

## Capitalism in the 21st Century

‘A tour-de-force of Marxist analysis; both a significant addition to the literature on Marx’s theory of value and an accessible introduction to why it is essential to understanding the multiple crises of 21st-century capitalism.’

—Murray E.G. Smith, Professor of Sociology, Brock University

‘Carchedi and Roberts make killer arguments that Marx’s labour theory of value is indispensable for understanding capitalism’s environmental destructiveness, economic crises, impact on knowledge production, and aspects of its financial processes.’

—Rick Kuhn, author of the Deutscher Prize-winning  
*Henryk Grossman and the Recovery of Marxism*

‘Fundamental: it explains the characteristics of the current world through its most objective dimension—the theory of value—which, in an anti-dialectical way, has been forgotten by the left in recent decades. In this book economics is politics and politics is economics.’

—Raquel Varela, author of *A People’s History of the Portuguese Revolution*

‘This book offers a rigorous Marxist interpretation of some of the major issues in contemporary capitalism. Its analysis is firmly based on the Marxist labour theory of value and is coupled with meticulous empirical support.’

—Stavros Mavroudeas, Professor of Political Economy,  
Panteion University, Greece

‘Capitalism will always be capitalism, but in the 21st century new forms, controversies and challenges have appeared [...] This book masterfully descends to the concrete to show the strength of Marx’s law of value and the alternative socialist planning.’

—Juan Pablo, Professor of Applied Economics,  
Complutense University of Madrid

‘[Carchedi and Roberts are] two of the most accomplished and prominent Marxist authors.’

—Lefteris Tsoulfidis, Professor of Economic Thought,  
University of Macedonia, Greece

‘Brilliant Marxian theoretical and empirical analysis [...] as if updating Ernest Mandel’s *Late Capitalism* for the 21st century.’

—Seongjin Jeong, Professor of Economics, Gyeongsang National University

Published in association with the International Initiative for  
Promoting Political Economy (IIPPE)



Edited by

Ben Fine (SOAS, University of London)

Dimitris Milonakis (University of Crete)

Political economy and the theory of economic and social development have long been fellow travellers, sharing an interdisciplinary and multidimensional character. Over the last 50 years, mainstream economics has become totally formalistic, attaching itself to increasingly narrow methods and techniques at the expense of other approaches. Despite this narrowness, neoclassical economics has expanded its domain of application to other social sciences, but has shown itself incapable of addressing social phenomena and coming to terms with current developments in the world economy.

With world financial crises no longer a distant memory, and neoliberal scholarship and postmodernism in retreat, prospects for political economy have strengthened. It allows constructive liaison between the dismal and other social sciences and rich potential in charting and explaining combined and uneven development.

The objective of this series is to support the revival and renewal of political economy, both in itself and in dialogue with other social sciences. Drawing on rich traditions, we invite contributions that constructively engage with heterodox economics, critically assess mainstream economics, address contemporary developments, and offer alternative policy prescriptions.

Also available

*Beyond the Developmental State:  
Industrial Policy into the Twenty-First  
Century*

Edited by Ben Fine, Jyoti Saraswati  
and Daniela Tavasci

*Microeconomics:  
A Critical Companion*  
Ben Fine

*Macroeconomics:  
A Critical Companion*  
Ben Fine and Ourania Dimakou

*Money and Society:  
A Critical Companion*  
Axel T. Paul

*Dot.compradors:  
Crisis and Corruption in the Indian  
Software Industry*  
Jyoti Saraswati

# Capitalism in the 21st Century

Through the Prism of Value

Guglielmo Carchedi and Michael Roberts

PLUTO  PRESS

First published 2023 by Pluto Press  
New Wing, Somerset House, Strand, London WC2R 1LA  
and Pluto Press Inc.  
1930 Village Center Circle, Ste. 3-384, Las Vegas, NV 89134

[www.plutobooks.com](http://www.plutobooks.com)

Copyright © Guglielmo Carchedi and Michael Roberts 2023

The right of Guglielmo Carchedi and Michael Roberts to be identified as the authors of this work has been asserted in accordance with the Copyright, Designs and Patents Act 1988.

