more breathable air. As the world's atmosphere becomes more polluted with carbon and microplastics, these effects may only grow worse. Hotter temperatures, too, have statistically been associated with armed conflicts and crime waves the world over. From increases in violent crimes in cities during hot summers to the correlation between armed conflicts and water shortages or heat waves stretching back as far as 3,000 B.C., the relationship between heat, drought, and human volatility is undeniable. As temperatures increase—and as freshwater around the world becomes scarcer—small skirmishes and large-scale wars will become more frequent (and more intense) across the entire globe. When it comes to natural disasters, hurricanes and wildfires leave more than physical destruction in their wake: they create psychological casualties, too. After Hurricane Katrina hit New Orleans in 2005, more than 60 percent of those who evacuated were diagnosed with acute stress disorder; later, a third of people in the region were diagnosed with post-traumatic stress disorder. After Hurricane Mitch, a storm that struck Central America in 1998 and killed 11,000, a whopping 90 percent of adolescents in the area developed PTSD. So climate won't just transform our social systems and our relationships to ourselves and one another by making us crankier in the summer or clogging our brains with pollutants. Its ravages will leave us psychologically transformed as we reckon with the destruction we have wrought.

The economy, too, is at the mercy of climate change: as natural disasters proliferate and the systems through which humans feed and sustain themselves begin to change, the neoliberal global economy in place right now will certainly change, too. Up until now, the world's economy has been defined by capitalism, specifically neoliberal capitalism: a global economy in which endless, exponential profit is the only goal. In pursuit of more, humanity has engineered the systems that have poisoned our Earth perhaps past the point of no return. Faced with the prospect of cutting emissions or watching the planet destroy itself, global society needs to make a choice: more profits, enabled by fossil fuels, or continued existence, which requires an end to fossil fuels and carbon emissions for now and forever. The outsized natural disasters that are hallmarks of climate disaster—hurricanes, wildfires, and tornadoes—cost billions of dollar to recover from. Our planet is currently at just one degree of warming—by four degrees, damages could pass $600 trillion, more than twice the wealth that exists in the world today. So if the countries of the world decide not to reform emissions (and thus to keep the economy running as it is,) the global market will still be forcibly remade by the need to funnel money toward repairing cities that fall victim to warming.

Warming will also usher in a new era of global politics as socioeconomic dynamics change across the world, leading to a politics that could be steered by fear, anger, and austerity. As

the neoliberal economy collapses, the book suggests, so too will neoliberal politics—and what political structures might rise up to fill the vacuum could be very different from the ones we accept now. While the creation of a collective "world-state" capable of collectively fighting back against warming might represent one end of the spectrum, a global descent into authoritarianism led by a population-dense, economically mighty country like China or Russia might represent another. Whether a single autocratic, hypercapitalist regime emerges to deny climate change and pursue total economic, social, and political control or whether the globe works together to create a new kind of world-state remains to be seen. But what *The Uninhabitable Earth* makes clear is that as the planet transforms, the political systems we have in place may not weather the storm. The planet is changing quickly—and our social, political and economic systems, which are inextricably bound together, will need to change, too, if humanity is to find new, collectively responsible ways of mitigating emissions, caring for one another in the wake of natural disasters, and ensuring that those most vulnerable to the ravages of climate change aren't left behind.

SYMBOLS

Symbols appear in **teal text** throughout the Summary and Analysis sections of this LitChart.

CASCADES

Normally, the word *cascades* denotes a series of waterfalls—but throughout *The Uninhabitable Earth*, David Wallace-Wells uses the imagery of a cascading group of waterfalls to symbolize how the Earth's many climate systems feed into one another, creating compounded destruction as one system after another begins to fall apart. By creating a clear, symbolic image of one stream of water pouring into another, gathering momentum as they descend together into a larger collecting pool, Wallace-Wells suggests that the systems that have already begun to break down as a result of global warming are not isolated. Instead, one affects the other intimately, as in the case of the albedo effect: when white space on planet Earth—like polar ice caps—reflects the Sun's rays back into the atmosphere. But as the ice sheets melt, there is less white space on the planet to reflect the Sun's rays back into the atmosphere, so the Earth absorbs heat and radiation faster, and thus warms faster. By referring to climate systems like the albedo effect as cascades, Wallace-Wells urges readers to picture for themselves an image that encapsulates the mounting, multiplying speed and power of climate change.

QUOTES

Note: all page numbers for the quotes below refer to the Tim Duggan Books edition of *The Uninhabitable Earth* published in 2020.

Part I, Cascades Quotes

Many perceive global warming as a sort of moral and economic debt, accumulated since the beginning of the Industrial Revolution and now come due after several centuries. In fact, more than half of the carbon exhaled into the atmosphere by the burning of fossil fuels has been emitted in just the past three decades. Which means we have done as much damage to the fate of the planet and its ability to sustain human life and civilization since Al Gore published his first book on climate than in all the centuries—all the millennia—that came before.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 4

Explanation and Analysis

In this passage, taken from the early pages of *The Uninhabitable Earth*, author David Wallace-Wells begins unraveling some of the most pernicious "fairy tales" about climate change—starting with the connection between warming and the Industrial Revolution.

It is easy to imagine that global warming is a "debt" humanity has long "accumulated," and the book admits that this is an attractive line of thinking. But believing that the effects of warming we're experiencing today are the fault of generations long past—and those generations alone—means ignoring our present generation's own ongoing complicity in the story of climate change. Most of the emissions that have hurt the environment so badly have been expelled within the last few decades—a timespan during which politicians, scientists, and even the general populace were well aware of climate change's threats. By illustrating that the humanity has collectively decided to avoid confronting our role in warming and continue business as usual, Wallace-Wells starts the book off with a harsh call to arms. There is no more time to waste on inaction. Humanity needs to accept responsibility for the damage it has wrought and decide, collectively, to stop knowingly destroying the only planet we have—and, for that matter, the only planet we know of that's capable of sustaining human life.

> But however sanguine you might be about the proposition that we have already ravaged the natural world, which we surely have, it is another thing entirely to consider the possibility that we have only provoked it, engineering first in ignorance and then in denial a climate system that will now go to war with us for many centuries, perhaps until it destroys us. […] You could [call the planet a] "war machine." Each day we arm it more.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 22-23

Explanation and Analysis

In this passage, Wallace-Wells complicates his earlier argument that climate change is not just a "debt" that's accrued over time. We are not paying for the sins of our distant ancestors, but we *are* reckoning with how decades upon decades of compounded inaction have effectively turned the planet into a well-armed "war machine" that will be unleashing the very feedback systems we've triggered for centuries to come.

This passage encourages readers not to think of climate change as a moral debt that must be paid. This line of thinking arguably inspires only more despair and more inaction, since humanity winds up feeling guilty and, on some level, resultantly desirous of the very payback the Earth stands to give us. What we need to understand, this passage posits, is that morals and ethics aside, we've engineered the logistics of climate change ourself. So it's not that the Earth is punishing us for our neglect by unleashing natural disasters and weird weather—it's that our continued reliance on fossil fuels and carbon emissions has triggered the Earth's natural feedback systems and sent them into overdrive. By pointing out that "each day we arm it more," the book suggests that until global governments take a radical stance on halting emissions—and finding ways to create "negative emissions" by absorbing some carbon out of the atmosphere—the Earth's arsenal of feedback responses will only grow stronger.

We're currently living in a geological era called "the Anthropocene"—a term that suggests humanity has dominated the planet and conquered Earth. But this couldn't be farther from the truth. In reality, our illusions of exceptionalism have only made the *planet* stronger. Our willful ignorance about the cost of our perceived domination has created a situation in which humanity is actually at the planet's mercy. We see ourselves as the winning species, but in reality, we're more vulnerable than ever because of how our way of life has "armed" our own planet against us.

> The assaults will not be discrete—this is another climate delusion. Instead, they will produce a new kind of cascading violence, waterfalls and avalanches of devastation, the planet pummeled again and again, with increasing intensity and in ways that build on each other and undermine our ability to respond, uprooting much of the landscape we have taken for granted, for centuries…

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 23

Explanation and Analysis

The major takeaway from the first part of *The Uninhabitable Earth* is the concept of "cascades"—a term author David Wallace-Wells uses to describe the latticework of interconnected systems crises that will be triggered as a result of global warming. In this passage, Wallace-Wells expounds upon the "cascading violence" that will, over the decades to come, begin battering humanity so intensely and so often that we will not be able to recover in between these interconnected "assaults."

In order to underscore early on in the book just how interconnected all of our climatological, biological, social, political, and economic systems are, Wallace-Wells uses the symbol of a cascade, calling to mind the image of a cascading waterfall that drops, tier upon tier, into a larger, roiling basin below. As the systems crises in our environment compound, our grip on "the landscape we have taken for granted" will be lost.

As natural disasters create economic chaos, economic chaos will create social unrest, and social unrest will create new (and potentially quite destructive) political and interpersonal systems. So, within the logic of cascades, a Category 5 hurricane is no longer just a Category 5 hurricane that can easily be cleaned up—it's an indiscrete assault that affects the economy, the mechanics of food production, the spread of disease, and the proliferation of psychological trauma in the affected area. As these cascades ripple through our society, the book posits, we will have to confront the latticework of warming in a way we never have before—otherwise, life as we know it may

disappear.

Part II, Chapter 1: Heat Death Quotes

❝ This is among the things cosmologists mean when they talk about the utter improbability of anything as advanced as human intelligence evolving anywhere in a universe as inhospitable to life as this one: every uninhabitable planet out there is a reminder of just how unique a set of circumstances is required to produce a climate equilibrium supportive of life. No intelligent life that we know of ever evolved, anywhere in the universe, outside of the narrow Goldilocks range of temperatures that enclosed all of human evolution, and that we have now left behind, probably permanently.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 47

Explanation and Analysis

In this passage, taken from a chapter about heat and rising temperatures, the book outlines how specific the temperature range in which humans can survive (and thrive) truly is.

This passage underscores the preciousness of the "narrow Goldilocks range of temperatures" that enclosed and enabled the full scope of human evolution. Humans are fragile creatures, and we require a very specific set of circumstances to live. What most people don't recognize is that we have already exited this very narrow zone—the zone that essentially gave birth to humans in the first place—and are, right now, in unprecedented new territory.

One of the central thematic questions throughout the book is that of the tension between action and hope versus despair and inertia. Recognizing that we've left behind—"probably permanently"—the range of temperatures in which we're capable of surviving threatens to plunge a large part of the population into a sense of hopelessness. But to give up hope is to continue business as usual and to further accelerate the path of warming we're already on. Only by reclaiming stewardship of the planet and fighting together to find a solution that will minimize warming—allowing humanity to hew as closely as possible to our precious "Goldilocks range"—can there be any future to speak of for ourselves and our planet.

Part II, Chapter 2: Hunger Quotes

❝ Global warming, in other words, is more than just one input in an equation to determine carrying capacity; it is the set of conditions under which all of our experiments to improve that capacity will be conducted. In this way, climate change appears to be not merely one challenge among many facing a planet already struggling with civil strife and war and horrifying inequality and far too many other insoluble hardships to iterate, but the all-encompassing stage on which all those challenges will be met—a whole sphere, in other words, which literally contains within it all of the world's future problems and all of its possible solutions.

Related Characters: David Wallace-Wells (speaker), Thomas Malthus

Related Themes:

Related Symbols:

Page Number: 58-59

Explanation and Analysis

In this passage, the book introduces the concept of "carrying capacity"—an idea proposed by Thomas Malthus as a metric by which we can measure just how great a population our planet can support.

While the book doesn't necessarily agree with Malthusian calls for stringent population control in order to prevent the planet from becoming too crowded, it does acknowledge that the planet has a maximum capacity. Not only is there only a certain load our planet can bear—but as we approach the upper limits of its capacity, we will still have to contend with the ravages of warming. In fact, warming will directly affect our planet's carrying capacity, altering how capable Earth is of supporting life as each system begins to break down. We don't know our planet's full carrying capacity—and it may remain in flux for decades as climate change cascades through every sphere of life and reshapes what our planet looks like and how its people and governments respond to warming. Climate change will force us to reframe what we know about our human limits as we meet the challenge of sustaining life on a planet filled with "insoluble hardships."

Part II, Chapter 3: Drowning Quotes

❝ But as "familiar" as sea-level rise may seem, it surely deserves its place at the center of the picture of what damage climate change will bring. That so many feel already acclimated to the prospect of a near-future world with dramatically higher oceans should be as dispiriting and disconcerting as if we'd already come to accept the inevitability of extended nuclear war-because that is the scale of devastation the rising oceans will unleash.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 65-66

Explanation and Analysis

In this passage, the book engages in a discussion of how normalized the expectation of sea-level rise has become in order to point out how complacent humanity is—and will continue to be—in the face of warming's ravages.

Sea-level rise is one of the most frequently cited side effects of global warming. It's all but assured that, within decades, coastal communities like Miami and Bangladesh will experience erosion and loss of livable territory as ice caps melt and sea levels creep up foot by foot. And yet, as this passage highlights, many people have "already [grown] acclimated" to this idea and are unperturbed by the idea that whole cities could be wiped off the map. This, the book posits, is a dangerous side effect of how intense climate change's ravages promise to be: when faced with such immense change, people become inert and resigned.

This section of the book seeks to show readers that we can't be okay with what we perceive as only a few feet of sea-level rise and only a few cities missing from the map. The larger effects of sea-level rise will echo through every level of society by creating multiple refugee crises, contributing to the spread of tropical disease, and washing away valuable sites of crop production (thus creating economic chaos and potential food shortages around the world). By illustrating the "scale of devastation the rising oceans will unleash," the book attempts to shake readers from their complacency and understand that the cascades of warming aren't separate, but rather deeply intertwined—and all the more powerful for that fact.

Part II, Chapter 4: Wildfire Quotes

❝ By accidents of geography and by the force of its wealth, the United States has, to this point, been mostly protected from the devastation climate change has already visited on parts of the less-developed world—mostly. The fact that warming is now hitting our wealthiest citizens is not just an opportunity for ugly bursts of liberal schadenfreude; it is also a sign of just how hard, and how indiscriminately, it is hitting. All of a sudden, it's getting a lot harder to protect against what's coming.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 80

Explanation and Analysis

In this chapter, the book seeks to use California's ever-worsening wildfires to illustrate the fact that climate change is a powerful and "indiscriminate" force.

This passage posits that most of the United States—a wealthy and geographically lucky place—has been insulated from the worst effects of climate change, even as poorer countries like Bangladesh and the Democratic Republic of Congo have felt some of warming's most acute effects for decades. Because the U.S. has been lucky, the book suggests, its government and its people, too, have been slow to act when it comes to climate change. It's easy to believe, when one can't directly witness warming's ravages, that one will be spared from the worst—but California's wildfires, which grow worse with each passing year and which increasingly have come to devastate some of the wealthiest parts of the country, prove otherwise.

By describing the wildfires and the mudslides, spikes in air pollution, and astronomical repair costs they create, the book highlights some of the cascading effects of climate change and suggests that no part of the world should consider itself safe from warming. The pollutants California's wildfires release spread across the country; the forests they decimate leave us with fewer carbon-absorption sites, and, as those trees burn, they actually release more carbon into the atmosphere. If humanity doesn't come to understand that being "mostly protected" is a temporary state—and that soon there will be nowhere on Earth that isn't implicated in the fight against climate change—things will become potentially unsalvageable not just in California, but around the globe.

Part II, Chapter 5: Disasters No Longer Natural Quotes

❝ Extreme weather is not a matter of "normal"; it is what roars back at us from the ever-worsening fringe of climate events. This is among the scariest features of rapid climate change: not that it changes the everyday experience of the world, though it does that, and dramatically; but that it makes once-unthinkable outlier events much more common, and ushers whole new categories of disaster into the realm of the possible.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 87

Explanation and Analysis

In this passage, the book introduces a discussion of how our "natural disasters" will soon "no longer" be natural at all. As warming escalates, so too will the frequency and intensity of extreme weather events the world over—and author David Wallace-Wells suggests that normalizing these events will directly contribute to the inertia and inaction with which so much of the globe is already meeting climate change's increasingly apparent ravages. Normalization, the book suggests, is a cascade in and of itself. The more people accept "outlier events" as regular features of weather, the more they'll continue denying just how immediate a threat climate change really is. Once-in-a-lifetime storms now occur multiple times each hurricane season; wildfires ravage huge swaths of the world, generating more emissions in their wake; and tornadoes uproot whole cities. If we accept these weather events as normal and try to ignore their worrying magnitudes, our indifference will cascade through every level of society. Soon, it will be hard to remember what "normal" weather even was.

Part II, Chapter 6: Freshwater Drain Quotes

❝ Today, the crisis is political—which is to say, not inevitable or necessary or beyond our capacity to fix—and, therefore, functionally elective. That is one reason it is nevertheless harrowing as a climate parable: an abundant resource made scarce through governmental neglect and indifference, bad infrastructure and contamination, careless urbanization and development.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 95

Explanation and Analysis

In this passage, author David Wallace-Wells examines the "political" roots of the current water crisis around the globe, ultimately suggesting that the "functionally elective" crisis mirrors the world's "functionally elective" non-response to the urgent matter of climate change.

