

Introduction

This book is ultimately an argument for *degrowth*. However, it differs from other critiques of economic growth and capitalism in not approaching the imperative of growth as an *idea* or *policy* that we might argue about, as if better ideas and policies could be implemented on the basis of empirical evidence, reason, morality, democratic decision making, or political activism. All these avenues have been tried in innumerable debates and political experiments throughout the world – but all have finally proven futile. Everywhere politics have succumbed to the logic of the market. Democratic political systems have been unable to curb the logic of globalized capitalism. Democracy sees to it that any politician sincere enough to seriously advocate degrowth will not have a future in politics. The ecologically suicidal trajectory of global society is not the result of misguided policies, corrupt politics, or human nature, but of the imperatives inscribed in the artifact of general purpose money – the idea that everything can be converted into anything else.¹ Without redesigning

¹ In economic anthropology, general purpose money is distinguished from special-purpose money, which can only be used for transactions within a restricted sphere of exchange (cf. Bohannan 1955). Rather than refer to money as a general and universally homogeneous phenomenon, we need to “distinguish between those characteristics of money that are unique to capitalism and the various money forms (like cowrie shells or wampum beads) that pre-existed it” (Harvey 2018: 52). Although various forms of money have emerged over the millennia (cf. Weatherford 1997; Graeber 2011; Le Goff 2012), the establishment of modern, general purpose money accompanied the expansion of market trade in the eighteenth century. I may henceforth sometimes refer to general purpose money simply as money.

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money, all our insights and aspirations for a better world will come to nothing. This is tantamount to proposing that we need to transform our very conception of politics by recognizing the power of artifacts to organize social life and, concomitantly, that to change society we need to redesign our artifacts.

The argument for degrowth is necessarily also an argument against capitalism. The case against capitalism has been made by countless writers, activists, and warriors over the past two centuries. Entire libraries can be filled with their analytical deliberations and manifestos and the accounts of their struggles. The case against growth did not begin mounting until the early 1970s, after two and a half postwar decades of unprecedented economic expansion primarily in North America, Europe, and Japan. Whereas anticapitalists continued to focus on the widening inequalities and injustices generated by the modern economy, the critique of growth added to this focus on unequal distribution an emphasis on how it tends to degrade the global environment. These two objections to what mainstream economists and most people in general think of as progress and development have long occupied center stage in political debates. They have organized the political arena in terms of opposed ideologies regarding key topics such as the benefits of unregulated market trade versus government intervention. Critics of capitalism and growth have tended to assume that this is a battle of *ideas* – that proponents of capitalism and growth suffer from misconceptions or ulterior motives that they might be persuaded to abandon. But my argument in this book is that advocacy of economic growth is *not* simply a conspiracy or a misconceived idea. The economists and the capitalists are not mistaken about how to most efficiently manage money – they know exceedingly well how money operates, what kinds of incentives it tends to generate among people, and how people will tend to pursue those incentives. General purpose money, however, *is* indeed a debatable idea – and growth is its implicit, built-in imperative because it inevitably generates incentives to conduct exchanges that augment the sum of money available at the outset and because growing sums of money represent growing claims on other people's labor and resources. The ultimate adversary of critics of the modern economy is not a group of misguided or evil people – capitalists, economists, or neoliberal politicians – but an *artifact* with an inherent inertia. While most political debate focuses on how money should be handled – to ensure not only growth and security but ostensibly also sustainability and resilience – I will argue that it is more essential to debate how money should be *designed*.

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The movement now united under the banner of “degrowth” represents the recognition that the anticapitalist programs of socialism have not decreased global inequalities or environmental degradation. It signifies a widespread transformation of leftist sentiments particularly following the collapse of the Soviet Union. Rather than celebrate the triumph of capitalism and free market trade, it retains an anticapitalist critique but pursues even more radical ways of challenging business as usual than conventional socialist programs. The advocacy of degrowth in recent decades reflects the fact that the alternatives to capitalism offered by the political history of the twentieth century proved no better than the system they professed to replace. It is no coincidence that the calls for degrowth have attracted growing support during the decades that have seen the dissolution of the Soviet Union, the economic ascendancy of China, and the destinies of other socialist nations such as Venezuela and North Korea.