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

ISBN 978 0 7453 4088 3 Paperback

ISBN 978 1 786806 96 3 PDF

ISBN 978 1 786806 97 0 EPUB

Typeset by Stanford DTP Services, Northampton, England

# Contents

<i>List of Figures</i>	vii
<i>List of Tables</i>	ix
<b>Introduction</b>	1
<b>1. Value and Nature</b>	6
Marx and Engels on Nature	6
Labour and Nature: The Source of Wealth	10
Measuring the Damage	11
Nature and Rent	13
Raw Materials and Profitability	15
Global Warming and Climate Change	18
Mainstream economics and climate change	22
Measuring Global Warming and Growth	25
The Market Solution	27
The ‘Degrowth’ Solution	34
The Planning Solution	37
Pandemics: Nature Strikes Back	37
<b>2. Money, Prices and Value</b>	46
Marx’s Value Theory of Money	46
Modern Monetary Theory	52
Cryptocurrencies	64
Digital Currencies	72
Inflation	75
<b>3. Crises and Value</b>	92
Marx’s Theory of Crises	92
Marx’s Theory of Crisis Is Both Cyclical and Secular	99
Alternative Marxist Theories of Crises	102
<b>4. Imperialism and Value</b>	117
Global Growth and Profitability of Capital	118
Productivity and Imperialism	121
Lenin and Modern Imperialism	123
The Economics of Imperialism: The Evidence	125

Alternative Views of UE	131
Super-exploitation	134
Measuring Unequal Exchange in Trade	140
Is China Imperialist?	143
Summary	145
<b>5. Robots, Knowledge and Value</b>	<b>146</b>
Robots and the Law of Value	146
Knowledge and Value	161
How Is Knowledge Produced?	163
Machine ‘Thinking’	167
Individual and Social Knowledge	173
Class Knowledge	174
The Myth of the Non-neutrality of Knowledge	177
Value and the Internet	180
Conclusion	185
<b>6. Socialism</b>	<b>187</b>
Value and Socialism	187
The Transitional Economy	193
Case Study: The Soviet Union	198
Case Study: China’s Transition	205
Productivity versus Profitability	211
State Capitalism or a Transitional Economy?	217
Socialist Planning versus the Law of Value	225
<b>Appendix 1. The Value Theory of Inflation: The Method</b>	<b>237</b>
<b>Appendix 2. Measuring Unequal Exchange in International Trade</b>	<b>238</b>
<i>Notes</i>	240
<i>Bibliography</i>	259
<i>Index</i>	268

# Introduction

The purpose of this book is to bring to the reader a Marxist interpretation of some of the major issues in contemporary capitalism in the 21st century. We rely on the tool of Marx's value theory to deliver scientific explanations of the laws of motion in 21st century capitalism. Marx's theory of value in capitalism is the red thread running through the book.

What is value? Marx starts from the view that value is the result of the exertion of human labour. Without any exertion by humans nothing is produced that keeps human beings alive and well. So that means value is not some metaphysical abstraction, but actually physical – it exists in objective reality. Think of it this way: electricity is real; it is the movement of electrons through atoms of usually copper. We cannot always see it (although we can experience its results: light, heat and shocks). And it can be measured in volts, watts and amps. Similarly, the exertion of human labour (both objective and mental) is material and so can be measured in labour time (hours, minutes etc.).

Nature also has value (to us) in that, without air, the planet, trees, forests, water etc., there would be no human life. So it has (use) value to humanity. But it requires the exertion of human labour to turn this intrinsic use value of nature into other use values for humanity: from forests to timber to houses involves the exertion of human energy (and thus labour).

Marx calls this aspect of human labour, its use value. But it is only under capitalism that the use values required and generated by human labour turn into commodities for sale on a market for private profit. The results of human labour are converted into commodities which then have value with dual aspects: use value for the purchasers of those commodities and value, also called exchange value because it becomes manifest as money through exchange. These two aspects of value within the commodity reveal the basic contradiction of capitalist production ie between production for social need (use value) and for profit and the accumulation of capital (exchange value). That's why Marx starts with the commodity in *Capital*.