Water shortages are a perfect example of the cascades the book explores—the "elements of chaos" that form the great latticework of climate change's most devastating effects are both natural and manmade. While some of these cascades are part of the Earth's feedback loops, or uncontrollable physical responses to warming temperatures, some of these cascades are engineered through humankind's own neglect, carelessness, and greed. Cascades like water crises ripple through every part of society, creating social, political, and economic chaos. Scarcity creates social strife and deepened divides throughout society; it also offers big businesses an opportunity to exploit people's desperation. There are political solutions to these kinds of man-made crises, but many world governments' puzzling inaction also makes its way down to everyday citizens, who see their leaders doing nothing about climate change's many ravages and decide that there must be nothing *to* do about them.

By using our inexplicable inability to make progress on the very solvable water crisis, the book suggests that humanity will need some kind of trigger in order to catapult itself toward meaningful action on climate change. If we do nothing on the political or social level, the book suggests, climate change will continue to spawn crises like water shortages until the fabric of all our daily lives is transformed by scarcity and lack.

Part II, Chapter 7: Dying Oceans Quotes

❝ But the ocean isn't the other; we are. Water is not a beachside attraction for land animals: at 70 percent of the earth's surface it is, by an enormous margin, the planet's predominant environment. Along with everything else it does, oceans feed us: globally, seafood accounts for nearly a fifth of all animal protein in the human diet, and in coastal areas it can provide much more. The oceans also maintain our planetary seasons, through prehistoric currents like the Gulf Stream, and modulate the temperature of the planet, absorbing much of the heat of the sun.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 103-104

Explanation and Analysis

In this passage, the book explores the symbiotic relationship between the human world and the natural world, suggesting that the natural world is not "other" from the human one: both worlds are inextricably intertwined and deeply dependent on one another.

By focusing on the ocean as one of the systems most intertwined with human life, the book paints a portrait of just how much we stand to lose should we neglect to take meaningful action against climate change. We are in a constant cycle of symbiosis with the ocean. We turn to the oceans for food, we count on the oceans to regulate our seasons, and we are dependent on the unseen forces of the Gulf Stream below to keep our temperatures within a certain range. But the ocean can only provide us with those things if we take care of it—and if we limit the harmful emissions that cause die-offs of sea life and changes to the ocean's temperatures, levels, and currents. If the ocean can't regulate itself because of our own neglect, we, too, will suffer as the ocean's food supplies vanish and the seas begin unleashing toxic chemicals as a result of higher temperatures.

By highlighting just how interconnected the various parts of our planet are—using the oceans as a prime example—the book suggests that unless we claim responsibility for nature by seeing its fate as intertwined with our own, we won't stand a chance against understanding or fighting climate change.

Part II, Chapter 8: Unbreathable Air Quotes

❝ In recent years, researchers have uncovered a whole secret history of adversity woven into the experience of the last half century by the hand of leaded gasoline and lead paint, which seem to have dramatically increased rates of intellectual disability and criminality, and dramatically decreased educational attainment and lifetime earnings, wherever they were introduced. The effects of air pollution seem starker already. Small-particulate pollution, for instance, lowers cognitive performance over time so much that researchers call the effect "huge"…

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 110

Explanation and Analysis

In this passage, the book explores one of the less-obvious cascades associated with climate change—how the polluted air we breathe changes how we live. The "secret history of adversity" this passage describes is the invisible effect polluted air has had on generations of individuals who've come of age on a warming planet. Carbon, microplastics, and other forms of small-particulate pollution impact everything from bodily health to test scores to instances of violence in any given area. The cognitive impact associated with polluted air makes people less productive and more violent—so, already, at just one degree of warming, it's clear that climate change is rewiring our society in ways we won't fully understand for decades to come.

This cascade is one of the most insidious effects of climate change because of how it threatens to ripple through our society, remaining unseen until it's too late. When cognitive function declines because of pollution, people struggle to keep up in school and to enter the workforce. Their lives are harder, and when whole communities find themselves living in a literal (and metaphorical) haze, that means fewer people have the time, energy, and resources to become invested in the fight against climate change. Greater pollution and its side effects also lead to more violence in more communities—and on a large enough scale, pollution could become the hidden culprit behind mass civil unrest and discord. These are just a couple of the ways that climate change has the potential to affect every area of human life, twisting the fates of people who aren't even aware of what endless emissions and microplastic pollutants are doing to them.

❝ Already, aerosols have been reflecting so much sunlight away from the earth that, in the industrial era, the planet has only heated up two-thirds as much as it would have otherwise. […] The result is […] a "devil's bargain": a choice between public-health-destroying pollution on the one hand, and, on the other, clear skies whose very clearness and healthiness will dramatically accelerate climate change.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 116

Explanation and Analysis

This passage, in which author David Wallace-Wells outlines one of the most painful "bargain[s]" humanity must face in the struggle against climate change, illustrates one of the many obstacles to meaningful action to mitigate global warming.

This passage outlines research that shows that our atmosphere is now so full of pollutants and particulates that those tiny pieces of debris are actually keeping our planet cooler than it should be, given our level of emissions. All of the pollution in the atmosphere is poisoning our air, our seas, and our people—but it's also tragically keeping the temperatures from rising even faster. Such a terrible catch-22, the book posits, is one of the many reasons that governments stall when it comes to action against climate change. The situation is so bad that even our most intuitive solutions—stopping emissions or creating carbon-capture plants to pull pollutants from the air—are no longer truly helpful. Further inaction will only make things even worse. We are running out of time, and the imperfect solutions we have now will soon be gone. But the book underscores that through radical hope and collective action, we can still find ways to salvage our planet.

Part II, Chapter 10: Economic Collapse Quotes

❝ The global halving of economic resources would be permanent, and, because permanent, we would soon not even know it as deprivation, only as a brutally cruel normal against which we might measure tiny burps of decimal-point growth as the breath of a new prosperity. We have gotten used to setbacks on our erratic march along the arc of economic history but we know them as setbacks and expect elastic recoveries. What climate change has in store is not that kind of thing—not a Great Recession or a Great Depression but, in economic terms, a Great Dying.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 130

Explanation and Analysis

In this passage, the book outlines the economic catastrophes that will unfold across every level of the global economy as warming seizes the planet. Every day we don't act meaningfully on a political, legislative level against climate change, the costs associated with warming increase. As arable land erodes, systems of food production fail, and hurricanes and wildfires and tornadoes leave costly damages in their wakes, the neoliberal global economy we have in place is already struggling to keep up. If the costs associated with warming continue ramping up—but our world governments do nothing to mitigate emissions and look for new sources of power—our new, "brutally cruel normal" will be an economy that is functionally dying. The purpose of capitalism is, and always has been, unmitigated growth, and we have long turned to fossil fuels to enable every sector of our economy. But spending money to invest in renewable energy and preventative infrastructure against natural disasters now—though it would represent a hit to the economy, no doubt—is a far better method than doing nothing, which would result in hundreds of trillions of dollars in damages around the world.

This passage warms that global warming will continue to affect and change our manmade systems—our politics, our economy, and our social structures—in increasingly serious ways unless we take swift, meaningful action. If we continue to let the damage pile up and ignore the fact that economic growth shouldn't be the lone metric of a healthy society, the book warns, we will pay in devastating ways down the road, and our economy may simply never recover.

Part II, Chapter 11: Climate Conflict Quotes

❝ But wars are not caused by climate change only in the same way that hurricanes are not caused by climate change, which is to say they are made more likely, which is to say the distinction is semantic.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 136

Explanation and Analysis

In this chapter, the book explores how armed conflict is yet another of climate change's unseen cascades.

While some might debate the idea that wars are caused by climate change, this passage posits that claiming the link between warming and armed conflict is a "semantic" one—which is to say it's a petty or inconsequential distinction to make. Climate change will expose, through the melting of ice sheets and permafrost, new territories on

land and at sea, leading to land grabs that could turn violent and territorial. As floods and wildfires erase arable land from the face of the earth, food productivity will slow and important resources will become scarce, leading to more conflict. And as climate change adds pollution to our air and drives up our temperatures, the cognitive and psychological effects of hotter cities and more congested airways will have unseen, unpredictable effects on people's moods and volatility. So climate change will have many effects on our society, not just our physical planet.

This is significant because it's important to consider the unseen ways that global warming will transform life on earth. Only in understanding what it is we stand to lose—possibly forever—will be able to find the collective will to take action against climate change.

Part II, Chapter 12: "Systems" Quotes

❝ And while it may seem intuitive that those contemplating the end of the world find themselves despairing, especially when their calls of alarm have gone almost entirely unheeded, it is also a harrowing forecast of what is in store for the rest of the world, as the devastation of climate change slowly reveals itself. […] This may be why so many of them seem concerned with the risks of crying wolf about warming: they've learned enough about public apathy to worry themselves into knots about just when, and precisely how, to raise the alarm.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 150

Explanation and Analysis

In this passage, the book begins to explore the careful line that scientists and climatologists must walk as they attempt to raise the alarm about the impending horrors climate change threatens to visit upon us.

Scientists know that most people are apathetic, at best, about climate change, while others deny its reality entirely. So when scientists attempt to share their data with the world, they don't want to be accused of "crying wolf" because climate change isn't unfolding fast enough for people to see its immediate effects. Climatologists and other scientists studying the climate must find a way to spur people to action—and to get people to take responsibility for the planet as a collective—without plunging people into the despair they themselves experience when considering how much damage has already been done. By illustrating how delicate the balance between hope and despair is, the book suggests that we must act now, while hope is still an option.

❝ At what point will the climate crisis grow undeniable, un-compartmentalizable? How much damage will have already been selfishly done? How quickly will we act to save ourselves and preserve as much of the way of life we know today as possible? For the sake of clarity, I've treated each of the threats from climate change—sea-level rise, food scarcity, economic stagnation—as discrete threats, which they are not. Some may prove offsetting, some mutually reinforcing, and others merely adjacent. But together they form a latticework of climate crisis, beneath which at least some humans, and probably many billions, will live. How?

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 154

Explanation and Analysis

This passage concludes the book's second section about the disparate "elements of chaos" that form climate change's cascades—but it asks just as many questions as the section preceding it has answered, showing that there is still much that is unknown about how humanity will live once these cascades start to accumulate more intensely.

The threats that humanity faces in the coming decades are not "discrete," or separate: instead, they are all intertwined. Each of climate change's consequences—like wildfires, social unrest, and pollution—are connected to one another. As climate change intensifies, the speed and seriousness with which this "latticework of climate crisis" blankets us will, too. The most pressing question facing us is how we will manage to live through each compounding onslaught of extreme weather and profound social change. We don't have the answers to how we'll live through these things yet, but it's becoming clearer that if we want to survive them, we will need to begin taking action rather than sinking into despair. It is easy to think of climate change as a problem that will only affect nature, or one that will only change certain things about our world. But the reality is that climate change will transform *every* facet of life on Earth—and once we recognize that, we can start taking

ownership of our duty to nature and to one another.

Part III, Chapter 1: Storytelling Quotes

What does it mean to be entertained by a fictional apocalypse as we stare down the possibility of a real one? One job of pop culture is always to serve stories that distract even as they appear to engage. [...] In a time of cascading climate change, Hollywood is also trying to make sense of our changing relationship to nature, which we have long regarded from at least an arm's length—but which, amid this change, has returned as a chaotic force we nevertheless understand, on some level, as our fault. The adjudication of that guilt is another thing entertainment can do [...] in projecting rather than accepting guilt. [...] In fictional stories of climate catastrophe we may also be looking for catharsis, and collectively trying to persuade ourselves we might survive it.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Related Symbols:

Page Number: 158

Explanation and Analysis

In this passage, the book attempts to explain why humanity repeatedly turns to fictional stories of the apocalypse for entertainment—when a very real transformation of our world is happening right now, everywhere we look.

The idea that Hollywood movies and other forms of entertainment do more than just amuse us is central to this explanation. Any piece of entertainment has various directives—to distract us from our world while simultaneously "mak[ing] sense" of it, to assign the guilt associated with the end of the world on outside, unseen forces such as giant monsters or greedy corporations. Humanity is ready and waiting to devour narratives in which we're the good guys at best, and hopeless bystanders at the very worst. These stories allow us to see the end of the world not just as someone else's fault, but as other, fictional peoples' problems. And if movie characters can survive, pull together, and carve out a new society, our logic follows, so can we.

But the reality of the apocalypse is much different than how it appears on-screen. Our world likely won't end swiftly and neatly—climate change is a long, grueling process in which our world will transform before our eyes over a series of decades, not a single day and night of a storm or a monster attack. So when we consume media about the end of the world—especially climate-related apocalypses—we're further entrenching ourself in our already-establish modes of disinterest, inaction, and projection. We allow ourselves the luxury of thinking that those who came before us are responsible for the end of the world, and that those who come after us will magically have the resources to fix what's wrong. But the reality is that we're all complicit in climate change—and while eliminating our individual carbon footprints isn't the answer, neither is refusing to engage with the realities of warming that are already all around us.

Global warming [shows us] that we didn't defeat the environment at all. There was no final conquest, no dominion established. In fact, the opposite: Whatever it means for the other animals on the planet, with global warming we have unwittingly claimed ownership of a system beyond our ability to control or tame in any day-to-day way. But more than that: with our continued activity, we have rendered that system only more out of control. Nature is both over, as in "past," and all around us, indeed overwhelming us and punishing us—this is the major lesson of climate change, which it teaches us almost daily.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 158

Explanation and Analysis

Here, the book interrogates the usefulness and the accuracy of the term "Anthropocene." Contemporary scientists have used this term for several decades to describe our current geological era—an era in which humanity has, ostensibly, achieved dominion over planet Earth.

Wallace-Wells suggests that telling ourselves that we live in the Anthropocene, or the age of man, isn't only a narcissistic point of view—it's also a false one. We haven't actually dominated nature, and the idea that we could ever control our planet's vast, intertwined climate systems—and all of their tangential effects—is patently foolish. But the reason we tell ourselves that we have, the book suggests, is tied up in our idea to see ourselves as separate from and beyond the confines of nature. We want to believe, as our weather systems spiral further out of control and our people begin to see the cognitive and psychological effects of pollution and rising temperatures, that we won't all be affected by

these problems. But the reality is that climate change's "major lesson" is that even though we have done a good job of damaging and decimated nature, we haven't erased it—in fact, it very well may soon erase us.

Part III, Chapter 2: Crisis Capitalism Quotes

❝ Big things make us feel small, and rather powerless, even if we are nominally "in charge." In the modern age, at least, there is also the related tendency to view large human systems, like the internet or industrial economy, as more unassailable, even more un-intervenable, than natural systems, like climate, that literally enclose us. This is how renovating capitalism so that it doesn't reward fossil fuel extraction can seem unlikelier than suspending sulfur in the air to dye the sky red and cool the planet off by a degree or two.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 177

Explanation and Analysis

In this passage, the book examines one of the main sources of helplessness and inaction when it comes to climate change: the feeling that the systems we have in place are too "big" and indestructible to change, even as the largest force of all—the force of warming—stares us down.

Capitalism is the main focus of this chapter, because it is the system that has, for a long time, dominated our world and spurred our society to produce more, consume more, and ignore the effects of endless expenditures of money and resources. Some scholars have noted that it's easier to imagine the end of the world than it is to imagine the end of capitalism, but what this book posits is that in order to save the planet, our world's governments do need to start imagining the end of capitalism—or at least its overwhelming "renovati[on.]" It's ironic that our man-made systems and ideals seem less vulnerable than the massive, seismic shifts that are taking place all around the globe as floods, famines, and other disasters—all hastened by warming—show us the might of our planet every day. There is no other Earth for us to go to once this one becomes uninhabitable, and there is no scenario in which a continued existence under capitalism does anything to solve climate change. So in order to really take definitive action against warming and reclaim stewardship of the Earth, humanity needs to consider whether our false societal constructs are really more immovable than our planet's ecosystem of feedback loops and destructive cascades.

Part III, Chapter 3: The Church of Technology Quotes

❝ Of course, those are religious fantasies: to escape the body and transcend the world. […] The solution[s to climate change that the tech world offers are] not […] rational one[s]. Climate change does threaten the very basis of life on this planet, but a dramatically degraded environment here will still be much, much closer to livability than anything we might be able to hack out of the dry red soil of Mars.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 194

Explanation and Analysis

In a chapter that explores the "church of technology," author David Wallace-Wells focuses on the tech world's irrational solutions to the very real problem of climate change.

