

Pierre  
Charbonnier  
**Affluence  
and Freedom**

*An Environmental  
History of Political Ideas*



# Affluence and Freedom



# Affluence and Freedom

## An Environmental History of Political Ideas

Pierre Charbonnier

Translated by Andrew Brown

polity

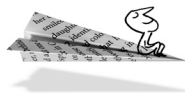
Originally published in French as *Abondance et liberté: Une histoire environnementale des idées politiques* © Editions La Découverte, Paris, 2020

This English edition © Polity Press, 2021

Cet ouvrage a bénéficié d'une aide à la traduction de l'École des hautes études en sciences sociales / The translation of this book was supported by a grant from EHESS, Paris.

This work received the French Voices Award for excellence in publication and translation. French Voices is a programme created and funded by the French Embassy in the United States and FACE Foundation. French Voices Logo designed by Serge Bloch.

Polity Press  
65 Bridge Street  
Cambridge CB2 1UR, UK



Polity Press  
101 Station Landing  
Suite 300  
Medford, MA 02155, USA



All rights reserved. Except for the quotation of short passages for the purpose of criticism and review, no part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publisher.

ISBN-13: 978-1-5095-4371-7

ISBN-13: 978-1-5095-4372-4 (paperback)

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

Library of Congress Cataloging-in-Publication Data

Names: Charbonnier, Pierre, author. | Brown, Andrew, translator.

Title: Affluence and freedom : an environmental history of political ideas  
/ Pierre Charbonnier ; Tranlated by Andrew Brown.

Other titles: *Abondance et liberté*. English

Description: English edition. | Cambridge, UK ; Medford, MA : Polity Press, 2021. | Includes bibliographical references and index. | Summary: "Why our most cherished political ideas are based on a certain conception of our relation to the environment - and one that can no longer be sustained"-- Provided by publisher.

Identifiers: LCCN 2020049122 (print) | LCCN 2020049123 (ebook) | ISBN 9781509543717 (hardback) | ISBN 9781509543724 (paperback) | ISBN 9781509543731 (epub)

Subjects: LCSH: Ecology--Political aspects. | Political ecology--History. | Political science--Philosophy.

Classification: LCC QH540.5 .C43 2021 (print) | LCC QH540.5 (ebook) | DDC 577.01--dc23

LC record available at <https://lccn.loc.gov/2020049122>

LC ebook record available at <https://lccn.loc.gov/2020049123>

Typeset in 10.5 on 11.5pt Times New Roman MT by  
by Fakenham Prepress Solutions, Fakenham, Norfolk NR21 8NL  
Printed and bound in Great Britain by TJ Books Ltd, Padstow, Cornwall

The publisher has used its best endeavours to ensure that the URLs for external websites referred to in this book are correct and active at the time of going to press. However, the publisher has no responsibility for the websites and can make no guarantee that a site will remain live or that the content is or will remain appropriate.

Every effort has been made to trace all copyright holders, but if any have been overlooked the publisher will be pleased to include any necessary credits in any subsequent reprint or edition.

For further information on Polity, visit our website:  
[politybooks.com](http://politybooks.com)

# Contents

<i>Acknowledgements</i>	viii
<i>Foreword by Dipesh Chakrabarty</i>	ix
<b>Introduction</b>	1
<b>1 The Critique of Ecological Reason</b>	7
The fabric of liberty	7
The other history: ecology and the labour question	11
An environmental history of ideas	14
Subsisting, dwelling, knowing	16
Autonomy and affluence	21
<b>2 Sovereignty and Property: Political Philosophy and the Land</b>	30
The political affordances of the land	30
Grotius: empire and possession	35
Locke: the improving citizen	42
<b>3 Grain and the Market: The Order of Commerce and the Organic Economy in the Eighteenth Century</b>	50
Good use of the land	50
The agrarian kingdom of the Physiocrats	52
The liberal pact: Adam Smith	58
Two types of growth	63
Fichte: the ubiquity of the moderns	66
<b>4 The New Ecological Regime</b>	72
From one liberalism to another	72
The paradoxes of autonomy: Guizot	75
The paradoxes of affluence: Jevons	80
Colonial extractions	85
Extraction-autonomy: Tocqueville	89

<b>5 Industrial Democracy: From Proudhon to Durkheim</b>	94
Revolutions and industry	94
Property and labour	95
Proudhon as critic of the liberal pact	100
The fraternal idiom	103
Durkheim: 'carbon sociology'	106
The political affordances of coal	113
<b>6 The Technocratic Hypothesis: Saint-Simon and Veblen</b>	118
Material flows and market arrangements	118
Saint-Simon: a new social art	121
The technological normativity of the moderns	125
Laying bare the productive schema	128
Veblen and the cult of efficiency	130
The engineer and property	134
<b>7 Nature in a Market Society</b>	142
Marx as a thinker of autonomy	142
Putting the forest to good use	145
Technology and agronomy	148
Conquering the globe	153
Karl Polanyi: protecting society, protecting nature	156
Disembedding	160
Socialism, liberalism, conservatism	163
<b>8 The Great Acceleration and the Eclipse of Nature</b>	172
Freedom from want	172
Emancipation and acceleration: Herbert Marcuse	175
Oil and atomic power: invisible energies	179
<b>9 Risks and Limits: The End of Certainties</b>	187
Alarms and controversies	187
The critique of development and political naturalism	190
Risk and the reinvention of autonomy	198
The impasse: between collapse and resilience	204
<b>10 The End of Modern Exception and Political Ecology</b>	209
Symmetrizations	209
Authority and composition	215
Under naturalism lies production	219
Unequal ecological exchange	224
Provincializing critique	229
A new conceptual cartography	234

<b>11 Self-Protection of the Earth</b>	237
Changing expectations of justice	237
Autonomy without affluence	244
Towards a new critical subject	252
<b>Conclusion: Reinventing Liberty</b>	259
<i>Notes</i>	265
<i>Bibliography</i>	295
<i>Index</i>	315



## *Acknowledgements*

This book is the result of a long process of writing that would have been impossible without the help of several research institutions that have now been rendered so fragile. My thanks go first to these bodies: to the Centre national de la recherche scientifique, to the École des hautes études en sciences sociales, and to all those who support them and defend their independence. Most of the thoughts brought together here stem from a series of seminars held at the EHESS between 2015 and 2017. I thank all the students who followed these seminars and who encouraged me with their questions to continue this work. A very large number of people (I would not be able to draw up an exhaustive list) have at one time or another contributed to this book with their knowledge and their questions. They include Lorraine Daston, Philippe Descola, Bruno Karsenti and Justine Lacroix, who attended the habilitation defence of the thesis that was the origin of the present work. Bruno Latour and Baptiste Morizot were the tireless and much appreciated reviewers of different versions of the manuscript. Later on, Rémy Toulouse and the Éditions la découverte team gave me all the confidence I needed to complete the project. Gildas Salmon was the main witness to its development and, as always, one of my main advisers. The following pages were mainly written at the Bibliothèque nationale de France while my son was being looked after at the crèche. So I have to thank the staff of these two institutions, both as vital as they are fragile, and, in particular, Saïda Mousli from the crèche. Anne, finally, was present right from the start, and Darius came along a little later. You both taught me to put this work in the right perspective, so that it matters, but not more than everything else.

# *Foreword*

Dipesh Chakrabarty

A great transformation – to use Karl Polanyi’s famous expression in his 1944 book of the same name – is under way in the world today. Its magnitude is such that dealing with it calls for profound and difficult shifts in our ideas about economy and polity. The planet-wide environmental crisis that goes by the name of ‘climate change’ or ‘global warming’ calls into question the long-held assumption that the pursuit of human freedoms or autonomy – so central to the idea of politics – was inseparably connected to the pursuit of abundance or affluence. ‘Climate change’, writes Pierre Charbonnier, the author of this ambitious and brilliant book, ‘is exploding one by one all the strata of modern political reflexivity’ (p. 237). Charbonnier follows in Polanyi’s footsteps in seeking to understand and historicize this transformation in order to articulate the demands it makes on our imaginations of the future. Yet his task is rendered far more difficult than Polanyi’s by a difference between the contexts in which they undertake their respective projects. The transformation analysed by Polanyi – the rise of the market economy – had come to maturation in the nineteenth century, a good forty years before he began to work on the topic. He could truly be the historian of the ‘great transformation’ he wanted to study, for that transformation itself was in the past. Charbonnier, however, is living through the very transition he seeks to historicize. The phrase ‘histories of the present’ is popular in academic circles, but it signifies an intellectually hazardous enterprise. For the present, as Indian grammarians often remarked in the past, only half reveals itself. You see through it but darkly. How do you describe, analyse, get an intellectual grip on something that is swirling around you? How do you arrest and study the waves you are swimming in? How do you create the intellectual distance that you need for your analysis to have a modicum of objectivity?

Charbonnier rises to this challenge, first, by leveraging his sense of a looming crisis to political relationship not only to the present but,

more significantly, to the received ideas of the political. Hence his statement:

Climate change is the name of the historic present because it is both a fact, established by geosciences, a heritage to bear, whether we like it or not, and an ordeal to be overcome – in other words, a political condition. And if this ordeal is so difficult to face up to, it is because the current deterioration of planetary ecological conditions is more than just the result of an error committed in the past and needing to be corrected later, or a figure of evil of which we have become aware in retrospect. (p. 241)

Even the standard critiques from the left that assign culpability to the ‘capitalist mode of production’ or ‘technoscientific objectification of the world’ appear insufficient. They are relevant for their critiques of exploitation of humans by humans. But their ‘productivist’ language keeps them committed to the affluence/autonomy duality, with the consequence that the subject of resistance they envisage remains imprisoned within a construction of ‘the social’ that maintains ‘the exteriority of nature’. Within this framework, ‘the nonhuman environment’ is regarded as a ‘stock of available resources’ on the basis of which one can ‘draw the conditions of emancipation’ (p. 238). It leaves unquestioned, says Charbonnier, the ‘two totally heterogeneous’ spheres that imaginaries of the ‘modern’ assume: the ‘officially recognized ... [territory] promoted as the space for the political and legal emancipation of the individual’, and an ‘unofficial’ sphere consisting of ‘the geo-ecological space necessary for the material maintenance of subsistence’, generally accessed by ‘extra-legal means (nebulous commercial contracts, colonization)’ (pp. 228–9).

The maintenance of this separation is what has ironically led to the historical conditions Charbonnier finds himself in when he introduces his book to the reader. On the one hand, there is the world described and celebrated, famously, by the Canadian psychologist Steven Pinker, a world where ‘poverty, illness and ignorance’ are being reduced, where the overall median income almost doubled between 2003 and 2013, and figures relating to life expectancy, literacy, nutrition and the number of children surviving beyond childhood are on the rise (p. 5). The growing size of the human population, one could add, also points to human flourishing. In 1900 humans numbered around 1.6 billion. Today there are nearly 8 billion of us. There is no question that, speaking of material consumption, human beings, overall, are much better off today than their predecessors ever were on this planet. On the other hand, it is also a world – thanks precisely to the growth of human numbers, consumption and technology – where the concentration of

CO<sub>2</sub> in the atmosphere has passed the level of 410 parts per million, where three-quarters of the world's insects have disappeared over a few decades, indicating, as Charbonnier puts it, 'that the transformation of the Earth is now taking place at a pace commensurable with the length of a single life, and even of a simple writing project' (p. 1). It is a world in which the association – 'long viewed as necessary – between autonomy and modernity, between the sense of liberty and the uses of the Earth' increasingly appears unviable (p. 245). The memory of postwar prosperity in the West still lives on, the rising and visible affluence in nations like China and India are there for all to see, and yet the world seems 'so close to us' but 'already so old' (p. 251). Or, as Charbonnier puts it elsewhere, the price of so many humans living it up as if there were no tomorrow is the damage we end up doing to the life-support system of the planet: 'All the biogeochemical cycles that structure the global economy are being pushed beyond their capacity for regeneration by the rhythm of productive activities; the nature of our soil, air and water is changing, thereby creating a new context for human collectives and their struggles' (pp. 4–5).

Charbonnier asks whether humans can continue to flourish in a deteriorating world. This query shapes one of the intellectual horizons for his project – how to imagine the future of human freedoms at a time when we cannot afford any longer to ignore 'the process of planetary disruption that is leading us into the unknown' (p. 6). He writes:

The theoretical and political imperative of the present is therefore to reinvent freedom in the age of climate crisis – i.e., in the Anthropocene. Contrary to what one sometimes hears, it is not a matter of stating that infinite freedom in a finite world is impossible, but that this freedom can be gained only by establishing a socializing and sustainable relation with the material world. (p. 25)

But what would those freedoms be? And whose freedom? Of humans alone? How did the idea of human autonomy come to treat 'nature' as external to 'society'? If the task with regard to the future was to create a political order inseparable from the ecological one, then the properly historical question would be: how did they come to be separated? And when?

To answer this second question, the one amenable to historical analysis, Charbonnier invents a method that is as impressive for its originality and inventiveness as for the sustained, deep, and vigorously anticolonial erudition that this book presents to the reader. He tells two stories at once. One is the story about how, in modern Anglo-European political thought beginning in the sixteenth–seventeenth centuries, ideas of personhood and autonomy that once acknowledged, in

however attenuated a form, their entanglement in the materiality of the Earth through the category ‘land’, gradually – in tandem with changes in infrastructures and institutions – yielded place to categories like ‘society’ and ‘economy’ that appeared to float free of the Earth, the latter now regarded as a mere repository of ‘resources’ for the use of humans (pp. 244–5). The result was that projects for ‘autonomy’, dependent on the assumption of abundance in the sphere of economy, lost all sense of their material entanglements even as the Earth – as all the climate-related statistics make clear – began to approach a state of exhaustion.

To get to the heart of this story, one has to begin with the emergence of the ‘modern’ world. Announcing his historical interests, Charbonnier tells the reader early on:

Even before the race to extract resources (a race that combined the notions of progress and material development) swung fully into action in the nineteenth century ... the legal, moral and scientific coordinates of the modern relationship with the Earth were already in place. ... [T]o understand the empires built on oil, the struggles for environmental justice and the disturbing trends in climatology, we must go back to the agronomy, law and economic thought of the seventeenth and eighteenth centuries; to Grotius, to Locke and to the Physiocrats. (p. 3)

A fascinating series of chapters follows. Charbonnier engages in reading closely a number of key European thinkers and philosophers who made the making of the ‘modern’ capitalist globe the object of their thought at various points in history. Grotius, Hobbes and Locke, Quesnay and Adam Smith, Rousseau, Kant, Fichte, Guizot, Tocqueville, Mill, Malthus, Jevons, Proudhon, Durkheim, Saint-Simon, Veblen, Marx, Marcuse and, of course, Polanyi, along with many others, crowd these pages, making for scintillating studies in comparison and contrast, but all mobilized masterfully to sustain the architecture of the larger argument that Charbonnier builds.

These European savants raise for our author a ‘terrifying question’, one that structures the second part of the story he tells. For it turns out that the history of the modern cannot be told in separation from the history of domination and racial violence that European powers unleashed in the colonies and at home, over people of colour, women, minorities and the nonhuman world. The ‘terrifying question’ is this:

To what extent is the political autonomy of Western nations, as a project but also to the extent that it has been partly achieved, dependent on these asymmetries of power and knowledge? Is

autonomy something you buy, a luxury that you can afford when you illegally profit from the riches of others? (p. 87)

The voice of the Surinamese slave who asked Voltaire ‘Is it at this price that you eat sugar in Europe?’ resonates through these pages (p. 86).

Armed with this historical knowledge, Charbonnier at least knows who his allies are and what principles might be involved in reimagining the futures of autonomy that, by the very logic of his thinking, must regain and retain a consciousness of its material entanglements in the Earth – and for that reason cannot be a project for humans alone – and must not replicate forms of colonial domination. The task is collective. It is not surprising then that, towards the end of the book, we should find Charbonnier in conversation with, amongst others, Bruno Latour, Nicholas Georgescu-Roegen, Kenneth Pomeranz, Timothy Mitchell, Philippe Descola, Ranajit Guha, Achille Mbembe, Eduardo Viveiros de Castro, Tim Ingold, Tania Murray Li, Baptiste Morizot and Joan Martinez-Alier, in a spirit of solidarity. Postcolonial criticism, new materialism, post-humanism, feminism and critical race theory provide him with much of the wherewithal from which he puts together the outlines of a possible post-socialist imagination of the future.

These conversations across disciplines help Charbonnier to figure out what the subject of resistance, the one who ushers in a more sustainable future – a ‘critical subject’, as he calls it (p. 252) – may look like *in principle*. Understandably, these last chapters are speculative. ‘It is probably not philosophy’s task’, he cautions the reader, ‘to affirm by speculative means what will be the name and the exact form of this collective capable of establishing itself as the subject of the ecological counter-movement.’ It is even possible that ‘the real trajectory of a collective political body and the conceptual expression of its mission’ may in fact diverge (p. 257). But Charbonnier’s hopes are undiminished by this prospect of divergence. Just as the industrial world called into being ‘the socialist counter-movement, and with it a political subject called “society”’ (p. 253), our current crisis will eventually produce a new critical subject. It will not look like a class nor ‘easily acquire a self-consciousness similar to ... “class consciousness”’. A coalition of disparate groups, ‘still diffracted by gender and race’, may ‘compose [note the Latourian diction] with the Earth’, a cluster that seeks to know ‘on what land and what Earth we intend to live’, though ‘the sociological profile of the emerging collective is necessarily unstable’ (p. 256).