Under capitalism the only objective way of valuing a product of human labour (a commodity) is by measuring the labour time involved, not by each consumer's subjective opinion of its value. Commodities have two aspects, a use value and a value because they are the products of both a specific (concrete) type of labour (which produces its use value) and of abstract labour, which produces its value. Abstract labour is the expenditure of human energy irrespective of the specific type of activity.

The alternative theory to Marx's labour theory of value is utility theory, which argues that each individual's personal estimate of use value or utility should be somehow aggregated to get the total utility of the products of human labour. This is impossible. How can the use value of a product that is estimated by one person be measured against another's?

It is the transformation of abstract human labour into the value of the commodities which is the focus of the law of value. Marx holds that there is a law-like relation between the labour expended under the capitalist production and value: the quantity of labour (measured in time) determines both the quantity of value produced, since value is labour, and the quantity realised through redistribution. *This is the kernel of the law.*

But value does not emerge from abstract labour immediately, only after some intermediate processes. The generation of value goes through different stages.<sup>1</sup> If the capitalist production process has been started but is not yet finished, the labourers are performing abstract labour and are *in the process of creating* the commodity's value. At this stage, the value is *potential*, that is, not yet realised because the commodity itself, not being finished, is still being created and thus it exists only potentially. When the production process is completed and the commodity is finished (but not yet sold), the abstract labour which has gone into it becomes the value produced, or *contained* or embodied in the commodity. The material substance of this value is abstract labour.<sup>2</sup> Since a commodity must be sold in order to realise its value, the value contained in the commodity is also its *potentially realised* value. When the commodity is sold, the value contained in it becomes *realised* value. This realised value is represented by money, the universally accepted form of value.

In a capitalist economy, due to competition among the many producers of the same commodity, a commodity sold on the market may not realise the value contained in it and so not all the labour which has been needed for its production. Competition on the market decides the *socially necessary labour time* required to produce and realise the value of a commodity. Profitability varies for different producers, but through competition there is a tendency towards an average profitability. So the price of a commodity will tend to be set by the cost of production plus the average rate of profit across the economy. The value contained in a commodity is thus modified into a price of production.

The major factor influencing profitability is technology. New technologies replace workers with means of production. They produce less value and surplus value but realise more value at the cost of the technological laggards. The latter, in their turn, will shift to more efficient technologies. It is this continual process of modification driven by changes in technology and competition that tells you that Marx's law of value is not a static equilibrium theory, instead, that the process of commodity production is in continual motion. When a pro-



duction process (P<sub>1</sub>) terminates, another one (P<sub>2</sub>) begins, that is, the outputs of P<sub>1</sub> become the inputs of P<sub>2</sub>. The value of the inputs of P<sub>2</sub> is then their value contained as output of P<sub>1</sub>. This is the basis of the *temporalist* theory of the transformation of (1) labour into value and of (2) value contained into value realised, which is usually referred to as the transformation of value into price.

There are three other aspects that are essential to the law of value and crucial to explaining developments in 21st century capitalism. Marx's great discovery in his law of value is *surplus value*. In capitalist production, there are owners of the means of production (factories, land, finance etc.) and there are the rest of us who own only their own labour power. The owners of the means of production employ human labour power to produce value contained in the commodities which are owned and sold by the owners/controllers of the means of production. But the owners do not pay the full value contained in the commodities to those selling their labour power to produce them. The owners of the means of production pay for the use of the machines and raw materials and the wages of the workers employed. But they receive in the value contained in the commodities and realised on the market a greater value than their costs. So there is a surplus value that is appropriated by the owners. This can be broken down into profits to the producer capitalists, interest to the finance capitalists and rent to the landlords.

As mentioned above, individual capitalists are continually striving to increase their surplus value in competition with other capitalists. They can do so by increasing the workforce and/or by increasing the intensity and hours of work by labour. But there are physical and social limits in doing this. Moreover, other capitalists may introduce new technologies that speed up the productivity of their workforce and so reduce the hours of work (or cost in value) necessary to make a commodity below the average. Such capitalists can then undercut those with less advanced technology. This forces all capitalists to invest more and more in technology/machinery to raise the productivity of labour and reduce relatively the use and cost of labour power. So the ratio of investment in constant capital (machinery and raw materials) will tend to rise relative to investment in labour power (variable capital). This ratio is called the organic composition of capital and in this book, we continually show its importance in our prism of value.