There are two avenues, the book posits, through which the tech world might try to erase the problem of climate change: the first, escape through transcending humanity (i.e., uploading the consciousnesses of those who can afford the procedure to some kind of supercomputer;) the second, escape through leaving Earth behind and colonizing other planets. Both of these avenues, Wallace-Wells suggests, represent the tech world's total abandonment of its directive and a squandering of its resources. Technology is capable of creating so many innovative ways of mitigating the effects of climate change: mass carbon-capture plants that would absorb toxic chemicals from the atmosphere, for example, are just one idea. By trying to escape climate change through fanciful methods—methods that will, no doubt, only be available to the wealthy few, even though the billions that are most vulnerable to climate change come from the Earth's poorest regions—tech is abdicating its duty to revolutionizing our society and creating actual solutions to the problem of warming.

❝ We think of climate change as slow, but it is unnervingly fast. We think of the technological change necessary to avert it as fast-arriving, but unfortunately it is deceptively slow—especially judged by just how soon we need it.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 198

Explanation and Analysis

In this passage, the book further underscores just how futile it is for us to wait around for "the church of technology" to save us. Tech moves slowly, but warming moves quickly, and we need resolute, swift action on the political level in order to buy ourselves more time for technology to catch up to our needs.

This passage illustrates just how dangerous it would be to fall into any sense of collective despair: what we need is action, and soon, because even technology isn't coming to save us quite yet. The tech world holds many promises: innovative technologies that will allow us to clean up our atmosphere, build infrastructure to protect against natural disasters, and deal with an impending refugee crisis on a never-before-seen scale. But tech moves slowly—in large part because we *all* move slowly due to the pollutants that derail and diminish global productivity, even as capitalism encourages us to work as hard and as fast as possible. The tech world can make good on its promises—as long as it works apace and doesn't get distracted by fanciful solutions for escaping climate change rather than confronting it. But we are running out of time: with every day of inaction, the world teeters closer to reaching two, three, or even four degrees of warming by the end of the 21st century. Thus, this passage implies that wide-scale collective action at the political level is needed to begin mitigating the effects of carbon emissions while the tech world, too, mobilizes in an unprecedented effort to come up with workable solutions to the problem of warming.

Part III, Chapter 4: Politics of Consumption Quotes

❝ If the world's most conspicuous emitters, the top 10 percent, reduced their emissions to only the E.U. average, total global emissions would fall by 35 percent. We won't get there through the dietary choices of individuals, but through policy changes.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 207

Explanation and Analysis

In this passage, the book outlines the ethos of this chapter on the "politics of consumption"—namely, the ways in which corporations place the onus of minimizing our societal carbon footprint on individuals, while they themselves reap the rewards of continuing to poison the planet with emissions.

Humanity does have a pressing responsibility to do what we can to salvage the natural world, but Wallace-Wells underscores that the burden of climate action shouldn't fall on the individual. Whether one person eats organic food, eliminates animal products from their diet, or outfits their house with solar panels doesn't much make a difference on a global scale. The action we need must be taken by the biggest corporations, the ultra-wealthy, and the politicians who have the power to draw the line on carbon emissions. Each individual choice a person makes to live a "greener" life is meaningful, no doubt, because it signals that there are people ready to make radical changes in order to become better stewards of the planet. But as the book goes on to talk about the wellness, organic, no-carbon industry and how it frames personal consumption as the thing that needs to be fixed, author David Wallace-Wells posits that this rhetoric is merely another way of allowing the "conspicuous emitters" who are actually responsible for climate change to get away with taking no real action at all. And inertia on the political and corporate levels, after all, is what has made the problem of warming so much worse than it ever needed to be.

Part III, Chapter 5: History After Progress Quotes

❝ There is no good thing in the world that will be made more abundant, or spread more widely, by global warming. The list of the bad things that will proliferate is innumerable. And already, in this age of nascent ecological crisis, you can read a whole new literature of deep skepticism—proposing not only that history can move in reverse, but that the entire project of human settlement and civilization, which we know as "history" and which has given us climate change, has been, in fact, a jet stream backward.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 218-219

Explanation and Analysis

In this passage, the book explores the idea that humanity may soon need to confront a deeply uncomfortable truth: that the arc of our history is no longer moving forward, but rather has been placed on a rapidly moving "jet stream backward."

Climate change is described throughout the book as a "revenge of time"—the seeds of over-consumption and inaction planted in just the last few decades are already coming back to show us that our actions as a population have serious consequences. And climate change doesn't just alter how we think of time by forcing us to reckon with the past—it also forces us to accept that our future will not be the one we envisioned for ourselves. For millennia, the story of human progress has been a forward-moving one—we were ever-changing and ever-growing, just like the capitalist systems we slowly put in place over time to measure our health as a society. But now, given the increasing intensity of climate-change-associated extreme weather events, we must confront the idea that as the future unfolds, we won't necessarily keep moving forward at the rate we have been moving—or at all. Our brightest days may be behind us. As climate change's cascades of disorienting change ripple through our world, the systems we've put in place won't function anymore. And, the book argues, we will have to find new ways to work with the world that warming is revealing to us, or accept the fact that there is no more progress in store for us.

Part III, Chapter 6: Ethics at the End of the World Quotes

❝ One threat of climate catastrophe is that [certain] strains of ecological nihilism might find a home in the host of consensus wisdom—and that their premonitions may seem familiar to you is a sign that some of that anxiety and despair is already leaching into the way so many others think about the future of the world.

Related Characters: David Wallace-Wells (speaker), Guy McPherson

Related Themes:

Page Number: 235

Explanation and Analysis

In this passage, the book delves into the question of how ecological nihilism, sometimes shortened to eco-nihilism, threatens to derail the fight against climate change by changing how we respond to climate change. Eco-nihilism is a brand of thought that presupposes that because the climate-change-hastened end of the world as we know it is near, there is nothing to be done and no point, essentially, to trying to find solutions. Eco-nihilism is a kind of detached despair—but it is despair nonetheless, and, as the book posits time and time again, despair is the enemy of action.

Left unchecked, eco-nihilist sentiments could even descend into more dangerous ideologies: eco-fascism, a movement already present in our world and bolstered by white supremacy, or climate authoritarianism, in which an authoritarian government might seize or control resources in order to influence increasingly large numbers of desperate people living on a dying planet.

But right now we don't live in a world governed by eco-fascists or climate authoritarians—we currently live in a world that can only be saved by hope and action. Eco-nihilism, and the Walden-like retreat from society it encourages, is just another form of blind acceptance. As despair mounts around the world while warming worsens, we must not let ourselves become "zombies" who shuffle through the world hopelessly waiting for its end; instead, we must commit to collective action and a greater presence in our communities than ever before.

Part IV, The Anthropic Principle Quotes

❝ These are the disconcerting, contradictory lessons of global warming, which counsels both human humility and human grandiosity, each drawn from the same perception of peril. The climate system that gave rise to the human species, and to everything we know of as civilization, is so fragile that it has been brought to the brink of total instability by just one generation of human activity. But that instability is also a measure of the human power that engineered it, almost by accident, and which now must stop the damage, in only as much time. If humans are responsible for the problem, they must be capable of undoing it.

Related Characters: David Wallace-Wells (speaker)

Related Themes:

Page Number: 244

Explanation and Analysis

In this passage, David Wallace-Wells explains an important paradox: humans engineered climate change within a remarkably short span of time, and so we should by that same logic be able to find the power to begin reversing, or at least mitigating, warming's effects on our society.

Our civilization is fragile, and so too is our planet. But by accepting our responsibility for the planet's warming—by admitting that our focus on growth, greed, and endless production is a harmful anomaly—we should be able to admit our power to divest from the systems that perpetuate

and accelerate warming. This is the necessary action that the whole world needs to take. There can be no change without recognition of what's happening to us and to our Earth. We must accept the tenuousness of our ability to exist and understand that there is a very narrow set of circumstances that enables us to thrive. After doing that, it will become all the more vital and urgent to preserve, however we can, those narrow circumstances.

❝ The path we are on as a planet should terrify anyone living on it, but, thinking like one people, all the relevant inputs are within our control, and there is no mysticism required to interpret or command the fate of the earth. Only an acceptance of responsibility.

Related Characters: David Wallace-Wells (speaker)

Related Themes:   

Page Number: 251

Explanation and Analysis

In this passage, author David Wallace-Wells explains his belief that all we have to do to "command the fate of the earth," and thus of ourselves, is to accept our collective responsibility—both for warming's ravages, and to find their solutions.

"Thinking like one people" is the first condition of assuming collective responsibility for the planet's future. For too long, greed and the empty pursuit of individual financial growth have steered our society. It's why we've prioritized profit over people, it's why our emissions are so high, and it's why the cost of building new infrastructure to mitigate warming seems pointless to leaders who are desperate not to spend money they don't feel they need to. But by changing our way of thinking and seeing humanity as a collective united in our duty to take care of our planet and one another, we can recognize that our existence is special and rare—and we can decide to do something to protect ourselves and the planet that allowed us to evolve. Whether our tenure on Earth is unique in the history of the universe or not, we should feel empowered by the impossibility of our existence and all the more motivated to protect it and ensure its survival.

SUMMARY AND ANALYSIS

The color-coded icons under each analysis entry make it easy to track where the themes occur most prominently throughout the work. Each icon corresponds to one of the themes explained in the Themes section of this LitChart.

PART I, CASCADES

Author David Wallace-Wells believes that climate change is "much worse than you think." There are a number of myths about climate change: that it's happening only in the Arctic, that it only affects the "natural" world, that economic growth and new technology will be able to reverse it, or that wealth has the power to insulate people against it. None of this is true.

The author wants to dispel many of the most pernicious, pervasive myths about climate change. The more barriers there are to a holistic, global understanding of what climate change really is, how it works, and whom it stands to affect, the less action there can be against it. By laying out the reality of climate change—and by alerting his readers that not only is climate change real, but it is already "worse" than many know—Wallace-Wells immediately engages his readers in a call to action.

The earth has already endured five mass extinction events, each one wiping out so many species that it constituted an "evolutionary reset." The "most notorious" of these extinction events occurred 250 million years ago, when carbon dioxide warmed the planet by five degrees Celsius. Right now, humanity is adding carbon to the atmosphere at a rate about ten times faster than preceded the last extinction event.

Here, Wallace-Wells puts our contemporary experience of warming into context on a much larger timescale. We are already living through an extinction event—and the one we're bringing on ourselves through endless carbon output is going to be even more lethal than the last "notorious" "evolutionary reset." With a scientific model for what's in store, Wallace-Wells underscores that there can be no doubts about what's coming for us.

Half of the carbon emitted through the burning of fossil fuels has been expelled in only the last three decades—decades during which politicians, scientists, and everyday citizens of the world were well aware of the costs of those emissions. The most nefarious myth about climate change is that humans are now paying for the sins of those who spurred the Industrial Revolution. This is a fallacy that "unfairly" allows those of us alive today to claim innocence. In reality, the self-destruction humanity has perpetrated is "the story of a single lifetime": the story of David Wallace-Wells' parents' generation.

Climate change and global warming aren't necessarily just the work of our distant ancestors—those who first harnessed the power of fossil fuels and began polluting the earth through emissions. Wallace-Wells warns the current generation against letting themselves off the hook or blaming climate change on the long-dead or the soon-dying. The fight against climate change requires immediate, collective action, and that can't happen if humanity is still searching for a scapegoat.

In spite of the work of many scientists who raised alarms about the ravages of climate change throughout the second half of the 20th century, humanity is on track to warm the planet by more than four degrees Celsius by the year 2100—a milestone that, if hit, will render vast regions of every continent on earth unlivable. The responsibility of avoiding such a fate now belongs to a single generation: the current one.

By laying out a timeline that isn't so far in the distant future, but rather well within the lifetimes of many who are being born in the present day, the author suggests that there's no time left to think of climate change as a problem for the future. Its effects are already here, and it is this generation's responsibility to recognize that and begin to make change.

David Wallace-Wells admits that he is not an environmentalist or even a "nature person." He is, like many other Americans, a person who has spent a large portion of his life "fatally complacent, and willfully deluded, about climate change." Several years ago, though, he began collecting stories of warming from around the world. He was deeply perturbed—and quickly changed—by what he came to learn.

Here, the author admits to his own complicity in the line of thinking that posits that climate change is a problem for another generation. But what the author has come to see through his research for this book is that climate change is already here—and it is only getting worse. His language as he describes his own "deluded" denial of this fact is regretful but not self-pitying. This reflects the attitude he's hoping to instill in his readers: he doesn't want them to despair, but rather to recognize what's happening and decide to begin making a change, even if that change starts only with their own self-concept of what it means to live responsibly on a warming planet.

The United Nations now projects that there will be 200 million climate refugees by the year 2050—a number equal to the population of the entire world at the peak of the Roman Empire. Though this figure is a high-end estimate, it shouldn't lull humanity into complacency: it should instead galvanize the world for what's to come.

Throughout the book, the author will introduce figures that illustrate the practical effects of climate change in stark, staggering new lights. David Wallace-Wells knows that he's straddling a thin line: such figures could make people feel hopeless, and like it's no use trying to combat climate change, or they could motivate people to finally do something about the ravages of climate change.

Most coverage of climate change is narrow and muted, mostly focused on sea-level rise rather than the myriad natural disasters that will envelop the globe as temperatures rise. There is "almost no chance" of avoiding floods, droughts, heat waves, and other meteorological phenomena. The global goal of stopping warming at two degrees Celsius, created in 2016 at the Paris accord, is now a best-case scenario rather than a hard upper limit.

The book criticizes how climate change is covered in our contemporary media landscape. Flooding is just one of many problems that we will certainly face in the years to come, and focusing so narrowly on just one of climate change's many consequences has left the general public uninterested in, and thus unprepared to confront, the reality of climate change. Already, awareness campaigns and mitigation techniques rolled out in the last half-decade are obsolete. Climate change is moving faster than anyone wants to recognize, and its interconnected effects will change everything we know of contemporary life.

There are many reasons—most of them rooted in fear and denial—that no major media outlets or politicians discuss the prospect of a world that warms beyond two degrees. The bottom line is that human beings have had too much faith in the idea that climate change will only affect some people, or that technology will save civilization as we know it: the world is not a "zero-sum resource competition" after all. It is time for humanity to look "squarely in the face of the science" and stop distorting—or ignoring—the facts of what's to come.

Many people ignore climate change by conceiving of it as an issue that will only affect—and thus need only be solved by—future generations. Another pernicious problem is that many people believe even if climate change's effects start to be felt more acutely in the years to come, this will only affect people in certain, vulnerable regions, so it's not worth worrying about. But David Wallace-Wells stresses that climate change isn't bound by borders, and it will not politely wait for humanity's capitalistic competitions to reach their peaks.

The science of warming is complex because it's built on multiple layers of uncertainty. Research doesn't just have to take into account what humanity will do in the coming decades, but also how the planet will respond to our unending emissions. Groups like the United Nations' Intergovernmental Panel on Climate Change (IPCC), which offers the "gold-standard assessments" on climate change trajectories, do this complex work of drawing connections between which reductions in emissions will lead to which patterns of warming. Their latest report indicates that the planet is likely to reach about 3.2 degrees of warming—far beyond the "tipping point" of the ice sheets' collapse.

This passage illustrates just how dependent the human world and the natural world are on one another. How humans act now—and how we react to the ravages of warming, once they become impossible to ignore—may impact how the Earth's feedback loops operate and cascade into one another. While there's no way of knowing exactly how much warmer the planet will get within a certain period of time, it's safe to assume that if the world's governments remain, as they are today, largely inert on climate reform, warming will continue exponentially.

It is difficult to model the future past the year 2100—but answers about what the planet will look like far into the future can be found within the geologic record of the planet. Looking backward, however, suggests that current climate models are conservative: the globe could reach temperatures double than what the IPCC currently projects, even if humanity hits the emissions-reductions targets laid out in the Paris accord.

This passage underscores the idea that climate change is "even worse than [we] think" it is, as Wallace-Wells noted in his book's opening line. Comparing current warming models with data from the historical record only proves that the measures being taken, even at the level of international legislations, are insufficient. This passage implies that agreements like the Paris accord and projections from the IPCC only reinforce humanity's sense that there's nothing to be done—or that taking radical action to cut emissions entirely is simply too much work.

Even though the numbers seem small it's important not to trivialize them: at two degrees of warming—the best-case scenario—400 million people will endure water scarcity, the equatorial band of the planet will become unlivable, and rolling heat waves will kill tens of thousands each year. At three degrees, southern Europe will be in permanent drought. At four degrees, the damages incurred globally from flooding, tropical disease, and wildfires could pass $600 trillion, more wealth than exists in the world today.

This passage confirms that global society as we know it is profoundly unprepared to confront the effects of warming. Warming won't just flood certain cities—the global damages, the interruptions to food production chains, and the displacements and refugee crises it will create are unprecedented in human history. There is never going to be enough wealth to repair climate change's damages, and there is going to be an increasingly small amount of space to which humans can safely flee a cascading, multiplying series of natural disasters.

Climate change is irreversible and unavoidable. While it is difficult to picture the severity of its outcomes given the fact that many of them are decades or even centuries away, it is necessary to start doing so rather than simply focusing on what changes will arrive in this century. While there are many uncertainties about the specifics of what lies ahead, it is clear that the earth is headed for somewhere between two and five degrees of warming—and that those increased temperatures will test what human life is able to endure.

