

SCARCITY

S C A R C I T Y

*A History from the Origins of Capitalism
to the Climate Crisis*

Fredrik Albritton Jonsson and Carl Wennerlind

H A R V A R D U N I V E R S I T Y P R E S S

Cambridge, Massachusetts & London, England | 2023

Copyright © 2023 by the President and Fellows of Harvard College
All rights reserved
Printed in the United States of America

First printing

Design by Tim Jones
Photograph by Diana Haronis, courtesy of Getty Images (RF, Image #1218072768)

9780674293045 (EPUB)
9780674293038 (PDF)

The Library of Congress has cataloged the printed edition as follows:

Names: Jonsson, Fredrik Albritton, 1972–, author. | Wennerlind, Carl, author.

Title: Scarcity : A history from the origins of capitalism to the climate crisis /
Fredrik Albritton Jonsson and Carl Wennerlind.

Description: Cambridge, Massachusetts : Harvard University Press, 2023. |
Includes bibliographical references and index.

Identifiers: LCCN 2022037064 | ISBN 9780674987081 (cloth)

Subjects: LCSH: Scarcity. Economics—Philosophy. | Nature—Effect of human beings
on. | Capitalism—Europe. | Europe—Economic policy. | Europe—Intellectual life.

Classification: LCC HB801 .J66 2023 | DDC 306.3/42094—dc23/eng/20221025
LC record available at <https://lcn.loc.gov/2022037064>

To our Mothers

CONTENTS

<i>Introduction: Beyond One Concept of Scarcity</i>	1
1. Types of Scarcity before 1600	21
2. Cornucopian Scarcity	46
3. Enlightened Scarcity	75
4. Romantic Scarcity	103
5. Malthusian Scarcity	124
6. Socialist Scarcity	149
7. Neoclassical Scarcity	173
8. Planetary Scarcity	203
<i>Conclusion: Toward an Age of Repair?</i>	230
<i>Notes</i>	249
<i>Acknowledgments</i>	283
<i>Index</i>	287

SCARCITY

INTRODUCTION

Beyond One Concept of Scarcity

Seen from outer space, the global economy is imperceptible. To the naked eye, even the most ambitious engineering project loses definition and dissolves into earth, oceans, and sky. The roads and railways, factories, and suburbs all seem to vanish without a trace. Only on the night side of the earth does the modern economy come into view: millions of lights joined together in a planetary luminescence.

Lights alone do not tell the whole story, of course. To take in the planetary impact of the global economy, other forms of observation are necessary. Hundreds of monitoring stations across the world now map the impact of economic growth on the carbon cycle. No physical trend of the last century has had a more profound effect than the accumulation of greenhouse gases. In the atmosphere, carbon dioxide forms a trace gas of miniscule proportions, yet this tiny chemical fluctuation turns out to have calamitous consequences for the climate system over time. Since the nineteenth century, greenhouse gas emissions from manufacturing and other energy-intensive sectors have begun to nudge the earth system toward a new state. Humanity has left the relatively stable climate of

the Holocene epoch and entered a new stage in the history of the planet, provisionally named the Anthropocene.¹

The cumulative effect of all our economic actions casts a shadow across the atmosphere, locking in heat in the biosphere and thereby raising the annual mean temperature of the planet. This is the consequence of a highly peculiar phenomenon: exponential economic growth. For 99.9993 percent of the time that *Homo sapiens* has lived on earth, there was no sustained economic growth at all. Only in the last two, maybe three, centuries has economic growth become a natural part of human life—a seemingly unequivocal good essential to the thriving of humanity. Present generations find it difficult even to conceive of the world without the concept of economic growth. Since the seventeenth century, scientist and engineers have become more and more confident in their ability to control the natural world. Yet this new power is terrifyingly partial and perhaps far more blind than we realize. While humans have learned to split the atom, manipulate the genome, and put people on the moon, they have also inadvertently produced pollution and biodiversity loss on a planetary scale. The seventeenth-century project to control nature has given rise to a series of nightmarish side effects that are now jeopardizing the very conditions that have enabled the emergence of complex societies. Global environmental change is putting the future of the human species at risk.²

To address these problems, capitalist societies have to change the way they interact with the planetary environment. We need to alter the way we think about the economy and nature, as well as the relationship between the two. For the better part of the last century, much of our approach has been grounded in modern neoclassical economics and its fundamental axiom of scarcity. Because human desire for consumption is assumed to be insatiable and nature is by definition finite, economists reason that all humans and firms are forced to make tradeoffs to maximize their happiness and profits. This means that, at any given moment, economic actors seek to make the most efficient use of natural resources and, over time, they strive to develop science and technology to engender as much economic growth as possible. If, in this process, natural resources start running low, economists predict that entrepreneurs aided by new science will respond to higher prices and develop substitutes. The conception of nature as scarce, yet capable of infinite improvement and infinite

substitutability, has proven remarkably effective in promoting economic growth and ever-expanding consumption. Yet this conception of scarcity is also at the heart of the planetary crisis we now face.

For some time now, scientists have warned of sweeping, systemic changes to the earth system caused by fossil fuel economies and over-consumption. Anthropogenic climate change is the best-known threat. Greenhouse gases are pushing the planet toward new extremes of heat, humidity, drought, and flood. These changes will likely lead to a decline in agricultural productivity in key regions. Global warming will cause sea levels to rise, threatening densely populated coastal areas that are particularly vulnerable to rising seas. Oceanic ecosystems are also under increasing strain. Acidification threatens vital biota like coral reefs and phytoplankton. Closely linked to climate change is the trend of rising extinction rates. Climate deterioration and land-use change are rapidly reducing the terrestrial biodiversity that underpins the proper functioning of ecosystems and human economies. As if this were not bad enough, chemical pollution also poses unprecedented risks to the planetary environment and human well-being. Meanwhile, modern agriculture produces excess flows of nitrogen and phosphorus that damage the health of waterways and coastal ecosystems. Industrial agriculture and land clearance also appear to accelerate the emergence of new pathogens like COVID-19. With so many interrelated and escalating threats, capitalist societies appear to have reached a breaking point. Without fundamental transformation, humanity confronts planetary disaster.³ We are therefore left with no other option than to reconsider fundamentally how we organize our economy.