The law of value says that only human labour can create value. Machines can produce more units of commodities per worker, but without the exertion of human labour, machines cannot make commodities. (We have not yet reached a world of total automation where all use value is produced by robots and if we ever do that will not be capitalism.) As the rise in the organic composition of capital can only come about by capitalists investing more surplus value in machines relative to investing in human labour power, there is a tendency in

capitalist production for the subsequent increase in new value to be less than the increase in investment employed. In other words, the rate of profit in a capitalist economy tends to fall over time. There are many counter-tendencies to this tendency, in particular, increased exploitation of the human labour force, that is, a higher rate of surplus value; and in the case of national economies, increased trade and investment by technologically advanced capitalists in foreign markets with less efficient means of production in order to appropriate surplus value. Again, this counteracting factor is a key feature of our analysis of modern imperialism in this book.

Thus, the law of value leads to surplus value, the organic composition of capital and the rate of profit on capital. With these categories, we have the basis of a Marxist theory of 21st century capitalism.

However, our analysis is not only on theory but also based on empirical evidence. This is not a book full of quotes from Marx and Engels, although they are there. And it is not filled with lengthy theoretical arguments. More, it is a narrative backed by the best data we have to expound our explanations.

We start in Chapter 1, not with a discussion of the nature of value in modern capitalism, but with the value of nature. This is literally a burning issue. The planet and all its living species are increasingly being degraded by the capitalist mode of production, where the accumulation of capital for the few overrides the interests of the many, and not just humanity. Environmental degradation has always been a feature of capitalist production for profit, but in the 21st century this has reached an existential point with global warming and climate change which threaten to sacrifice nature and humanity on the altar of profit: the ultimate insanity of an irrational system. In this chapter, we attempt to show that market forces cannot reverse the disaster ahead and only ending the domination of the law of value can do so.

In Chapter 2, we consider the basic relationship between value and money in modern capitalism. Money is the universal expression of value in motion. And with the rise of finance, the sector of capitalism where money supposedly makes more money without the intervention of human labour, we analyse the allegedly new theories of the role of money in the 21st century, modern monetary theory (MMT) and the new digital and cryptocurrencies and their role. And we offer an original Marxist theory of inflation in modern economies against the flawed mainstream alternatives.

In Chapter 3, we turn to the major fault-lines of capitalism since its emergence as the dominant mode of production some 200 years ago. We cover the various theories offered in the past to explain regular and recurring crises of production and investment under capitalism over the last 150 years. But we base our approach on Marx's laws of value and profitability to explain the causes

of crises and why the macroeconomic policies of government and monetary authorities won't work in ending regular and recurring slumps.

In Chapter 4, we move onto the international arena to analyse the economic foundations of imperialism in the 21st century with new empirical evidence. We show that modern imperialism, which emerged towards the end of the 19th century, is still with us (with the same usual suspects). The appropriation of value by the imperialist countries continues on an even grander scale than 100 years ago. There is no prospect of any so-called 'emerging economy' catching up to join the imperialist elite.

Modern capitalism is increasingly no longer dominated by the production of things for profit. Capital now needs to appropriate knowledge or mental labour and commodify the product of that labour. Mental labour is just as material as objective labour; and as available for exploitation by capital in the 21st century as the production of tangible things was in the 19th and 20th centuries. In Chapter 5 we present an analysis that shows the conditions under which knowledge has value for capital and human mental labour is exploited and commodified. And we consider the impact of the rise of the robots and artificial intelligence in the 21st century, and even quantum computers, designed to replace human labour. We argue that machines do not think like humans and so can never fully replace human activity.

In our final chapter, we pose the alternative to capitalism in the 21st century: socialism. In particular, we apply value theory to understanding the features of the transition from capitalism to socialism and from a system of value creation to one of meeting social need. To do that, we look at the 'case studies' in the 20th century of such transitions as in Soviet Russia and China, to draw lessons for the 21st century. We review the old debate on the feasibility of democratic planning over value in the light of new studies in the age of quantum computers and algorithms.