What is happening to the planet right now is already unstoppable—all humanity can do is resolve to mitigate these oncoming changes and crises by any means necessary. Right now, there is still time to come up with meaningful solutions and to prepare for the worst—but at two or three degrees of warming, the devastation may be so great that international cooperation (or human will) has broken down almost completely.

Within the bounds of a two-to-five-degree warming scenario, the biggest question is what the human response will be. Our own will and ability to change course is all that stands between humanity and a disastrous five degrees of warming. If humanity continues on its current trajectory of carbon emissions, changing nothing, many regions will become unlivable by the century's end: humanity may have to sequester itself in the global north to survive.

The consequences of global warming are great, and Wallace-Wells encourages readers to picture the immense changes and sacrifices that will have to be made if nothing is done right now, in the present. An Earth that is only habitable in small, sequestered areas will present an unprecedented human rights crisis—and this is just one example of how warming's practical effects will have devastating social, political and economic costs.

While it's unlikely that the entire globe will become uninhabitable, it's not an impossibility. The fact that humanity has created the conditions for its own extinction is the "overwhelming cultural and historical fact of the modern era."

This passage underscores the fact that it's humanity and human industry that have brought the planet to this tipping point. While some warming is natural, the degree and rate of warming right now is undoubtedly hastened by human impact. Humans have created their own destruction—and now we must find the will to pull ourselves and our planet back from the brink.

Climate change is, in many ways, already here. Hurricane Harvey, which struck Houston in the summer of 2017, was the kind of event that happens once every 500,000 years. But Harvey was the third storm of such intensity to hit Houston in just two years. Hurricanes in Ireland, floods in Maryland, and record-breaking heat waves in Russia are all symptoms of warming that affect our present-day lives. Unprecedented wildfires, heat waves, floods, and storms across the globe aren't just becoming humanity's new normal: humanity has entered a new climate system entirely, far from the one that nurtured its growth over billions of years.

The Earth's ecosystem is at once hardy and delicate. The superstorms, raging wildfires, and rapidly melting ice shelves that draw our attention around the globe today are increasing in intensity and urgency. So it's not far off base to state that we are already seeing what it's like to live on a planet that is warming past a temperature meant to sustain and nurture life. While humans aren't yet being cooked by the sun's rays, there are other more insidious symptoms of warming unfolding every day—and these symptoms will only make it progressively harder for humanity to continue to thrive and flourish. We have engineered our own greatest existential threat, and we have so altered the planet's equilibrium that we have pushed the atmosphere outside of the bounds of the life-sustaining and into the realm of the lethal.

The changes humanity is seeing now are the effects of the last several decades of emissions. Even if humans were to stop emissions entirely right now, the climate would still continue warming well into the future—and the scale and frequency of these natural disasters will continue to increase.

This passage underscores why radical, collective action against climate change is needed right now. The effects don't stop as soon as the problem stops—we will still be paying for the last several decades of emissions for many, many years to come, but a reduction or halt in emissions now could stop a problem that's already difficult to manage from spiraling completely out of control.

The term "Anthropocene," a name given to humanity's present geologic era, is misleading: it implies that humanity has dominated nature. But Wallace-Wells quotes a prominent oceanographer who states that the planet is an "angry beast" or even a "war machine"—and each day, humans are responsible for arming and angering it further.

We currently live in an era whose very name tells us that we have conquered nature and dominated the planet. But Wallace-Wells stresses that this idea couldn't be farther from the truth. In reality, the planet is more than equipped to fight back against our dominion and make survival difficult or even impossible. Every step we take to further cement our authority actually undercuts our ability to survive beyond the next several decades.

The "cascading violence" of warming that approaches will batter humanity with increasing intensity, making response and recovery difficult at best. The "**cascades**," or rolling and compounding environmental effects, that climate change will create in the environment are interconnected and dangerous. For instance: warmer temperatures will melt Arctic ice. Less ice means less white ground that reflects sunlight back into space—and more of it absorbed into the atmosphere, which means the ocean can absorb less carbon, which warms the planet even faster.

This passage introduces the book's central symbolic image: a "cascade" or cascades of compounding feedback loops that operate much like a cascade of waterfalls do: by feeding into one another, gathering strength and power until unleashing themselves in one mighty stream. The warming effect described here is just one example of a cascade: wildfires creating mudslides, flooding leading to an increase in disease, and many other compounded scenarios represent the intricate, interconnected latticework of our climate systems and their feedback loops. As these natural feedbacks cascade into one another, nature will become weaponized: wind will tug trees from the ground and turn them into battering rams, floods will cut off food deliveries and medical supplies from communities in need, and both rich and poor communities will suffer.

Another "wide-eyed climate delusion" is the idea that climate can be governed or changed by any institution, instrument, or piece of technology. The planet thrived before humanity's arrival, and it will survive beyond its end. Climate disaster is the most direct and overwhelming threat human civilization has faced—greater than any human conflict or war. It will take unified resistance to halt the **cascade** that is the collapse of international trust and collective responsibility.

The natural world as we know it will be decimated by climate change—but on a long enough timeline, the planet will do the work of repairing itself and creating something new. But humanity, which needs an extremely narrow set of circumstances to thrive (or even just to survive) is not equipped to weather the coming storms. That's why action is needed now—so that the disasters don't continue to compound and cascade over the decades to come, annihilating us before we have a chance to fight for our survival.

Climate disaster's effects aren't just going to affect the human world—after all, nature is not as separate from modern human life as most would like to think. In the last 40 years, vertebrate animal and insect populations have declined immensely, and the weather has changed the way humans experience the world. The migration patterns of fish and pollinators have shifted enormously, and some species of bear don't even hibernate during winter any longer. It's important not to see stories about changes in nature as "allegories"—we are not sequestered from the natural world. Rather, the natural world in many ways governs the human one, influencing everything from crop yields to pandemics to crime waves.

Humans depend on nature for many things—like temperature regulation, food sources, and unseen systems such as pollination and carbon capture that allow our food to grow and our air to stay clean. And nature depends on humanity for its survival, too. Already humanity's excesses have ravaged the natural world, destroying whole species, systems, and patterns. But the idea that nature will the only thing to suffer is a fallacy: the natural world is part of our world, and so we have a duty to do all we can to repair it.

The economy, too, is directly tied to climate, and prosperity will come from aggressive action to curb warming. Hundreds of trillions of dollars in damages are at stake should the globe continue to warm—and turning away from economic growth as an "orienting beacon" will be necessary.

This passage declares the book's intent not just to focus on the climatological and biological effects of climate change, but also on the effects warming will have on manmade systems such as politics and economics. Up until now, society has been organized around capitalism and economic growth—but warming will put a swift stop to that, rendering the metrics by which humans measure success entirely irrelevant.

There is no time to moralize or learn lessons from climate disaster: the threat is too imminent and too immense. Already, millions of people die each year from the effects of air pollution, and should the earth reach 2 degrees of warming, as many as 150 million could die each year. There is no available language or reference point for this kind of mass death—"the facts" are "hysterical."

By calling the facts of climate change "hysterical," Wallace-Wells isn't suggesting that they're ridiculous or far-fetched; rather, what he's saying is that the projected numbers for the casualties associated with climate change are so staggering and so miserable that they should induce hysteria and mourning in anyone. But while these numbers have been vetted by international panels and carefully considered by scientists and climatologists, many people still can't conceptualize the "hysteric" scale of climate crisis.

As serious as the threat of climate disaster is, people should not allow it to inspire passivity and hopelessness. While a dramatic threat, it's also a democratic one—humanity has a collective responsibility to face it rather than become complacent. Global warming is unequivocally humanity's doing—but this fact should be empowering. Humans are the "authors" of global warming, and so they must share in responsibility and continue to write its story until the end.

This is perhaps one of Wallace-Wells's most urgent arguments: he suggests that humanity's role in climate change is a cause for action and optimism rather than despair and passivity. According to his reasoning, humanity got itself into this mess, so surely it can engineer systems that will help to dig us all out of it together.

Wallace-Wells himself is optimistic. If humans could have engineered warming, they can engineer solutions to its threats as well. Carbon capture technology and other as-yet-unknown inventions still hold the potential to transform the fate of humanity from "apocalyptic" to "merely grim." Over the course of the writing of this book, the author says, he and his wife had a child—and while many question whether it's "moral" to reproduce given the threat of climate disaster, Wallace-Wells believe that the fight is not yet lost and that optimism is the key to winning. He knows his daughter will inherit an unknowable world—but that her generation will live "the greatest story ever told."

Wallace-Wells positions himself as an optimist, even after an opening section that speaks unrelentingly of disaster. This is somewhat of a radical stance to take—but he believes it is the only one that will allow humans to come up with ways of mitigating or halting altogether the systems that have caused the planet to warm so rapidly. In other words, Wallace-Wells is an optimist because he knows he has to be: pessimism and inaction only ensure the annihilation of life as we know it.

A huge portion of emissions can be cut just through the end of inefficiencies in construction, food production, and the minting of currency. There are many actionable avenues to a drastic fall in emissions, including constricting the carbon footprints of the world's richest 10 percent and issuing political mandates that place the onus of change not on individuals but corporations. But reaching these milestones will require a reframing of the story of human civilization from one of triumph over the Earth to a recognition of the fragile ecosystem made from human culture and the planet that sustains it.

By laying out these small ways that emissions can be cut, Wallace-Wells shows that there are no longer any reasonable excuses for inaction when it comes to climate change. He implies that human greed—and human obsession with a narrative of triumph and conquest—is all that is holding us back from taking the steps that must be taken to ensure the survivability of our planet for future generations.

The chapters to follow endeavor to provide a "kaleidoscopic accounting" of the costs that will accompany just one more generation of business as usual. The planet's "force of retribution" is primed to **cascade** though nature—but humanity must not conceive any longer of the natural world as separate from our own. The world that is left behind once warming takes its toll on nature won't be one that human beings can inhabit.

Just a few more years of ignoring climate change will effectively end any chance humanity has at surviving in the long term. The cascading effects of climate disaster will surely visit us no matter what—but there is a swiftly closing window of time in which we can mitigate those cascades' effects and make sure that our one Earth does not become, as the title of the book warns it might, completely uninhabitable.

PART II, ELEMENTS OF CHAOS, CHAPTER 1: HEAT DEATH

Humans are "heat engines"—we must continually cool off to survive. As degrees of warming increase, this will become more and more difficult. At five degrees, most of the globe could become unsurviveable, and even at two or three, just stepping outside in parts of India and the Middle East could be lethal. Since 1980, dangerous heat waves around the world have increased fiftyfold. Soon, just working outside during the summertime will be unhealthy for people in many parts of the globe.

By beginning with an examination of heat, Wallace-Wells gets at the heart of climate crisis's most threatening manifestation: temperatures that rise steadily with no end in sight. Our planet is already observably warmer than it has been in the past—but the many-armed machine of climate change threatens to compound these upticks in temperature exponentially.

Already, deadly heat waves are responsible for thousands of deaths each year: in 2010, 55,000 Russians died in a heat wave, and in one period during 2016, temperatures in Iraq only dipped below 100 at nighttime. Air conditioners burn nearly three-quarters of a million barrels of oil each day in Saudi Arabia during the summer—but air conditioning is not a permanent solution to the increasing number of heat waves and record-breaking single-day temperature spikes each year.

This passage shows that humanity can come up with helpful short-term solutions to rising temperatures—but running air conditioners on full blast throughout the hottest regions of the world is tantamount to putting a Band-Aid on a giant wound. Not only does air conditioning escalate emissions even further, but air conditioners are also only available in well-off, stable parts of the world to those who can afford them. A bigger solution to these skyrocketing temperatures is urgently needed.

It is unclear how much hotter it will get as we leave behind the "narrow Goldilocks range" of conditions hospitable to human life. The lack of clarity as to what's coming is "eerie," but it's entirely dependent on what humans choose to do in the years to come. Even though global warming has been recognized as a problem for three-quarters of a century, there have been no meaningful changes to everyday life around the globe—if anything, market forces and politics have made things even worse. Carbon emissions continue to grow each year, and while 195 countries have signed the Paris treaty, many of those countries' commitments are merely "rhetorical," as in the case of China, whose emissions continue to grow each quarter.

This passage makes clear the fact that temperatures are rising because humans are doing nothing. The half-measures, empty gestures, and far-off plans for the future aren't doing anything to stop the cyclical feedback loops in which people, seeking short-term solutions to rising temperatures, actually release more carbon and pollution into the atmosphere, thus warming the planet even faster and more quickly.

Because of the increase in warming, the UN's National Climate Assessment now suggests that negative emissions—technologies that suck carbon out of the air by machinery or by forest expansion—are needed in order to stay below an increase of two degrees. But these technologies aren't entirely realistic, and there's no time to wait for them to become real: humanity is behind, and even a change in emissions may yet trigger four degrees of warming by 2100.

Wallace-Wells stresses that just halting emissions is no longer enough—we need to actively start finding ways to pull pollution from the air. Every year wasted as the globe pursues difficult-to-enforce treaties and gradualist policies represents another part of a degree of warming.

The world is urbanizing, and fast—but hundreds of millions of people living in cities means more heat trapped in tall buildings and cement sidewalks, released into the atmosphere in the creation of devastating "heat island" effects. Many millions who've migrated to cities in the last decades may find themselves forced out by melting roads and buckling infrastructure—already, 354 major cities have average maximum summer temperatures of 95 degrees Fahrenheit or higher. Already, over a billion people worldwide are at risk for heat stress, and in spite of heat stress and heat stroke's reputations as "pathetic" ailments, being cooked alive by heat death is one of the cruelest and most painful ways to die.

There are many ways in which our planet is ill-equipped to handle such a rapid rise in temperature. It makes sense, then, that human-engineered things like buildings, roads, and transportation structures aren't equipped to deal with warming, either. There are many parts of the world where humans will soon be more vulnerable than ever to the terrifying effects of direct heat—billions of lives can be saved, but humanity has to act now.

PART II, ELEMENTS OF CHAOS, CHAPTER 2: HUNGER

Declining crop yields—and the hunger that results—are one of the many **cascades** that climate disaster may bring. As population increases, warming annihilates crop growth: by the end of the century, there could be 50% more people to feed, but over 50% less grain and protein with which to feed them. There is only a small swath of the world possessing the ideal growing temperatures, and climatologists' older theories about carbon acting as a fertilizer to spur new plant growth have proven inaccurate. Increases in pests, fungus, disease, and flooding threaten crop yields worldwide.

Wallace-Wells suggests that the ways in which climate change stands to affect our methods of food production is one of its most insidious cascades. As the practical effects of climate disaster such as flood, drought, and pestilence make their ways through our climate systems, they reveal the structures humanity has put in place to reap from the natural world to be flimsy and untenable. We depend on the Earth to feed us, but the Earth needs us to be its stewards in order to continue sustaining us.

Bleak, fatalistic predictions by economists like Thomas Malthus (who believed that long-term economic growth was impossible in the face of population growth) are perhaps off-base—there is a "green revolution" underway, and undernourishment and extreme poverty have fallen massively in the last several decades. But many climatologists and scientists are still worried by the concept of "carrying capacity"—the rough number of how much population a given environment can support before it collapses. Global warming is only one factor in determining carrying capacity—war, inequality, and other humanitarian questions are all part of the equation.

The more people there are, the more food we must produce to feed them all around the world. Global warming is a direct threat to our available, arable land—and its social, political, and military effects will put even greater strain on our capacity to harness those resources. Wallace-Wells explains that while Malthus's warnings about the necessities of population control were perhaps needlessly cutthroat, it's true that even our current food production systems can only sustain so many. And as climate change's cascades continue to impact the globe, there will be fewer and fewer places in which those food production systems can function.

As countries around the globe try to bring hundreds of millions of their citizens into the global middle class, however, the fact remains that the path there is fraught with "climate chaos." Food production already accounts for a third of all carbon emissions—and while the world needs to cut its meat and dairy consumption in half by 2050 to avoid compounding climate disasters, the likelihood of this happening as Westernized consumption patterns boom is slim.

Ironically, the very mechanism by which humanity has come to sustain itself—mass industrialized food production—is contributing directly to warming in a number of ways. Changing the ways we eat and the things we consume is necessary, and it's just one of the ways climate change will forever change the face of our society.

Ignorance and indifference contribute to the globe's failure to adapt new methods of sustainable agriculture—John Steinbeck once said, "A crime is something someone else commits."

Coming up with new ways of feeding ourselves is something we can certainly do—but first, we have to admit that the food systems we have in place make us complicit in our own destruction, and the destruction of the very planet we depend on for survival.

Drought threatens food production just as seriously as heat. Much of the world's arable land is rapidly transforming into desert. If the globe warms five or even three degrees, major regions of the world will be locked in perennial drought, worse even than the notorious American Dust Bowl. There are currently nearly one billion people who are undernourished or facing "hidden hunger" in the form of dietary deficiencies across the globe today, and warming will add to that number mightily.