Looking back at the framing of public discourse, the early 1970s in Europe and North America were a time of traumatic disillusionment. The optimism of the postwar decades had been replaced by a gloomy understanding of global capitalism and a dystopian anticipation of crisis. The economic expansion of the 1950s and 1960s had fostered general optimism even as the environmental movement began questioning the foundations of industrial society. The message of *Silent Spring* (Carson 1962) had been a wake-up call, ominous but still possible to handle by a credible, modernist political establishment. The Vietnam War raised critical questions about the role of economically developed nations in an increasingly unequal world order, but even these doubts had seemed surmountable by a new and emancipated generation championing civil rights and announcing the arrival of the Age of Aquarius. However, a few years after the vociferous student revolt of 1968, the optimism of the various social movements that had been so diagnostic of modernity decisively gave way to postmodern hesitations about the economy, the future, and even our construction of reality. In 1971, excessive military expenditures in Vietnam forced President Nixon to abandon the Bretton Woods gold standard, leaving the dollar – and so much else – without a solid referent. The same year saw not only the birth of NASDAQ and electronic money but also the publication of several foundational critiques of the industrial economy, which up to then had been growing incessantly for a quarter of a century. This was the year Nicholas Georgescu-Roegen published *The Entropy Law and the Economic Process* (1971) and Howard Odum *Environment, Power and Society* (1971). The following

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year saw the publication of the Club of Rome report *The Limits to Growth* (Meadows et al. 1972), Arghiri Emmanuel's (1972) classic analysis of the imperialism of international trade, and the United Nations' Stockholm Conference on Environment and Development. The same year André Gorz coined the word *degrowth*, Eric Wolf (1972) launched the concept of "political ecology," and Gregory Bateson (1972) published *Steps to an Ecology of Mind*. Then, in 1973, came the first global oil crisis and the publication of E. F. Schumacher's *Small Is Beautiful: A Study of Economics as if People Mattered* (1973) and Ivan Illich's *Tools for Conviviality* (1973). In the years 1971 to 1973, in other words, a very widespread reappraisal of economic growth, technological development, and the reliance on fossil fuel energy shook Euro-American society.² While economic growth and the concomitant expansion of societal metabolism today continue to be promoted as the supreme purpose of human societies, we are still struggling to make sense of that traumatic loss of modernist self-confidence almost 50 years ago. We continue to be torn between the diametrically opposite perspectives of, for instance, Serge Latouche (2009) and Steven Pinker (2018).

Current deliberations on sustainability suggest a frustrating impasse. In this book I will argue that the fundamental categories of modern thought, aligned as they are with the features that we have attributed to the artifacts that organize our economy, are a common denominator of a myriad social and ecological problems experienced by people worldwide. But to fathom how deeply misguided we are by these categories, we need to keep a critical distance to the profusion of concepts that are now being generated to instill faith in "green" growth, sustainable development, ecological modernization, dematerialization, fair trade, circular economies, transition towns, and a host of other notions projecting the illusion that we are, after all, on the right track.

To the extent that we are *not* on the "right track," we need to establish what is the ultimate nature of our problem. Many would be content with responding "growth," suggesting an idea or policy that must be put into question. Even more would say "capitalism," as a shorthand for an abstract *system* that has been scrutinized and criticized ever since the pioneering analysis of Karl Marx. Others might focus on "globalization," the "market," "neoclassical economics," or even "modernity." While

² In his posthumously published book *Good Work*, Schumacher (1979) specifies "the date when a hole appeared in the skin of the balloon" as October 6, 1973. This was the date when it became evident to the world that economic growth was contingent on oil prices.

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I have the utmost respect for all these voluminous discourses, I believe that the phenomena with which they are concerned are all the results of a more fundamental problem, which tends to remain the elephant in the room, namely, the idea and artifact of *general purpose money*: the assumption that *anything you have can be exchanged for anything else*.³ This is so “natural” to us that we don’t even see it. It is like water to fish. But no other species could have come up with such a strange notion. Nor is any other species projected to make the planet uninhabitable. I would not hesitate to claim that this is not a coincidence.