Time is running out for capitalism and for the planet. To paraphrase Gramsci, 'the old is dying, but the new is not yet born'. The 21st century will decide whether the new will replace the old before it is too late.

# 1

## Value and Nature

### 1.1 MARX AND ENGELS ON NATURE

Marx and Engels are often accused of what has been called a Promethean vision of human social organisation, namely, that human beings, using their superior brains, knowledge and technical prowess, can and should impose their will on the rest of the planet or what is called 'nature' – for better or worse. The charge is that other living species are merely playthings for the use of human beings. There are humans and there is nature – in contradiction. This charge is particularly aimed at Friedrich Engels who, it is claimed, took a bourgeois 'positivist' view of science: scientific knowledge was always progressive and neutral in ideology; and so was the relationship between man and nature. Indeed, the 'green' critique of Marx and Engels is that they supposedly were unaware that *Homo sapiens* were destroying the planet and thus themselves. Instead, Marx and Engels had a touching Promethean faith in science and capitalism's ability to develop the productive forces and technology to overcome any risks to the planet and nature. This critique runs contrary to the writings of Marx and Engels. Marx wrote:

Nature is man's inorganic body, that is to say, nature in so far as it is not the human body. Man lives from nature ... and he must maintain a continuing dialogue with it if he is not to die. To say that man's physical and mental life is linked to nature simply means that nature is linked to itself, for man is a part of nature.<sup>1</sup>

This conception of humans and nature as parts of a single totality can be found throughout Marx and Engels' work. That Marx and Engels paid no attention to the impact on nature of human social activity has been debunked recently in particular by the groundbreaking work of Marxist authors like John Bellamy Foster and Paul Burkett.<sup>2</sup> They have reminded us that throughout Marx's *Capital*, Marx was very aware of capitalism's degrading impact on nature and the resources of the planet. Marx wrote that

the capitalist mode of production collects the population together in great centres and causes the urban population to achieve an ever-growing preponderance ... [It] disturbs the metabolic interaction between man and the earth,

i.e., it prevents the return to the soil of its constituent elements consumed by man in the form of food and clothing; hence it hinders the operation of the eternal natural condition for the lasting fertility of the soil. Thus, it destroys at the same time the physical health of the urban worker, and the intellectual life of the rural worker.

As Paul Burkett says: ‘it is difficult to argue that there is something fundamentally anti-ecological about Marx’s analysis of capitalism and his projections of communism’.

Far from promoting an instrumentalist approach to animals, what Marx emphasised is the material relation that governs the existence of humans and all species. Marx’s classical historical-materialist analysis argues that human beings share a close kinship with other animals biologically and psychologically. Marx was a strong critic of Cartesian metaphysics, for its removal of the mind/soul from the realm of the animal and the reduction of the latter to mere mechanical motions. In Marx’s words, ‘Descartes in defining animals as mere machines, saw with the eyes of the period of manufacture. The medieval view, on the other hand, was that animals were assistants to man.’ Marx’s analysis of the historical development of capitalism highlighted this transition in animal relations. For him, Descartes’ depiction of animals as machines represented the status that animals were accorded in capitalist commodity production. Marx took note of the ongoing changes, such as the reduction of non-human animals to a source of power and the altering of their very existence in order to further the accumulation of capital. He specifically focused on how the historical development of capitalism, including the division of town and country that accompanied it, shaped these conditions, reducing animals simply to instruments and raw materials, as reflected in the general logic of the system.

But he suggests that the human species is distinctive in its capacity to produce more ‘universally’ and self-consciously, and thus is less one-sidedly limited by specific drives than other animals. Humanity is therefore able to transform nature in a seemingly endless number of ways, constantly creating new human needs, capacities and powers.

Engels too must be saved from the same Promethean charge. Actually, Engels was well ahead of Marx (yet again) in connecting the destruction and damage to the environment that industrialisation was causing. In his first major work, *Outlines of a Critique of Political Economy*, again well before Marx looked at political economy, Engels notes how the private ownership of the land, the drive for profit and the degradation of nature go hand in hand.<sup>3</sup>

To make earth an object of huckstering – the earth which is our one and all, the first condition of our existence – was the last step towards making

oneself an object of huckstering. It was and is to this very day an immorality surpassed only by the immorality of self-alienation. And the original appropriation – the monopolization of the earth by a few, the exclusion of the rest from that which is the condition of their life – yields nothing in immorality to the subsequent huckstering of the earth.