This passage highlights how worsening climate systems will assault food production sites as the global population continues to rise. With fewer places to grow crops and raise livestock, less fertile ground to imbue the things we eat with nutrients, and more mouths to feed than ever, a global food shortage—or a "hidden" epidemic of nutritionally insufficient food—is all but guaranteed should we continue on our current course.

Some technological breakthroughs do promise solutions: soil-free startups, vertical farming, lab-grown meats, and other innovations could mean new ways of producing and consuming food. But the environment is saturated with carbohydrates—and further nutrient collapse threatens to put a strain on hundreds of millions, if not billions, of people. Climate change threatens to transform the globe into an "empire of hunger."

The alternative solutions to food production outlined here are well within reach. But like so much else associated with climate change, humanity needs to find the collective will to start putting these solutions in place right now if we are to prevent a planet that is motivated and transformed by human hunger.

PART II, ELEMENTS OF CHAOS, CHAPTER 3: DROWNING

The sea is destined to "become a killer." Four to eight feet of sea-level rise is expected by the end of the century. But humanity has convinced itself that a rise in sea level will be the worst ravage of climate disaster. Because of this, resources are so laser-focused on combating sea level rise that extreme weather events, diseases, and other effects get overlooked.

Wallace-Wells takes issue with how so much of our present discourse around climate change is steered by concern over sea-level rise. In many ways, it's one of the most potent "elements of chaos"—higher seas threaten to erase entire cities. But before those cities are erased, there will be a slow and painful erosion of resources, an increase in tropical disease, and a sharp uptick in refugees who will need to be resettled in other still-inhospitable parts of the globe.

Whole cultures will be swallowed by the sea: the Maldives and the Marshall Islands, most of Bangladesh, Miami Beach, and the White House will all be condemned to an Atlantis-like fate, displacing hundreds of millions of climate refugees. By 2045, as many as 311,000 homes in the United States are at risk of chronic inundation; by 2100, the number expands to 2.4 million properties and domiciles. And the flooding won't stop then: seas will continue rising for thousands and thousands of years.

By laying out the numbers-driven data about what, materially, we stand to lose should the sea levels continue rising at their current rates, David Wallace-Wells highlights just how profoundly humanity is at the mercy of the very catastrophes it's engineered. The seas will keep rising until the ice caps stop melting—which, because humanity refuses to stop creating new carbon emissions, may continue for a very long time.

Coasts aren't all that will be affected—inland flooding, which has affected 2.3 billion people around the globe just since 1995, will continue to devastate the planet as rainfall increases. At just 1.5 degrees Celsius of warming, flood damages increase worldwide by between 160 and 240 percent. Even with a huge reduction in emissions, these predictions are all but guaranteed to come to pass.

People think of coastal regions—like Miami, Bangladesh, or New York City—as the places that will suffer the worst effects of sea-level rise. But flooding is an inland problem, too, and inland regions can be even more poorly prepared to combat flooding than regions that regularly contend with storm surges, typhoons, and more.

Already, communities around the globe are struggling to adapt to the prospect of new coastlines. The melt rate of the Antarctic ice sheet tripled between 2008 and 2018—each year, the sheet loses over 200 billion tons of ice, meaning sea levels could rise several meters within just 50 years. All climate science is ruled by uncertainty, but sea-level rise is literally unprecedented: never before has the breaking-up of ice on such a scale been seen.

The sea-level rise we're witnessing isn't just steady—it's in fact exponential. This paragraph is yet another example of how the effects of climate change build up and cascade down. Warmer temperatures mean that the ice melts even faster, contributing to levels of rising waters that are difficult to accurately predict.

The melting of the Arctic threatens to trigger many more **cascades** of climate chaos. As ice melts, up to 1.8 trillion tons of carbon will be released from the ice in the form of methane gas, which is even more powerful than carbon dioxide. This flips the ice sheets and the permafrost in Canada, Russia, and other northern regions from carbon sinks—which absorb atmospheric carbon—to carbon sources. By 2100, the Arctic may have released 100 billion tons of carbon—half of all the carbon produced by humanity since the dawn of industrialization. Losing the "albedo effect," in which white swaths of ice reflect sunlight back into space rather than absorbing it, also threatens to suck more greenhouse gases into the atmosphere.

Through the potent example of ice sheets, Wallace-Wells illustrates how one climate cascade doesn't just represent a single threat. Not only are ice sheets contributing to sea-level rise, but the melting of the ice caps creates many other problems. All of these things are interconnected—and each one hastens the pace at which our planet is warming and growing more and more inhospitable.

Some climatologists and ocean chemists predict 50 to 80 meters of sea rise at three degrees of warming—Montreal, London, New York City, Saint Petersburg, and Mumbai would be erased from the map at that level. Though this is the "ceiling" of sea-level rise, the Earth will get there eventually—it's just a matter of when.

Even the experts are unclear on just how high the seas will rise, as it's difficult to predict something that's affected by so many disparate cascades. What is clear is that without immediate action, the amount of land we stand to lose to sea-level rise—and the reflective ice that stands to melt—will forever change the face of our planet.

PART II, ELEMENTS OF CHAOS, CHAPTER 4: WILDFIRE

In 2017, the Thomas Fire spread through Southern California, forcing over 100,000 people to evacuate and burning over 50,000 acres in one day. The fires that broke out in 2017 weren't as "unthinkable" as the media suggested they were: California's fire seasons are, almost every year, debilitating. But they're getting worse. In 2017, five of the 20 worst fires in the state's history hit. In the years that followed, the fires continued to worsen, and the media continued to spin stories of "unprecedented" damage, when really, it wasn't the scales of the disasters that were unbelievable but the types of people they affected. Realizing that a city as wealthy and beautiful as Los Angeles was so vulnerable came as a shock to many.

Natural disasters like wildfires are one thing when they strike poor, vulnerable areas—but when they force celebrities from their homes in real-time, more people notice just how bad things are really getting. Wallace-Wells seems to lament that it takes this kind of destruction to get people to see that climate disaster is indiscriminate, immune to the supposed barriers of wealth and class.

The extreme fires in California are likely to worsen—soon, we will long for the "normal" fire seasons we're experiencing right now. The United States is vulnerable to the effects of climate chaos—and it's becoming harder to protect against them. Wildfire damage is expected to double by 2050, and there will be no fire "season"—the scourge will be year-round.

This passage calls into question what humanity is willing to accept as normal. We already look at superstorms and raging, prolonged wildfire seasons as a part of everyday life—even though they're markedly worse now than they have been in recent decades. One of the biggest threats to collective action against climate change is this phenomenon of normalization.

Globally, wildfires are beginning to set off new biological feedback cycles. From mudslides to air pollution to compromised drinking water to the release of carbon stored in the trees that burn, fires threaten to unleash one of the "most feared" **cascades** of all. Right now, deforestation comprises about 12 percent of carbon emissions, while forest fires comprise about 25 percent. The deforestation of the Amazon promises to add 1.5 degrees Celsius of warming. Additionally, when forests are decimated, the bugs that live there flee—spreading insect-borne diseases to new regions. These cascades reveal the "true cruelty" of climate change.

This passage is one of the book's most direct illustrations of how the interconnected cascades of our climate systems threaten to provoke one another and create chaos for humanity. Wildfires aren't just concerning in and of themselves—all the other forms of destruction and change they threaten to unleash also have to be taken into account. Wallace-Wells continues to illustrate the interconnectedness between the many disparate parts of our world in order to emphasize that fighting climate change requires innovation, dedication, and a rigorous understanding of how these feedback systems function.

PART II, ELEMENTS OF CHAOS, CHAPTER 5: DISASTERS NO LONGER NATURAL

The natural disasters to come will soon become so frequent and so normalized that humanity will simply refer to raging hurricanes, typhoons, tornadoes, floods, and droughts as "weather." History is now happening all at once: the seeds of these disasters were sown long ago. The drastic changes in weather of the last several years—global heat waves, "500,000-year" floods, and wildfires in the Arctic Circle—will all seem normal by 2040. The unthinkable will soon become the banal.

In this passage, the book outlines one of the most dangerous consequences of warming's steady escalation: humanity has become desensitized to just how bizarre and catastrophic our natural disasters are. This pattern, the book suggests, will only continue to worsen as the weather does—and unless humanity acknowledges that these kinds of weather events are anything but normal, there will be no urgency behind our fight against climate change.

Because climate chaos unfolds unevenly, some regions will experience more drastic, sudden changes than others. New categories will need to be invented for hurricanes, and regions that suffer from wealthier countries' indifference to climate change will need to be prioritized. Humanity has no adequate defenses against the superstorms like Hurricane Maria and Hurricane Irma that threaten to upend our present categories for sorting natural disasters.

One of climate change's many invisible consequences is an increasing disparity of wealth and privilege. While well-off (or luckily positioned) countries don't see the worst of climate change on a day-to-day basis, vulnerable countries and territories like Puerto Rico, Bangladesh, and Indonesia will suffer the most drastic changes the most quickly. It will be easy for some people to ignore climate change while others will have to reckon with its deadly fallout almost constantly.

The globe will be more connected than ever, as a warming Arctic creates intense blizzards in the northern latitudes while America's "tornado alley" shifts miles each year, creating longer paths for cyclones. These are not "acts of God" any longer, but the all-too-explicable effects of climate change.

The warming atmosphere is literally rearranging our current weather patterns. This means that even those who believe they're immune to the effects of certain weather events by virtue of their location will soon find themselves vulnerable to unprecedented disasters.

Storm damages from tornadoes, hurricanes, and wind storms will produce other kinds of cascades: wastewater, toxic gas releases, and displacement of hundreds of thousands of people. Communities will be devastated so often and so quickly that there won't be time to rebuild between weather events. Eventually, those fleeing climate disasters may not even be able to find high enough ground or fortified-enough cities in which to remake their lives.

The costs of rebuilding, the logistical planning needed to shelter refugees, and the ever-mounting unpredictability of these extreme weather events means that soon, many parts of the planet may be battered beyond repair. The social, financial, and political toll this will take will be enormous—and as weather redraws the lines of our habitable zones, we will have to redraw the lines of our society.

PART II, ELEMENTS OF CHAOS, CHAPTER 6: FRESHWATER DRAIN

While 71 percent of the planet is covered in water, only about two percent of that water is fresh—and only one percent is readily accessible. And humans don't just need water to drink—we need it for agriculture and industry. By 2030, experts expect that global water demand will outstrip supply by 40 percent. This crisis isn't unfixable—it's mostly due to political and bureaucratic missteps—but still as many as 2.1 billion people already lack access to safe, clean drinking water. Climate change threatens to worsen the water crisis around the globe. As glaciers melt, water resources shrink, and freshwater availability worldwide could decline by two-thirds. Five billion people could be affected by 2050.

By explaining how many people are already suffering from a dearth of freshwater access at just one degree of warming, the book shows that we as a global society aren't at a great baseline when one considers the tragedies, disasters, and shortages to come. There is already a strain on safe drinking water all across the globe, from the world's wealthiest countries to its poorest. As the effects of warming continue to impact—or in some cases destroy—our freshwater sources, it will also become more difficult to ensure that everyone has water.

As some lakes around the world evaporate, others will experience a boom in aquatic plant growth, which multiplies carbon emissions and furthers the water crisis. Underground aquifers promise to provide freshwater—but these resources are limited, and many of the world's aquifers are already drained.

This passage shows that even when it comes to freshwater sources, every climate system and natural resource we have becomes weaponized by warming. The lakes we look to for water may dry up due to heat or become carbon sources themselves. No part of the world will remain unchanged by the ravages of warming.

In March 2018, Cape Town experienced an acute water crisis. The drought exaggerated existing social and political conflicts in the metropolis, but residents themselves weren't really responsible for the crisis—personal consumption is certainly not the reason the world is in climate chaos. Only in the most of extreme droughts does personal use of water make a small bit of difference. Water issues affect four billion people each year—at just one degree of warming.

This passage illustrates how the side effects of warming patterns—such as water shortages—have reverberations throughout the social, political, and economic spheres of our society, especially in places where tensions along the lines of race and class are particularly fraught. Instances like this water crisis in Cape Town aren't unprecedented—but how bad they will get and how profoundly they will change our society is a frightening prospect.

Though the planet currently has the resources to provide clean water to its entire population, there is no collective political will to make water accessible to all. Water demand is expected to increase 50 percent in the next several decades, even as climate change makes water scarcer. Throughout human history, armed conflicts stretching as far back as ancient Sumeria have been tied to water shortages—and as evidenced by the Syrian drought of 2006-2011, which helped bring about a civil war, modern humans will not be spared from the violence and uncertainty water scarcity creates.

This passage highlights how frustrating—and even fatal, in many cases—political and social inaction is. Right now, many people are suffering needlessly as they endure water shortages—but it doesn't have to be this way. Unfortunately, this is a grim predictor of the many needless casualties of climate crisis still to come. Unless society around the globe can stop thinking in terms of profit, greed, and exceptionalism and start thinking in terms of global stewardship of the planet, these disparities will continue to widen as climate crisis seizes the world.

PART II, ELEMENTS OF CHAOS, CHAPTER 7: DYING OCEANS

Though humans have long tended to see the ocean as unfathomable and mysterious, ocean makes up 70 percent of the earth's surface. The oceans play an important role in feeding people, regulating seasons, and modulating the planet's temperature by absorbing the sun's heat. But warming poses a serious threat to all of these functions. With fish populations migrating north and ocean waters acidizing as they absorb excess carbon dioxide, the ocean is becoming another factor in adding degrees of warming to the earth.

This passage significantly underscores the deeply symbiotic relationship between the human world and the natural one. Humans depend on the ocean for food—but the ocean's health is at the mercy of the patterns of human industry. As humans pollute the world, the ocean becomes yet another complex feedback loop. The processes that normally cool the planet and keep the atmosphere clean invert and become agents of further warming.

Mass bleaching events, which have already decimated a huge percentage of reefs, including the famous Great Barrier Reef in Australia, will threaten 90 percent of all reefs by 2030. Reefs support a quarter of marine life, supplying food and income for hundreds of millions of people around the globe. In acidic waters, the fish, bivalves, and crustaceans that feed the world will no longer be able to thrive.

The ocean is a complex system in and of itself, and each of the world's oceans is a part of the larger planetary-wide system of warming and weather. Here, the book telescopes all the way down to look at the microorganisms and small ocean creatures whose existences are threatened by the erasure of coral reefs. In doing so, the book shows that every seemingly inconsequential cog in the larger machine of our planet's ecosystem is, in fact, vital. As these small microcosms break down, the whole system begins to cascade into chaos.

Between reef die-offs and the de-oxygenation of huge swaths of ocean, humanity is entering a period of mass extinction. The ocean is suffocating, and, in the process, releasing noxious chemicals such as hydrogen sulfide into the atmosphere, triggering feedback loops that will be difficult, at the least, to recover from.

The ocean can only hold so many chemicals, but as it releases them into the atmosphere to save itself, it jeopardizes other parts of the climate. This passage yet again illustrates just how deeply interconnected all of our climate systems are—and just how much is threatened when the effects of warming create chain reactions and cascades of more pollutants.

The Gulf Stream and other major currents regulate regional temperatures, but in a warming and dying ocean, these paths may be interrupted, leading to a huge disruption in the planet's equilibrium and weather systems. Though this may not happen on a human timescale, the Gulf Stream's velocity is decreasing noticeably—and the ocean's transformation is reaching a dangerous tipping point.

Nature and humanity are at one another's mercy. As human industry changes the ocean's feedback responses to increased pollution and excess freshwater, the ocean threatens to compound other sources of warming and heat the planet even faster. Humanity's refusal to pay attention to these cascades means that we are approaching our "tipping point" with more velocity each day.

PART II, ELEMENTS OF CHAOS, CHAPTER 8: UNBREATHABLE AIR

Though humans aren't at risk of suffocating due to lack of oxygen, the changing climate means that people around the globe are ingesting harmful carbon dioxide particles that directly affect cognitive ability, causing declines in clarity of thought of over 20 percent. The planet's air is only getting dirtier, and deaths from inhaling pollutants are expected to double as climate change seizes the planet. 10,000 people globally already die from air pollution each day—and as the air around the world becomes more toxic, that number will only skyrocket.

This passage, again, shows how most coverage of climate change looks at fatalist, far-fetched, worst-case scenarios, while ignoring the casualties of warming that are already present in our everyday lives. We are nowhere near a scenario in which there's no longer enough breathable oxygen, but we're ignoring the very real fact that the air we do *breathe is not very good for us, and we're delaying the social and political action that might have an impact on the air's health.*

Studies have shown that a person's test scores, labor force participation, and lifetime earnings are all directly tied to the quality of the air they breathe. In significantly smoggy or toxic areas, these numbers are all in decline. From China to California to Delhi, pollutants often prove life-threatening; over 1.3 million people died during China's "airpocalypse" of 2013. Pollutants affect heart rate, asthma, and pregnancy outcomes, and air pollution has been linked to cognitive issues such as ADHD and autism spectrum disorders. Globally, about 95 percent of the world's population is currently breathing air that is polluted enough to be dangerous.