The reader will not grudge Charbonnier the moment of this speculative flight, for he has earned it through the meticulous genealogy of the present that he has also provided in this book. Readers may disagree with particular propositions that he puts forward. But nobody

will miss the stimulation of Charbonnier's thoughts. It will remain a provocation for further thought, reflection and action. Readers will return to this book to agree, to disagree, to ask questions and even to find guidance as we keep negotiating the anthropogenic and planetary environmental quandary in which we find ourselves.

Chicago, 11 December 2020

# *Introduction*

As I was writing this book, the American observation site on Mauna Loa, Hawaii, indicated that the concentration of atmospheric CO<sub>2</sub> had passed the level of 400, and then of 410 parts per million (ppm).<sup>1</sup> This measurement proves that, on the scale of even such a tiny activity as writing a philosophical book, ecological reality is being silently but spectacularly transformed. Let's just point out that this level had remained below 300ppm over the whole of preindustrial human history, and that when I was born the rate was 340ppm. A high-profile German study has also shown that the biomass of flying insects has been reduced by 76 per cent in 27 years:<sup>2</sup> despite protective measures and the creation of nature reserves, three-quarters of the world's insects have disappeared over a few decades. And this is just one piece of evidence from a vast body of research on the deterioration in soil and water quality, and the decline in pollination and ecosystem maintenance,<sup>3</sup> all of which indicates that the transformation of the Earth is now taking place at a pace commensurable with the length of a single life, and even of a simple writing project.

Over the same five-year period, the global political landscape underwent equally dramatic changes. Donald Trump's rise to power in the United States in 2016, Jair Bolsonaro's in Brazil in 2019 and the Brexiteers' victory in the United Kingdom in June 2016 are the clearest signs in a series of events often seen as marking the disintegration of the liberal order. Pretty much across the world, a movement back towards entrenched borders and social conservatism has created a loose alliance between those who have lost out in the process of globalization and are now desperately in search of new protectors, and the economic elites who are determined to force nations to compete with one another so as to preserve capital accumulation. Earlier, however, the Paris Agreement, adopted to general enthusiasm in December 2015, had foreshadowed the emergence of a new kind of diplomacy aimed at bringing the concert of nations into the era of



climate change awareness. Despite the weaknesses that underlay this agreement, it was this attempt to forge a bond between diplomatic cooperation and climate policy that was attacked by the new masters of chaos: there was no question of founding a world order on any limitation of the economy.

During this same period, we were also able to witness the opening up of many new fronts of social protest, all focusing on the plight of the Earth. The latest changes I have made to this book have been in response to the ‘yellow vests’ (*gilets jaunes*) social protest movement in France; after all, it must not be forgotten that these protests were triggered by a draft fuel tax. People have embarked on a process of creating new relationships with their local territory, as in the ZAD of Notre-Dame-des-Landes in France<sup>4</sup> and in the conflict between the residents of the Standing Rock Indian Reservation and the Dakota pipeline project in the United States<sup>5</sup> – these movements were just getting under way as I was starting, in my seminars, to draw links between the history of modern political thought and the question of resources, housing and, more broadly, the material conditions of existence. In short, recent events are constantly confirming the idea that social conflict is now based on the issue of human subsistence. But as well as all that – the climate marches, Greta Thunberg’s speeches and the acts of civil disobedience carried out by Extinction Rebellion in London – there were also Haiti, Puerto Rico, Houston: the intensification of tropical hurricanes and the inadequacy of government responses have turned climate vulnerability into an indicator of ever more politicized social inequalities. The distribution of wealth, vulnerability and the protective measures available means that the destiny of things, peoples, laws and the machinery that assembles them has to be understood as part of the same whole.

Five years is sufficient time, therefore, to record some crucial changes – and also to look back on a past that may be close, but seems a totally different world from the one in which we are now moving, a world, indeed, to which we will never return. The speed of these developments also leaves us facing a darker question: where will we be when five more years have passed?

This book is both an investigation of the origins and significance of these events and one of the many ways in which they have made themselves manifest, albeit on a microscopic scale. Its meaning lies in the context of global ecological, political and social transformations whose importance we can dimly grasp, though we cannot as yet describe them accurately, let alone transcribe them into a theoretical language. In a sense, this work consists of bringing the practice of philosophy to bear on this history, recalibrating philosophy’s methods (and the type of attention it pays to the world) in the light of these issues.

My book takes the form of a long historical and conceptual detour, which covers several centuries and very variegated forms of knowledge. This detour can be summarized as follows: to understand what is happening to the planet, as well as the political consequences of this evolution, we must take another look at the forms of occupation of space and land use prevalent in the early modern societies of the West. The deployment of a state's territorial sovereignty, the instruments used to possess and improve the soil, and the social struggles that took place in these circumstances all form the basis of a collective relationship to things, a relationship whose final moments we are currently living through. Even before the race to extract resources (a race that combined the notions of progress and material development) swung fully into action in the nineteenth century, some of the legal, moral and scientific coordinates of the modern relationship with the Earth were already in place. In other words, to understand the empires built on oil, the struggles for environmental justice and the disturbing trends in climatology, we must go back to the agronomy, law and economic thought of the seventeenth and eighteenth centuries; to Grotius, to Locke and to the Physiocrats. To understand why we keep failing to impose constraints on the economy in order to protect our livelihoods and our ideals of equality, we must go back to the labour question<sup>6</sup> of the nineteenth century and the way industry affected the collective representations of emancipation. The current debates on biodiversity, growth and the status of the wilderness are just the last stage in a long history in which our social conceptions, and the very material structure of the world, were being constructed at the same time. The ecological imperative itself, insofar as it is recognized as such, finds its meaning in this history.

In more strictly philosophical terms, this means that the forms of legitimation of political authority, the definition of economic objectives, and popular movements striving for justice have always been closely linked to the way we use the world. The meaning we give to liberty, the means that have been used to establish and preserve it, are not abstract constructions, but the products of a material history in which soils and subsoils, machinery and the properties of living things have provided us with crucial tools. The current climate crisis dramatically reveals this link between material abundance and the process of emancipation. The United States Department of Energy, for example, has recently dubbed natural gas, a fossil fuel, 'molecules of US freedom',<sup>7</sup> thus summoning up the imaginary realm of an emancipation from natural constraints: freedom, it seems, is literally contained in fossil materials. This fantastical statement stands in stark contrast to all the findings of climatology, and the way they translate

into political terms: the atmospheric accumulation of CO<sub>2</sub> not only compromises the Earth's ability to function as a habitat, but requires a new conception of our political relation to resources. In other words, these same molecules contain the very *opposite* of freedom; they are an ecological prison from which we cannot escape.

We therefore need to compose a history and identify a new type of political problem by using our present geological and ecological experience as a piece of evidence, as the visible part of a puzzle that needs to be seen as a whole. The main thread of this history is indicated by the book's title: how did the legal and technological construction of a society based on growth permeate and guide the meaning we give to liberty? How, likewise, did struggles for emancipation and political autonomy draw on the intensive use of resources to achieve their ends? In short, what does a material history of liberty tell us about current political transformations?

\* \* \*

I have constructed this narrative and this analysis out of three great historical blocks, separated by two ecological and political transformations of revolutionary significance.

The first of these blocks is preindustrial modernity: this was a social world in which working on the land constituted the basis for subsistence and the terrain for the main social conflicts, an essential reference point for thinking of property, wealth and justice. Land was simultaneously a disputed resource, the basis of the symbolic legitimacy of power and the object of conquest and appropriation.

Then, gradually, during the nineteenth century, a new ecological coordinate was added to the material and mental world of human beings: coal, and then oil – in other words, fossil fuels. Thus, a second historical block came into being when societies reconfigured themselves on the basis of the way they used these energy forms that were concentrated, space-saving, easily exchangeable and able profoundly to reshape the productive functions and the social destiny of millions of men and women. With fossil fuels, modes of organization and collective ideals would undergo a major and challenging material rearrangement.

Finally, very close to home, a second ecopolitical transformation began, the proportions of which were at least as vast and crucial as the previous one. It inaugurated a third kind of world, one whose initial stages we are now experiencing, and one that can be defined by a catastrophic and irreversible deterioration in global ecological conditions. All the biogeochemical cycles that structure the global economy are being pushed beyond their capacity for regeneration by the rhythm of productive activities; the nature of our soil, air and

water is changing, thereby creating a new context for human collectives and their struggles.

After a general, introductory chapter, Chapters 2 and 3 are devoted to the first historical sequence; Chapter 4 attempts to describe the characteristics of the first great transformation; Chapters 5–9 relate to the intermediate sequence; the last two chapters outline the issues that are becoming prominent at the dawn of the era of climate change awareness. Modern political thought has thus historically unfolded in three worlds very different from each other: a terrestrial, agrarian, highly territorial world; an industrial and mechanical world, which engendered new forms of solidarity and conflict; and a world out of joint, about which we still do not know very much except that, in it, the pursuit of the ideals of liberty and equality takes on an entirely new guise. Each time, collective aspirations and relations of domination have been profoundly affected by the specific characteristics of these worlds.

\* \* \*

Throughout this book, I want to contribute to the politicization of the ecological problem, and more broadly to the construction of a collective reflection on the changes that are affecting the modern paradigm of progress. One can get an idea of the state of this debate simply by indicating the two opposing positions that structure it.

On the one hand, a number of global statistical data show a reduction in poverty, illness and ignorance: the overall median income almost doubled between 2003 and 2013, a decreasing proportion of the population is below the threshold of extreme poverty,<sup>8</sup> life expectancy is increasing and literacy is spreading, the infant mortality rate and malnutrition are falling. Some intellectuals, such as the Canadian American philosopher Steven Pinker, have become celebrities by interpreting this kind of data as proof of the virtues of the liberal utopia. The combination of capital, technology and moral values centred on the individual, a combination that Pinker somewhat monolithically traces back to the Enlightenment, is, he claims, a tried and tested formula for extracting humanity from its difficulties on both the moral and the material level. The partial successes achieved by the dominant pattern of development are thus interpreted in such a way as to block any attempts at social and political reorientation and to discourage those who, by demanding anything more or anything better, would unwisely hamper the machinery of progress.<sup>9</sup>

On the other hand, of course, we find all those who are alarmed by the decline in biodiversity, by the current sixth phase of extinction, global warming, the depletion of resources and the increasing number of disasters – indeed, they sometimes go so far as to foresee the

imminent end of human civilization, or even the end of the world altogether. Although they themselves do not adopt the rhetoric of apocalypse, the major scientific institutions responsible for recording changes in the Earth's system, the Intergovernmental Panel on Climate Change (IPCC) and the IPBES in particular, foster a legitimate sense of loss. But in the same way that we must draw a distinction between the improvement of certain economic and human indicators and the validation of a theory of development dating from the eighteenth century, we must recognize that there is a gap between the horrendous damage inflicted on the planet and the view that modernity is a pure and simple catastrophe. The current vogue for the idea of collapse reveals a heightened awareness of ecological vulnerability, and the belief of some people that it is too late to save the world is just an intensified version of this.

Depending on the indicators that are selected and the way in which they are ranked, we can deduce that we live both in the best of all possible worlds and in the worst. The philosophy of history has long since drawn a contrast between the narrative of the universalizing mission of reason and the counternarrative of the madness inherent in the will to control. But this theoretical commonplace is not only reductive in terms of the history of ideas, it also leaves us unable to grasp the problem we are facing: it is possible, for some at least, to live better in a world that is actually deteriorating. The contradiction we face is not a matter of perception, or even of opinion; it is situated in reality itself, and more exactly in a differentiated social reality. Economist Branko Milanović, for example, has shown that the fruits of economic growth over the past twenty years have greatly benefited a new global middle class – typically the huge Chinese middle class, created by that country's industrial boom.<sup>10</sup> But it is also this population that suffers most from pollution and a crowded urban environment, as well as from fierce labour discipline within the framework of a repressive state.<sup>11</sup>

The measurable growth of the economy, as well as in incomes, is a deceptive indicator. For while it still conveys many of our images of material and moral improvement, it is also inseparable from the process of planetary disruption that is leading us into the unknown. A true politicization of ecology lies in the gap between these two dimensions of historical reality. Angelic enthusiasm and dark prophecies of the endtimes are thus merely two exaggerated interpretations of a far more complex reality that forces us to reconsider the meaning we give to liberty when its dependence on ecological and economic factors means that its own perpetuation lies in the balance.

# *The Critique of Ecological Reason*

## **The fabric of liberty**

For a very long time, we thought that social conflicts were woven from rival experiences and conceptions of liberty, that history was played out in the endless struggle between those demanding recognition and those in a position to grant them that recognition. We thought that what mattered was winning the right to enjoy the world and its riches as equals, under the protection of a just state. The conquest of freedom of conscience, protection against the arbitrariness of power and economic justice all seemed to us to be responses to expectations arising from within society, unfolding in an immutable external space. And then there emerged struggles for which relationship to this territory became an issue, forcing us to revise this conception of injustice and how to remedy it. When ecological and climate warnings, for example, lead us to trace back the chain of energy dependencies, life forms and associated interests so as to scrutinize them more closely, we do indeed become aware that the fate of the world as it is known – and not only the fate of society – hangs on the resolution of a political riddle.

Although we thought we were fighting on common ground, we are starting to realize that this common ground is, now more than ever, the object of our differences. The soil, the ocean, the climate and the associations between living beings are undergoing transformations that we are trying to gauge with the help of science and that are forcing us to liberate them from the political silence to which we have long relegated them. As these serial destabilizations occur, the communities that have to face up to them will voice demands for a new kind of justice and a redefinition of what it means to dwell on the Earth. These movements, while prolonging the social struggles with which history has made us familiar, testify to a profound change in the relations between the social body, its own idea of itself and its natural environment.

Struggles for equality and liberty, and against domination and exploitation, have not ceased to drive human history, but they are more and more often entrenched in a conflict over the very soil that lies beneath these fundamental differences and needs to be protected. Or rather, they shed a tragic light on the way that political and ecological conditions are intimately linked, and subject to joint transformations.

This is what makes contemporary political events so difficult to grasp, given our history and our intellectual reflexes. How, indeed, can we think of these two dimensions of the present – the political order and the ecological order – at the same time? How can we bridge the growing economic and social inequalities and the increasing number of global environmental and climate disasters to which, so far, there is no response? How can we use the same instruments to diagnose the democratic collapse experienced by many states – including the major economic and political powers – and the support provided to these regimes by the main fossil fuel and mining industries? The very shape assumed by contemporary social relations, and therefore the pathologies that they generate, are the result of an increasingly contested arrangement between territorial organization, the quest for productive intensity, the authority of science, the colonial legacy and many other factors that involve the way we use the world.

At the heart of these ecopolitical arrangements is the meaning of our freedom and our capacity to establish it. This is what the climate issue makes tangible in a quite spectacular way. The rise in average temperatures is the result of a century and a half in which fossil fuels have been burned on a huge scale: after having treated the atmosphere as a spillway for industrial pollution, we are starting to understand that its capacity of absorption is limited and that our way of inhabiting the Earth depends on it. So it is the ashes of industrial freedom that are accumulating over our heads; it is the spectacular increase of our technological grip on the world and the cultural imaginary of high modernity that are at stake – urban sprawl, the automobile, household appliances and a certain sense of comfort and security.

In other words, we cannot separate ecology from politics. Social institutions, especially the state, have a material life that is not a technological prerequisite for the deployment of social life. The experience of injustice is becoming ever more apparent from the way that space and land are used, and from the demands for compensation that follow in the wake of disasters: this testifies to the fact that the flows and networks that sustain our lives co-define our political condition. All this forces us to sharpen our knowledge of the material dependencies that make and break our conception of emancipation. It is crucial for example to know that our phones, our cars, the contents of our plates



are the coagulation of a set of supply chains that go back to mines and their employees, to the soil, to geological expertise and to capital flows, and that the price of these goods almost never reflects the real social cost of their production. We are often unaware that our economic cruising speed requires 25 per cent of the Earth's annually produced biomass to be integrated into commercial circuits or sacrificed to make room for them,<sup>1</sup> or that, in the case of the world's wealthiest regions, demand exceeds the environment's biocapacity by 100 per cent.<sup>2</sup> We are experiencing a geological experiment of global magnitude, one that upsets all the familiar eco-evolutionary dynamics.

But we close our eyes to this experiment and its consequences because they clash with what is most dear to us, or what often appears as such, namely the possibility of enjoying absolute, unconditioned freedom. Yet nothing is more material than freedom, and in particular the freedom of modern societies, which have concluded a pact with the productive capacities of land and labour – a pact that is now falling apart.