To create an economy for the future, we need novel ways of thinking. To develop new ideas, we need to understand the past. This book condenses five hundred years of debates about the relationship between nature and economy, surveying how philosophers, political theorists, and economists in the past have conceived of this relationship. While historians often point out that knowing history prevents us from repeating it, we believe, more ambitiously, that historical knowledge not only allows us to avoid repetition but provides us with a shared understanding that can help us construct a better future. We hope that readers of this book, by gaining a better sense of how people in the past have conceived of the nature-economy nexus, will be inspired to think imaginatively

about alternatives to the neoclassical idea of scarcity. We need to move toward an economy that is capable of meeting human needs at the same time that it allows for the earth system to operate in a manner that favors both human flourishing and the diversity of nonhuman life.

Although focused on the concept of scarcity, the centerpiece of modern economics, this book is not written from within the discourse of neoclassical economics. Rather, it locates economic thinking in a much broader historical context. We hope that many scholars, including anthropologists, historians, sociologists, political scientists, and economists, will find our historical approach useful. Our main purpose, however, is to reach concerned global citizens intent on pursuing solutions to the looming planetary crisis. Much of the argument here took shape in the classroom as we debated these ideas with undergraduates. We have written the book with students and other young people in mind, trying to make our ideas as accessible as possible, even to newcomers to intellectual history.

Varieties of Scarcity

The past is filled with different ways of thinking about scarcity. Since the sixteenth century, an array of philosophers, political theorists, economic theorists, even novelists and poets, have sought to identify and articulate the “ideal” relationship between nature and the economy. In their writings, we find a diverse set of ideas about scarcity: its sources, its implications, and its demands on human actors. The organization of this book reflects what we consider to be major trends and shifts in the evolution of these historical conceptions. Moving roughly chronologically through the centuries to our present day, each chapter identifies past ideas of scarcity that emerged in contemporary writings about the nature-economy relationship. To make sense of these different intellectual currents, we have grouped ideas that are closely related under a common rubric. Our names for these types of scarcity are not necessarily actor’s categories—that is to say, they were not used by people in the past. Yet by categorizing and naming these past versions of scarcity, we have put together a rich and long-term history of a concept that today is all too often considered synonymous with neoclassical economics. The modern neoclassical conception of scarcity emerged only in the 1870s. Prior to that moment, people understood the nature-economy nexus in many different ways. We seek to make clear

that scarcity itself can and should be liberated from its connotations in modern economics.

While this book names several distinct historical conceptions of scarcity, most ultimately fall within one of two umbrella categories. *Cornucopian* ideologies include a series of ideas that endorse an active mastery of nature together with a dynamic and expansive notion of desire. All versions of Cornucopianism are rooted in optimism that nature's resources, however limited, can be extended infinitely by humans—although as we will see, they often differ on how exactly to improve nature's bounty and how expansively to embrace human desires. The category of Cornucopian ideologies includes what we call Cornucopian Scarcity, Enclosure Scarcity, Enlightened Scarcity, Capitalist Scarcity, and Neoclassical Scarcity. This tradition first emerged in the seventeenth century and eventually reached a dominant position by the end of the nineteenth century. As an intellectual current, Cornucopianism has helped push us headlong down our current path of ever-expanding economic growth and planetary crises.

The category of *Finitarian* scarcity, meanwhile, emphasizes the limits to human power over nature and the need for constraint and moderation of human desires. As we shall see, the Finitarian ideologies featured in this book variously perceive the reasons for these limits and offer different approaches to constraining human desires. But at their base, these ideologies are rooted in the fundamental belief that nature's abundance is finite—and that human desires must be curbed to maintain a balance between nature and economy. The category of Finitarian ideologies consists of what we term Neo-Aristotelian Scarcity, Utopian Scarcity, Malthusian Scarcity, Romantic Scarcity, Socialist Scarcity, and Planetary Scarcity. We note that Enclosure Scarcity and Socialist Scarcity can be understood as composites of Finitarian and Cornucopian forms.

Although the Romantic and Socialist versions of scarcity have had a powerful and recurring influence over culture and politics, only their sixteenth-century predecessor, Neo-Aristotelian Scarcity, achieved cultural hegemony in the West. Finitarianism therefore primarily represents a history of resistance and aspiration rather than dominance. Yet we would be remiss to underestimate Finitarianism's intellectual force, which drives not only its ability to attract devoted adherents, but also its power to stimulate creative thinking about alternative futures.

Finitarian and Cornucopian worldviews developed side by side in mutual opposition. Conflict bonded them together, such that each side defined itself by rejecting the other. Because they sought to answer the same question—are there limits to economic growth?—they often ended up feeding on each other, generating rival forecasts of the future and competing conceptions of the public good. The intellectual currents we examine in this book demonstrate how Finitarianism and Cornucopianism emerged as oppositional intellectual frameworks. We might think of their development as a form of family feud inherited from one generation to another, always locked in battle, but producing new grievances and new areas of conflict over time. The fear of limits to economic growth provoked optimistic visions of abundance, which in turn came under attack by critics. Of course, this conflict did not happen in a material vacuum. Both sides looked to the natural world and technology to justify their positions: where Cornucopians celebrated the bounty of natural resources, the power of human ingenuity, and the insatiability of desires, Finitarians emphasized limits, unintended consequences, and simple needs.