Just as the book discussed hidden epidemics of hunger in the form of nutrient deficiencies in an earlier chapter, here, it examines another silent casualty of climate change. The very real effects of life on a warming planet are already here, and they are already ravaging the world's most vulnerable. Climate change is already altering the outcomes of human lives all around the planet in unprecedented and unpredictable ways.

Chemical pollutants and carbon particles aren't the only things compromising the air we breathe and the things we consume: microplastics, too, are a direct threat. Fish tested all over the world contain microplastics, as do honey, beer, and sea salt. Globally, most human bodies probably contain microplastics as well. By 2050, there may well be more plastics in the ocean than fish.

Microplastics are a human-engineered "element of chaos" in the fight against climate change. They are transforming our oceans, our animal life, and likely our own bodies, but nearly every level of our society relies on the plastic materials that create and emit these pollutants. Like every other aspect of climate change, microplastic pollution will only continue to build in power as the years go by, no doubt having unprecedented and frightening effects on food production, rising temperatures, and the quality of human life around the globe.

When plastics break down and degrade, they release methane—yet another airborne pollutant that threatens human life and accelerates warming. Aerosol pollution, too, poses a sinister threat: particles that hang in the earth's atmosphere reflect heat back into space, keeping the temperature cool. Unfortunately, this places humanity in a terrible catch-22: halting or drastically decreasing emissions rapidly will undoubtedly now result in an even more hastened warming of about half a degree. Pollution is destroying global public health, but it's also cruelly protecting humanity from something much worse: rapid warming.

This passage reveals the unsustainable position in which humanity has found itself when it comes to mitigating pollution. At this point, pollution is actually preventing more warming—a tragic and twisted fact that reveals just how insidious the invisible cascading effects of warming are. Taking apart one part of the climate system implicates all parts of the climate system. Everything is interconnected, and one change may trigger unforeseen feedback loops that actually hasten the whole process.

Scientists and climatologists have managed to find a potential solution to this "devil's bargain:" by dispersing sulfur dioxide into the atmosphere, the element's change into sulfuric acid will reflect the sun's rays back, keeping the planet cool as emissions decrease. This, however, would turn our skies red, create more acid rain, decimate plant life, and result in many more thousands of pollution-related deaths annually. And once humanity begins such a program, it can never stop.

This passage shows that the mitigation solutions available to us now require immense tradeoffs—and will still require us to live on a rapidly warming planet whose feedback loops are constantly creating new forms of destruction. There is no more time for half-measures when it comes to climate policy: if we don't take action soon, there will be more and more of these terrible trade-offs to contend with.

PART II, ELEMENTS OF CHAOS, CHAPTER 9: PLAGUES OF WARMING

Diseases that haven't circulated in the planet's air for millions of years are trapped in the Arctic ice—and as the ice melts, those diseases will be released back into the atmosphere. People's immune systems will have no idea how to fight back against these ancient plagues. Even more recent diseases—namely the 1918 flu and the bubonic plague—threaten to thaw out and reenter the world. Though not all of these organisms will survive, there is precedent for their ability to do serious damage: in 2016, a boy in Russia was killed and 20 others were infected by anthrax released when a reindeer's 75-year-old frozen carcass thawed out of the permafrost.

The release of new and old diseases into the atmosphere is yet another casualty of climate change. When most people think of climate crisis, they think of rising sea levels and rampant natural disasters—that is, dramatic, contained events that wash away life as we know it. But what this book suggests is that the most tragic and dangerous effects of a warming planet aren't those that are the most explosive or obvious. Like air pollution and malnutrition, localized resurgences of old diseases are already happening all around the globe right now, affecting vulnerable individuals.

What is more frightening even than the release of ancient diseases is the migration of existing regional ones. Certain bugs (and thus certain maladies they carry) are only a threat in certain parts of the world, such as yellow fever in the Amazon and malaria and zika in other tropical regions. As the earth warms and temperatures shift, the bugs that carry these diseases can migrate northward and mutate. For example, since 2010, Lyme cases counts have increased in places like Japan and South Korea, where the disease had never before existed, and, in Minnesota in the 2000s, ticks dropped the moose population by more than 50 percent in a single decade.

Just as the locations of arable farmland and the paths of tornados and hurricanes shift as warming rewrites our weather maps, so too do the regions in which tropical diseases can thrive stand to shift. This passage is emblematic of how the interconnected systems of climate crisis feed off of one another in unexpected and often initially invisible ways.

The most uncertainty about new and emergent diseases is centered around the bacteria that live inside human bodies—more than 99 percent of which are unknown to science. Right now, most of the bacteria that lives inside the body is harmless, even helpful. But in May 2015, nearly two-thirds of the global population of the saiga, a small antelope native to central Asia, died in just a few days. The cause of death was a bacteria that lived inside the animal's throat—during a heat wave, humidity triggered a bacterial response that killed a huge number of animals. The trigger of climate change, science suggests, could turn any number of bacteria living inside us into bullets.

By highlighting yet another invisible potential effect of rising temperatures, the book points out just how much we don't know about the dormant enemies climate change stands to unleash upon the world. The larger implication is that without immediate action, there's no telling what previously benign features of human life will suddenly become weaponized liabilities. Only in controlling warming now can we have a say in what new developments do or do not reach us by the end of the century. Animals are already suffering from mass die-offs like this one—and if humanity doesn't recognize the interconnectedness of the human world and the natural world, we may all be headed for similar fates.

PART II, ELEMENTS OF CHAOS, CHAPTER 10: ECONOMIC COLLAPSE

The mantra of global markets is that economic growth has the power to save humanity from anything that comes its way. But economic growth the world over is inextricably tied to the discovery, processing, and production of fossil fuels—so much so that some scholars suggest that the "singular innovation" of burning fossil fuels is all that has allowed humanity to expand and amass more wealth and power from one generation to the next. This growth is, on a long enough timeline, probably an "aberration."

With this chapter, the book begins to move away from the natural and biological consequences of warming as it takes a closer look at how climate change will affect our man-made institutions, and particularly economics. The book isn't just exploring how climate change affects the natural world or the ability of humans to sustain life: it's also going to interrogate how the systems we've engineered to mark success and govern ourselves will fall apart as climate change takes hold of more and more of the Earth.

Just as fossil fuels caused warming, warming causes a drop in economic growth—scientists currently project more than 20 percent losses in per-capita earning the world over by 2100. Climate change reduces global output of resources—and as GDP declines at rates triple (or more) than it did during the Great Depression, the world economy will surely be devastated. The economic halt on the horizon is not a depression or a recession, but instead a "dying."

Our global economy is not built to withstand the global natural and societal transformations that climate change will set off. In a way, climate change has been engineered in service of skyrocketing profits—pursuit of a healthy economy has decimated the health of the planet. Now, climate change will completely derail the global economy, according to all available projections.

The cascading effects of natural disasters and public health crises aren't just devastating but expensive. Costs to agriculture and arable land, the destruction of homes and businesses, and the breaking-down of expensive infrastructure will all produce an economic setback from which the world might not be able to recover. The world was "simply not built for climate change."

The costs of building new infrastructure, relocating farmlands, and protecting against further disaster will all prove to be too much once the Earth reaches a certain level of warming. Already, at just one degree, swaths of the world economy are suffering and whole towns destroyed by natural disasters remain unfixed. There's not enough wealth to go around now, and there certainly won't be in the future.

Even as humanity has innovated in new sectors like technology, climate change and its negative cognitive effects have stymied productivity and clarity of thought. Since heat is directly linked to increases in crime and decreases in test scores and employment, the hotter it gets, the harder all sectors of production and economy will be hit. Even countries like the United States that are poised to endure such a crisis will no doubt feel the ripple effects of a decimated world economy.

Yet another insidious effect of climate change is how it lowers brain function and thus productivity. In an economy based entirely around exponential production goals and a constant trajectory of growth, this means that our economy is already behind where it would need to be to sustain us through warming. And the book underscores that in the future, people will only become more incapacitated by warming's ravages.

Many countries treat economic growth as the best metric of a healthy society—but as warming continues and climate change racks up damage within those countries (some research suggests the figures could reach up to $550 trillion), economic superpowers will have to decide how to respond. A rapid energy transition could cost $26 trillion—a large figure, but one dwarfed by the cost of inaction. If the world acts now according to the commitments outlined in the Paris Agreement, the world's economy may stabilize at a 15-25 percent loss in GDP. Still, there may not be a way to bounce back from those numbers.

The book is deeply critical of the fact that human society uses the economy as a measure of success and progress. In reality, pursuing profits and economic growth is largely what has gotten us into this mess. The world is not healthy—and on a long enough timeline, the economy will begin to reflect what's actually happening all around the world. And at that point, it won't just be too late to save the economy—it may well be too late to save the planet. A shock to the economy now in the form of immediate action towards a rapid energy transition may save it from total destruction later.

PART II, ELEMENTS OF CHAOS, CHAPTER 11: CLIMATE CONFLICT

While experts caution that wars aren't caused by climate change, this is half-true in the same way that hurricanes aren't directly caused by climate change. Researchers claim that for every half degree of warming, societies the world over could experience a 10-20 percent increase in the likelihood of armed conflict. By 2100, there could be 40-80 percent more war—and this is a best-case scenario.

The correlation between a rise in temperature and a rise in armed conflict isn't completely direct, but increased instances of war are nevertheless made more likely by a warming earth in the same way that natural disasters are. Warming magnifies human and natural crises alike.

Warming affects violence and armed conflict in many ways. Melting ice opens up new territories to fight over and new arenas for those fights to take place. Countries at risk of losing army and naval bases seek to arm themselves in other ways. The race to build footholds in eroding areas heats up. Warming weather is shown to have psychological and cognitive effects on human beings—so in regions that are hot and getting hotter, such as the Middle East, warming produces not only a strain on resources but a more sinister, invisible sense of psychological pressure.

By laying out all the different ways in which the side effects of global warming stand to directly contribute to a rise in armed conflicts around the globe, the book reminds readers that the human world and the natural world are not separate: what happens in nature reverberates throughout humanity, and vice versa.

Compromised agriculture, stalled economics, forced migration, and rapid social change are all factors that contribute to the rise of violence in any given place as a result of warming. War is "an all-encompassing aggregation" of warming's biggest **cascades**, and in places like Yemen, where the social, political, and economic situation is already fragile, warming could tip the scales irreversibly. Climate change won't be the sole cause of the coming wars—but it will be the spark that ignites already-present "kindling."

Because climate change threatens to compromise and change every aspect of the society we've engineered, it stands to reason that on newly shaky ground, humanity will be much more vulnerable to armed conflict. So while war isn't as direct an effect of climate change as, say, melting ice caps, it's nonetheless one of the cascades that threatens to plunge our planet past the tipping point.

Hotter weather and more highly polluted air are directly linked with increases in violent crime rates, robberies, and acts of larceny. Natural disasters that leave communities devastated and short on food by affecting their infrastructure and agriculture also, in their own way, lead to increases in crime rates. As the cascades mount, these chain reactions will compound and worsen.

Climate change doesn't just deplete resources, shift boundaries, or open up new arenas of conflict: rising temperatures are statistically shown to make people less focused and more volatile. As "normal" temperatures around the globe continue to rise into unprecedented territory, humanity may become markedly more violent on the whole and less capable of regulating conflict.

PART II, ELEMENTS OF CHAOS, CHAPTER 12: "SYSTEMS"

What David Wallace-Wells calls **cascades**, climate scientists refer to as "systems crises." The American military calls them "threat multipliers," citing not just armed conflicts but mass refugee crises as the threats in question. 13 million Americans alone will be displaced by the threats associated with warming—but the US, a wealthy nation, will not be the first or the hardest hit by the ravages of climate crisis.

At this point in the book, it's clear that the cascades that will compound and feed into one another as warming seizes the planet will change the face of our Earth. But the greater toll on humanity—and the injustice that toll will represent—is a more complex thing to explore.

Slowly-developing countries like the Democratic Republic of Congo—the countries which produce the least emissions—will, ironically and tragically, be the most affected. And when scarcity, uncertainty, and desperation take hold of these countries, **cascades** of conflict will begin to unfold. By 2050, there could be 200 million to a billion climate refugees in need of shelter and resources. The "scrambling" that climate disaster produces will surely change the face of global society forever.

Climate injustice is a very real threat. As countries suffer the physical, social, and economic effects of climate change, not everyone will suffer equally. As refugee crises and political turmoil—side effects of fewer resources, shrinking land masses, and social unrest—seize different countries around the globe, a new kind of inequality will emerge. Every part of humanity's experience of life on Earth will be changed by warming.

Another system soon to fall into crisis is the human body itself. Pollution and tropical diseases are not the only things that will pose an immediate threat to human health around the globe: water pollution in the wake of natural disasters and rainfall shocks that deplete nutrients from food supplies will mean that once-prosperous communities will have to reckon with deprivation. While many people will, in the coming years, decide not to reproduce, believing catastrophe to be inevitable, "stoic wisdom [can be] an alibi for indifference."

Even though climate change will take an immense toll on the planet and its human inhabitants alike, the book stresses that it's irresponsible to state that things are already so far gone that there's no sense in investing in our planet's future. To do so is to give into the climate despair that not only tolerates but rewards indifference and inaction.

The biological, social, and economic problems ahead are bad enough—but the psychological effect of living in a collapsing world is yet another **cascade**. Research shows that 62 percent of Hurricane Katrina evacuees developed acute stress disorder. Scientists and climatologists have been shown to experience "climate depression" or "environmental grief" at a high rate, but their secondhand suffering is nothing compared to those who are experiencing the early stages of climate chaos firsthand. Throughout the world, natural disasters leave those in their wake suffering not just with pressing issues of food scarcity, polluted resources, and crumbling infrastructure, but also with severe and overwhelming cases of PTSD. As temperatures rise globally, suicide rates increase—40,000 additional annual suicides are possible by 2050 if emissions don't stop.

This passage examines the psychological side effects of enduring natural disasters and of living on a warming planet where destruction and death tolls are only continuing to rise. The cascades on display in this section of the book aren't just about compounding natural crises—those cascades bleed over into realm of the human, too, highlighting the inseparability of the natural world and the human one.

The research that this book has laid out so far comes from our world today—a world that's just one degree warmer. Though some of the book's predictions and projections will be proven false, everything that researchers and climatologists know right now comes from precedent—and there is no precedent for what will happen next on a warming planet.

Scientists and climatologists are using what's happening in today's world—a world already significantly affected by warming—to determine what will unfold in the years to come should humanity take no meaningful political action to halt emissions. Projecting how climate change will drastically alter life on Earth is one of the best shots these experts have at shaking the world's nations from their inertia.

50 years ago, there was barely any research about climate change—and in 50 years, scientists will know even more about how systems crises interact and unfold. Much is difficult to predict, but all 12 threats outlined in this section of the book are well within the realm of possibility. Humans will shape how these cascades unfold, how much more damage we are willing to endure, and how quickly we are prepared to mobilize against the "latticework of climate crisis."

Preparing for the unknown effects of global warming won't just mean building sea walls or creating carbon capture plants—the whole of global society must be ready for social, political, economic, and psychological turmoil at every level of civilization. As global warming cascades through our world, there's no telling which crises will develop first and how they'll feed off of one another. But what is undeniable is the fact that these systems are intimately intertwined, and that when one domino begins to fall, the rest are sure to follow.

PART III, THE CLIMATE KALEIDOSCOPE, CHAPTER 1: STORYTELLING

Human beings have told stories about the end of the world for thousands of years—yet when faced with scientists' calls for us to pay attention to the Earth's warning signals, it is difficult for humanity to reckon with the reality of apocalypse. David Wallace-Wells calls this effect "climate's kaleidoscope"—the condition of being "mesmerized" and transfixed by the threat of Armageddon without actually ever perceiving it clearly.

By introducing a new mechanism through which humanity tends to view the threat of warming, Wallace-Wells continues to explore one of the many threats to action and meaningful change in the fight against warming. It's one thing to be told about the ravages that will soon seize the earth, and yet another to imagine them. But to really understand what they will look like—and how close they truly are—is a difficult task.

People love when books, movies, and other forms of entertainment deal with apocalypse—but these stories often reinforce the idea that humanity can survive or surmount the challenge of climate crisis with little preparation or effort. In reality, the world will look and feel much different at two or three degrees of warming, and humanity will no longer have the luxury of enjoying these narratives from afar: they will be unfolding, everywhere, right before our eyes. No one will feel insulated from (or curious about) the impacts of climate change in a world that's ravaged by escalating degrees of warming.

Holding the unrelenting change and slow destruction of our one Earth at arm's length is just another mode of inaction and indifference. By consuming narratives that are anthropocentric and, yet again, extol humanity's ability to conquer anything, we are collectively deciding to do nothing until it's too late. Our hopes of triumph are not enough—there needs to be real political and social action now, or there will be no possibility of pushing back warming's ravages.