This is the reason why political emancipation must today be reformulated in material and geographical terms. Whether at a local or global scale, we impose on nature in ways that contravene the simplest principles of sustainability. The erosion of the fertility of agricultural land, the saturation of atmospheric carbon storage sinks and the collapse of biodiversity between them comprise a set of indicators that testify to the limited capacity of the environment to cushion the blows inflicted on it, and on its propensity to return these blows in unexpected, often unpredictable and sometimes catastrophic ways. Some of the biogeochemical cycles and evolutionary dynamics that make the Earth habitable are now being pushed beyond their threshold of tolerance, climate being only one of these transformations, albeit doubtless the most spectacular.<sup>3</sup> Thus, access to territory, our common future, and the most basic conditions of justice, in other words all that constitutes the basis of a political existence, are being simultaneously compromised.

But to say that ecology and politics tend to be superimposed is not enough, because many different ideological strategies are based on this observation. For example, a 'green finance' is emerging, one that tries to label certain investments as responsible, and thereby attract capital to projects that are respectful of natural balances or the principles of low energy.<sup>4</sup> Behind this 'green finance' lurks the ambition to build up markets that are compatible with environmental requirements and thus bypass the longstanding criticism of them on the part of the ecological movement. The assembly and circulation of capital now claim to meet environmental standards without jeopardizing the idea of the fundamental freedom of stock exchange and market operations.



On the side of conservative and reactionary movements, for example, the idea that nature can serve as a norm for social organization is gaining ground.<sup>5</sup> Thus, so-called ‘integral’ ecology is proposing to re-establish principles deemed quite commonsensical and yet abandoned by modern political culture. Family and nation are considered as natural communities backed by an identity conferred by the soil of one’s ancestors in an alleged continuity of settlement, and the preservation of the environment, it is claimed, then fits smoothly into this substantialist framework whose legitimacy is based on the so-called natural order of things. The diffuse requirement that a conformity be found between our modes of organization and the physical, living substratum of the world is reflected in multiple forms that are obviously incompatible with each other, so that the belated marriage between the moderns and ‘nature’ is celebrated in a rather confused way.

For some people, peace can easily be restored to this ecological battlefield by limiting the stakes to simply slowing down the economic and extractive machine. Once we have eliminated the accumulative drive inherited from the past and now rendered obsolete by technological efficiency, the economic mega-machine will obediently bend to natural constraints to allow the same society to carry on as before, with the same political organization, albeit rid of its productivist excesses. But, as has already been suggested, moving away from ecological forcing and decarbonizing the economy implies a total redefinition of what society is, a rearrangement of relations of domination and exploitation and a redefinition of our expectations of justice. In other words, it is the democratic organization and the aspirations that sustain it that need to be decarbonized – not just the economy. Gaining access to ‘prosperity without growth’, to use the title of a famous work,<sup>6</sup> is the result not of a technological solution but of a political transformation whose historical equivalents are to be sought in the great technological and legal revolutions that founded modernity and served as a laboratory for our shared ideals.

Climate change and the disruption of eco-evolutionary dynamics are therefore not crises of nature, but events that require a redefinition of the project of autonomy. This project was born in the age of the early nineteenth-century revolutions, and then perpetually postponed and hindered, especially outside the area of Western industrialization; it consisted of dismissing arbitrary authorities and entrusting the assembled people with the power to provide themselves with their own rules, to grasp the rudder of history, and to realize the liberty of all as equals. This conquest was never brought to any real completion; furthermore, these days, we feel uneasy about the material possibilities that first supported it. The growth and technological intensification that for so long made control of our historical destiny a tangible ideal

now induce an increased sense of submission to the arbitrariness of nature. This is the main hypothesis of this book: affluence and freedom have long walked hand in hand, the second being considered as the ability to escape the vagaries of fortune and lack that humiliate human existence, but their alliance and the historical trajectory it has followed have now come up against a dead end. Faced with this, the alternative that presents itself sometimes contrasts the pure and simple abandonment of the ideals of emancipation under the pressure of severe ecological constraints, on the one hand, with an enjoyment of the last moments of autonomy that we still retain, on the other. But who would want an authoritarian ecology or a freedom without tomorrow? The theoretical and political imperative of the present is therefore to reinvent freedom in the age of climate crisis – i.e., in the Anthropocene. Contrary to what one sometimes hears, it is not a matter of stating that infinite freedom in a finite world is impossible, but that this freedom can be gained only by establishing a socializing and sustainable relation with the material world.

### **The other history: ecology and the labour question**

How, these days, can we embark on a theoretical and political inquiry into these questions? First, by telling the right kind of history. Contrary to what philosophy has traditionally suggested, sensitivity to nature and the desire to treat it as a person rather than a thing are not the only, or even the main, framework within which the emergence of an environmental critique can be understood. Instead of abstractly conceiving a nature for which we might feel empathy, we would like to set the contradictions we have just described within the history of the labour question – a question that can therefore no longer be separated from the ecological question, as both of them are two stages of the same internal conflict within our history.

The term ‘labour question’ refers to the tension that results from the orientation of societies both towards increasing material well-being and towards the construction of a political-legal system of rights focused on equality and liberty. In fact, the requirements of the first objective and the sacrifices made to that end by a large part of the population have jeopardized the project of equalizing conditions, a project of which the French Revolution was the main historical symbol. The labour question is the search for the right balance between enrichment and equality, between growth and the distribution of its benefits. Forged semantically in the nineteenth century, this term refers to all the pathologies affecting industrial societies and the measures taken to mitigate or compensate for them: the transformation of the

division of labour and, in particular, the way it has been shaped as a market expose society to the risk of fragmentation. Institutions respond to this risk by protecting the socializing nature of labour. To put it another way, poverty poses a specific problem in an economy of abundance: it becomes, as it were, even more scandalous than it was in a subsistence regime (where it appeared as, if not permanent, at least as structural), because it now affects not only people's lives, but also and above all their civil status.

To assert that political ecology is based on a historical line that leads us to such issues is also to suggest that the labour question has a deep affinity with the way in which the material world has been endowed with a central political value. Social relations are thus closely related to, and in fact inseparable from, relationships with nature. The massive transformation of the material structure of societies, as a result of the new ways of relating to space and resources that have developed in European countries and their colonies, has been central to the reconfiguration of working conditions, and thus of social dynamics. While it is true that the construction of modern industrial societies has not been indifferent to the physical and living environment in which they have spread, this is simply because the hope of a relationship with a prosperous world, one that is under our control and can provide us with security – in other words, the development of a nature that is productive, familiar and stable – has functioned as a general framework in which ideals more commonly considered to be political have been embedded.

These ideals are therefore immediately fitted into a historical dynamic that ignores the permeability of the natural and the social spheres. Once the system of rights and the material system are considered as two dimensions of the same historical process, there is no longer any reason to reserve the term 'political' for the former.

In an essential study of these questions, English historian Gareth Stedman Jones noted that the intellectual and moral impact of the Enlightenment on the emergence of political republicanism cannot be reduced to ideas of equality and liberty. Equally important was the promise of an end to poverty, that is, the elimination of the hitherto rampant problem of scarcity.<sup>7</sup> This simultaneously ideological and practical ambition, of which we find the clearest formulation in authors such as Nicolas de Condorcet and Thomas Paine, gives a material meaning to the principle of equality, since the development of technology and commerce was conceived as a way of reducing the gap between the propertied classes and the rest. Of course, the idea of improving living conditions for the greatest number is closely linked to the conception of nature as a productive resource, and may not be unrelated to its exploitation. But if we keep this idea in mind, the

fact remains that we are being given an indication of the relationship between nature and politics in modern societies. Although nature has not been protected or promoted as a heritage, nor has it been the stage on which an essentially sociocentric dramaturgy has unfolded. The social, the political and the material domains are linked, both because these different levels of reflection and historical evolution are conjoined, embedded in each other, and because the space of theoretical elaborations is saturated with considerations on what our relationship to nature can and must be. There is just one movement that affects labour, rights and the material world all at once, and it is as such that it must be considered.

This historical reflection on the labour question is linked to a broader questioning of the division between nature and society, resulting from the anthropology of modernity, which – in particular in the work of Bruno Latour and Philippe Descola – has indeed nourished a salutary scepticism with regard to the modernist triumphalism that prevailed in the nineteenth and twentieth centuries in the Western world, and which long boasted of having set mankind on the path of progress by winning a decisive victory over nature, lack and heteronomy. Indeed, the conception of the social as an autonomous sphere, as a space that produces its historicity by means and ends of its own, progressively imposed itself in the wake of the Enlightenment as a central feature of societies that sought to be modern. It was particularly crucial in the French revolutionary and post-revolutionary periods,<sup>8</sup> but it also extended to the struggle for emancipation of the slave colonies against the European empires: the fight for self-determination was thus an avatar of the project of autonomy, now turned against the very same people who had first conceived of that autonomy.<sup>9</sup>

This form of reflexivity has also played a central role in the establishment of the social sciences, since they were quick to note that the endogenous nature of social transformations is what renders ‘the social’ observable as a scientific object in its own right, but especially because they set themselves the task of elucidating the practical realization of this ideal of autonomy, as well as the pathologies proper to it.<sup>10</sup> It is still this form of reflexivity that makes it possible to establish a close link between this new type of political thought and democratic principles, since autonomy thus conceived carries with it the demand for an ideally complete control of the people over their political destiny. But we can now perceive a tension between this modernity, for which the endogenous character of the constructive and critical process is central, and the current re-evaluation of this same historical phase, for which political autonomy overlaps and obscures in many ways a constitutive mode of relationship to nature. In other words, the rethinking of our understanding of the concept of nature over

the last two or three centuries has brought about an upheaval of our categories of thought that goes beyond the question of whether or not nature should be given a value of its own. What is in question, rather, is the way in which nature's material, spatial and productive properties have been incorporated into the dynamics of modernization as it has actually been shaped, in both its successes and its failures.

### **An environmental history of ideas**

The following investigation is based on a number of changes to what is usually considered the basis for an environmental critique of the political order.

The dominant formulation of the ecological problem in philosophy takes an essentially normative form: it consists of elaborating principles intended to modify the hierarchy of values and, from an apologetic point of view, to convince the greatest number of people that we need to rebalance relations between humans and nonhumans. These values are generally rooted in socially situated practices, where new preferences, new attachments and new conceptions of justice and injustice are elaborated; but philosophical work is often confined to a purely normative retranslation of these practices: it focuses on principles first and foremost. Philosophy sets itself the task of shaping a pre-existing conviction about the value of nature in order to better justify that nature, rather than observing or provoking transformations in practices that relate to the forms of exploitation of nature.

One of the most important consequences of this theoretical perspective is that it tends to separate conceptualizations that are recognized as 'ecological' from others that are not. But this theoretical dissociation acts as a historical methodology for a great number of thinkers, since it supposes that one could write the history of ecological thought by taking as a guide the ethical conviction being promoted. The spontaneous attitude of the ecologist to the history of ideas thus consists in producing a narrative staging the gradual emergence of ideas whose prototypical form is provided by environmental ethics, by the critique of technological instrumentality, or by other paradigms that seek to relativize or eliminate anthropocentrism and objectivism in philosophy.<sup>11</sup> The main limitation of this type of work is that fundamental environmental intuition works only partially. Indeed, it must be admitted that this intuition consists in pleading for a systemic reassessment of the relations between humans and the material world, and thus making these relations a focal point of conceptualization. But if we follow this theoretical and historical track in a consistent way, it is impossible to organize a chronological survey in accordance with

the principle of similarity of ideas. Too often, indeed, the ecological history of thought retraces the steps of its own normative principles, which it observes as they gradually appear and which it follows back until they are dissipated in a too distant past. Another model sometimes replaces this paradigm of the gradual emergence of the same: the game of historical and geographical leap-frog in which John Baird Callicott, for example, indulges when he seeks ecological traits in a wide range of non-Western ideas, at the cost of decontextualizing certain statements that meet the requirements of resemblance.<sup>12</sup> But the underlying logic remains the same, since it is still the principle of identification that plays the role of historical methodology.

The *history of environmental ideas* thus wagers on an intellectual separatism for which a certain tradition of thought is set out in successive touches to the canvas, and differs from a common fund of moral and political thought that is implicitly considered as irrelevant. To this, one can contrast an *environmental history of ideas*, where the centrality of the relations between nature and society functions as a way of analysing all ideas, theoretical controversies and their history. The difference between these two patterns is that, in the second, the corpus that is most likely to appear relevant is now completely different and includes all conceptual operations mobilizing these relations, whether or not these operations are oriented towards the constitution of the environmental normative ideal. But we must recognize that, from the moment we leave the immediate past, the epistemic locus at the intersection of the natural and social realms is mainly occupied by philosophers, economists and sociologists who cannot be identified as environmentalists: it is not their consideration for nature that makes them relevant.

This is the second difference with the separatist model: historical enquiry is no longer oriented by the principle of doctrinal resemblance, but by the search for historical transformations that affect the relationship between the natural and the social realms in the history of thought. Before the galaxy of ideas and norms that could legitimately be called 'environmental' or 'ecological' was formed, and before social struggles were explicitly oriented towards these ideals, collective relations to nature were already subject to reflexivity and critical distance. It is these types of knowledge and these debates that we are likely to miss if we insist too much on the principle of identity, both as a historiographical instrument and as a basis for ideological recognition. Bentham's thought is one example of this problem. He has often been presented as an ancestor of the animal cause since, at the centre of his moral thinking, he placed the elimination of suffering in sentient beings – human or not.<sup>13</sup> But what is the value of this abstract normative principle if we separate it from the reflections of the same

Bentham on the consolidation of the English commercial empire and the autonomy of the markets? These are also consequences of his first principles, and just as important for the ecological question as is animal welfare. After all, in these processes the fate of vast areas of land and those who worked on them was at stake.

For the environmental history of ideas, the environment is less an object than a point of view: the ecological analyst demonstrates his or her versatility by focusing on any social doctrine and reconstructing its relevance from the relationships to the material environment that are seen as possible or impossible. As against the 'separatist' strategy, against the history of environmental ideas, this is a more integrative method for which ecological thought is not confined to a set of pre-established demonstrations, and which allows itself the possibility of creating surprises in the conventional history of our social relations with nature.

This method aims to establish links with the history of political and economic ideas, but also with environmental history. After having developed as a history of pollution and environmental depredation, as a history motivated by opposition to the dominant narrative of a modernization without negative externalities,<sup>14</sup> environmental history has also become less easily distinguishable from a general history of industrial development, its legal and ideological structures and its social consequences. Historians not explicitly motivated by ecological goals have thus incorporated into their reflections issues dear to their ecologist colleagues.<sup>15</sup>

Rather than writing a brief, continuous history of environmental awareness, therefore, I shall be writing the long, frequently interrupted history of the relationship between political thought and forms of subsistence, territoriality and ecological understanding. If the invention of modern political legitimacy coincides with a specific way of dealing with the world, it is riven by numerous controversies and crises. In the pages that follow, we will study several critical moments connected to such concepts as property, production, waste, territory, risk and climate. These spaces of controversy jointly shape what could be called the environmental reflexivity of our societies. We will understand this expression to mean the capacity of any society to develop not only techniques for the control of nature, but also and inseparably forms of knowledge relative to the merits of these techniques and a critique of these forms of knowledge and general orientations.

### **Subsisting, dwelling, knowing**

The reader may have noticed some terminological hesitation over my use of the word 'nature', for nature is indeed both the object of this



book and, at the same time, a conceptual obstacle when trying to write an ecological history of the political. Philosophy and the social sciences have discussed at length the impasses of the concept of nature, perhaps excessively: it is true that it is a problematic concept, but this is quite simply because it encloses in its very fabrication a certain conception of the relations between humans and nonhumans. As several now classic works have shown, 'nature' more or less arbitrarily isolates a set of phenomena that both are available for objectification and appropriation and are considered to lie outside the political sphere. Naturalism, if by this we understand any sociohistorical configuration in which the world is likely to be categorized as 'nature', is thus a singular arrangement of things and people that already envelops a certain order, certain hierarchies, certain possibilities and impossibilities.<sup>16</sup> In other words, the concept of nature must be one of the intellectual elaborations that we need to analyse, rather than one of the tools of our analysis.

But we do not have a more satisfactory semantic and conceptual option: words such as 'milieu', 'environment', 'ecosystem' and even 'nonhuman' imply theoretical choices that are neither transparent nor universal. As for terminological innovations such as *natureculture*,<sup>17</sup> despite their welcome potential for provocation, they seek to designate an ontological continuum that doubtless gives us yet one more problem to face: if all things are of the same ontological rank, then why does the description and categorization of entities arouse so much controversy? So the strategy that we will adopt here is to break our object into several pieces and distinguish between three thematic blocs: *subsisting*, *dwelling* and *knowing*.