To grasp how money indeed is “the root of all evil,” as St. Paul recognized more than two thousand years ago, we need to accept the claim of so-called Actor-Network theorists that artifacts intervene in social life. They don’t have *agency* – that would be to fetishize them – but they have very significant consequences. Artifacts are invented by humans, but then we let them take control over us. We delegate the destiny of world society and the biosphere to these *things* and *ideas* of ours. This is what Karl Marx aptly classified as *fetishism*. Our tools become our masters. They compel us to behave in certain ways. The aggregate logic of these compulsions – these imperatives that are inscribed in the inertia of money – is capitalism. We all know that it is fundamentally about greed: everyone wants to pay as little as they can for what they buy and charge as much as they can for what they sell.⁴ This logic leads inexorably to globalization, encouraging lower wages and more lax environmental legislation in the periphery of the world-system. The logic of the world market sees to it that low wages and lax environmental legislation are comparative advantages favoring imports from some countries. The ascent of China has been founded on the recognition that low wages are good for business. While the increasingly globalized logic of the market continues to unfold, economists are compelled to use a neo-liberal discourse to justify these processes as “efficient” and “rational.”

³ This claim is often dismissed as reductionism. Thus, for example, the editor of an online publication advocating a radical transition of global society rejected it by arguing that his premise was instead “the emergence of a globalized social-ecological system conditioned by multiple co-causal, co-evolutionary developments and forces not reducible to single primary drivers.” My rejoinder would be to ask if any of these “developments and forces” would be thinkable without general purpose money. Like the blind men trying to visualize the elephant, each specialized discourse will tend to defend its unique perspective.

⁴ Greed has become “second nature” to modern existence. We have become accustomed to a range of corporate strategies to sell us things we don’t need or that last ever shorter spans of time, prompting ever quicker rates of replacement.

Crucially, their preoccupation with monetary values obscures the asymmetric flows of biophysical resources (including embodied labor) that are orchestrated precisely by the market prices that they study. The real-life processes of the market and the ostensibly neutral observations of mainstream economists thus mutually reinforce each other. The logic of general purpose money generates not only unevenly distributed growth, globalization, increasing inequalities, and environmental degradation but also the social condition of modernity. This has long been obvious to philosophers and sociologists of money (e.g., Simmel 1990 [1907]). At an existential level, money conditions us to abstraction, interchangeability, and disembeddedness, which tends to alienate us not only from fellow humans but also from our natural environment. The history of ideas in sociology and environmental history is replete with observations to this effect.

The inherent potential of artifacts to mold our relations is evident to anyone who has ever played a game of *Monopoly*. For most of the players the game will inevitably end in disaster. The world economy can be metaphorically viewed as a gigantic board game. The winners don't win because they are evil. If that was the problem, it would make things much easier. It would make the politics of challenging inequalities and unsustainability into a simple matter of restraining the agency of evil people. But the rules of the game survive the substitution of human players. Unlike natural laws such as the principles of thermodynamics, those rules have been written by humans. They are social constructions. Even the pieces in the game – the checkers, so to speak – have been designed by humans. Yet it is symptomatic of fetishism that we find it hard to even imagine that those pieces can be redesigned, and the rules rewritten. This is clearly a psychological predicament: we need to be able to see alternatives to general purpose money before we are prepared to accept that the problem is how money is designed.

Our lives have been governed by general purpose money for only a few centuries, but humans have been here for hundreds of thousands of years, without destroying the biosphere. What can we learn from our history? What is it about general purpose money that, within a few centuries, brings us to the brink of disaster? I think a clue to the answer can be found in how our dictionaries define the word *liquidate*. Among alternative meanings, my Webster's dictionary provides "to convert into cash" and "to destroy." This is significant. In making all values interchangeable, general purpose money dissolves the kinds of distinctions on which all living systems depend: between the short term and the long term, the

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small scale and the large scale, the trivial and the essential. It makes it possible to trade Amazonian rainforests for Coca-Cola and the lives of African children for dividends on Wall Street. If we really want the kind of economic and ecological restraints evoked by visions of degrowth or a postcapitalist society we must redesign money. It is my conviction that there is no other way, short of disaster. That is why, in this book, I not only spell out the implications of such an approach for a wide range of topics – economic history, climate change, our concept of technology, the role of energy in human societies, our understandings of value and exploitation, and ideas on whether nonhuman objects have agency – but also offer a concrete proposal on how money and the economy could be redesigned.