In reality, climate change is difficult to talk about because the narrative is hard to understand. There's no real "evilness" in the story of climate change—humanity itself is the antagonist. In real climate narratives, there is only compounded complicity and shared responsibility in the global denial of what is happening to the Earth because of human greed.

The media we consume about the apocalypse has taught us to see climate change itself as the antagonist—when, in reality, humanity is its own worst enemy. Accepting and internalizing the true narrative of warming is a task too daunting—and in many cases, too painful—for much of humanity.

Humanity's conceptions of nature, too, are in for a change. The stories we tell about the natural world are often structured like dioramas—enclosed, distanced, and set up so that viewers can learn something from them. But we will soon no longer have to study nature closely to see the effects of a warming planet—nor will there be any time left to learn from what nature is telling humanity as reefs die, storms surge, and droughts spread.

This passage underscores, yet again, that it's convenient for humanity to think of the natural world as somehow separate, distant, or disconnected from our own. But the reality is that we live in and through nature—and as warming seizes hold of the planet and nature's feedback systems struggle to sustain themselves, we won't be able to ignore how greatly we depend on nature any longer. Nature is dependent upon us to do something to stop its destruction.

Panic over plastic consumption and bee death are two other major climate "fables" that, it will soon be clear, say more about humanity's desire to panic but remain inert than about our desire to actually preserve the earth. The idea that something will suddenly, swiftly wipe huge swaths of the Earth away—something beyond human control—is another way that humanity falls back on denial, inaction, and fatalism instead of turning to collective action and meaningful legislation.

By focusing on microplastics or colony collapse—the latter of which is a normal part of bees' life cycles—humanity raises great panic over small, single-issue parts of the climate crisis. There are many cascades that are more pressing, many more sociopolitical side effects of warming more dangerous—and yet humanity, time and time again, chooses to compartmentalize and catastrophize microcosms of warming rather than looking at the phenomenon as a whole.

Sociologists and environmentalists refer to the current era as the "Anthropocene," a term that suggests humans have so fully dominated the globe that weather, animal kingdoms, and plant life have all been transformed into things no longer truly "natural." In fact, modern humanity hasn't successfully "paved over" nature. Attempts to control what nature has in store by building seawalls, carbon-capture fields, and other climate-change repellants just underscore how impossible it is to remove nature from the picture. After all, Florida and Southern California, where people are making some of the most obvious attempts to control and reshape nature, will not endure by 2100. Humanity hasn't defeated the environment at all—we have only given nature more ammunition, forcing it to spiral more quickly beyond control.

This passage underscores one of the most dangerous, destructive features of contemporary thinking. By naming our current era the Anthropocene and claiming our triumph over nature's might, we have done ourselves a great disservice. Thinking of the natural world as conquerable means thinking of it as separate, as a liability. This perspective, the book posits, is what has led to a global climate of inaction and denial about the very real threats warming presents. In ignoring our duty to nature and centering ourselves, we have assured the destruction both of the natural world and the human one, proving we've really conquered nothing.

Even though scientists have known these facts for a long time, fears of being labeled "alarmist" have dogged their attempts to share their research. Media reporting on climate change has been called "climate porn." Attempts to obscure the true threat of climate change have lulled humanity into inaction and denial, and even international conferences, treaties, and accords often seem like pure political theater: change isn't happening fast enough, nor is it spreading far enough around the globe.

This passage is yet another in which the book underscore the thin line that leading scientists and climatologists must straddle as they struggle to share their message with the public. On the one hand, being "alarmist" discredits their painstaking models of what our future looks like. But on the other hand, treating climate change as anything other than the profound existential threat it is would be irresponsible and perhaps waste the precious time we still have to engineer solutions to our currently projected warming patterns.

What has come to be known as "scientific reticence," however, does have its uses. Scientists know that learning too much too fast about climate disaster can lead to burnout, panic, or further denial and inaction. Scientists don't just shoulder the burden of predicting what comes next—they must strike the careful balance between hope and fear needed to motivate change. For decades, as scientists presented data, no one listened: in 2018, with the IPCC report about the effects of two degrees of warming, scientists at last leaned toward fear. Yet still no one listened, and many were left wondering what would make the globe wake up.

Trying to decide whether hope or fear is a better motivator is a hidden, unseen part of work as a climatologist. Humanity is fragile, and we've been trained to think about climate change and apocalyptic, existential threats in a certain way: we want to see ourselves as invincible, moral conquerors. Shattering these paradigms is difficult, but it must be done if humanity is to recognize our collective responsibility to fighting climate change immediately.

PART III, THE CLIMATE KALEIDOSCOPE, CHAPTER 2: CRISIS CAPITALISM

There are many cognitive biases that prevent people from seeing the threat of climate change clearly. From anchoring, in which people are unable to look away from the mental models they build for themselves (for example, being unable to imagine the Earth other than it is today), to the bystander effect, to the illusion of control, people's minds will often literally refuse to let them comprehend the planet on which they live. The fact that climate change engages so many human biases is a mark of just how much of human life it affects. The scope of climate change is so immense that people instinctually look away, as if turning from the glare of the sun. But throwing our hands up at the size of the problem and becoming complacent is exactly what allows climate crises to grow so hugely out of hand.

Our brains are, arguably, not wired to fully understand the looming casualties associated with climate change. It's a daunting prospect to consider: a complete rearrangement of life as we know it, and the destruction or sudden obsoleteness of so much of our social, political, and economic fabric. But realizing that these biases must be overcome is the first step to meeting climate change's many threats with decisive action.

In addition, the system of capitalism is so enormous and so ingrained that it is difficult to look directly at it or to revise it. "It is easier to imagine the end of the world than to imagine the end of capitalism," says one literary critic. Capitalism and global warming are two monoliths that humanity has created yet cannot seem to halt. But the climate isn't governed by capitalism: capitalism is threatened by climate.

Just as it's hard to imagine the Earth looking or functioning differently from how it does today, it's hard to imagine the end of the social, political, and economic systems that govern humanity. But climate change promises to rewire those systems—some of them so extensively that they're no longer relevant to how we'll live our lives under the effects of warming.

Many wonder if capitalism can survive climate change. David Wallace-Wells predicts that some aspects of capitalist systems, such as trade and rent-seeking, will endure. Even in a world where every major economy faces shocks and assaults in the form of extreme weather, it seems that capitalist systems will scramble to endure. The promise of constant growth is one that corporations and governments will likely try to keep alive even in the face of stagnation and increasingly stark financial inequality.

In this passage, the book examines the bleak forecast concerning global capitalism. We as a human society are so entrenched in capitalistic systems that even at the end of life as we know it, it seems impossible to leave behind the very systems that hastened the escalation of climate crisis. By all metrics, the Earth is headed for radical changes and serious destruction, but it may be impossible to eradicate these systems even in the face of all that. Humans will cling to the trappings of normal life even when it becomes clear that we cannot keep ourselves separate from nature's ravages through our economy.

The market's promises of trickle-down economics and equality for all have long been failures, and leading economists have, in recent years, begun to admit that the "science" of capitalism is nothing but a fantasy. The promise of growth has justified injustice and exploitation for centuries. Now, with even more "wounds to salve" due to climate crisis, that promise will be put to the ultimate test.

A major transformation is due—no matter how big it is, capitalism as it exists right now cannot endure the debts and damages that will begin to accrue at further degrees of warming. Wallace-Wells suggests that capitalism has made empty promises to billions of people, and now, it is time to reckon with capitalism's actual effect on the world.

The largest looming cost to capitalism is the necessity of new forms of adaptation and mitigation to combat warming. Decarbonizing the economy and building preventative infrastructure will be a long and costly fight. The planet will need to mobilize as it did during World War II in order to secure negative emissions. Carbon capture plants will require over a third of the planet's available land to prove effective and over $30 trillion just to start up. It would be less expensive to simply stop putting carbon in the atmosphere now than to engineer the technology that would remove it—but for now, capitalism's iron grip is difficult to escape.

Here, Wallace-Wells underscores just how tightly we hold capitalism in a death grip—or, how tightly it holds humanity in a death grip of its own. Even though it would make more financial sense to stop carbon emissions now, our society struggles to let go of the idea that growth and profit are the only goalposts worth aiming for. If no serious action is taken, and soon, not only will the global economy be destined to fail—but the compounding damage done to the planet in the decades to come will be impossible to reign in.

PART III, THE CLIMATE KALEIDOSCOPE, CHAPTER 3: THE CHURCH OF TECHNOLOGY

Technology may have the power to save humanity—but few leading technologists seem to have an interest in doing so. Many are more concerned with the threats from artificial intelligence than the threats from climate change. Climate change is just one of many threats of annihilation that the tech world considers, but by sidelining the very real threat of climate change in favor of entertaining scenarios such as a simulation shutdown or a revolution of badly-programmed superintelligence, tech contributes to humanity's inertia.

The tech industry, like capitalism, has long promised to democratize and improve the way people around the globe live their lives. But the book shows that, in reality, tech—like capitalism—is just another institution that largely ignores the threats of climate crisis, preferring to focus on implausible, far-fetched threats rather than the existential crisis that is already here in front of us.

For many of the Bay Area's "futurist vanguard," the goal is to eliminate humanity and engineer "posthumanity" in order to escape, rather than confront, the very real disasters that humanity will be forced to reckon with in the years to come. Eternal existence in a cloud or on a hard drive is not the comfort these tech giants believe it to be, and Wallace-Wells believes that it is nothing more than a "fantasy" that humanity will "escape the body and transcend the world." Carving out an existence on our degraded but still perhaps livable planet is much more doable than creating a colony on, say, Mars.

The tech world isn't only engaging in climate denialism by imagining the biggest threats to humanity to be supercomputers or simulations. It's further perpetuating the illusion that humanity can—and will—escape from the natural world and create an entirely new sphere detached from nature. This is a harmful fallacy, and one that will swiftly and overwhelmingly be disproven in the course of time. Rather than searching for improbable escapes from our Earth, we should be finding new, innovative ways to save the planet we already have.

"Technology will take care of everything," some tech workers say—but in spite of transformative technological advancements, humanity has in many ways been left high and dry by both big tech and the green energy "revolution." The market continues adding new advancements to the same old systems rather than undertaking the radical changes that need to be made to truly secure economic and existential well-being for the planet.

The capitalist tech sector's promises don't acknowledge the fact that structural, societal change to combat climate crisis needs to happen now—not in a decade or two. Without a real mobilization of tech's valuable potential, the tech world becomes just another cog in a machine that denies the realities of climate crisis.

Even though renewable energy sources are more affordable than ever, the world is still burning 80 percent more coal than it was just 20 years ago. The world is powered more than ever by "dirty energy," and the challenge of changing that is daunting: methods of deforestation, agriculture, raising livestock, and waste disposal must be overhauled, an international accord must be reached, and preventative structures to quell the effects of climate disaster must be erected. And even if all of that is managed, a sustainable future will be an ongoing, unceasing fight.

The gap between the renewable energies available to us today and our failure to seize upon them illustrates that the climate crisis is largely enabled by inaction. Whether the cause of that inertia is denial, despair, or pride, it is a position of extreme stillness that the world can no longer afford.

Climate change moves quickly, but tech does not. Technology needs to transform rapidly in order to help the globe cut emissions at a rate that will make continued life on this planet possible. Electricity, communications, and agriculture all run on carbon—these systems need to be "replaced at the root," and fast. An undertaking like this has never been attempted or even imagined—and while it will surely discomfit consumers and corporate interests alike, the fate of life as we know it hinges on its success. Carbon capture plants are the best chance humanity has to buy more time until a revolution like this one—something that will take, experts predict, hundreds of years to complete—can be achieved.

Humanity is living on borrowed time—and we will be until there is a swift, widespread halt of carbon emissions. By illustrating just how expansive a change to our systems this requires, the book underscores that there's no more time to waste. Humanity needs to come up with new solutions, now, rather than turning to despair or disinterest. There is still time to uphold our duty to our planet—but accomplishing that goal requires collective, organized action.

Nuclear power promised to revolutionize the world in this way back in the 1950s—but the threat of nuclear warfare derailed humanity's attempts to devote itself to nuclear solutions. The destructive meltdowns of several major nuclear plants, too—Three Mile Island, Chernobyl, and Fukushima—scared many away from the promises of nuclear energy. But it's worth considering that the number of lives lost in these disasters was comparatively small to the lives that will be lost if the world continues to sideline nuclear solutions. Even the 4,000 deaths associated with Chernobyl are dwarfed by the 10,000 people who die each day from small-particle pollution, a byproduct of burning carbon.

Climate change demands new ways of thinking. This includes revisiting what we know about nuclear power—its benefits and its tradeoffs. While the nuclear power accidents that occurred in the 20th and 21st century were frightening and devastating, we must reframe the scales we use to measure loss. The loss of a habitable Earth—and billions of lives along with it—is a loss from which we could never recover. Nuclear power, for all its uncertainties and liabilities, also holds great promise in terms of helping humanity reduce carbon emissions or, one day halt them altogether.

So far, one of the tech world's best potential contributions to a climate-ravaged world is the escape into augmented reality it provides. While increased screen time and obsessions with video games now seem like liabilities, a generation from now—when the destruction of climate change is everywhere—addiction to escapist tech may well be considered "adaptive."

Climate change promises to have cascading effects over all aspects of our lives—including how and where we live them. While escapist tech now seems like a threat to how we handle climate change, creating a greater sense of distance and inaction, if the world continues to warm and self-destruct this same escapist inaction may become a survival tactic. This passage warns against such inaction while also admitting that if things continue on their current course for long enough, inaction may be the only option available.

PART III, THE CLIMATE KALEIDOSCOPE, CHAPTER 4: POLITICS OF CONSUMPTION

In 2018, environmental activist David Buckel set himself on fire in Brooklyn's Prospect Park to bring awareness to the climate crisis. His death signaled to many that the climate crisis demands a more intense political commitment than mere "ethical consumption." In the years to come, empty gesturing will likely become popular across the social spectrum—banning cars, painting roofs white, and bragging about lowered carbon footprints, for instance.

By drawing attention to David Buckel's protest suicide—and the empty gestures it laid bare—the book deepens its discussion of what kind of radical action is needed to finally bring widespread attention to the limited time we have left to halt emissions. Empty gestures focused on individual consumption won't turn the tides of warming at all—only top-down legislative action will. Protestors like Buckel use radical, destructive action in hopes of opening people's eyes to the suffering climate change will cause, but it's clear that even radical actions like these do not spur citizens or politicians out of their collective sense of denial.

The reality is that individual consumption isn't the problem—the current political and economic order is. Individual solutions in the "wellness" and "new New Age" industries focus on a purification of individual daily life—non-toxic, organic, carbon-free products that don't actually change anything (and often have a hefty carbon footprint themselves). "Conscious consumption" is essentially a cop-out.

Wellness routines and conscious consumption don't actually meaningfully lower humanity's carbon footprint—and the production of the accoutrements of these non-toxic, "carbon-free" products is undoubtedly yet another force adding pollution to the atmosphere. Individual consumers can't shift the needle on warming—only radical political and economic action will do that.

These half-measures grow out of the political ethos of neoliberalism, which promised unending growth in the markets of the West. But the blind spots of neoliberalism have spawned philanthrocapitalism and the fallacy of a "moral economy." Struggling citizens are asked to prove their worth in a system defined by competition and financial success—and neoliberalism's promise of a stable, reliable, and cooperative international economy has been proven a sham. If poor countries flood while rich countries boom, climate crisis may soon deal neoliberalism one final blow. Tribalism, nationalism, and terrorism will take over.

It's no wonder that the only solutions to climate change offered within our neoliberal, capitalist society are small individual consumption choices. Big business is putting the burden of saving the world on the individual consumer rather than admitting its own role in the hastening of emissions and thus the rapid advance of climate change. Until these systems are dismantled—and the "philanthrocapitalism" that the market hides behind is revealed to be the sham it is—there will be no meaningful, large-scale economic or political action against climate change.

With the collapse of neoliberalism, authoritarianism at the global level might begin to rise. A "neoliberalism beyond neoliberalism" in which a world-state concerned only with the growth of capital could possibly emerge. Though there is some hope for the emergence of a global alliance working in the name of common humanity, the impossibilities of dismantling capitalism threaten to instead prioritize wealth-focused autocracy. In this scenario, a population-dense, economically powerful country like China could take control of the "community of nations." Disorder, conflict, and global war are just as possible as the creation of a "global order." Given the international community's inability to broker any kind of meaningful arrangement to halt or ease climate disaster, it seems that anarchy is just as possible as the rise of one global empire.

At the same time, if neoliberalism collapses, it's not guaranteed that a better system will take its place. It will be hard to shake the world from its preoccupation with capitalist growth—and in a power vacuum, the world's governments may ultimately declare a greater allegiance to continuing the growth of material wealth than to the radical action needed to start saving the planet. This is yet another way that warming will destabilize our world from the inside out—natural disasters won't be the only potential factors in a rewiring of our global socioeconomic order.