Nearly all of the ideas of scarcity that we examine in this book are part of the system of *capitalism*. Capitalism, although difficult to define as it assumes so many different forms across time and space, we take to be a social system that emerged for the first time in Europe during the early modern era (circa 1500–1800). The capitalist order is based on the institutions of private property, markets, money, profits, capital, corporations, and wage labor. Some of these institutions can be found in earlier social systems, but when we add that, in capitalism, competition, entrepreneurship, consumerism, colonization, commodification, specialization, and scientific progress serve the larger purpose of capital accumulation, we inch closer to a robust definition. We also need to include a centralized state that is capable of intervening, regulating, and legislating in a manner that promotes the expansion and stability of capitalism. All of these characteristics do not have to be simultaneously present for us to view a society as capitalist—after all, capitalism contains both free and enslaved labor, free competition and monopolies, private and public property, free trade and protectionism, democratic and authoritarian states. Yet, the fewer of these institutions a society contains, the further away from capitalism it drifts. We can also define capitalism by looking for its ecological footprint. Capitalist accumulation requires intensifying exploitation of the local and

global environment through processes of commodification, extraction, and scientific management. Lastly, we need to take seriously capitalism's capacious ideological apparatus, with room for numerous conflicting ideologies. Without able intellectual defenders, capitalism could never have become a dominant social and political force in the world.

Five Hundred Years of Scarcity

To understand how the rivalry between Cornucopian and Finitarian forms of scarcity emerged, we must begin by considering the notions of limits and abundance in preindustrial societies. Prior to the age of capitalism, the nature-economy nexus was conceived of in a variety of ways. Anthropologists have found evidence of hunter-gatherers enjoying "affluence without abundance."⁴ Paleolithic foragers did not have much, but because their wants were small, they always had more than they needed. Only in the aftermath of the Neolithic Revolution, when new institutions emerged based on centralized power and sedentary populations, did the view of nature and desire shift. The formation of agricultural societies was made possible by the interglacial epoch known as the Holocene which began 11,700 years ago. While the early Holocene was considerably warmer than the last few millennia, the trend overall was toward relative stability. Carbon dioxide levels in the atmosphere during the Holocene varied between 260 and 285 parts per million while the temperature shifted only very little, about one degree Celsius up or down from the global average. Internal variations like the Roman and Medieval Warm Period or the drop in temperatures during the seventeenth-century Little Ice Age were trifling compared to the great cycles of the Pleistocene. This relative stability of climate allowed agricultural societies to rely on predictably recurring cycles and flows within the organic economy.⁵

In agrarian societies, people began to conceive of the social order as a steady oscillation between physical scarcity and material plenty. The biblical notion of seven good years followed by seven years of famine captured the prevailing fatalism. The word *scarsete* or *skarcete* first appeared in Middle English during the fourteenth century as a loan from the Old French *escharseté*.⁶ During this period scarcity referred specifically to the insufficient supply of necessities to feed the common people. It was an earthly phenomenon, produced by bad weather and harvest failures. When

dearth proved persistent, it led to subsistence crisis and mass death, unless societies maintained emergency supplies.

Even during years of relatively abundant harvests, there was a general sense of finitude. Along with these material constraints, a moral imperative to curb human appetites also emerged. According to the Christian worldview of the sixteenth century, as we show in Chapter 1, the relationship between human desires and nature was conceived as a delicate balance of limitations. Religious doctrine made it clear that pious people never let their desire for pleasure, of any kind, run amok. When kept within socially and spiritually circumscribed limits, desires could exist in harmony with nature's limited yield. People were expected to respect the inherent restrictions of nature and make do with the little they had. It is thus in sixteenth-century Europe that we locate the earliest Finitarian model, and the only one to achieve any kind of cultural hegemony: Neo-Aristotelian Scarcity. Losing control over one's desires was, as Aristotle had said long ago, tantamount to losing one's humanity. Yet even in the 1500s, these ideas about human desire were challenged by a growing culture of commerce and enclosure that spurred critiques and alternatives from the likes of Thomas More and Martin Luther.

A radically new Cornucopian way of conceiving of the relationship between nature and the economy emerged in the seventeenth century, starting the slow and circuitous route toward the modern neoclassical concept of scarcity. As Chapter 2 shows, the natural philosopher and politician Francis Bacon popularized the idea that humanity could, with the aid of scientific knowledge, bring nature under control and force it to share its dormant riches. Bacon's disciple, Samuel Hartlib, praised nature as an infinite treasure, capable of giving rise to earthly abundance. Soon thereafter, the economic writer, fire-insurance entrepreneur, and London real estate tycoon Nicholas Barbon endorsed insatiable desires as not only natural, but also socially beneficial. In contrast with the traditional notion of harmonious limitations, scarcity was now seen as the product of intertwining infinities: the endless human desire for consumption and infinitely expandable nature. We describe these ideas collectively as Cornucopian Scarcity, reflecting their position as progenitors of later Cornucopian ideologies that developed across the ensuing centuries. Unlike its sixteenth-century predecessors, Cornucopian Scarcity legitimized boundless wants as the force that—supported by scientific

advances—would propel the infinite improvement of nature and hence infinite human progress.

Paradoxically, Bacon and Hartlib's dream of godlike power took shape in the midst of the Little Ice Age, when mean temperatures in Europe decreased by one degree Celsius. While we do not have a full picture of how climate deterioration challenged seventeenth-century society, we know that Hartlib and his circle sprang to action during the harsh winters and near-famine conditions of the 1640s and 1650s. Like most people in the period, they regarded the relationship between the economic order and the climate as interdependent. If the landscape could be brought under scientific control, "savage" nature would become "civilized."⁷ Writing in the following century, the Scottish Enlightenment philosopher David Hume explained, according to the logic of the day, that the warming trend was the result of the fact that "the land is at present much better cultivated, and that the woods are cleared, which formerly threw a shade upon the earth, and kept the rays of the sun from penetrating to it."⁸

If the seventeenth century witnessed a radically new form of thinking about nature and economy, the eighteenth century—the focus of Chapter 3—emphasized gradual progress. While much of the previous century's optimism survived, Enlightenment-era thinkers were not quite as enamored with the ideas of infinite human desire and endlessly bountiful nature. David Hume, Daniel Defoe, and Adam Smith, among others, argued that nature could provide great—but perhaps not endless—wealth. For example, Hume suggested that nature was always scarce but that it was possible, through industriousness and scientific progress, to slowly extend its boundaries. As long as human creativity remained vibrant, there were no absolute limits to growth. Enlightenment-era thinkers were also more inclined to believe that humans, while drawn to consumption, should temper their selfish desires. Hume argued that commercial civilization, political liberty, and liberal education would refine and redirect human desires onto a higher plane. Civilized people would become more prone to poetry and philosophy than to rampant consumption of luxuries. The Enlightenment version of scarcity therefore envisioned an incremental curtailment of initially strong desires for material affluence and a gradual, scientifically engineered, expansion of nature's bounty. This was a more sensible and measured form of Cornucopianism, in which the future held the promise of a partial easing of the yoke of scarcity.