The first, *subsisting*,<sup>18</sup> is undoubtedly the most obvious of the three, since it covers all the activities by which human collectives derive their means of physical reproduction. It is labour, as a functional task dedicated to the satisfaction of needs, but also as a collective activity coordinated and shared between different members of a given group. Subsistence therefore concerns the relationship to vital resources and reveals that it is always a collective relationship. This concept of subsistence is ordinarily conceived as falling within the sphere of the economy, but by highlighting this apparently evident fact, we immediately destabilize it. Indeed, the contemporary economy that comes into being with the neoclassical paradigm is defined both as an art of exchange and as a science of the composition and optimization of subjective interests. This usage relegates the practical modalities of subsistence to a secondary status, as Karl Polanyi has remarked: a division within the object of the economy emerged when the neoclassical or 'formal' paradigm was imposed,<sup>19</sup> establishing a profound imbalance between the two sides thus separated. Under these



conditions, subsistence appears at worst as a trivial prerequisite to the real economy, the economy that can be formalized, mathematized and ultimately governed, and at best as just one of the spheres that can be organized by the market. Yet one may legitimately conclude that the 'substantial' dimension of collective action, especially insofar as it is oriented towards the world of material resources, is irreducible to the mere play of individual interests. It also involves the reproduction of the collective and its environment and the general conditions of existence.

To grant political centrality to questions of subsistence may seem paradoxical, inasmuch as the political order claims to be built on essentially symbolic procedures, involving the will rather than the need, convention rather than necessity. But as we will see later, a careful reading of the political theories accompanying the process of modernization invites us to reconsider this fragile evidence. The disruption of living conditions caused first by the agro-industrial transition, and then by the massive use of fossil fuels in the nineteenth century, created a social relationship to affluence and to the totally different lack familiar to societies based on the organic cycle of the fertility of the Earth and the hierarchies of status that it legitimized. And these transformations are reflected in the debates that have led to the emergence of the political and moral positions classically recognized by the history of ideas – not because they are the unconscious reason for these, but because material reflexivity and political reflexivity are constantly intertwined.

The second element that makes it possible to trace the contours of collective forms of relationship to the material world can be subsumed under the notion of dwelling. This term itself has two facets, territoriality and security. On the one hand, society unfolds in a constantly reconstructed geographical space: humans are distributed across space in accordance with their activities and other sociologically defined criteria, in relation to what classical geographers called 'possibilities' – affordances<sup>20</sup> silently inscribed in the territory: plains, mountains, rivers, coastlines, etc., contribute to shaping the internal variety of the social body. As human geography has shown, space is not only an abstract coordinate of collective existence, but a material attractor for phenomena related to inequalities, identity formation, the sense of belonging and cultural difference, but also to conquest and the balance of power between centres and peripheries. The meshing of the territory by technological infrastructures, in particular transport, as well as the capacity of certain political entities to project their power towards new spaces whose political destiny depends on a spatial and legal differential, are remarkable examples of the importance assumed by political geography among the moderns.

The other side of dwelling, as habitat, is the possibility of finding a source of security in the place one lives – i.e., both a minimal exposure to the dangers of the natural environment and also an opportunity to conduct one's activities on the basis of a lasting relationship with the elements of the environment. Security is a combination of the spatial factor with the temporal factor, since it is a relationship to the future marked by the gradual elimination of uncertainty: the future must resemble, as much as possible, a perpetuation of the present. The need for security is closely related to the understanding of the material and spatial context, since any threat is generally understood as menacing the apparatuses for controlling and channelling space. Nature probably comprises the typical case of the object needing to be controlled, in the modern political imaginary. A secure supply of food and energy, hygiene and, more simply, security of the domestic home form part of the collective relations to the material world, and all these dimensions overlap, of course, with the transformation in relation to affluence and lack. As many historians have noted, the establishment of industrial society has been accompanied by the endangering of a very large number of people, generally deprived of the means of production: protection has become one of society's essential expectations, given the need to ward off increased material vulnerabilities. Exposure to industrial and technological risk is only one of the modalities of a more general relation to the world as a provider of security; it has found a great variety of political expressions since the nineteenth century. Property and security are very closely linked, as was perceived by the drafters of the different versions of the Declaration of Human Rights: often forgotten in favour of the principles of equality and liberty, security and property have always lain at the heart of modern political expectations.

Through the concept of dwelling, we seek to designate the overlap between the territorial character of all social existence, manifested at the local level by municipalities and 'local areas' and on the larger scale by nations and their empires, and the need for security, which gives a qualitative sense to the relation with lived space.

The third aspect of the collective relationship to nature can be subsumed under the concept of knowledge – that is, the processes by which we ensure an intellectual mastery of things. In a way, it was this core meaning that was highlighted by the first critiques of our mode of relation to modern nature: under the notion of objectification, a wide range of philosophical propositions sometimes linked to the ecological movement tried to show that the world had been reduced to instrumental status by the experimental sciences and their technological application. This critique stemmed from the idea of a relation to the world prior to these objectifying structures, concealing

the now forgotten meaning of being-in-the-world in its fullness and wholeness.<sup>21</sup> But this philosophical anteriority, converted into a moral priority, does not explain how it has sacrificed itself to something less true and less good than it is; instead of critique, it offers a merely dogmatic statement.

Our perspective on the links between knowledge and the relation to nature is very different from those approaches that monolithically deplore technoscientific modernization, defined as a triumph of instrumental reason. Indeed, the principles of the environmental history of ideas described above suggest that there is no relation to nature or to the world in general that is not mediated by socially shared categories of thought and technological instruments. Of course, not all categorical systems are really 'sciences' in the narrow sense of the experimental sciences born in the classical age, but they all fulfil an elementary sociological function, identified by Durkheim and later by the sociology of science: the connection between scientific authority (claiming the point of view that allows us to say what things are like) and political authority (claiming the point of view that allows us to say how humans should be governed). The challenge is not just to note the increase in our knowledge of physical and biological things, which is indeed quite remarkable in modern societies, but rather to point out that most of the decisions taken about the economic and territorial control of nature have been linked to scientific institutions. The space of controversies about the proper use of the world has systematically incorporated a point of view whose specificity was that it claimed to speak in the name of nature itself, in accordance with its own mechanisms, and in an ideally unbiased, factual way. It is up to a critical history of science to pronounce on the validity of such a point of view and on the effectiveness of its autonomy with regard to other social authorities, but the fact remains that the very participation of scientists in social controversies is a salient feature of modernity. This modernity reflects the secularization of relations with the world, since the decline in the authority of religion has been compensated for by the emergence of technological and scientific elites playing a similar role.

Agronomy, demography, certain branches of sociology, and the engineering sciences have all been central actors in the political and material organization of modern societies. They have provided it with some of its most important impulses, especially when it came to making the territory productive and controlling it by means of the quantification, classification and standardization of economic and political conduct. The world of industrial technoscience, and in particular chemistry, is considered as the main achievement of the power of modern technology over nature, but we must not forget that this effort was not solely aimed at the optimization of production.

The experimental sciences also, and doubtless earlier in history, played a central role in the genesis of the progressivist ideal, providing modernity with the first consistent figure of a linear evolution of knowledge in accordance with a dynamic projected towards the future. These sciences not only have a functional role, but also represent a prototype of the progressivist orientation of history, whose extension into the sociopolitical sphere was the central issue for Enlightenment thinkers, right up to positivism. The empirical sciences, finally, such as botany and zoology, or geography, were at the forefront of colonial exploration: it was these sciences that made it possible to absorb the quantitative and qualitative diversity of things; it was they that were most often deployed on the pioneering fronts of modernization and globalization, by creating inventories, drawing maps and making lists, to prepare the ground for the administration and exploitation of territories.<sup>22</sup>

Knowledge of the world is therefore closely linked to the dynamics of social and environmental modernization in three main ways. First, through the emergence of a form of authority that intervenes in a lasting and profound way in social life, that configures our relations to the world and dictates the legitimacy of these relations; second, through the explicit ambition of turning modern generations into a people that will be the depository of a knowledge tending to the universal, covering the totality of things and capable of exhausting its variety right across the world; and, finally, because the forms of knowledge of the world are inseparable from the way the social sphere knows itself, and from the way in which it defines itself and relates to its own reality.

### **Autonomy and affluence**

Now let us describe the dead end to which our historical legacy has brought us. When societies resolved to no longer depend on transcendent, arbitrary and external authorities – God, King, Providence – they discovered a new authority: their radical dependence on matter and the means invested on integrating it as massively as possible into the economy. The project of autonomy thus implies an ambivalent attitude towards ecological and evolutionary processes. While it goes without saying that the social body must always borrow something from the outside world in order to reproduce, the demand for emancipation long dreamt of freeing itself from these servitudes, in the name of the fight against all forms of heteronomy. But this was not done in a naïve and unambiguous way: modern political thought has formed a judgment on the collective relationships with nature that it considers

possible, valid, and preferable, and the current ecological imperative is merely the form that the tension constituting the historical trajectory of industrialized societies takes today. This imperative is a fundamental rearrangement of modernity: as the result of a transformation of the labour question, ecological reason is neither an ahistorical preoccupation linked to the somewhat vague intuition of an eternal vulnerability of nature, nor the belated emergence of an awareness of the risk and dangers of modernization in its advanced phase, but the current stage of the critical awareness that was born with the rise of the ideals of affluence and autonomy – i.e., of freedom.

Collective relationships with nature have always been at the heart of the political and historical construction of societies, especially those that define themselves as modern. The history and sociology of science and technology have produced many significant studies of this question and have guided reflection on the arrangements between humans and nonhumans, arrangements which for many researchers are crucial for an analysis of modernity. But if the last two or three centuries are to be read as the slow and conflictual construction of a technoscientific society, ultimately capable of dramatically altering the very shape of the Earth and the global climate, how is it that we are still looking for the correct political formulation of the ecological problem? Shouldn't we by now have come to a quite adequate understanding of political issues, if by that we mean an understanding of where the best possible arrangement between humans and nonhumans can be found? There is a paradox here that still resists philosophical analysis: for two or three centuries, we have been immersed in a world where our common destiny is largely played out in the operations of quantification, transformation and exploitation of the material world, and yet we are unable to appropriate these operations in order to fit them to our sense of justice, i.e., to resist the blind dynamics of extraction and accumulation. Land, machines and energy have always been at the centre of modernity, and yet they have never imbued our political categories enough to make us sufficiently sensitive to the political problems they pose.

This paradox leads to an untenable situation: on the one hand, we seem to have a history of modernity as a technological, material phenomenon, as a complex arrangement with nonhuman beings, and, on the other, a history of modernity as the advent of a public space exclusively focused on the human sphere and its rights. The consequence of this twofold focus is that the problems raised at the intersection of these two histories are insoluble. However, our hypothesis is that these epistemological and political blocs are both incomplete, that the aspiration of each to reduce the other to its logic is illegitimate, and that our objective must be a better understanding of

their relationships. Let's go even further: contemporary political issues are completely incomprehensible if we keep these realms separate. To gain a better grasp of these issues, we must therefore identify the two guiding ideals of modernity and monitor the dynamics that are created at their intersection. The will to modernize is expressed in the form of a twofold injunction, one oriented towards affluence, the other towards freedom, or, to characterize it more precisely, towards individual and collective autonomy.

Let's start with the first modern ideal, affluence. The break between a past characterized by perpetual lack and by the constant pressure of needs and a future defined in a more or less utopian way by the relaxation of this pressure and the access to a certain prosperity has played a central role in the way the majority of people supported the project of modernization. It meant that everyone could legitimately hope to benefit from better living conditions than those of their parents, and that this improvement should entail an easier access to private happiness and a greater quality of life. Above all, the break between *before* and *after* affluence meant this support lasted a very long time, from the response to the pessimistic prophecies of Malthus at the turn of the nineteenth century to the current exhaustion of prospects for economic growth and the growing number of ecological threats. The will to affluence inaugurates a new temporality and gives the modern era one of its most durable engines and one of its most powerful justifications.

The human species today has a technological and organizational capacity such that it can capture roughly a quarter of the biomass produced annually on the continents – i.e., a quarter of the solar energy converted by plants into living matter.<sup>23</sup> This helps explain both the change in scale of human activity in recent centuries and also its inescapable rootedness in the physical and biological processes that regulate the land system. Indeed, the material abundance obtained by access to exosomatic energies (i.e., energies that are not incorporated into human or animal muscular movement), comprised essentially of fossil fuels as well as by the increased yield from land and labour, projects the human species into a hitherto unimaginable dimension of activity, which tends to coincide with the very wide and very slow temporality of geology. This is what the 'Anthropocene' means: human history and geohistory come together, thanks to the practical means developed to realize the industrial dream of affluence.<sup>24</sup> But the Anthropocene cannot be understood as the elimination of the dependencies that bind us to the physical world: nothing can be sampled from the ecological environment unless organic elements are restored to it, and neither can there be growth without entropy. The extraordinary productive momentum of which we remain the heirs, and which has

already exhausted certain resources, has eroded the specific and genetic diversity of living things, and more generally reached certain planetary limits,<sup>25</sup> therefore paradoxically forcing us to remember a truth as simple as it is brutal: the wealth produced is only temporarily removed from planetary ecological cycles, and any non-returned sampling compromises the maintenance of these dynamics.

However, it is useless to separate the bright side from the dark side of affluence – on the one hand the development of technologies that lengthen life span and relieve its sufferings, on the other hand our exposure to catastrophes. The conquest of affluence is neither catastrophe nor salvation, but involves such a major part of the political significance of the last few centuries and the struggles which stirred them that it must be preserved from an overly partial judgement that would make it a mere mistake or a definitive truth.

Affluence can first of all be defined as the proclamation of an elimination of the pressure of needs – the obsolescence of the motive for survival in human action. Keynes, for example, described the future of capitalism as based on the tendency to abolish the ‘economic problem’, namely the incentive to act that constitutes subsistence and which natural evolution has imprinted on us.<sup>26</sup> Once they have reached a stationary condition, humans will have to redirect their original economic impulses and, according to Keynes, convert them into a spirit of leisure. Deprived of the ancestral reason of lack, humans will have to learn to make nonproductive use of their acquisitive instincts and cultivate nonrival and fully integrative occupations, or else persist in anachronistic economic attitudes. The foresight and depth of these analyses do not detract from the fact that they are largely utopian: the real reduction in working time necessary to meet basic needs makes all the more surprising our persistent attachment to economic incentives.

But there are other conceptions of affluence: far from making possible the liberation of time and the disappearance of the economy, it could require of us dispositions for labour and discipline, and the acceptance of the rationalized control of our desires and our expenses, without which the continuous and lasting accumulation of wealth would be impossible. Affluence, thus portrayed, is less a step towards emancipation from the economy than the penetration of the economy into all spheres of our existence, the domination of our value system by the motif of interest. Max Weber systematized this conception of affluence and its ethical, religious and social sources, and even made it the centre of gravity of capitalist modernity<sup>27</sup> – indeed, he also described it as an absurd process of accumulation with no other end than the reproduction of rationalized patterns of action. Added to this less rosy picture is the fact that access to larger raw quantities of consumer goods and wealth has historically been absorbed by a



concomitant population explosion that has drastically limited the liberating potential of growth. The moral sacrifice demanded by affluence then becomes difficult to accept, unless this second reading is tempered by a third, which considers the injunction to material development as a directly political phenomenon.

Indeed, the accumulation of wealth is only possible if the economic order takes the form of a market that autonomously allocates this wealth. The 'immense accumulation of commodities' in which capitalism consists, as the first lines of Marx's *Capital* put it, is thus merely the visible face of a process of differentiation within the social sphere, which distributes human beings according to their access to ownership of the means of production, or more broadly their participation in the construction of the new industrial society. This political interpretation of the productive order by socialist thinkers gives affluence an immediate hierarchical dimension, which, while it does not confuse the productive orientation of the economy with the domination of the workers, raises the inevitable question of how they are connected. After Marx, Polanyi showed how the affluence organized by the market (i.e., in the form of the maintenance of the lack as a driving force for economic actors)<sup>28</sup> puts societies under such pressure that they may rise up against each other.

Whether joyful, austere, or fully political, affluence is one of the cardinal collective aspirations around which modern societies are organized. It would be easy to write its story in a linear fashion: difficult beginnings, an intermediate phase of expansion and success, and a tragic end, burdened by inequalities, under the thick cloud of pollution and on an overheated planet. But this story would be merely a succession of blind empirical facts, in thrall to simplistic contrasts. More seriously, it would be disconnected from the fully political reasons that made such a prospect of progress desirable, and which mean it cannot be reduced either to a simple desire for material well-being or to a guilty hubris: the aspiration to affluence is indeed embedded in a political rationality without which it is incomprehensible, in its successes as in its dead ends.

This political rationality, which is the second guiding ideal of modernity, is called autonomy. To the closely related notions of liberty (essentially individual), and emancipation (which refers to the acquisition of rights), this term adds the idea of a collective historical orientation. In the words of Castoriadis, this tendency of the collective body to discover, by unrestrained investigation, the conditions of its 'self-institution' poses an 'abyssal question':<sup>29</sup> society aims, through this demand, to constitute an order absolutely independent of any exogenous determination, to appear as a reality *sui generis* from an ontological and historical point of view. It owes its reality to



nothing other than itself, and its movement over time is the product of an orientation that it gives to itself, in complete transparency. The requirement of autonomy therefore supposes on the part of the social an ability to withdraw into itself in order to discover in itself the source of a normativity which it will then unfold in the form of law.