In a nutshell, my argument begins with the phenomenon of general purpose money – an artifact of the uniquely human capacity for abstract symbolic representation – which generates the globalized market that has become the study object of mainstream economics. General purpose money has been conducive to the commodification of human time and natural space while obscuring material asymmetries in exchange and thus promoting time-space appropriation and other forms of unequal exchange. Capitalism is the aggregate logic of general purpose money. Major critics of this logic include Marx and Polanyi, but both failed to see that modern technology is contingent on unequal exchange. Marx believed that technology could be excised from capitalism, rather than intrinsically being a zero-sum game, in which some people save time and space at the expense of time and space lost for others. The main purpose of this book is to show how modern conceptions of money, energy, and technology serve as an ideology that obscures material processes of appropriation and exploitation. This ideology, moreover, tends to pervade the conceptual frameworks of both the guardians and the critics of business as usual.

A fundamental and insidious dilemma is that even the most radical critics of capitalism tend to frame its contradictions in terms of concepts that ultimately derive from its own assumptions. There is a widespread consensus among Marxists, widely defined, that the global economy for centuries has been degrading the environment (e.g., Bunker 1985; Foster et al. 2010; Moore 2015) – and some have suggested that the process can be understood in terms of “ecological unequal exchange” (Foster and Holleman 2014; Holleman 2018) – but these empirically rich interpretations of our global ecological predicament all tend to be couched in the notion that the root problem is an asymmetric transfer of underpaid

“values” from periphery to core. Beginning with my publications on this topic in the 1990s, my argument is instead that ecologically unequal exchange is not about asymmetric transfers of values, but of resources. The transfers of resources are *orchestrated* by attributions of economic value, but our conceptualization of them must detach itself from theories of value. This is not a trivial quibble, because labor or energy theories of value are very unlikely ever to be taken seriously by the mainstream economists who continue to shape the dominant discourse on the relation between ecology and economy. To posit the existence of values that systematically contradict the operation of the market will not persuade mainstream economists. Not that I think they are likely to ever recognize unequal exchange in this sense either, but, unlike contested notions of purportedly “real” values, the acknowledgment that the market is degrading the biosphere is ultimately incontrovertible (cf. Georgescu-Roegen 1971). It is thus more analytically robust to argue that the market is “killing the planet” (Koumoundouros 2018) than to debate whether its assessments of “value” are justified. Even the economists will sooner or later have to take that argument seriously. Rather than champion contested understandings of value – which, as I show particularly in Chapter 9, ultimately derive from our immersion in the conceptual constraints of general purpose money – our task must be to show how market attributions of economic value inexorably lead to asymmetric transfers of resources. These asymmetric transfers of resources are in turn inextricably linked to increasing global inequalities and ecological degradation. They are also prerequisite to “development” – understood as the accumulation of technological infrastructure – which, paradoxically, is widely understood as something that might alleviate economic inequalities and environmental harm.

I was originally trained in anthropology, but most of the literature listed at the end of this book will be unfamiliar to anthropologists. For decades I have had the privilege of forging a transdisciplinary research field on the challenges of global justice and sustainability – we have called it *Human Ecology* – but I believe that transdisciplinary thinking is ultimately a personal endeavor. It can at times be an exhilarating pursuit, even if it is often agonizing and fragmenting. The fields drawn upon in this book include anthropology, history, economics, the philosophy of technology, energy transitions, environmental justice, industrial ecology, Marxist theory, Actor-Network Theory, and much more. I cannot, of course, do justice to any of them. But instead of apologizing for my attempts to bring together these disparate discourses, I want to emphasize

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that our only chance of grasping the predicament that is now being called the Anthropocene is to transcend our particular frames of reference and exert ourselves to connect divergent perspectives into a fundamentally revised worldview.