While the Hartlibians and Hume opened a path for the modern notion of scarcity, there were contemporary voices who objected to the ideology of infinite growth and infinite consumption. During the seventeenth century, the anti-Enclosure militant Gerrard Winstanley put forth a radical critique of property and money, arguing that they polarized society and drove a wedge between rich and poor. Winstanley saw scarcity as a universal condition, experienced even during moments of abundant harvests and economic flourishing, with the rich constantly striving for more and the poor always fearing starvation—a condition we will call Enclosure Scarcity. Winstanley was responding to the violence of the enclosures—the first crucial step in agrarian capitalism whereby the land was transformed from a shared space of common use and existential meaning to an economic resource accumulated in the hands of the few. About a century later, a philosophical contrarian from Geneva, Jean-Jacques Rousseau, argued that the constant desire for consumption had contaminated the social fabric. Everything in society and nature had become subjugated to the quest for trivial luxuries, resulting in the corruption of the good life. Insatiable desires, infinite growth, and perpetual scarcity, Winstanley and Rousseau argued, were social constructs that had a beginning and should have an end. They each formulated their own Finitarian vision of the world.

The full flourishing of the Industrial Revolution in the nineteenth century fostered a new wave of Finitarian notions of scarcity. Chapter 4 examines the Romantic writers who launched a systematic rethinking of both human desire and nature. These thinkers imagined a world in which people were motivated by beauty and community rather than consumption, and treated nature as the spiritual center of human life. What we call Romantic Scarcity embraced human restraint and material simplicity that respected the finite resources and the transcendental value of the natural world. At the same time, Thomas Robert Malthus pessimistically argued that the needs of a geometrically growing population would soon outstrip the agricultural yield, since the latter could grow only at an arithmetic rate. Disease, war, and famine would cull the surplus population until, after much suffering, the excess numbers were brought back into balance with a strictly circumscribed natural world. As Chapter 5 shows, Malthusian Scarcity held that the world's finite supply of land placed immovable physical limitations on human growth.

The revolutionary changes underway in the nineteenth century also sparked Karl Marx's radical critique of both the Enlightenment and Malthusian versions of scarcity. Marx argued that scarcity was driven not by the boundless desire for consumption but rather by industrial capitalists' incessant pursuit of capital accumulation. He shifted the blame for scarcity from humanity in general to the emerging industrial capitalist class, who constantly sought to impose labor on the working classes not primarily to enjoy the fruits thereof but to reproduce their dominance. Since the incessant force driving the capitalists, as a class, was the reproduction of command and control, we call it Capitalist Scarcity. Together with other radicals, such as Robert Owen and Charles Fourier, Marx envisioned an alternative future, one based on an entirely different relationship between nature and the economy. They looked forward to a world in which technology would produce an abundance of material wealth to satisfy all basic needs, while liberation from capitalist domination would free people to pursue the full spectrum of human passions, not just those that could be satisfied through consumption. Whereas Malthus identified the sources of scarcity in the clash between the earth's physical limits and the insatiability of collective human desire, the originators of what we call Socialist Scarcity saw the future as the interplay between a needs-based economy and the scientifically driven mastery of nature.

After the disruption of the Little Ice Age, the climate of the northern hemisphere grew more favorable during the Enlightenment and the nineteenth century. This warm spell coincided with the wide-ranging adoption of fossil fuel, first in Britain and then across the West. A geological endowment, stored up over millions of years, enabled a quantum leap in energy use during the nineteenth and twentieth centuries. Yet precisely this windfall also disrupted the carbon cycle that controls the planetary climate. By unleashing carbon dioxide into the atmosphere on a scale never seen before, the new fossil fuel economy brought the Holocene epoch to an end. Carbon dioxide levels indicate clearly that this shift had happened already by the end of the nineteenth century, just as socialist theorists and marginalist economists launched their rival bids to remake the world.⁹

Marx's vision of an overthrow of existing social relations shook the European bourgeoisie to the core. Liberal thinkers set out to develop an alternative ideology, one that put capitalism in a more favorable light.