PART III, THE CLIMATE KALEIDOSCOPE, CHAPTER 5: HISTORY AFTER PROGRESS

Contemporary Western thought often categorizes history as "a story that moves in one direction"—progress is inevitable, and there is no tragedy that humanity can't conquer. But while humanity likes to conceive of history as having "right" and "wrong" sides, climate change is on its own side. Climate change won't help anything grow or flourish—it will only move things backward.

This passage underscores a more niche effect of climate change on human life. Humanity has always conceived of itself as constantly moving forward, expanding, growing, and evolving—but now, we must begin to reckon with the fact that all of our progress has brought us to a peak from which we can only descend. This mass reframing of how we think about the arc of our history is just another way climate change threatens to destroy everything we know about ourselves.

Climate change will require humanity to reconsider its history and search for the truth. Modern humans have been around for 200,000 years, but agriculture—which is, no doubt, the largest single precursor to both capitalism and climate change—has only been around for 12,000. Some sociologists even call the Neolithic Revolution "the worst mistake in the history of the human race."

For centuries—longer, even—humanity has celebrated its own advancements as unprecedented, life-giving, and decidedly positive. But climate change will soon force us to reconsider the actual impacts of each stage of our long, complicated evolution as a species. We may have to acknowledge the fact that all of our innovations have come at the cost of any real future progress. We have neglected our duty to the Earth's preservation, and now we may not be able to survive long enough to continue on the path of constant innovation and revolution we've told ourselves is the story of our existence.

Modern humans are not as hardy or resourceful as their hunter-gatherer forefathers—for most of the 200,000-year history of humanity, the climate was stable and the planet was well-tended. This makes modern civilization seem like a "blip," but it's a blip that has nevertheless pushed the world and all its systems to the brink. Humanity's story of its own success and triumph is now falling in on itself, exposing the collective myths that have propelled society forward until now.

This passage is complex in that it outlines a strange paradox at the heart of human civilization. Humanity's history of industry and innovation has been impossibly short in terms of geological time—but so powerful in its destruction that it has, in just a few thousand years, forever changed the face of the planet. Realizing that unchecked growth and uncapped greed are not the goalposts of a healthy society is a painful process. But humanity will need to dispel these myths, and others still, if we are to survive the destruction we ourselves have wrought.

Pulling back the curtain on the true story of humanity doesn't make any clearer what global society will do in the face of rapid warming—it is difficult to begin internalizing the belief that, as history marches forward, life will no longer improve. Other modes of thinking about history—seeing history as cyclical or eternally recurring—might offer a more accurate view of the human narrative. Many empires have fallen before now—Egypt, Rome, the Akkadian Empire—so it's possible to imagine future generations of humanity living in the ruins of this one.

This passage suggests that humanity needs to come to terms sooner rather than later with the fact that our exponential growth and innovation may have already come to a halt. There may be no more prosperous time on Earth at any point in the future than the one we're in right now—as our resources depleted and our planet warms, our human empire may well be on a sharply downward trajectory.

Climate change has often been described as a "revenge of time," and this view of history makes that descriptor even more apt. A "carceral model" of history, in which humanity will be forced to pay its debts and live with its mistakes, is perhaps the most accurate mode of thinking about the future. New cities and ancient ones alike will be flooded by sea-level rise or made unlivable by drought. The face of the planet will be altered forever, and the systems humanity has spent thousands of years developing will become irrelevant. Human civilization may well become an "afterthought" in the long lifespan of the planet.

Even though it's dangerous to think that the Earth's systems of warming are retributive in a moral sense, it is accurate to point out that climate change is indeed a feedback system. We've done certain things to survive and grow without thinking about the Earth, and now, in response, the Earth is doing things to survive without "thinking" about us. So the idea that human civilization may well become an aberration or an "afterthought" is plausible—but it will be because of our own arrogance and greed.

PART III, THE CLIMATE KALEIDOSCOPE, CHAPTER 6: ETHICS AT THE END OF THE WORLD

Years ago, author David Wallace-Wells interviewed the alarmist climatologist Guy McPherson via Skype. A former conservation biologist at the University of Arizona, McPherson now lives in Belize with his partner, where he is awaiting the end of the world. McPherson believes that humanity will be extinct within ten years. A homesteader who coined the term "near-term human extinction," McPherson is something of a grifter who leads New Age-style workshops about how to process the end of the world.

Wallace-Wells criticizes McPherson's ethos as yet another excuse to retreat from politics and activism and blithely accept that there is nothing to be done in the face of warming. By listening too closely to people like McPherson, the book warns, humanity will be even less likely to take responsibility or pursue action in the face of climate change.

According to Wallace-Wells, McPherson's prophecies are paranoid and based on misunderstandings of very basic climate research, but that doesn't mean that, as warming seizes the planet, humanity won't turn to figureheads like him. While this is problematic, Wallace-Wells does wonder why the rest of humanity isn't thinking at least a little bit more apocalyptically. He predicts that soon, we will—but that this line of thought could tip into hysteria or even a perverse excitement about the end of civilization.

Humanity is drawn to the most dramatic, compelling conclusions—this is evident from how we consume media about the apocalypse excitedly and voraciously. So it stands to reason that humans would be more willing to listen to a problematic doomsday prophet than the measured advice of scientists and climatologists. But this is counterproductive and even dangerous: resigning ourselves to paranoid projections, rather than taking what actions we still can, will only continue to harm the planet.

From the Book of Revelation to Yeats's "The Second Coming" to the poetry of Robinson Jeffers, our culture makes it clear that humanity's anxiety about the end of the world is intertwined with its deep-seated knowledge about "the fragility of its fabric." Eco-nihilism and doomsday prophecies can easily take hold of a society that knows its own weaknesses—a society that has already come to see its understanding of itself as nothing but a cultural myth.

Unfortunately, the more we choose to reckon with the role humanity has played in the destruction of the world, the more hopeless and despairing people might become about having played that role. Accepting responsibility for the natural world should be an empowering, motivating stance—not one that drives people further into stultifying, inert self-pity.

Climate disaster will surely inspire a number of new tendencies. Some people will withdraw from society, choosing to let nature run its course, while others will focus on building refuges to preserve humanity. Stoic, ascetic impulses, rooted in Buddhism and transcendentalism, are one answer—but hiding away from society is yet another way in which the human psyche reveals its inability to reckon with the reality of climate crisis.

Choosing to ignore society as warming runs its course is yet another despair mechanism in which inertia and inaction win out. This, of course, further harms the cause of action against climate change. While it might seem noble to try to detach oneself from society and accept the changes sweeping the Earth, this kind of withdrawal—especially if it becomes mainstream and popular, drawing in large masses of followers—is just another form of dangerous denial.

Ecological nihilism, or eco-nihilism, on the other hand, is something to worry about. Unchecked, parts of society may grow into eco-fascism on the left or separatist movements on the right. At the center-left will be those who call for mass mobilization and collective action—"environmental pragmatists" rather than radicalized alarmists. But even that does not seem sufficient to address the scale of the issue, as global mobilization against climate change has been elusive so far.

It's difficult to predict what new sociopolitical movements will arise as a result of climate change, and when. But if there is no collective political action against climate change, the world risks eco-fascists and political radicals taking matters into their own hands and actually further derailing the collective fight against warming.

As environmental panic and despair grow throughout the world, motivating humanity toward fringe movements or nihilistic withdrawal, "political depression" also threatens to take hold and turn humanity into "zombies" who do little but shuffle toward oblivion. To snap humanity out of this stupor, many sociologists and cultural figures suggest that humanity must "un-blind [themselves] to human exceptionalism" rather than descend into "climate apathy" or a sense that humanity is receiving its just deserts.

There are many difficult balances to strike in the fight against climate change. The balance between hope and fear is one, as is the balance of measuring out the many tragic catch-22s we find ourselves in as we struggle for immediate answers to the problems warming represents. But perhaps the most careful balance to strike is the thin line between admitting collective complicity in warming's trajectory and descending into self-loathing acceptance that the Earth is meting out payback. This stance threatens to halt potential action in the fight against climate change and create even more devastating consequences for all of humanity.

It will be difficult to watch the world descend into two or three or four degrees of warming without "crumbling collectively in despair." But as history marches onward, it seems that normalizing climate suffering at the same pace we accelerate it is the only way to remain in-the-moment and up to the task of facing down the ravages of a warming earth.

The complex directive the book outlines here suggests that as climate change worsens, humanity will have to find a way to continually remind ourselves of how bad things are—and how much worse they stand to become—so that we don't succumb to hopelessness and despair.

PART IV, THE ANTHROPIC PRINCIPLE

In spite of the draw of apocalyptic narratives, no one wants to see disaster coming—but climate science has nonetheless predicted that disaster is well on its way. Predictions about sea-level rise and rising global temperatures will soon be put to the test—and the only thing that can falsify those predications is for humanity to change how we behave. In other words, human actions—not climate systems—are what will determine the future.

This section is titled "The Anthropic Principle," after the idea positing that sentient life isn't a happy accident of the universe but rather the way the universe is engineered. This passage also frames humanity as a central, vastly important player in a large game. Humans have engineered climate change, and our actions are the only thing that can slow its course at this point.

The earth's fragile climate system gave rise to humanity, creating an impossibly specific set of circumstances in which life could not just exist but flourish. Ironically, humanity may be what brings itself to an end, squandering the rare opportunity presented by Earth's improbably hospitable environment.

While human life isn't necessarily an accident or a fluke, that doesn't mean it's not precious and rare—we are, as far as we know, singular. So our undoing through conscious destruction of the one place that seems to be able to support us is all the more tragic and foolish.

The physicist Enrico Fermi is famous for the concept known as Fermi's paradox: if the universe is so big, why hasn't humanity located any other intelligent life forms? Climate may just be the answer. Earth's climate was inhospitable to human life for most of its history—and in a rare moment of comfort, humanity has taken over. Now, the planet's climate is quickly reverting to an inhospitable range. The universe is billions of years old, and it's possible that the lifespan of a civilization is truly only a few thousand years long. Civilizations could've risen before on this planet or any other in the universe—but they also could've sunk back into nonexistence when their climate filtered them out through mass extinction events.

Fermi's paradox is an eerie concept. It calls into question whether humans are truly alone in the universe and unique in the history of planet Earth, or whether we are unknowingly repeating a set of circumstances (or a version of a set of circumstances) that has unraveled time and time again, long ago. But this is yet another mechanism through which humans could turn to despair, inaction, or indifference. Thinking that we're just one of many civilizations that have fallen over the course of Earth's lifetime threatens our sense of urgency in protecting the planet and ourselves—but thinking that we alone have doomed ourselves to snuffing out the last vestige of sentient life in the universe stands to inspire a different kind of doom and nihilism.

The search for other intelligent life in the universe promises to change how humanity conceives of itself. Humankind may be very special—or it might turn out that the human race is much less important than people would like to think. There are many planets throughout the universe that are similar to Earth and could theoretically support life—but no life has been found. Many theories try to explain why this is: it may be that aliens are watching over Earth like spectators at a zoo, or it may be that alien civilizations are in states of suspended sleep, waiting for the universe to evolve, or it may be that aliens have found a way to wall themselves off from discoverability.

There are endless possibilities for why no other intelligent life has made itself known to humanity. But the book suggests that just because we haven't yet had contact with other life forms doesn't mean they aren't out there—or that they haven't possibly endured the same struggles and trials we have here on planet Earth.

This kind of thinking reframes the Anthropocene entirely. Humans may not be alone—and they likely aren't the first intelligent life in the universe. It's possible that entire civilizations have sprung up, thrived, and collapsed—maybe even on planet Earth—thousands or millions of times before. Rather than seeing our insignificance as pathetic, however, many astrophysicists and sociologists suggest it should be an "uplifting" prospect—human civilization and its progress is fragile, and it must be protected. Humanity shouldn't be "suspicious of our exceptionality"—we should feel empowered by it.

The book once again calls for optimism, hope, and wonder in the face of huge, unanswerable questions about our planet and the universe. Rather than sinking into despair, we should see this moment as an opportunity to harness all of our strength in order to preserve what is very possibly a singular way of life on a totally unique planet.

Seeing ourselves as singular and special might be helpful in focusing collective, global attention on what humanity is doing to the Earth by consciously choosing to destroy it. To "think like a planet"—in other words, to reclaim stewardship of our one precious Earth—is to escape the bounds of neoliberal thought and reframe the human experience entirely. Accepting responsibility for what humanity has done to the Earth is the first step in rising to the threat of climate change.

Rather than thinking small, like we've been trained to do by our socioeconomic circumstances, the book posits that we should all be thinking in more expansive terms. Seeing our planet for what it is—a unique and fragile place—will help us to treat one another and nature with more generosity and mindfulness. If we don't radically reframe our thinking and consider ourselves stewards of a precious planet rather than colonizers or profiteers, it's certain that all our progress as a species will be lost forever.

The ravages of climate change are tragic—but humanity has everything we need to reverse course. A carbon tax, a shift away from beef and dairy, and investment in carbon capture could all contribute to salvation for humanity—but whether the world will be able to unite and take these crucial steps remains to be seen. Most likely, some will leap into action while others despair. But no matter how one perceives the climate kaleidoscope—choosing to see the Earth as a life raft, a vengeful monster, or a fragile "Pale Blue Dot"—there is only one planet, and only one chance to save it.

The answers to how to begin combating climate change are all readily apparent. And policymaking at the global or even national level could put many of these defense mechanisms into place easily. But the real test will be whether humanity will be able to reframe our thinking about our own progress as a species—and maintain that foundational change on a long enough timeline to repair some of what has been broken.

AFTERWORD

Since finishing this book in 2018, David Wallace-Wells has become slightly less optimistic. He's watched humanity's "only room" continue to fill with carbon and other toxic matter. The 2020 paperback edition of this book, which includes this newly-written Afterword, arrives in a different context than the original edition—the world has continued marching on, setting new and terrifying records as warming continues.

Even though David Wallace-Wells's book exposed the horrors climate change threatens to bring if left unchecked, there hasn't been any significant new action on the climate front in years. While many journalists, activists, and scientists are struggling to spread their messages of warning and keep hope alive, inaction continues to increase climate change's threats.

Since the book's publication, the UN has issued a "Doomsday" report outlining the need for mass global mobilization in the face of climate change. Climate activists' messages of action and initiative have reached millions of people around the globe. Mass protests in the United States and the United Kingdom have put pressure on policymakers to "tell the truth" about the existential threat of climate change. Polls have showed that more Americans than ever believe in (and feel threatened by) warming. "Contemporary politics is now protest politics," and the world's radical anger is a good thing.

This passage provides a heartening glimpse into real, on-the-ground action taking place not just in the streets of the world's capital but in the hearts and minds of everyday citizens. This kind of optimism in the face of uncertainty and fear is what's necessary, the book posits. Even if the world's governments are slow on the uptake, a politics of protest and demonstrative action is our best shot at bringing a deeper level of awareness to the issue of warming.

In spite of the social and political progress made in the last several years, history does not flow directly forward. Brazil's policies threaten the Amazon basin, China's investments in renewable energies have collapsed, and Canada has approved new oil pipelines. While individual hypocrisy in terms of climate action—taking international flights while buying organic, for instance—is forgivable, hypocrisy on the part of corporations and political leaders is not just unforgivable but unsustainable. Normalization is humanity's greatest enemy.

Even though there's a wider social awareness about the dangers of climate change than there ever has been before, inaction, and actions that actively worsen the warming situation, are still rampant on the political level. As the book has stated, profit-chasing is just as harmful to the cause of fighting climate change as despair. And until the world's leaders, not just its citizens, start recognizing that, there will be no real progress in the fight to reduce emissions.

California's ever-worsening fire seasons are an example of normalization's consequences. Many Californians simply refuse to see or internalize the horrors of worsening wildfires. In an interview with Los Angeles mayor Eric Garcetti, Garcetti said that the "only thing that will stop [the fires] is when the Earth, probably long after we're gone, relaxes."

Here, Wallace-Wells spotlights Eric Garcetti's words of hopelessness in the face of climate change in order to illustrate what must not *happen on a global scale. Telling ourselves that when we've been washed away from the face of the Earth, the planet will still be able to heal is a fallacy. The planet, too, will be transformed by our continued ravages, and while certain parts of the natural world may recover on a long enough timeline, most of life as we know it—plant, human, and animal—will be forever lost.*

Humanity is likely to continue on this path of normalization, comforting ourselves in order to continue with daily life while ignoring the rapidly-worsening crisis unfolding at every level of society, with the most vulnerable suffering the most terribly. Unless the wealthy and comfortable can see their fates as intertwined with the imperiled and the destitute, no meaningful action will be taken. Still, David Wallace-Wells remains hopeful that there will be a call to collective action—even if he knows that this state of mind might make him seem "crazy, or better yet naïve."

In this passage, it becomes clear that Wallace-Wells is choosing optimism—and encouraging his readers to do the same—because for him there's literally no other option. Eco-nihilism, indifference, and inaction are, at this point, some of the greatest threats to the fight against climate change. Unless people like Wallace-Wells constantly affirm their commitment to optimism and action, the unthinkable may soon befall all of humanity.

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