If modern society seeks to be transparent to itself, this is not so that it may discover natural and ahistorical organizational principles, but in order to give itself laws that suit its current state, insofar as this state is affected by the forms of the division of labour, and by the dominant moral or religious values that circulate in it. These characteristics are subject to change and require that a society which seeks to be autonomous will continually correct its institutional principles so as to respond as adequately as possible to its own historicity. Thus are woven the concepts of critique and history, the two sides of this open, dynamic understanding of autonomy:<sup>30</sup> as this autonomy is never realized in an ideal way, it must conduct its own self-critique, and it is this self-conscious movement that leads social and political history in a direction that is in stark contrast to the model of perpetual repetition of tradition.

We cannot examine all the sources of this ideal. Let us merely name some of the elements that fuelled this ambition. The ideal of autonomy is a legacy of the Enlightenment, and, going back before the eighteenth century, we must seek its beginnings in the weakening of the feudal divide between the aristocratic elite and the people, following the emergence of a literate urban bourgeoisie, sometimes steeped in ancient culture and a spirit of free religious scrutiny, even sceptical philosophy.<sup>31</sup> These social groups assumed a crucial importance with the development of the earliest modern commercial and cultural circuits in Europe and with the gradual separation between the temporal power wielded by the states that emerged from the wars of religion, on the one hand, and religious power, on the other. The Enlightenment forged these different elements into a powerful intellectual synthesis that made the arbitrariness of power and its corruption the main target of its critique, but above all imposed in Europe a contractual conception of the relations of political interdependence, one meant to eliminate the old statutory hierarchies of rank and condition. Taken up and generalized under the banner of human rights, in particular by Thomas Paine, these principles then acted, from the revolutions at the turn of the nineteenth century onwards, as a reference point for all movements of emancipation, in particular those that led to the emergence of the working class.<sup>32</sup> Equality, liberty and property, undoubtedly the three central terms around which the bourgeois republics of the nineteenth and twentieth centuries were established, thus reflected a more general demand for the autonomy of society. This took the form of principles

of government, such as the mechanisms of democratic representation and the constitutional guarantees of individual liberties, but it primarily covered the dominant conception that the collective body had of itself from the modern age onwards.

Like the ideal of affluence, the principle of autonomy has been criticized, sometimes severely. For example, some see individualism as one of its belated consequences,<sup>33</sup> while other more interesting critiques have focused on what might be called the margins of autonomy. Its grey areas are indeed as wide as they are compromising: modern societies, while demanding for themselves total political autonomy, reduced their colonial peripheries to slavery and the cruellest extortion; they left women in a subservient situation both in terms of politics and at home, contrary to their own principles; and, of course, it was during the reign of the ideal of autonomy that the dynamic of capturing natural resources responsible for the current global ecological crisis was set in motion. It would therefore be tempting to write a counter-history of the movement for autonomy, seeing in it only the spurious justification for an ongoing series of dispossessions and marginalizations. But whether we subversively underline the repressive dimension of this movement, or whether we simply point out its current contradictions, we are left with the idea that it constitutes a sufficient theoretical reference point from which modern history can be grasped: there is nothing beyond it, except the contradictions and faults it accumulates.

It is this type of interpretation from which we here intend to distance ourselves. The political energy that was manifested in the dethroning of monarchs, in the limitation of sovereign powers, in the demand for economic and civil liberties and, ultimately, in the formation of the democratic structures of which we are the anxious heirs is indeed not unrelated to political ecology, i.e., to forms of material reflexivity. But if this is indeed the case, it is because this energy has been released over time in close affinity with the ideal of affluence. That is why, if we wish to shed light on the political history of our relationships with nature, we need straightaway to situate ourselves in the polarity constituted by the coexistence of the ideal of affluence and the ideal of autonomy. Each of these two ideals depends on the other to function, and it is at the level of the friction between them that the genesis of the political problem of climate change can be analysed.

In the past, political autonomy initially relied on the prospect of material prosperity to make itself desirable. Affluence sustainably fed and supported the project of the legal emancipation of individuals and groups by giving it tangible support, and there are reasons to believe that freedom without affluence would have been less attractive. In particular, in the second half of the nineteenth century, it was the emergence of a 'middle class' of employees enjoying stable rights,

as well as the appearance of practices of consumption subservient to the social prestige of commodities, that most clearly reflected the affinity between political emancipation and economic growth.<sup>34</sup> The second wave of the democratization of capitalism in the aftermath of the Second World War assumes a similar significance, since it too has made possible the widespread acceptance of the idea that growth and democracy are inseparable. At the same time, the conditions under which access to affluence took place presupposed (and still presuppose) the establishment of huge ecological, military and legal asymmetries between Europe and its colonial margins. The struggle against these asymmetries now provides a point of convergence between postcolonial reflexivity and environmental reflexivity; the extremely complex and painful relationship of these reflexivities with the modernizing heritage once again expresses the tensions that appear at the crossroads of economic development and democratization.

The objective of material affluence was also the subject of internal critique, particularly at the end of the growth period of the Trente Glorieuses in France [the period of recovery and prosperity, 1945–75]. This was made possible by the paradoxical activation of the principle of autonomy: it was in the name of society's self-institution as a space where justice, equality and law reigned, and which must be protected as such, that the demand for the ecological transformation of modernity was voiced. Without this typically modern desire to incorporate and correct developments that are socially considered pathological, and therefore seen as jeopardizing the extension of the egalitarian and democratic order, political ecology is impossible. We are therefore witnessing the slow and currently unsuccessful reversal of the relationship originally established between freedom and affluence.

This polarity is still present at the beginning of the twenty-first century, but it has undergone a series of transformations that compromise its ability to orient history in a sustainable way. We can get an idea of the importance and the significance of these questionings from the network of decades-old controversies about the end or limits of growth, the soundness of the dominant indicators of wealth and, more broadly, the social and political benefit of economic development.<sup>35</sup> The idea of relaunching welfare policies in response to both democratic and ecological crises has emerged as a component of contemporary debates, without, however, having any decisive influence on the treatment of the more general question of inequalities.<sup>36</sup> These issues have also been the subject of official reports that, while reducing the issue to measures of fiscal policy, or even of the rational management of environmental assets,<sup>37</sup> have nonetheless contributed to provoking the reaction of the public authorities. All these contributions shape a diffuse dissatisfaction with the form that currently makes

up the compromise between growth and democracy – i.e., the tension between affluence and freedom. As for us, our hypothesis will be as follows: an ecological policy is defined by a commitment to better understanding the formation and dissolution of this polarity, and by that policy's capacity to take note of its exhaustion and to seek new political energies.

## *Sovereignty and Property: Political Philosophy and the Land*

### **The political affordances of the land**

We must not get our history wrong: this is one of the main conditions for giving the ecological question its full political depth. However, now is the point at which the conceptual narrative we intend to construct really starts, and we have chosen to take the story back to the seventeenth century – long before nature was the subject of an ethical re-evaluation for conservation and heritage purposes, long before the damage to the environment aroused an empathetic and aesthetic reaction. If we have to go back so far, this is because the political arrangements between humans, territories, resources and living beings that we know and in which we still move largely took shape in that period. In the seventeenth century, at a time when political thought was bursting with ideas about the conquest of new lands, how to share them out, how to work them more efficiently and, more generally, how to lay down the rules for their use, it was almost impossible to differentiate between the ordering of the world and the search for the right standards in civil society.

What the philosophical and legal tradition has gradually fallen into the habit of calling sovereignty and property merges into the takeover of nature. The shape of the terrain and its strategic points, the distances travelled, trade and the rivalries it arouses, the shaping of the soil for production: territory and its opportunities constitute a playing field for political thought. Today, we have got into the harmful habit of considering as political, in the texts of classical authors, only what is relevant to the constitution of the rational rule of law, the genesis of the autonomous political subject, and their mutual relations. But the moral and normative edifice that was being put in place at the time was inseparable from a close attention to subsistence and habitat, and the knowledge they require.

As we will see from the examples of Grotius and Locke, the construction of a common space for humans under the authority of

the law, in the context of a sudden increase in the amount of land accessible and suitable for exploration, was the priority objective of jurists and philosophers. This construction provided political thought with an empirical base that still influences current political thinking. The capacity to form a community on a shared territory against a horizon of conflict, of ever-possible rivalries, operated as a criterion for political thought, including the quest for the pacification of domestic relations – i.e., relations within the community occupying the geographically continuous territory of a given political entity.<sup>1</sup> The system of assigning the individual to a portion of space via the concept of property is linked to the way in which the state carves out a territory that it will place under its law: property and sovereignty are two versions, two types of application of a rationality based on the ‘domain’, derived in the first case from the Latin lexicon of *dominium* and in the second from *imperium*.

Behind the notions of sovereignty and property lie the practical schemas of conquest and improvement. Conquering and improving – that is, giving its law to more or less recently discovered lands and increasing the productive capacities of a suitable soil – are two of the main methods that then organize collective relations with the world. Conquering and improving preoccupied, to an obsessive degree, the main theoreticians who entered the political arena, notably Grotius and Locke, and it was around these schemas that what we would henceforth call the political affordances of the land were structured.<sup>2</sup> By this phrase, we mean the materials that the nature of the land offers to the political and legal imaginary, in this case in a context prior to large-scale industry and the coming of the machine. Land presents spatial and economic constraints, some of which are structural, such as the fact that rules of coexistence have to be established over a limited and disputed territory, and others accidental, like those ‘natural borders’ formed by a line of coast, a mountain range, the differentiated ecological properties of land depending on whether or not it is fertile, and the presence of mines. Politics always compromises with these affordances, which are neither pure and simple causes, nor simple decorative elements: we make do with them in order to get by, to imagine partnerships, to conceive principles of solidarity.

However, in the seventeenth century, under the joint pressure of what are ethnocentrically called the ‘great discoveries’ and the opening of immense trade routes, and the development of new techniques for land development, political controversies that did not go back to these affordances of the land were few and far between.<sup>3</sup> While the intellectual elites of the time drew on their rhetorical skills to assert the interests of their Prince in some part of the globe or other, they saw the land as a crucial stake. ‘The rights of war and peace’, to use

the title of Grotius's major work, is essentially a *nomos* of the land, as Carl Schmitt puts it – a set of juridical arrangements that arise from territorial occupation.<sup>4</sup> Power is always geo-power, and we are still familiar today with an imaginary based on Renaissance painting in which the legislator, the merchant and the cartographer are never very far away from each other – with, in the distance, on the very edge of the spectrum of dignity and consideration, the original occupants of the disputed lands.

The past few decades, together with the rise of the ecological problem, have accustomed us to think that the political history of nature begins at the moment when a pathological relationship with the environment emerges, a relationship essentially linked to industrial development. The idea of 'ecological crisis' has thus become a marker of the historical present, an epistemological, moral and political regime that defines the conditions under which the question of how the world is used arises in the early years of the twenty-first century. So we must force ourselves to decentre our standpoint and admit that the political history of nature began before the ecological crisis and that the knowledge of this *before* is essential if the successive transformations of this history are to appear clearly to us.

So, what changed in European Christian culture that enabled sovereignty and property to assert themselves as the key concepts of a new political rationality? The sixteenth and seventeenth centuries in Europe were characterized by a profound reorganization of the structures that framed the social existence of men and women. The self-assertion of the modern state first and foremost involved increasingly advanced technological and administrative means to influence populations directly, in particular through the conduct of economic and monetary affairs, but also through war. These states pursued strategically oriented trade policies based on their own interests, and developed institutions to make these strategies an essential part of their *raison d'être* – what we know as mercantilism.<sup>5</sup> It was also in this period that the bond between political authority and religious authority began to loosen. The historiography of the early modern period has abundantly shown that the religious civil wars provoked by the Lutheran Reformation and the Counter-Reformation played a decisive role in the new independence of political power from the universalist claims made by the Christian Empire.<sup>6</sup> The period of unrest in Europe following the Protestant schism, culminating in the Thirty Years' War at the beginning of the seventeenth century, gradually forced European political and legal elites to hasten the collapse of imperial unity, and to conceive as fully sovereign the various territorial entities resulting from this dislocation. It is this political order that is often associated with the treaties of Westphalia, signed in 1648 between the various parties involved in these

religious conflicts. These treaties formed one of the founding acts of civil peace, but above all created the basis for the emergence of a partly secularized conception of political association under the authority of a state that no longer recognized the salvation of souls as lying within its purview. The preservation of peace therefore rested on a set of legal commitments between states – that is, provisions that conferred on these political entities a responsibility previously subordinated to the realization of a supernatural purpose whose ultimate guarantor was the Church. We must of course see the turning point symbolized by the Westphalian order in its proper perspective, but even if the chronology is, as ever, a complex matter to establish, the turning point between the sixteenth and seventeenth centuries redefined in depth the sociological, political and theological frameworks of Christian Europe.<sup>7</sup>

History shows us that this period was generally experienced as a time of extremely serious unrest, which deeply affected people's relation to time.<sup>8</sup> Social time, hitherto structured by the eschatological horizon, by prophecies and their interpretations, and lacking any real historical depth, gave way to a dynamic of chronological succession. The future appeared deeply uncertain, essentially determined by the complex interplay of human will and chance, and therefore freed from the endlessly deferred imminence of the Apocalypse. The 'event-filled dimension' [*dimension événementielle*] of history, therefore, was not just the result of an accumulation of conflicts, but rather the realization that our situation is defined by our ability to take charge of these conflicts. We can therefore say that the emerging historical consciousness caused with respect to time what the emergence of the autonomous state at the same time caused with respect to space. The dissolution of Christian imperial universality and of the eschatological horizon freed up specifically political capacities for action in limited spaces in principle circumscribed by law – capacities for action and decision that now related to an open time in which human historicity and its crises unfolded.

These upheavals were of crucial importance for the history of political philosophy, because the type of discourse we call 'political philosophy' was formed in these circumstances. This form of knowledge and the social project it harbours are the heirs of the liberation of space and time, or at least of their transmutation, opening up the possibility of rationalizing the collective grasp of the common frameworks of existence. As soon as these common frameworks were no longer immediately defined by theology, the stage was set for another way of defining common goals. The articulation of multiple wills in a political whole whose guardians must be the representatives of a certain law, the contractual rationality that would dominate political thought until Kant and Rousseau to provide the breeding ground for



the Enlightenment – all of this sprang from the decay of the feudal structures of society and the symbolism that supported it.

One of the most notable ways in which this genesis of modern conceptions of sovereignty persisted was precisely their concern for the spatiotemporal coordinates of coexistence. The constitution of the modern consciousness of time contributed to the formation of the ideals of progress, indefinite perfectibility and historical consummation, to which we will have to return. At the same time, modern political geography must also be understood as an effect of the overall changes in European culture. In conjunction with the self-affirmation of the state vis-à-vis the Church, and the constitution of a political economy consciously oriented towards competition between nations, there arose the question of the sharing of the seas and lands recently opened up to conquest by the great discoveries in America and Asia. The different European maritime empires, Portugal, Spain, the United Provinces, France and Britain, were in fact faced with the need to share out huge spaces deemed to be ‘free’, as not administered by autonomous and politically conscious nations. This opening of the New World was conceptualized through the terms *res nullius* and *terra nullius*, which marked the absence of any legitimate rights assigned to these spaces. This historic moment, focused on what were also called ‘goods without a master’, gave rise to an immense surge of predatory violence, mainly directed against indigenous communities. But it also triggered a form of political and legal reflexivity, which has permeated the whole of modern political tradition, and of which we are still partly the heirs, whether we like it or not.<sup>9</sup>

This political reflexivity essentially made land and sea the centre of gravity for the conceptualization of conflicts and their resolution. It was the occupation of a portion of geographic space that posed the cardinal problem for political thought; its solution involved, by a chain of consequences, the definition of the main characteristics conferred on a sovereign entity.<sup>10</sup>

What do all these things have to do with the question of nature, and above all how do they clarify the present ecological perspective? Should we not rather see the seventeenth century as the age of the invention of modern sciences, the age of Newton and Descartes and of the mathematization of the world?<sup>11</sup> Was it not this movement that most dramatically and directly determined the modes of relation to the natural world that constituted modernity? Actually, the central importance granted to the Cartesian ideal of mastery and possession in the historiography of the ecological crisis must not be disputed, but put into perspective. The emergence of the experimental approach and the translation of physics into mathematical language did indeed open up new practical possibilities, but they did not contain everything a society

needs to determine its orientation with regard to material things. In any case, the history of the sciences has abandoned the idea that the development of the objectivist paradigm is an autonomous historical force, invested with a relation to the truth capable of imposing itself on the social and political order on the basis of evidence.<sup>12</sup>

As soon as we view in their proper perspective the sciences of matter and life, as well as the various types of knowledge with a technological, agricultural or medical vocation where the Galileo-Cartesian ideal does not apply in any transparent manner, we can better assess the mesh between knowledge and politics that defined the seventeenth century. The sciences constitute one dimension of our collective relationship with nature among others, and their independence is precisely a part of modern ideology that needs to be relativized. Legal and political thought is therefore neither a simple external legitimization of a budding technoscientific triumph, nor a second rationality doomed to mimic or adopt the rationality of the sciences, but one of the social forces which contribute to forging a sociomaterial order irreducible to technological domination. This order consists of modes of appropriation of the soil and of things, the fruits of the earth and living spaces; the logic here is a political logic. However, the emergence of the modern sciences does not take place in a world where these questions are absent: the world that welcomes modern science and technology is already ordered in a singular way, notably by geographic discoveries and imperial order, by the Reformation and its consequences for the conception of sovereignty, by transformations in the relations between the economy and political power, and by the relative obliteration of the Church.