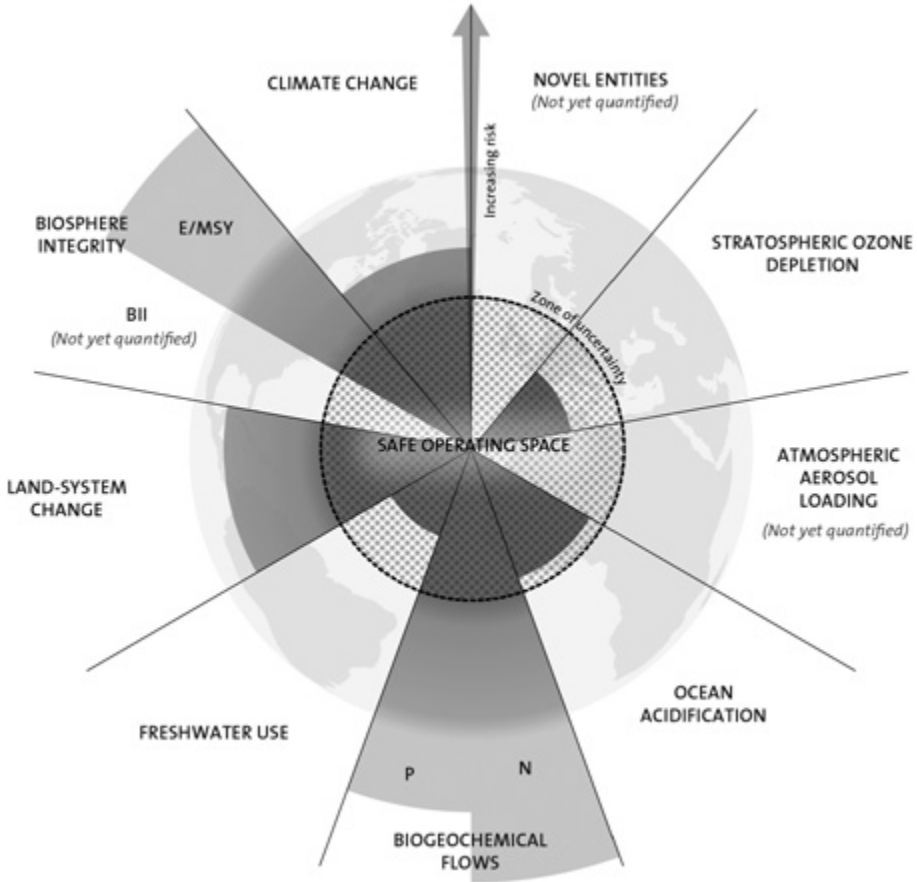
Nearly simultaneously, William Stanley Jevons, Léon Walras, and Carl Menger developed what would become modern neoclassical economics. The version of scarcity at the heart of the new economic discourse that they pioneered had very little to do with either the problem of poverty or the challenge of resource exhaustion. Instead, their version of scarcity, explored in Chapter 7, was a philosophical conjecture that originated in the assumption of insatiable human wants and infinite substitutability on the one hand, and on the other hand, the fact that all resources are by definition finite. They all argued that, while people who experienced poverty or confronted dwindling natural resources certainly faced scarcity, their experiences differed only by degree from those of everyone else. Without tapping into the scholarship in anthropology or psychology, economists alleged that people everywhere confronted the same universal condition of scarcity. This textbook example makes their position clear: “Small bands of African Bushmen face it; so do Amazon Indians and Greenland Eskimos. Peasants in China, Egypt, and Peru suffer from it; so do urban dwellers in Moscow, Paris, and New York. All of them, every day, wrestle with the basic economic problem of scarcity.”¹⁰ To be human thus means to be involved in the Sisyphean task of constantly striving for abundance in the context of inescapable scarcity. Regardless of how much wealth is attained or how it is distributed, the nagging desire for more never goes away. This version of Cornucopianism was systematized and popularized by the neoclassical economists, starting with the London School of Economics professor Lionel Robbins. “We have been turned out of Paradise,” he began. “We have neither eternal life nor unlimited means of gratification. Everywhere we turn, if we choose one thing we must relinquish others.” Robbins concluded: “Scarcity of means to satisfy ends of varying importance is an almost ubiquitous condition of human behavior.”¹¹ It is one of history’s many ironies that at the same time that the West enjoyed a golden age of unprecedented affluence (1945–1975), scarcity became the centerpiece of economic analysis.

In the twentieth century, fossil fuel–induced economic growth gathered further momentum as petroleum and natural gas facilitated the development of new technologies, from international air travel to synthetic fertilizer. The sustained boom after World War II led to an escalation of carbon emissions, increasing the level of atmospheric carbon dioxide from 311 parts per million (ppm) in 1950 to 331 ppm in 1975. Cheap energy ush-

ered in unprecedented affluence in the advanced economies of the world, but also set the planet on the path toward multiple tipping points. By the end of the twentieth century, the new, interdisciplinary field of earth system science illuminated the risks created by runaway growth to the stability of the system. The discovery of ozone depletion in the 1980s brought home to a stunned world how seemingly trivial forms of consumption could lead to planetary danger. Common household goods like refrigerator coolants and shaving cream posed a lethal threat to the safety of the biosphere. Around the same time, anthropogenic climate change entered into public awareness. More and more voices warned that the old dream of godlike power over nature had opened a Pandora's box of environmental horrors.

By the early twenty-first century, the dominant idea of Neoclassical Scarcity was on a collision course with a new understanding of the world: Planetary Scarcity, which we take up in Chapter 8. In 2000, the atmospheric chemist Paul Crutzen and the ecologist Eugene Stoermer coined the term Anthropocene to draw attention to the dramatic rupture in the history of the planet. Rapid economic growth based on fossil fuel use had forced the earth out of the Holocene and into a new geological epoch. From the beginning, the concept of the Anthropocene included a host of threats besides climate change. The Planetary Boundaries framework, devised by the environmental scientist Johan Rockström, described nine major tipping points that had the capacity to force the earth out of its Holocene state: climate change, biosphere integrity, land use change, freshwater use, biochemical flows, ocean acidification, atmospheric aerosol loading, stratospheric ozone depletion, and novel chemical entities. These nine boundaries revealed a tragic flaw in the Cornucopian conception of scarcity embraced in mainstream economics. Instead of seeing the natural world as a boundless stock of resources to control and command, earth system science models suggested that exponential economic growth was producing more pollution than the planet could absorb, risking major disruption to the safe functioning of the system.¹²

The growing threat to the global environment served up a frightening twist on the old fear of natural limits to growth, expanding the problem of finite *stock* to a scarcity of *sinks*. Energy and matter flow through the earth system between different reservoirs. When the flux of matter into a reservoir is greater than the outflow, the reservoir is defined as a



Planetary Boundaries, 2015. The Planetary Boundaries model defines the human economy as a subset of the global environment. Each of the nine boundaries suggests a quantitative measure for safe development. *Credit: Stockholm Resilience Center.*

sink. When coal, oil, and natural gas are burned, carbon dioxide is transferred from the ground to the atmosphere. Naturally occurring processes gradually remove carbon from the atmosphere and sequester it in sinks like the oceans, terrestrial vegetation, rocks, and soil, but the capacity of these sinks to store carbon dioxide is not unlimited. Beyond a certain threshold, excess carbon in the atmosphere will trigger a cascade of tipping points that undermine the safe functioning of the system.¹³