It is quite possible and not uncommon to spend a lifetime unraveling the conceptual framework of a single human mind – such as a writer, a philosopher, or one of the apostles – but we may sometimes need to remind ourselves that the meticulous exegesis of the thought of a person such as Karl Marx or St. Paul risks having but a tenuous relation to the real world in which we are immersed. When the anthropologist Claude Lévi-Strauss explored the structure of indigenous Amerindian thought systems he was convinced that his own mind was not only retracing those of Native Americans, but that such mental worlds in some way reflected nature – the biophysical world that had generated the human brain. He may have been right about the congruity or at least compatibility between Amerindian worldviews and natural conditions. But the impasse of the Anthropocene forces us to concede that there are aspects of our own, modern thought systems that very poorly reflect the biophysical world in which we are immersed. This book attempts to address this discrepancy between modern thought and social organization, on the one hand, and the natural, material conditions of our existence, on the other. Its main thesis is that fundamental aspects of the modern worldview have been shaped by our historical experience of two kinds of human artifacts – products of the human mind that have themselves reconfigured that mind to the point that its incentives and aspirations starkly contradict the biophysical conditions of human existence.

The first artifact that so pervasively leads our thoughts astray is money – or, more specifically, the so-called general purpose money that has increasingly come to dominate our lives over the past three centuries. Its basic idea is that most things are interchangeable on the market. This idea has transformed our ways of thinking, our social relations, and our relations to the natural world of which we are a part. It has made possible the kinds of modern technologies that require continuous inputs of fuels and other resources that can be purchased on the market, provided that the prices are right. To apply concepts familiar to the economists, the generalized fungibility of commodities on the global market has paved the way for technological development as made feasible by arbitrage.

This brings us to the second kind of artifact that has led our thoughts astray. The tangible materiality of technology misleads us into assuming that its existence is simply a matter of discovering how to assemble

components of nature, as if access to those components were not a matter of *social* relations and rates of exchange. As I hope to show in this book, we need to fundamentally revise our understanding of the conditions of technological progress. But to grasp the inherent, distributive dimension of modern technology, we need to understand the role of money in obscuring what I have called *ecologically unequal exchange*.

These are convictions that have haunted me for a long time. If the reader will feel that I am repeating myself in the chapters of this book, it is because I have been intent on illuminating these basic conditions from a wide range of perspectives: theories of magic and fetishism, semiotics, world-system analysis, the history of economic thought, philosophy of technology, theories of energy transitions, thermodynamics, Marxist theory, Actor-Network Theory, and more. The transdisciplinary character of my argument is thus not just a methodological ambition but also a consequence of having been drawn into a very diverse set of conversations. To curb asymmetric global resource flows, and to avoid the most disastrous scenarios of the Anthropocene, our only chance is to critically rethink and redesign the artifacts – money and technology – that currently rule our thoughts and lives. It is ultimately money – and the technologies it makes possible – that is producing obscene social injustices and destroying the biosphere. I do not think that it is productive to blame a certain category of people such as capitalists or economists – or even an abstract system called *capitalism* – for these destructive processes. Indignation will not suffice to curb the exploitative and disastrous trajectories of general purpose money and capital accumulation, as illustrated historically by the destinies of movements such as Luddism or communism. The evils of the Anthropocene do not emerge from the character of any specific group of humans, but from our vehicles of interaction. For humans to assume responsibility for the future of society and the biosphere, we must be prepared to rethink how the checkers are designed in the game through which we engage each other.

The primary aim of this book is to challenge the understandings of money and technology that dominate mainstream thinking in economics and engineering, but a no less important point is its observation that even the most influential critiques of the current world order tend to be either constrained by such mainstream understandings or deluded by the complete rejection of modern analytical thought. Different chapters thus engage the shortcomings of Marxist theory and posthumanism, respectively. The most troubling impasse of the Anthropocene is the incapacity of its most radical critics to think beyond diagnoses such as “capitalism” or