Once the earth becomes commodified by capital, it is subject to just as much exploitation as labour.

Engels' major work (written with Marx's help), *The Dialectics of Nature*, written in the years up to 1883, is often subject to attack as extending Marx's materialist conception of history as applied to humans into nature in a non-Marxist way.<sup>4</sup> And yet, in his book, Engels could not be clearer on the dialectical relation between humans and nature. In a famous chapter 'The Role of Work in Transforming Ape into Man', he writes:

Let us not, however, flatter ourselves overmuch on account of our human conquest over nature. For each such conquest takes its revenge on us. Each of them, it is true, has in the first place the consequences on which we counted, but in the second and third places it has quite different, unforeseen effects which only too often cancel out the first. The people who, in Mesopotamia, Greece, Asia Minor, and elsewhere, destroyed the forests to obtain cultivable land, never dreamed that they were laying the basis for the present devastated condition of these countries, by removing along with the forests the collecting centres and reservoirs of moisture. When, on the southern slopes of the mountains, the Italians of the Alps used up the pine forests so carefully cherished on the northern slopes, they had no inkling that by doing so they were ... thereby depriving their mountain springs of water for the greater part of the year, with the effect that these would be able to pour still more furious flood torrents on the plains during the rainy seasons. Those who spread the potato in Europe were not aware that they were at the same time spreading the disease of scrofula. Thus at every step we are reminded that we by no means rule over nature like a conqueror over a foreign people, like someone standing outside nature – but that we, with flesh, blood, and brain, belong to nature, and exist in its midst, and that all our mastery of it consists in the fact that we have the advantage over all other beings of being able to know and correctly apply its laws.

Engels goes on:

in fact, with every day that passes we are learning to understand these laws more correctly and getting to know both the more immediate and the more

remote consequences of our interference with the traditional course of nature. ... But the more this happens, the more will men not only feel, but also know, their unity with nature, and thus the more impossible will become the senseless and antinatural idea of a contradiction between mind and matter, man and nature, soul and body.

Engels explains the social consequences of the drive to expand the productive forces.

But if it has already required the labour of thousands of years for us to learn to some extent to calculate the more remote natural consequences of our actions aiming at production, it has been still more difficult in regard to the more remote social consequences of these actions. ... When afterwards Columbus discovered America, he did not know that by doing so he was giving new life to slavery, which in Europe had long ago been done away with and laying the basis for the Negro slave traffic.

The people of the Americas were driven into slavery, but also nature was enslaved. As Engels put it:

What cared the Spanish planters in Cuba, who burned down forests on the slopes of the mountains and obtained from the ashes sufficient fertilizer for one generation of very highly profitable coffee trees – what cared they that the heavy tropical rainfall afterwards washed away the unprotected upper stratum of the soil, leaving behind only bare rock!

Now we know that it was not just slavery that the Europeans brought to the Americas, but also disease, which in its many forms exterminated 90 per cent of Native Americans and was the main reason for their subjugation by colonialism.<sup>5</sup>

Humans can work in harmony with and as part of nature. It requires greater knowledge of the consequences of human action. Engels said in his *Dialectics*:

But even in this sphere, by long and often cruel experience and by collecting and analyzing the historical material, we are gradually learning to get a clear view of the indirect, more remote, social effects of our productive activity, and so the possibility is afforded us of mastering and controlling these effects as well.

But better knowledge and scientific progress is not enough. For Marx and Engels, the possibility of ending the dialectical contradiction between man and nature and bringing about some level of harmony and ecological balance would only be

possible with the abolition of the capitalist mode of production. As Engels said: 'To carry out this control requires something more than mere knowledge ... it requires a complete revolution in our hitherto existing mode of production, and with it of our whole contemporary social order.'