At the same time, earth system science also pointed to a second closely related planetary crisis of biodiversity. Rapid land use change and

climate change threatened to unleash a sixth mass extinction in the near future. Here, too, science challenged the idea of nature as a mere stock of resources for human use. By defining biodiversity as a nonrenewable and irreplaceable foundation for all life, ecologists insisted that there were sharp limits to human power over the earth. These warnings have only grown louder in recent years. The Finitarian concept of Planetary Scarcity captures this tension, acknowledging that the earth system itself can and will be overwhelmed by insatiable wants and endless growth.¹⁴

Under these manifold pressures, neoclassical economics came under attack from a variety of directions. Many of its most prominent advocates sought to address these critiques by revising the neoclassical doctrine. Just to mention a few, in the 1970s the Hungarian émigré Tibor Scitovsky and the American economist Richard Easterlin revised the more-is-better assumption.¹⁵ Around the same moment, the Oxford-trained economist Fred Hirsch argued against the idea that economic growth necessarily contributes to the quality of life.¹⁶ Harvard-economist Amartya Sen launched a new form of development economics centered on freedom and quality of life rather than the “narrower views” fixated on gross national product or industrialization.¹⁷ More recently, the British economist Karen Raworth fused the Planetary Boundaries framework with a universal model of social and economic development. She, too, rejected the growth ethos of conventional economics in favor of satisfying all humans’ basic needs within the ecological limits set by Planetary Boundaries. She accused the neoclassical economists of adopting a model of scarcity that neglected the moral ends and environmental constraints of actual economic life.¹⁸ Finally, Cambridge economist Partha Dasgupta has developed a program for the economics of biodiversity, focusing on not just physical capital but also human capital and natural capital.¹⁹ Many other efforts are currently underway within economics to address previous shortcomings. Yet the extent to which academic economists have re-oriented their research agendas should not be overstated. Out of nearly nineteen thousand articles in the top five economics journals between 1957 and 2019, “climate change” and “global warming” appeared only twenty-six times in the titles and thirty-two times in the abstracts.²⁰ Moreover, most of the economics curriculum taught at universities around the world remains faithful to its traditional principles. As such, the conception of scarcity that informs how policy makers, journalists, and

business leaders approach the world is still very much grounded in the canonical version of neoclassical economics. To be absolutely clear, this book does not offer a critique of the usefulness or instrumentality of the neoclassical concept of scarcity—instead, the problem we highlight is that it has been *far too* successful. That is, by promoting the optimal use of resources and maximum economic growth, it has fostered a world in which the economy and nature are on a collision course. The primary aim of this book is therefore to expand our intellectual toolbox by drawing on how people in the past have understood the sources, meanings, and repercussions of scarcity, so that we can transcend the current hegemony of neoclassical economics.

The Power of Ideas

As intellectual historians, we believe that the manner in which people make sense of the world deeply shapes their actions. Each generation produces a world in the image of its ideas. The institutions we form, the policies we implement, the laws we pass, and the practices we pursue are undeniably structured by the prevailing worldview. As the great economist John Maynard Keynes declared:

The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else.²¹

This is not to suggest that ideologies govern everything or that history unfolds according to a simple inherent logic, only that ideologies play a profoundly important role in shaping political agendas, legal changes, economic processes, and individual behavior. We reject deterministic models that see a one-to-one relationship between any particular society and its ideas; all societies are capable of producing an array of ideologies. While ideas always mirror the social structure, economic conditions, and political realities of their time, they also have the power to reshape these conditions to a significant degree.

The concept of ideology often has negative associations; it is seen as the opposite of the actual, the real, or the true. We employ the term differ-

ently here. For us, an ideology constitutes a worldview: a basic understanding of a society and how its constitutive parts fit together and acquire a discernable logic and purpose. An ideology offers a coherent perspective on a society that unifies its believers and creates a shared identity. Ideologies tend to be both rationalizing and legitimizing, in the sense that they provide “plausible explanations and justifications for social behavior which might otherwise be the object of criticism.”²² Ideologies can be said to be naturalizing, in the sense that they are often presented as natural, self-evident, and commonsensical. They are also frequently made to appear ahistorical, having no discernible beginning and thus no inevitable end. While ideologies pretend to be universal, applicable to everyone, they never achieve absolute dominance. Alternative ways of understanding the world are always available for those who seek them out.

Currently, the ideology of modern economics holds a powerful sway over the world. Neoclassical economists offer a coherent explanation of economic phenomena, and in so doing powerfully legitimize and encourage the maximization of efficiency, profits, utility, and growth. The theory also sets boundaries for what is considered real and common sense. Once students of economics accept the neoclassical notion of scarcity, only a particular understanding of the present and a limited set of future worlds become possible. Even though the actual conditions of modern capitalism do not look much like the models employed in modern economic theory, the theory nevertheless plays a critical role in structuring the modern understanding of capitalism. Thinking of nature as a storehouse of appropriable and tradeable material wealth alters how people interact with the earth system and all its elements. It makes it reasonable to conceive of the biosphere, first and foremost, as a standing reserve and a factor of economic growth.

If economists and politicians continue to use the modern neoclassical concept of scarcity to address the looming planetary crisis, they run the risk of generating solutions that only exacerbate the problems. They trap us in an intellectual framework that is unlikely to yield the kind of creative thinking we need. It certainly would be convenient if we were able to continue addressing our environmental problems with ever more economic growth—something humans have become very skilled at doing—but that is no longer an option. Yet the very idea of stepping off the infinite growth trajectory invokes multiple anxieties: we can no

INDEX

Page references in italics indicate a figure.