The object of this chapter is therefore the way in which the affordances of the land organize classical political thought, and catalyse the central demand of modernity, namely the right to the security of life and goods – in other words, the autonomy of the individual.

### **Grotius: empire and possession**

Of all the authors in the classical philosophical tradition, Hugo Grotius (1583–1645) is undoubtedly the one who best expresses the connections between the regulation of the conflicts that break out in the sphere of individual interests, the genesis of a state that is sovereign over its territory and its people, and the establishment of a cosmopolitan order.

First, Grotius was, without doubt, a thinker of empire, a jurist and administrator whose precocious talent was placed at the service of his sovereign. No sooner was he a doctor of law, in 1604, than the Flemish

thinker was entrusted with the writing of a treatise to legitimize the extension of the trade circuits of the United Provinces across East Asia. Moreover, it was the Dutch East India Company (Vereenighde Oostindische Compagnie), founded in 1602 to compete with its English equivalent, that was the direct sponsor of this text, *De Jure Praedae*; for a long time, only the twelfth chapter was known, published separately under the title *Mare Liberum (The Liberty of the Seas)*.<sup>13</sup> Caught up in a war against the dominance of the Spanish Empire and intent on winning a role for itself in the trade of oriental spices, alongside Portugal, the United Provinces hoped to play a leading part on the new international scene. But this competition between empires was not played out solely in terms of power relations: to a large extent, it was in the red tape of juridical argumentation, in the production of legal knowledge, that the world was shared out, and imperial and commercial jurisdictions established. The capture of the Portuguese ship the *Santa Catarina* by Jacob Van Heemskerck in February 1603, in the Strait of Singapore, triggered this quest for an international order: this capture, of significant commercial and symbolic value, had to be subjected to an arbitration in which the different interests at stake would confront each other, and from which the principles of coexistence between maritime powers would be defined.<sup>14</sup>

Ever since the debates held in the previous century in Vitoria and at the school of Salamanca, imperial rivalries had been a fundamental impulse behind the constitution of the European legal corpus, but Grotius formulated these controversies in a new way. *Mare Liberum* and, later, *The Rights of War and Peace* help explain the affinity between the categories of modern law and the spatial and material considerations that then drove the different political actors. The treaty on the liberty of the seas, first of all, provided a striking overview of the intersection between the physical and morphological properties of maritime space that the legislator needed to take into account, and the meeting of different commercial and territorial interests in this common space.

The treatise opens with the assertion that ‘every nation is free to travel to every other nation, and to trade with it’. This ‘primary’ rule of international law – i.e., of the universal law regulating the relations between different nations and drawn from the knowledge of natural principles – stems from the will of God, who did not want nature to ‘supply every place with all the necessaries of life’. Thus, he ‘wished human friendships to be engendered by mutual needs and resources, lest individuals deeming themselves entirely sufficient unto themselves should for that very reason be rendered unsociable’.<sup>15</sup> Human sociality is defined as a form of mutualism generated by the unequal endowment of different communities and the different places on which they settle.

From Grotius's perspective, then, the tendency to trade does not lie in a disposition towards gain, but in an immediate compensation for the variations internal to nature, which unequally distributes her gifts and her obstacles. Interdependence stems from factors which these days we would call geographic and ecological, but which are balanced by the ability of humans to communicate and trade. To obstruct this provision amounts to limiting the expression of nature in human beings and denying divine justice. Like Seneca, Grotius sees the geographic shaping of the continents and the oceans that surround them as a testimony of this supreme will: the oceans are understood as crossing points, vectors of contact between communities, in particular because the wind that blows on them provides another natural opportunity for trade. The techniques of navigation appear as the practical foundations of a vision of the world and the connections that must be established within it: this is a remarkable example of the affordances of the territory, now recast by political thinking and given a normative shape. The Mediterranean maritime culture of the ancients, which deeply affected the law, is thus extended to the oceans.

In Grotius, the principle of the liberty of the seas is subordinated to an antihegemonic argument: the oceans ensure the coexistence of distinct actors in the same space, and it is in the nature of things that they cannot be appropriated. It was on this basis that it became possible to challenge any attempt on the part of Spain or Portugal to establish restrictions on access to the oceans in general, and to strategic crossing points in particular. Here, the common character of the sea has a defensive value; it is mobilized strategically to assert the rights of a political and economic actor in a dominated position. Conversely, however, with regard to movable property, it is legitimate to claim restrictive access. Agricultural land, in particular, has a distributive function that is well suited to establishing restrictions on use by others.<sup>16</sup> The land produces fruits that can be separated, divided and distributed equally or unequally, and it is therefore more convenient to organize this distribution by allocating limited spaces to individuals who will be responsible for them and who will benefit from them, since they too will make their mark on the soil of these lands: as we will see below, this is one of the most stable elements in the political affordances of the land.

Occupation thus establishes property when the hold exerted on the thing is permanent, manifests itself through external signs, or can be expressed as effective control over that thing and its productive capacities. Appropriated things, whether public or private, must lend themselves to the establishment of borders, which is the only material technique on the basis of which laws can be established: borders can organize the distribution of things effectively between humans,

by signifying on a symbolic level the separation and allocation of territories, and by restraining, on a material level, if necessary, any inclinations to overstep them. From this definition of property, to which we will return, Grotius draws two consequences. 'The first is, that that which cannot be occupied, or which never has been occupied, cannot be the property of any one, because all property has arisen from occupation.' And: 'The second is, that all that which has been so constituted by nature that although serving some one person it still suffices for the common use of all other persons, is today and ought in perpetuity to remain in the same condition as when it was first created by nature.'<sup>17</sup>

The first point is simply to deny Portugal any ownership of Asian seas and lands based on occupation, since this occupation was incomplete, unsupported by hard evidence, and impermanent. The second, more important, point positively defines a set of things naturally resistant to appropriation, at least before contracts that stipulate the reverse, and are mutually accepted, can determine otherwise. The moral and legal tradition, says Grotius, agrees on what these things are: air, running water, the sun and the wind.<sup>18</sup> This is what contemporary economic theory calls 'public goods'.<sup>19</sup> Numerous contentious cases are mentioned in the text: what about shores, dikes, jetties, partially enclosed fisheries, moorings and creeks? What about all those things that have an intermediate status between open and closed? True, it is to a certain extent possible to apply techniques of semi-closure to running water, borrowed from the way plots of land are treated, but the fact remains that the sea 'must remain governed by primitive law',<sup>20</sup> which constitutes the strongest and most definitive argument against the Portuguese claims.

It is striking to note how alert the classical philosophy of law is to ecological, geographic and physical properties. These are not used to point to a crisis in ecological balance, or even to signal a disruption of subsistence conditions, but because the brutal opening up of new territories breaks the obvious relations between imperial trading societies and their territories. Finally, it is not without interest, we are tempted to add, that the notion of the 'common', which is currently enjoying a new interest in theories of sharing wealth, has long acted as a tool for diplomatic negotiations between rival empires.

We can still see a similar structure to the philosophical investigations in *The Rights of War and Peace*, published in 1625. This time, the main basis for theoretical discussion is less the conquest of commercial circuits in spaces without any master than the management of local conflicts internal to the domestic sociopolitical sphere. While international law represents an attempt to manage the 'empty spaces' – i.e., those surplus to the familiar domain of quarrels between ruling

families and between European ideological tendencies – the territory split by religious and civil conflicts is a ‘full’, saturated space. Here, rivalries unfold in a spatial regime where nothing is vacant, or at least deemed to be so. While international law, as Grotius conceives it, relates to the question of the restrictions of access that can be imposed (or not) on spaces considered as unoccupied and available, the theory of domestic political sovereignty aims, on a more limited scale, to stabilize the territorial allocation of peoples and individuals.

The conceptual instruments remain the same as in 1604, since it is still the notion of *dominium* that organizes the discussion. This term designates both the sovereignty that rulers exercise over their people and the authority of individuals over their domain, over the land they work and on which they live. It therefore covers what we would tend to separate out as political/constitutional law, and private/economic law. While Grotius sometimes considers cases in these two areas separately, he overall treats them as a problematic continuum, the common focus of which is the possibility of conflict. This is why his book, which explicitly aims to provide legal foundations for legitimate authority, opens on the problem of war: conflict, whether private, public or mixed, always constitutes a test case for the human capacity to regulate things. It is in and through conflict that the art of attributing to each person what is due to them is tested, that the ad hoc arbitration of a dispute takes the form of a law that can act as a basic reference point. Grotius therefore quickly dismisses the arguments making war an essentially illegal activity:<sup>21</sup> insofar as it always has its own end as a horizon, it is an opportunity to make explicit the principles of the just and the unjust, what is yours and what is mine.

The origin of property is derived from the well-known narrative already used in the treatise on the liberty of the seas: the story of God’s undivided gift of the world to man, and the spontaneous formation of a community of goods by individuals who have no notion of the motive of private interest. This primitive state is quickly disturbed by the imbalances caused by the arts and industry – i.e., by the ability to introduce technological mediations between humans, and between humans and their world. It is the domestication of animals and the cultivation of plants that put an end to the possibility of spontaneously sharing the fruits of nature: as soon as the resources cease to be a gift offered to the collective and become the products of labour, they are intuitively attached to an individual or a group of individuals who can easily claim to have an exclusive right over them. The moral spectrum of selflessness, incorruptibility and simplicity associated with the system of life in a community is, thanks to the new techniques of domestication and direct intervention in the natural environment, replaced by values more centred on the

individual, the protection of property, self-interest and ambition. At first, says Grotius (following Virgil), the availability of large tracts of land made possible the coexistence of suitable herds, marked with the name of their breeder, and the common use of pastures. But this lasted only ‘until the number of men and herds increased, and the land began to be divided not by nations, as before, but by families’.<sup>22</sup> The end of the economy of things that are found or simply collected, such as ‘wild fruit’, and the transition to an economy governed by the direct government of things and their productivity, therefore triggered the breakdown of primitive community ties: this was a ‘more convenient kind of life’, Grotius concedes, but one that required the development of a legal system capable of regulating the conflicts it entailed.

What prevented the fruits from being shared in common was, first of all, the distance from the places where the men went to settle; then, the absence of justice and love, which meant that neither in labour nor in the consumption of fruit was equality observed, as it should have been.<sup>23</sup>

This passage is characteristic of Grotius’s argument and indeed of the political thought of early modernity as a whole. The allocation of different families to lands now appropriated and geographically separated from each other necessitates forms of cooperation based on self-interested economic exchange. While these forms represent a gain in efficiency compared to the previous stage, they replace a form of sharing dictated by nature, a sharing that he recognizes as having formed the material base of the values of love, justice and equality. The roots of the unhappy consciousness of agrarian societies are thus identified: these societies inherit a value system corresponding to a bygone material regime whose survival they try to ensure in a radically different technological and economic context, one that promotes moral standards contrary to those early forms of attachment. The moral ambivalence of societies of breeders and farmers torn between the motivation of gain and the ideal of equality is therefore due to the historical sedimentation of modes of relation to the physical world; more precisely, it stems from the historical discrepancy between forms of division of labour and social values.

The domestication of plants and animals appears to be an evolutionary bottleneck: it is a necessary point in the collective trajectory of humanity, and makes it possible to distinguish between *before* and *after*, like an irreversible transition. But while its benefit is apparently beyond question, its political cost is considered high, since the genesis of property and of the feeling of ‘one’s own’ entailed the inevitable



development of hitherto unknown mechanisms for regulating conflict that are to some extent the indirect derivatives of domestication itself. 'From the division of land had arisen a new law',<sup>24</sup> writes Grotius, borrowing the myth of the Thesmophoria and of Ceres the Lawmaker: he therefore sees agricultural techniques and the management of herds on suitable pastures as the practical foundation of a legal revolution whose consequences were not fully absorbed, even much later. If the liquid element of the oceans favours shared management and free access, the solid element, as soon as it is subjected to techniques of productive supervision and cadastral planning, requires specific measures for the distribution of men and things. This material and practical genesis of the law makes it possible to reflect on how the layout of land and the properties of the living world can affect the constitution and application of legal norms. Contrary to popular belief, the selfish or generous nature of the human species is not the central issue; it plays second fiddle to a reflection on the practical schemas induced by the use of the material world.

If the division of land, and with it the idea of property based on the enclosure of a cultivated plot, mirrors the characteristic conflicts engendered by the agro-pastoral economy, the conception of political territory as a by-product of geographic discontinuities also mirrors requirements dictated by practice. The division of this territory must indeed impress itself on everyone as a manifest phenomenon, capable of supplementing its symbolic, conventional value with an effective protective function. In both cases, the legal system is composed neither of the pure imposition of abstract norms, nor of the effect of natural determinations, but as the optimal arrangement between present and largely contingent modalities of human interactions and objective characteristics.

The theoretical know-how involved in identifying and accompanying these arrangements, these affordances of the land, is one of the most striking features of Grotius's political philosophy. Through the practices and techniques of the occupation and use of territory, the world leaves its mark on the legal provisions for settling endogenous conflicts in the social sphere. Modern territoriality, as an instrument of pacification in the context of religious conflicts, is thus constructed from the laying down of lines of heterogeneous anthropological bricks, reorganized by the philosophy of law into a rationalized form. The presumed philosophy of the hunter-gatherer, replaced by that of the cultivator attached to the soil, was based on the connection between the 'common' and appropriation; the imperial and commercial ambitions specific to the sixteenth and seventeenth centuries prompted an anachronistic adaptation of this historico-conceptual device so as to arbitrate between different claimants in



a space deemed free and open; and the spatial allocation of private actors (individual farmers) and public actors (sovereign states within their borders) tends to foreshadow an administrative and economic system emancipated from theological quarrels and turned towards the efficient and peaceful use of the land. As we shall now see, the later stages of political theory would bear the mark of this geo-philosophy, insofar as they maintained and strengthened the centrality of the two figures of sovereignty and property, but without showing such a striking degree of porousness between the world and the concepts used to grasp it.

Anyone who thinks these are obsolete baroque quibbles should bear in mind a few simple examples. So, climate change, that ultra-contemporary phenomenon par excellence, reactivates a debate on the commons and their possession: with the gradual thawing and the opening up of new spaces for navigation and exploitation, the polar regions and the Arctic in particular are emerging from their legal and economic marginality to be subjected to very intense border disputes.<sup>25</sup> The strategic role of the Northwest Passage and the mineral wealth of these regions is giving birth to a new area of litigation perfectly aligned with the political rationality that Grotius inaugurated – and to which the climate issue is also connected. What the current legal literature calls global commons, i.e., the poles, the seabed, space – those ancient confines of modern jurisdictions – is again focusing attention on the old question of the affordances of the land. The classical theory of international law therefore has an obvious environmental echo, quite simply because the fundamental grammar of sovereignty and property remains alive in the contemporary forms of the struggle for resources. International law, which played a structuring role in Western political thought at least until the middle of the eighteenth century and the work of Emer de Vattel, before experiencing a sharp decline,<sup>26</sup> faced questions that have continued to arise – although this theoretical style has itself gone out of fashion.

### **Locke: the improving citizen**

Without necessarily seeing Grotius as the exclusive father of a political thinking of territoriality, it should be noted that the language of natural law would permanently embrace and structure philosophical reflections on the spatial establishment of human beings. These reflections, moreover, would live on, and the idea of an original affinity between the legal norm and territoriality would find a legacy in the philosophy of law at least up until Kant.<sup>27</sup> It is not necessary for our purpose to reconstruct all the stages of this story, but it is worth

pointing out that Hobbes was following in the footsteps of Grotius when he wrote, in Chapter 24 of *Leviathan*:

The NUTRITION of a Common-wealth consisteth, in the *Plenty*, and *Distribution* of *Materials* conducing to Life ... and ... in the Conveyance of it, by convenient conduits, to the Publique use. ... The Distribution of the Materials of this Nourishment, is the constitution of *Mine*, and *Thine*, and *His*; that is to say, in one word *Propriety*. ... And this they well knew of old, who called that *Νόμος*, (that is to say, *Distribution*,) which we call Law; and defined Justice, by *distributing* to every man *his own*.<sup>28</sup>

Here, the distinction between *thine* and *mine* appears as inseparably both economic and legal. Law imposes itself as a normative body which the economy in itself, as a sphere of unresolved appropriation, lacks. The primary object of this norm is what bears the fruits necessary for life, namely the land. So we are on familiar ground, since the formula of sharing the land as the origin of the law remains valid and still appears as the necessary consequence of an arbitration between rival claims. Hobbes's approach must also be seen as a way of radicalizing this logic of original sharing, since conflict no longer depends, as was the case with Grotius, on the practical contingencies of social organization after domestication and agriculture. In Hobbes, conflictuality has been converted into a general anthropological tendency, a natural behavioural pattern which needs, via the civil pact, to be exorcised: thus, the request for protection that emanates from the individual does not arise from a clearly identified and localized threat, even in the form of a dubious evolutionary reconstruction, but from a fundamental insecurity that stems from rivalry, the very form of human interactions.