## 1.2 LABOUR AND NATURE: THE SOURCE OF WEALTH

'Labour is not the source of all wealth. Nature is just as much a source of use values (and it is surely of such that material wealth consists!) as labour, which is itself only the manifestation of a force of nature, human labour power,'<sup>6</sup> so says Marx. 'The use values ... of commodities, are combinations of two elements – matter and labour. If we take away the useful labour expended upon them, a material substratum is always left, which is furnished by Nature without the help of man ... We see, then, that labour is not the only source of material wealth, of use values produced by labour.'

Marx writes in *Capital* of labour as a process 'by which man, through his own actions, mediates, regulates, and controls the metabolism between himself and nature. He confronts the materials of nature as a force of nature.'<sup>7</sup> There has been much academic discussion among Marxists and 'green ecologists' recently on the relation of humans to nature. The argument is around whether capitalism has caused a 'metabolic rift' between *Homo sapiens* and the planet, that is, disrupting the precious balance among species and the planet, and thus generating dangerous viruses and, of course, potentially uncontrollable global warming and climate change that could destroy the planet.

The debate is around whether using the term 'metabolic rift' is useful because it suggests that at some time in the past before capitalism there was some metabolic balance or harmony between humans, on the one hand, and 'nature', on the other. According to Saito, with *The German Ideology*, written in 1845, there was a turning point in Marx's travel towards an 'ecological dimension' in his critique of capitalism. Saito reckons this is when he begins to use the term 'metabolism' and refines his understanding of the concept as the general metabolic tendency of capital. Saito argues that Marx progressively realises that Capital's continuous expansion exploits not just labour, but also nature in the search for profit, leading to the destruction of the soil, deforestation and other such forms of the degradation of natural resources. Capital wants more and more value and, in particular, surplus value. That becomes the purpose of production and the metabolic harmony that existed between humans and nature before capitalism is broken. There is now a metabolic rift caused by capitalism.

However, any emphasis on rifts or ruptures has the risk of assuming that nature is in harmony or in balance until capitalism disturbs it. But nature is never in balance, even without humans. It is always changing, evolving, but with



‘punctuated equilibriums’, such as the Cambrian explosion, with many species evolving as others go extinct.<sup>8</sup> The rule of the dinosaurs and their eventual extinction had nothing to do with humans (despite what the movies may depict). And humans have never been in a position to dictate conditions on the planet or with other species without repercussions. ‘Nature’ lays down the environment for humans and humans act on nature. To quote Marx: ‘Men make their own history, but they do not make it just as they please; they do not make it under circumstances chosen by themselves, but under circumstances directly encountered and inherited from the past.’<sup>9</sup>

It’s true that Marx refers to the robbing of the soil by capitalist production. In *Capital*, Volume I, Chapter 15 on machinery Marx says:

Moreover, all progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil; all progress in increasingly the fertility of the soil for a given time is a progress towards ruining the more long-lasting sources of that fertility. The more a country proceeds from large-scale industry as the background of its development ... the more rapid is this process of destruction. Capitalist production, therefore, only develops the techniques and the degree of combination of the social process of production by simultaneously undermining the original sources of all wealth – the soil and the worker. (Marx, 1995 [1887])

But does Marx reckon, as Saito claims, that he saw the main contradiction of capitalist production in the ‘metabolic rift’ between humans and nature? Contrary to Saito’s conclusion, Marx rejected Liebig’s soil exhaustion theory of the limits of capitalism and rejected its implied Malthusianism that population would outrun the availability of food and the necessities for human life.

For Marx, capitalism was a system of ‘brutal exploitation’ of labour power in production for profit, not one of robbery or dispossession. Capitalism is not only subject to regular and recurring crises in production and employment. It fails to use effectively the scientific and technological discoveries that could end toil and disease globally. It is indeed degrading nature, exterminating species, and threatening to destroy the atmosphere of the planet, but these outcomes are the result of the contradictions to be found in the capitalist mode of production itself, not in some existential threat from outside the system.

### 1.3 MEASURING THE DAMAGE

Can we quantify the damage to nature imposed by capitalism? We cannot, if damage is defined as destruction of value. Nature, inasmuch as it is unaffected by human action, that is, inasmuch as it does not incorporate human labour carried out by labour for capital, has no value (for capital). Therefore, no value