- acidification, 3, 13, 195, 232, 241
agrarian capitalism, 10, 60, 115
agriculture, 3, 22, 29–30, 39, 93–95, 98,
101, 128–129, 131–132, 145, 155, 170, 172,
205, 214
alchemy, 53, 54, 76, 78, 79
alienation, 164
amour de soi, 107–108
amour propre, 107–108, 113
Anthropocene, 2, 13, 207, 227, 241
Apollo, 8, 203–205, 220
Arendt, Hannah, 18, 207–211, 217, 244
Aristotle, 8, 33–35, 43, 58, 168
Art of Living, 119–120, 192
Ashley-Cooper, Anthony (third Earl of
Shaftesbury), 85

Bacon, Francis, main discussion, 48–51,
53, 54–56; also, 32, 61, 72, 79, 110, 168,
197, 208, 212, 221

Barbon, Nicholas, 8, 62–69, 71, 74, 94, 96,
108, 113, 191
beggars, 41, 96
Bernardin de Saint-Pierre, Jacques-Henri,
111–112
biodiversity, 2–3, 14–15, 19, 148, 225, 227,
232, 236–238, 245, 247
biosphere, 2, 13, 17, 204–206, 209, 229,
236–237
Botero, Giovanni, 47–48
Boulding, Kenneth, 216–219, 228, 242
Brahe, Per, 28–29
Brundtland, Gro Harlem, 225–226
Butler, Joseph, 85–86

cap and trade, 235–236
capitalism, defined, 6–7
Capitalist Scarcity, 150, 165–166
carbon dioxide levels, 7, 11, 12, 14, 147, 153,
172, 206, 208, 217, 226–227

- carbon sinks, 13–14, 148, 207, 228, 230, 232, 246–247
- Carson, Rachel, 207–208, 213–215, 217, 220, 228, 239, 245
- chemical pollution, 3, 170, 196, 213–215
- circulation, 33, 58, 64, 66
- Clare, John, 114–118, 123, 213
- climate change, 3, 13, 15, 20, 170, 201, 225, 227–229, 232, 236, 240–241
- clothes, 27, 30, 37, 41, 65–66, 69, 82, 90, 92, 185
- Club of Rome, 220, 226, 235
- coal, 14, 22, 93, 121, 151–152, 154, 205, 223, 228, 235–236, 243, 245
- Coase, Ronald, 196
- Coase Theorem, 196
- Cold War, 194, 198, 207
- comparative advantage, 137–139
- consumer society, 6, 70, 76, 88, 173–174, 177–178, 207, 210–211, 213, 225, 240
- cornucopianism (umbrella term), defined, 5
- Cornucopian Scarcity, defined, 46–47
- COVID-19. *See* epidemics
- Coyle, Diane, 236
- Crutzen, Paul, 13, 206, 227
- Darwin, Charles, 118, 144–145, 244–245
- Dasgupta, Partha, 15, 236–238
- DDT (Dichlorodiphenyltrichloroethane), 213–215, 224
- decarbonization, 246
- Defoe, Daniel, 9, 72, 78–79, 83–84, 90, 96
- degrowth, 123, 240, 246
- department stores, 177, 186
- Descartes, René, 63, 86, 212–213, 221
- Dudley, Edmund, 25–27
- dyes (cochineal, brazilwood, indigo, sumac, woad), 30, 51, 65, 75, 79, 88
- Dynamic Integrated Model of Climate and the Economy (DICE), 200
- “Earthrise,” 204, 204, 219–220
- earth system science, 13–15, 205–209, 215, 233–234, 242, 245
- Easterlin, Richard, 15, 221, 223
- ecological economics, 208, 216
- Ehrlich, Anne, 219–220, 226
- Ehrlich, Paul, 219–220, 226, 235
- empire, 63, 75, 99, 147
- Enclosure Scarcity, defined, 39–40, 59–60
- Engels, Friedrich, 150, 153, 156, 164, 166, 168, 171, 173
- Enlightened Scarcity, defined, 76–77
- epidemics, 3, 59, 63, 247
- equality, 28, 33, 107, 110, 116, 147, 178–179, 245–247
- evolution, 144–146, 216, 218, 228, 244–245
- externalities, 195–196, 235
- extinction, 3, 15, 20, 95, 118, 170, 195, 218
- famine, 7, 10, 21, 23, 32, 98–99, 125–126, 129–130, 134, 136, 144–147, 219, 226
- fashion, 41, 65–66, 68–69, 84, 88, 186
- Fénelon, François, 71, 94
- Financial Revolution, 70–71, 76
- Finitarianism, definition, 5
- food supply, 125, 127, 130–131, 144, 147, 155
- foragers, 7, 221–223
- fossil fuel, 3, 11–13, 134, 147, 153, 205, 218, 226, 228–230, 234–35, 238, 243, 246. *See also* coal; natural gas; oil (petroleum)
- Fourier, Charles, 11, 150, 156–162, 167, 170, 243
- Francis (pope), 240
- French Revolution, 100, 135, 150, 178
- future, long-term, 134, 153, 215, 225, 242–244
- GDP (gross domestic product), 206, 223, 237–238
- Genesis, 21, 144, 203–205
- Ghosh, Amitav, 229
- Gide, Charles, 187
- globalization, 65, 90, 179, 225, 229, 245
- Godwin, William, 99–102, 130, 192
- gold, 43, 53, 58, 82, 88, 90
- Great Acceleration, 205–208, 218, 225, 227, 229, 234, 245–247
- Great Chain of Being, 25–27, 26
- Great Exhibition, 146, 173–174, 174
- Green Revolution, 220
- Haber-Bosch process, 176
- Hall, Joseph, 37