It was a little later, in Locke, that the question cropped up again. As David Armitage has shown, Chapter 5 of the *Second Treaty*, 'Property', incorporates many aspects of the territorial and ecological problems characteristic of the seventeenth century in Europe. This chapter enjoys a special status in the structure of the treatise, since a certain number of indications suggest that it was written separately from the rest, probably a few years later, as a relatively autonomous excursus.<sup>29</sup> This philological curiosity points to the intellectual and administrative conditions behind Locke's thinking on the question of property and, more generally, on the relationships between the state of nature and the industrious rationality of agricultural societies. Indeed, the English philosopher was closely linked to colonial interests in North America in the early 1670s, through his protector the Earl of Shaftesbury, who was then involved in the establishment of a colony in Carolina. Locke thus took part, in proportions difficult to establish, in

the drafting of the *Fundamental Constitutions* of Carolina, an essential text that was to determine the conditions of establishment of colonists on the American coast, and in particular the way in which the land was to be distributed between aristocratic families and ordinary peasants. In his own time, Locke was considered to be Carolina's main legislator, and his correspondence indicates that, even after leaving office as secretary to the Earl of Shaftesbury, he retained a direct interest in colonial affairs right up to the end of his life.<sup>30</sup>

The text of the *Fundamental Constitutions* appears to its interpreters to be much more conservative than the ideas defended in the *Second Treatise*, since in the former a large part of the land is reserved for large landowners: thus, English social inequalities are reproduced in America, and even increased, since forced labour is recognized as legitimate. A little later, on a trip to France in 1680, Locke wrote down his observations on wine, olives, fruit and silk – i.e., on Mediterranean agricultural production – with the idea that they could be adapted to the climate of Carolina.<sup>31</sup> These perfectly down-to-earth considerations were part of Locke's prolonged interest not only in the establishment and legislation of the colony, but also in its economic prosperity, even if the plantations ultimately chosen for America were different. In other words, whatever the ideological orientation of the *Fundamental Constitutions* and their compatibility with Lockean political philosophy, this text testifies to Locke's experience as a legislator and makes it possible to understand how the question of the land may have been of central importance to him.

The various aspects of the philosopher's involvement in Carolina noted by Armitage are particularly clearly expressed in the famous Chapter 5, on property. The text is governed by a conceptual gradation which leads it from a general ontological justification of the right to property (and not of its actual distribution) to a discussion of the different legal statuses of the land and enclosures, then finally to a political economy of property in the context of a monetarization of land value. The first paragraphs introduce the idea that only labour changes the status of things, no longer seen as just an undivided natural gift conferred by the Creator. The primitive community, even if Locke defines it in much more complex terms than those of his predecessors, is characterized by an immediate relation to the products of nature, which are simply found or collected. The wild state embodied by 'the wild Indian'<sup>32</sup> does not end until human beings turn their efforts to imposing a lasting transformation on things which, now bearing their mark, can legitimately be said to be appropriated. Labour identifies things with an individual in a practical way, because they are now visibly differentiated from common things, but also in a symbolic or ontological way, because these things are now part of the

individual sphere: they belong to me in the same way that I can belong to myself, i.e., dispose of myself freely.<sup>33</sup> This genesis of property implies as a corollary that limits are set to extension; but this argument is difficult to grasp, since Locke will proceed to give full legitimacy to the accumulation of land via monetary hoarding. It must therefore be understood that the appropriated domain extends to the measure of the individual's capacities for labour, but that it does not prohibit owners from selling their property later on.

Locke points out that the focus of all of this discussion is not things in general, but the land, 'the chief matter of property being now not the fruits of the earth, and the beasts that subsist on it, but the earth itself; as that which takes in and carries with it all the rest'.<sup>34</sup> This passage and the following paragraphs are based on the meaning that in those days was given to the term 'improvement'. Indeed, what makes the land the prototypical object of economic and legal appropriation is the fact that, in its primary state, it is a virtual base for productivity, merely actualized by the human labour, scientific knowledge and technology invested in it. The genesis of property as Locke views it is thus the conceptualization of an agronomic technique well known at the time, one that had lain at the centre of fundamental debates at least since the Stuart period<sup>35</sup> and right up until the industrial revolution. Improving land and making it profitable by enclosing and cultivating it were the central operations making it possible to respond to the political affordances of the land at the time Locke was writing. And enclosure asserted itself as the central agrarian technique in the formation of the law and the economy of early modernity: it was enclosure that materialized someone's practical grip on a plot of land, which signified its privileged relationship with an owner who worked it, and signalled the investment of a sufficient amount of knowledge and labour. We tend to forget the fact that the land does not produce by itself, or rather that it does not support the subsistence of a group of producers by itself: eliminating useless trees, channelling water, preparing the land, constructing access roads for people, animals and machines, selecting the cultivated varieties adapted to this or that soil, and, of course, enclosing it – all these activities prior to the exploitation of the soil require a very great investment in time and capital. The idea that the land itself is a 'factor of production' tends to blur the importance of these preparatory works without which it can no longer fully play that productive role, but, above all, without which the very idea of land ownership becomes meaningless for classical political philosophy. Through improvement, human beings establish themselves in a place that they transform into a site of permanent dwelling, marked by their imprint, known and travelled across by them: we here see, yet again, how territoriality connects law, science, economics and politics, and

how the concept of property takes the place of an epistemic space in which this debate can unfold.<sup>36</sup>

Locke's definition of property is thus the conceptual focus which serves to organize and prioritize human activity on two planes at the same time. First, it makes it possible to distinguish the 'industrious and rational'<sup>37</sup> people from the others, namely the Indians: this is how indigenous societies are excluded from legitimate relations to the land, since they are only hunter-gatherers – or at least they are perceived as such. But the practical foundations of appropriation by means of improving the soil also allow the social and economic hierarchy as it exists in an aristocratic society to be encapsulated in the concept of property. Indeed, as land improvement is a heavy investment, it is carried out by large landowners who use their capital to cultivate land which is then under the responsibility of a farmer, himself recruiting farm labourers to carry out day-to-day agricultural labour.<sup>38</sup> In his text, Locke estimates that a tenfold increase in soil yield is made possible by the improvement.<sup>39</sup> In other words, the capital used to recruit the labour necessary for improvement is the origin of nine-tenths of the value; in other terms, land developed by improvement is, from an economic point of view, ten times more useful than land left in its primary state. But this honour does not redound to the farm labourer who maintains the land daily: it goes to the investor who carried out the initial valuation, and therefore obtained the deeds of ownership. This is the reason why, in his definition of property, Locke speaks of 'labour' as a generic function, and not of 'workers' as the operators of this function.

These elements help to explain the passages in the same chapter where Locke explains that the formation of property through labour 'would hold still in the world, without straitening any body; since there is land enough in the world to suffice double the inhabitants, had not the invention of money, and the tacit agreement of men to put a value on it, introduced (by consent) larger possessions, and a right to them'.<sup>40</sup> The compatibility between the commercial exchange of land, on the one hand, and the availability of land for anyone who wishes to develop it, on the other, are here postulated. Locke is emphasizing the contractual, agreed nature of the exchange permitted by money, at the end of which inequalities in property may appear,<sup>41</sup> while at the same time he is ensuring that the first acquisition of the soil remains an unlimited economic and juridical mechanism. Obviously, it is the American context that makes it acceptable for some to accumulate land rent, since others always have the possibility of obtaining the full ownership of new land. The spatial abundance of America, considered as unexploited and therefore wasted by its first occupants, thus becomes the condition of possibility for a system whose inegalitarian character

is just an accidental effect of commercial contracts. '[T]he increase of people and stock, with the use of money, had made land scarce, and so of some value',<sup>42</sup> writes Locke, but this scarcity is merely relative if we adopt the transatlantic space as a benchmark. The convertibility of the territorial and organic value of the land into an abstract value, embodied by metals devoid of use value and incorruptible, in no way affects the primacy of the original appropriation: it is a consequence of the liberty to dispose of one's property, but does not, for reasons that are themselves geographic, prevent others from accessing the land.

Modern and nonmodern people, owners and workers of the land are thus entrenched in a philosophy of property whose conceptual articulations and constitutive language express power relations, statutory and economic inequalities both domestic and intercultural. The main thing here is that the sharing of land – the dynamic process which combines the occupation of, labour on, and development and ownership of the land – takes on an architectonic meaning in a theory whose objective is less to justify the authority of such and such a social group (an authority which in any case did not need Locke for it to be recognized) than to account for a sociohistorical conjuncture in which Europeans and Indians, owners and workers, cohabited on a land fundamentally conceived as being common to all, while incorporating agrarian practices into legal norms.

Naturally, the very idea of capturing the internal coherence of a material and social world structured by inequalities can be confused with the justification of these same inequalities. But this is an almost permanent pitfall in the history of ideas, and simply identifying it is not an adequate way of interpreting it. Thus, the synthetic character that can be given to the consideration shown for land in Locke's work is due to a simple mechanism: in seventeenth-century England, an empire that conceived of itself as indiscriminately colonial and commercial, individual parties entered into political contractual relations with others insofar as they needed the state to protect their ownership of land, i.e., the fundamental expression of their individual liberty. Property defines modern rational and forward-looking individuals, it assigns them to a specific place and at the same time engages them in civil relations under the authority of the republic, and therefore manifests how inscription in the material world is a central factor in the construction of political rationality. We cannot overemphasize the centrality and sustainability of this system of territorial and economic allocation which lies at the root of the liberal paradigm: the contents of liberty, its institutional and juridical frameworks, the prosaic nature of its link with subsistence and personal identity – all this takes place in a geographical and agronomic context that we cannot ignore.

If several centuries of material and spatial abundance (real or imagined) later contributed to making these ecological and political assemblages imperceptible, sweeping them under the carpet of the great wave of progressivist and industrial impulses, they were nonetheless still present. And of course, they are all the more so when the ecological and territorial enigma of liberty re-emerges in the age of climate change, when it becomes evident that the imaginary of improvement and conquest – of property and sovereignty – is at odds with the material possibilities of the present.

\* \* \*

The interpretation of classical political theories, especially of Grotius and Locke, that we are here proposing is based on a reminder of the material horizon of these authors, dominated by the experience of civil war, the discovery and exploitation of the non-European world and the confrontation with a system of agricultural subsistence, which also functions as a substrate of the social hierarchies in force. These three elements, which form the political affordances of the land, involve quite different ideas: the legal regulation of conflict, arrangements for sharing a surplus land considered as free, and the incorporation of land value into the most basic social mechanisms (in particular, the creation of groups identified as subject to the same law). If we bear this in mind, it becomes clearer that the lived space, far from being merely an external and neutral context of political thought, actually offers it opportunities without which it could not be deployed in the form with which we are familiar. Political societies, at the time, were defined by the way they occupied a soil: enclosures and the various techniques of territorial inclusion and exclusion, agrarian improvement, the identification of individuals with their place of life and subsistence, and the definition of spaces interior and exterior to the space of state jurisdiction – all these techniques separated these political societies from the so-called primitive societies supposedly unaware of law, i.e., the possibility of a peaceful settlement of conflict, and provided material support for internal hierarchies and asymmetries.

The resistance of the land to human settlement, and of course the types of skill that this resistance summons forth, constitute an inevitable testing ground for the constitution of a rationalized social order. The commitment of political subjects to each other, and of everyone to the sovereign, has most often been interpreted as forming an ideal whole, aptly called ‘political’. But this is a manifestly retrospective interpretation, one that bears the mark of a later state of relations between nature and politics, since the presence of a world actively taking part in political integration was clearly expressed by the classical political thinkers. The concept of property played a



central role in the transformation of economic and political inequality, but its significance cannot be reduced to the problem of ‘possessive individualism’.<sup>43</sup> *Property* names the properly political form whereby individuals gain access to the soil, the good use of the land that guarantees them entry into the space of *sovereignty*, a space that will play a protective role. In other words, the sociological and economic content of property relations in the state can be the subject of a whole series of critical analyses. We will be returning to these, of course, but we must first clearly identify the definition of the political entailed by this link between property and sovereignty in the seventeenth century. The canonical formula of early modernity, which makes land sharing the origin of law, and of individual property the institution that best captures this fundamental operation, gives politics a land to work on. But the formula does not give politics just any land, and not just in any way. This means that it does not necessarily do so fairly, let alone in a way likely to respond to the vulnerability of the material world that we face today. It simply means (but this in itself is far from insignificant) that preindustrial reason accepts the spatiality and the materiality of the actors in search of peace as a constituent element of the political problem.



# *Grain and the Market: The Order of Commerce and the Organic Economy in the Eighteenth Century*

## **Good use of the land**

It was in the eighteenth century that the alliance between freedom and growth that had shaped much of political modernity, and whose last days we are currently living through, began to take shape. This alliance was forged on the political affordances of the land – as a response to the problem posed by the construction of a just society in a world that is miserly with its gifts and shared out between rival communities. The eighteenth century was, in fact, the moment when one of the most powerful and lasting collective beliefs to which history has given birth gained momentum and began to guide the prevailing symbolizations and political practices in the West. This belief consisted in establishing a bond of mutual reinforcement between the conquest of prosperity by the optimization of the apparatuses of production, on the one hand, and the protection of individual and collective rights by the limitation of political arbitrariness, on the other. Destined to become free, equal and prosperous under the guarantee of the political entities that represented them, modern human beings embarked on the adventure of development, which would soon start to speed up when its revolutionary dimension became evident at the end of the century. Developing, making progress, realizing one's perfectibility: all became an imperative that would guide history and preside over the development of theoretical and practical forms of knowledge now invested with new authority. However, in this context, where emancipatory progressivism was combined with a war on nature, economics emerged as one of the main intellectual productions claiming to realize and organize this programme.<sup>1</sup>

In many ways, this anthropology of progress, of which the main thinkers of the eighteenth century, for example Rousseau and Kant,

were the advocates, manifests itself through economic types of knowledge. The emergence of an economic conception of communities has often been described as derived from a naturalistic interpretation of human behaviour and the laws that govern human cooperation. The search for individual utility, the driving force constituted by the avoidance of suffering and the maximization of pleasure, constitute for modern moral philosophy a natural basis for practical action – a basis that, once exposed, constitutes the main theoretical justification for the new political economy.<sup>2</sup> This naturalization of unconscious social mechanisms, which Mandeville popularized in his *Fable of the Bees*, does indeed make it possible to question a system where bad laws hinder the satisfaction of interests by adding additional burdens to the efficient exploitation of the land and the labour force. The modern thinkers of emancipation then collectively developed an evolutionary schema in which a humanity chained by a system of traditional and hierarchical obligations, in which the community took precedence over the individual, finally obtains recognition for an autonomous political and economic subject that provides the law with its ultimate norm.

The idea of a free composition of individual interests in the process of market exchange has played a central role in the rationalization of the conduct of human affairs. This theoretical and practical strategy also has a darker side, when it is used to depict as a vital necessity the submission of all, in particular the poorest, to the laws of selection and adaptation to austere and precarious natural conditions. Economics as a ‘dismal science’, in Thomas Carlyle’s famous words, economics as conceived of by Malthus and Ricardo in particular, is an arrangement in which the allocation of wealth according to market laws holds the right of life and death over individuals – in the name of a critique of the anti-economic character of charity and welfare.<sup>3</sup>

This history of political economy is a familiar one, but such an account in itself does not shed any light on the arrangements between territories, technologies, social aspirations and political authority that drive preindustrial modernity. So we need to look at things from a different angle, and envisage the political economy of the eighteenth century as the specific form that the response to the political affordances of the land took in that period – namely, as the process of forging a bond between humans and the soil. Economics, in other words, speaks of the good use of the land, and to that end develops practical skills capable of linking geo-ecological possibilities and impossibilities to political ideals. These possibilities include the intrinsically limited character of solar energy storage by plants. The ‘organic economy’<sup>4</sup> thus constitutes a material base so obvious that it can easily be overlooked:<sup>5</sup> these include the bonds of interdependence between the fertility of the land, the humans and animals that work it and live

on it, and the supervisory techniques that consolidate these bonds in the form of institutions, norms, knowledge and skills. Under organic conditions, economic competition at that time did not really aim at the indefinite extension of material well-being, as would be the case later, but at the best way of organizing things when confronted by the permanent resistance of nature (or Providence) to the sustenance and multiplication of human beings.<sup>6</sup>

This assemblage of people and things that we call the economy is thus gradually subordinated to a productive schema in which the soil, through legal, technological and financial measures, is coded as a resource:<sup>7</sup> by investing capital in land, the owner counts on a regular, predictable rent, which is the joint effect of a specific organization of labour and technological means, and which therefore tends to subordinate the emotional and social bond with this land to the abstract accumulation of wealth. The land and its fruits, very scarce and fought over – in particular grain – thus lay at the heart of the political enigma that all thinkers of this period were trying to solve. Their playing field was their own territory, that of the nations engaged in economic competition, but also almost the entire planet, thanks to the colonial projection of power and knowledge across America, Asia and Oceania.