- Hansen, James, 226–228
 Hartlib, Samuel, 53–55, 58, 71, 110, 208
 Hartlib Circle. *See* Hartlibians
 Hartlibians, 9, 53–58, 63–64, 74, 79
 Heidegger, Martin, 208, 210–213
 Holocene, 2, 7, 11, 13, 22, 147, 153, 206, 215, 226–228, 233–234
 Hume, David, 86–92
 Hutcheson, Francis, 85
 Huysmans, J. K., 185–187
- ideology, defined, 17
 Industrial Revolution, defined, 150–153
 industriousness, 9, 82, 87, 120
 Industrious Revolution, 65
 industry (work), 47, 55, 58, 67–69, 84, 90–93
 inequality, 28, 60–61, 67, 107, 245
 infinite improvement, 2, 9, 47, 51, 56–57, 64, 71, 76
 Intergovernmental Panel on Climate Change (IPCC), 227–228, 236
- Jevons, William Stanley, 121, 174–175, 180–183, 192
- Keeling, Charles, 208, 226
 Keynes, John Maynard, 16, 92, 178, 191–192, 242–243
 Kropotkin, Peter, 145–146, 171
- labor theory of value, 165, 179
 Law, John, 72–73, 77–78
 Linnaeus, Carl, 81–82, 106
 Little Ice Age, 7, 9, 11, 22, 46
 Locke, John, 61–64
 Luther, Martin, 8, 24, 35–37, 43–45
 Luxemburg, Rosa, 171
 Luxury, consumption, 75, 82, 186; critique, 41–42, 91, 94, 101, 184–186; pleasure, 66, 68–69, 88, 94
- Malthus, Thomas Robert, 125–126, 130–141, 144–147, 170
 Malthusian Scarcity, defined, 125–126
 Malynes, Gerard, 33
 Mandeville, Bernard, 67–69, 75–77
 manufactures, 22, 93–95, 170
- Marcuse, Herbert, 210–211
 marginalists, 11, 147, 181–182, 198, 244
 marginal utility, 182, 194, 221
 Marshall, Alfred, 188–192, 196–197
 Martineau, Harriet, 139–144
 Marx, Karl, 11–12, 150, 163–171
 McKibben, Bill, 240
 meat diet, 30, 135, 144, 147
 mechanism, 80, 220–221, 244
 Menger, Carl, 180–184, 194
 Merchant, Carolyn, 220–221
 merchants, 33–38, 43–45, 87, 90
 metabolic exchange, 169
 middle class (middling sorts), 64, 67, 87, 90, 140, 189
 Mill, James, 125
 Mill, John Stuart, 92, 117–121, 123, 134, 179–181, 192, 197, 224, 242–243
 moderation, 35–38, 44–45, 84–86
 money, 33–35, 41–44, 57–64, 165; credit, 58–59, 63, 70–72, 77–79
 moral sense, 85–87, 91; morality, 34–37, 91, 106; moral sentiment, 104
 More, Thomas, 24, 39–45, 85, 101, 115, 150, 192, 242
 Morris, William, 178, 189
- natural gas, 14, 205, 228, 235–236
 Neo-Aristotelian Scarcity, defined, 23–24
 Neoclassical Scarcity, defined, 183–184
 nitrogen cycle, 3, 237
 nobility, 27–28, 39–41, 64
 Nordhaus, William, 199–200, 236
- oil (petroleum), 12, 14, 205–206, 220, 225–226, 228, 234–236
 Owen, Robert, 149–150, 154–157, 168, 170, 188
 ozone, 13, 206–207, 215, 232
- Petri, Laurentius, 27
 phalanxes, 159–162, 160
 physiocrats, 94–95, 135, 145, 181, 244
 phytoplankton, 3, 230–232, 231
 Pigou, Arthur, 196, 199, 200
 Planetary Boundaries, 13, 14, 15, 123, 205, 227, 232, 240

- Planetary Scarcity, defined, 206–208
- Plattes, Gabriel, 53, 56–58, 64
- Pleistocene, 7, 22
- post-carbon society, 121
- poverty, 40, 44, 59–60, 161, 189; fear of, 39, 45, 67, 71
- Raworth, Karen, 15
- Reagan, Ronald, 202, 226
- religion, 8, 21–22, 27, 35–37, 44–45, 54–55, 68, 75, 85, 90, 128–130, 140, 143, 203, 216, 223, 240, 241–243
- repair, 232, 246–247
- Ricardo, David, 125, 137–139, 141, 147, 165
- Robbins, Lionel, 12, 201, 221, 234
- Rockström, Johan, 13, 205, 227
- Romantic Scarcity, defined, 104–105, 123
- Rousseau, Jean-Jacques, 10, 106–113, 213, 222
- Ruskin, John, 120–123, 170, 187, 224, 242–243
- Russian Revolution, 171–172, 178
- Sahlins, Marshall, 221–223
- scarcity, etymology of word in English, 7–8
- Schumacher, Ernst, 221, 223–224
- sea rise, 3, 233
- self-love, 85, 107–108; selfishness, 35, 84–87, 107, 191. *See also amour propre; amour de soi*
- Shakespeare, William, 32
- simplicity, 100, 104–105, 109, 122, 224, 246
- Skytte, Bengt, 57
- slavery, 43, 60, 65, 68, 70–71, 73, 83, 88, 99
- Smith, Adam, main discussion, 92–99
- Socialist Scarcity, defined, 150
- Solow, Robert, 198–200
- South Sea Bubble, 73, 76–78
- Sputnik, 208
- stationary state, 77, 99, 117–123, 131, 134, 137, 197, 242
- Steffen, Will, 205, 227
- stock, 13–15, 64, 99, 126, 200, 207, 215, 217–218, 228, 238
- subsistence, 8, 23, 95, 131–132, 134, 142, 144, 146, 161
- substitutability, 2–3, 12, 198–200, 206, 208, 218, 233–234, 236, 238–239
- sumptuary laws, 37–38, 67, 242
- Swift, Jonathan, 78–79, 82–83, 87
- synthetic fertilizer, 12–13, 151, 176. *See also Haber-Bosch process*
- taxes, 56, 95, 99, 109–110, 128, 181, 196, 200, 235, 237
- universal reformation, 52, 53, 57
- utility, 96; marginal, 180–183, 194, 221
- Utopian Scarcity, defined, 44
- Veblen, Thorstein, 184–185, 187, 189–191
- virtue, 34–35, 42, 70–71, 84–85, 90–91, 94–95, 97, 100, 104–105, 107, 109, 111–113, 120, 141, 186, 217–218
- vitalism, 81, 94, 244
- Walras, Léon, 12, 180–181, 183–184, 187
- Welfare Theorems, 194, 196
- wet bulb temperature, 233
- Winstanley, Gerrard, 10, 18, 59–62, 108, 115, 118, 150, 242
- Wordsworth, Dorothy, 18, 103–105, 112–113
- Wordsworth, William, 103–104, 112–114, 120, 213, 219
- World War II, 12, 198, 205–206, 213
- Zola, Émile, 186–187