The title that philosopher and politician Thomas Paine gave to his 1797 essay might be a suitable name for this enigma: *Agrarian Justice*, which discusses how access to the land generates political passions and instruments of government which structure preindustrial modernity.

### **The agrarian kingdom of the Physiocrats**

In the context of the eighteenth century, the rivalry between France and England became so important that it brought with it the formation of theoretical paradigms destined to compete with one another. Faced with the classical economy of the English liberals, which by its historical success has tended to obscure the existence of other epistemo-political spaces, the Physiocrats in France promoted a theoretical formula of great interest.

In the seventeenth century, Colbert sought to align the French economy with the strategy adopted by England and the Netherlands. This required support for the craft and manufacturing sectors, i.e., activities requiring significant technological investment, profit from which was mainly due to the added value created by labour; often identified with the modernization of the economy and increasing trade interdependence, this movement – stimulated by rivalry between states – is one of the main explanatory factors behind the European colonial and imperial dynamic, since the value added by labour was larger given

that imported raw materials were inexpensive. And this in turn was thanks to forced labour, slavery and all the mechanisms that ensured a low labour price in non-Western regions.

England successfully followed this path, which very soon set it on the path of the 'industrious' mode of development, as the historian Jan de Vries calls it – i.e., one based on intensification of labour and the commercial orientation of domestic productions. But in France, the results of the measures taken by Colbert to keep up the pace imposed by the other great commercial and political powers were hotly debated. From the middle of the eighteenth century, the Physiocratic school brought together Enlightenment thinkers who questioned the Colbertist heritage by highlighting its shortcomings. Colbert's measures had exposed the kingdom to fluctuations in international markets at the whim of investments, but above all it inevitably led to a weakening of the local countryside, i.e., the largest portions of the national territory where the main bulk of the population lived, left on the margins of a mode of development held responsible for a split between the peasant masses and a few urban elites.<sup>8</sup>

The polarization brought about by the new market and proto-industrial economy was identified quite early on by authors aware of the fact that, while economics was an instrument of politics, it had to serve the interests of the greatest number, across the maximum amount of territory. In a context marked by weak agricultural growth put under pressure by a comparatively more dynamic demography and by England's great commercial strides forward, the fruits of Colbert's strategy were slow in appearing, and those new, educated elites soon started to forge new plans.

However, the Physiocratic school did not direct its critique against the 'liberal' ideas in general, i.e., against economic *laissez-faire*. For Quesnay (1694–1774), the main representative of Physiocracy in economics and philosophy, liberation of the grain market was not a means of limiting the economic prerogatives of the state, but an objective to be pursued so as to ensure high prices and good remuneration for farmers and landowners, and to stimulate healthy competition in the agricultural sector. It was therefore obvious that a fluid and efficient market needed to be developed under the responsibility of the state, conceived as a direct administrator of the territory.

Quesnay was first and foremost a doctor, rationalist in his culture and close to the world of the French Encyclopaedists. He was close to government circles and also an expert in agriculture, which enabled him to familiarize himself with economic matters. The reputation he soon acquired made it possible for an informal circle to gather around him; those involved called themselves Physiocrats and included Mirabeau (the father of the revolutionary of the same name), who

with Quesnay co-authored the 1763 work *Philosophie rurale* [*Rural Philosophy*], and Mercier de la Rivière, a colonial administrator who in 1767 wrote a work in which the Physiocrats' theories were summarized and bequeathed to later generations, *L'Ordre naturel et essentiel des sociétés politiques* [*The Natural and Essential Order of Political Societies*]. But Quesnay remains, from an intellectual point of view, the most important member of what was sometimes called a 'sect', a word that underlined their political influence. Indeed, he provided the economic order then envisaged with its most analytical expression in his *Tableau économique* [*Economic Tableau*] of 1758.

Quesnay's agricultural experience and his training as a doctor led him to take an interest in the management of peasant affairs. He defends, for example, a model based on what was then called 'arable farming' [*grande culture* – literally 'large-scale cultivation'], namely the construction of a network of large modern farms run by a manager in the service of the owner, free to employ labour for a range of well-differentiated tasks. The accumulation of small individual or family farms was considered at the time to hamper agricultural development, as it involved the persistence of institutions associated with the feudal age, such as empty pasture (the use of communal lands to graze herds) and the 'artificial' regulation by the police of the price of wheat and, therefore, bread.<sup>9</sup> For Quesnay, the agronomic factor behind the switch from one model to another was the use of draft horses instead of oxen for carrying out heavy agricultural labour. The former were faster and more efficient, but also more expensive and more fragile. The additional cost linked to their use could therefore be amortized only by enlarging the cultivated areas and improving the techniques of veterinary care. The debate over the comparative advantages of horses and oxen was, in the context of an agriculture-dependent economy, of paramount importance, and the role it played in shaping the agrarian modernism typical of Physiocracy cannot be underestimated.<sup>10</sup> Indeed, the paradigm of arable farming was based on the capacity to generate agricultural surpluses in significant quantities, which allowed for traction by horses provided that a sufficient initial investment was made: horses, compared to oxen, aided production and thus required and justified a certain capital intensification of agricultural labour.

The notion of 'agrarian kingdom', often associated with this trend, referred to a project based on the solid agricultural foundations of a nation whose wealth would depend mainly on a food base guaranteed by a series of improvements and a class of owners with the capital necessary to maintain basic productive functions. For the Physiocrats, the manufacturing system, of which England was already the model, could not replace an organic economy, the natural character of which stemmed from the fact that it derived from the fruits of the land, but

also from the specific affinity between a social group – the aristocracy – and the soil that constituted the primary coordinate of collective coexistence. The *phusis* – a Greek term meaning ‘nature’ – whose echo we can hear in the baptismal name of the Physiocrats, was thus a thing that produced and distributed its fruits in the form of a free gift, but also the social structure considered the only one capable of doing justice to the immutable order of things by realizing it among human beings: Physiocracy was a physiology, in line with an organic and medical metaphor of political art that would later become very widespread.

The instruments of the free market and soil improvement were considered to be the catalysts of common prosperity, but they were completely dissociated from what would appear later, notably across the Channel, as the specific creation of the manufacturing bourgeoisie. For the Physiocrats, wealth was counted in ‘productions’, in the form of a quantity of useful materials of which money was merely the sign:<sup>11</sup> value was therefore not an abstraction linked to the interdependence of human needs and the trade to which these led, as would later be the case in economics, and more broadly in commercial ideology, but a tangible reality that sprang from the land. A nation that managed to accumulate money by exporting processed goods, but did not exploit its soil adequately and did not keep its population usefully occupied, would not be truly wealthy, but guilty of a vulgar taste for luxury. In this context, economics retained some of its former meaning; it designated the proper management of an initial heritage (here, the soil, or nature) on the model of the family; the accumulation of commodities and the independence of financial instruments, as well as conspicuous consumption, were considered solely as the signs of an institutional and moral pathology.<sup>12</sup>

Quesnay’s main contribution to economic analysis, his *Tableau économique*, was hailed by nineteenth-century economists, especially Marx, as a fundamental advance in the discipline, since it depicted for the first time economic flows in their entirety in graphic, numerical and synthetic forms. The table is also based on an implicit metaphysics and sociology, without which analytical formalization would have no meaning. This metaphysics, as we have already seen, grants nature an initial productive power, albeit one supported and actualized by agronomic know-how and the application of human and animal labour. Before the theories of value centred on exchange and its autonomy become hegemonic, Physiocratic substantialism appeared as a last attempt to root the economy in something heterogeneous to trade flows and labour value. This heterogeneity, which the liberal school (like Marxism later) tried to get rid of, allowed Quesnay to depict the whole of the social organism as traversed by a flow of matter

that could always be traced back to a simple, productive first principle, whose initial extent circumscribed and limited subsequent artisanal, industrial and commercial initiatives. The productive and pyramidal imaginary of the Physiocrats was also expressed consciously as a theological conception, where the concept of production referred to a higher power: 'Agriculture is a manufacture of divine institution where the manufacturer's associate is the Author of nature, the very Producer of all goods and all wealth.'<sup>13</sup>

The social structure that accompanies this metaphysics obeys a ternary division which separates 'classes'. The productive class, first of all, is formed by farmers, cultivators and agricultural workers, i.e., all the groups professionally attached to the initial formation of value in and by the land. The counterpart of this class is constituted by the so-called 'sterile' class, entirely physically dependent on the agricultural product; its activities correspond to the dispersion of this product across spheres functionally annexed, for the most part, to the agricultural world (the manufacture of tools, various services rendered to the productive class). 'Sterile' does not mean useless, let alone parasitic, but the term clearly expresses the fact that this class is immediately located inside a given material over which it has no control. Above these two classes is that of the owners: it is in the hands of this class that the capital necessary for the improvement and maintenance of the land is to be found, and it is this class which, in accordance with the political economy of the older societies, derives profit from agricultural labour in the form of rent. Its wealth and its capacity to increase agricultural production by investment depend on the surplus generated by the productive class – i.e., on the difference between the amount of grain produced and that which will be withdrawn from consumption as seeds for the following year. The analysis in the *Tableau* describes and monitors the flow of capital and food between the moment of initial extraction and the various branches of the economic circuit, with each group identified benefiting from the labour of the others (and therefore from part of the initial capital), and in return rendering functional services.<sup>14</sup>

The Physiocratic project turns out to be inseparably economic and political, scholarly and normative: knowledge about the economy is used to actualize the vitality of the soils and the people who are distributed across them, under the guarantee of a state identified with the exercise of agrarian sovereignty. The aim is to maintain a land-owning elite, to keep a cadastre for fiscal ends and to encourage investment in arable farming. The response to the political affordances of the land becomes the direct responsibility of the public authority. We can see very clearly in the *Tableau* the central tension that runs through this project – and beyond this, we can glimpse the political and



economic orientation of eighteenth-century France. It is in this text that we see formulated in a condensed form the way in which rationalist contributions fuelled a political thinking that one could describe as conservative, or in any case oriented by the conservation of a natural balance identified with the physical and moral order of things. The primacy of the land-owning class, justified by its symbolic and material affinity with the land, stems directly from feudal structures. The designation of the agrarian classes as 'productive' undoubtedly does them honour on an ontological or anthropological level, but it endorses the idea that these social groups were tied to a space that lay in the hands of the aristocracy. The sterile class was caught, to some extent, in the limbo of this metaphysics, since it was not linked to the land either by function or by rank. The contribution of rationalism and the Enlightenment to Physiocratic thought mainly lay in the methods of cultivation of this land and the form of economic argumentation and analysis, but the social hierarchies that derived from the economic organization of the kingdom remained the same as before.<sup>15</sup> From a historical point of view, moreover, Quesnay's recommendations were considered by the ruling classes as sufficiently compatible with their own interests to be applied in law: the edict on the free trade in grain in 1764 was generally perceived as a Physiocratic measure, and the rise in prices that followed this reform was unfavourable to the poorest in the population and spread the idea that the economists were *de facto* on the side of the landowners.

But the Physiocrats are not looking for a strategic middle term between two incompatible worlds: they were simply reluctant to accept the very idea that modernization would imply an overhaul of social structuring, as if history in its progressive orientation could grasp only one part of the phenomenon. The practical schema that dominated the thinking of this school was that of the agricultural surplus, the annual surplus that nourished and at the same time legitimized an idle but benevolent ruling class, considering the popular masses as tied to their land. It is not in itself surprising that the conceptual form of natural law and encyclopaedic progressivism could support this ideology, since in the middle of the eighteenth century the liberal synthesis as we know it today did not yet exist. We can see, by reading the Physiocrats, how deeply Western societies were reshaped to be reliant on new economic and ideological impulses at the end of the eighteenth century: very quickly, the landed base of this school of thought and the way it fuelled social thought would appear as a curious persistence of the past, as the vestige of a collective order still united with the agricultural revolutions of the Neolithic. The manufacturing economy, international trade, the polarization of the world between providers of raw materials and providers of labour value – in other words, ecology and



the institutional forms of industrial modernity – were left aside by the Physiocratic movement.

The fact that the ecological reflexivity of the economy took a substantialist and politically conservative form among the Physiocrats, despite their modernism, was no coincidence and should be borne in mind in what follows. Was it inevitable that the soil and the social and economic possibilities that it enclosed would lead political thought towards the conservation of hierarchies that had long supported societies stemming from domestication and agrarian surplus? In other words, did the political assemblages constructed from the material substrate of subsistence and housing inevitably lead to consolidation of the authority of the group at the head of this surplus? These questions can be found in the literature on the hydraulic empires of Asia – where the technological control of production by irrigation played a central role in the emergence of a centralized power – and recurred later in the works of James C. Scott: ‘seeing like a state’, to use his formula, is to construct techniques for supervising space – in particular maps and cadastres – which make it possible to focus resources at the same time as they distribute norms.<sup>16</sup>

### **The liberal pact: Adam Smith**

On the other side of the Channel, around the same time, an alternative assemblage of the organic and territorial coordinates of human coexistence linked with the desire for development was being put in place. The intellectual influence that it would soon gain, the prestige of the system of moral justifications and political prescriptions that it would develop, the large degree of conviction these ideas inspired in Western social elites: these would all gradually and enduringly identify the British political economy with the (after all immensely broad) concept of liberalism.

From our perspective, these constructions played a central role, since they were the ideas that developed in its prototypical form the formula of emancipation through affluence. What would henceforth be called the ‘liberal pact’ appeared explicitly in the middle of the eighteenth century in moral and aesthetic texts, for example in David Hume’s essay titled ‘Of Refinement in the Arts’. This brief text, linked to the controversy over luxury then raging in England and France, captures the central argument of liberal progressives in the first generation of the Scottish Enlightenment:

Another advantage of industry and of refinements in the mechanical arts, is, that they commonly produce some refinements

in the liberal; nor can one be carried to perfection, without being accompanied, in some degree, with the other. The same age, which produces great philosophers and politicians, renowned generals and poets, usually abounds with skilful weavers, and ship-carpenters. We cannot reasonably expect, that a piece of woollen cloth will be wrought to perfection in a nation, which is ignorant of astronomy, or where ethics are neglected. ... The more these refined arts advance, the more sociable men become: nor is it possible, that, when enriched with science, and possessed of a fund of conversation, they should be contented to remain in solitude, or live with their fellow-citizens in that distant manner, which is peculiar to ignorant and barbarous nations.<sup>17</sup>

The division of labour, says Hume, affects simultaneously the 'mechanical arts', crafts, science and political arts. The specialization of functions allows them to develop and to intensify relationships of interdependence, and plays a key role in the emergence of a civil society detached from its local roots, keyed to cosmopolitanism. Manufacturing perfection is, therefore, if not the cause, at least the natural accompaniment of a moral perfection of individuals and an optimal social state. The spirit of industry manifest in the worker or engineer makes them the vanguards of a civilizing dynamic in which physical and moral good are mutually interlocked. Commerce, whether it circulates knowledge, goods or ways of living, is at the heart of a process in which both the sensitive and moral faculties of individuals and their practical (i.e., economic) faculties are actualized. Very few theoretical schemas have had such deep and lasting consequences in the history of Western modernity as this one.

Smith's political economy was the heir to this pact, which it strives to transpose to an epistemologically safer plane. The increase in productive interdependencies and their politically virtuous character were subjected to an analysis aiming to see them as dictated by historical laws of development. Smith is often seen as having little interest in the ecological dimension of wealth, or at least as only rarely mentioning the agronomic and land debates in which he was involved.<sup>18</sup> However, *The Wealth of Nations* contains a set of prescriptions that can be called ecological, and which are visible in the chapter he devotes to the history of economics, and more specifically to Physiocracy.

At first, in fact, Smith recognized a set of objectives that he shared with the Physiocrats: the farm system, i.e., the French way, which was also oriented towards affluence and opulence, that is, growth. But, by contrasting it with its opposite, his presentation of the Physiocratic doctrine was mainly a defence of the English model. Indeed, after having extensively described and discussed the construction in England

of a legal system favouring the transformation of manufacturing *in situ* and intended to 'extend our own manufactures, not by their own improvement, but by the depression of those of all our neighbours, and by putting an end, as much as possible, to the troublesome competition of such odious and disagreeable rivals',<sup>19</sup> Smith shows that the French strategy seeks to block non-agricultural investment.

In general, this choice can appear to him solely as a form of accepted underdevelopment, since it violates the historical law described earlier in the book which states that capital spontaneously invests first in agriculture, then in industry, and finally in commerce.<sup>20</sup> Each stage of this evolutionary schema is admittedly more uncertain than the previous one, but also offers higher chances of profit. The relativization of agriculture in the economic and political system therefore stems from a historical logic, within which the development of mechanisms for securing capital (notably by the police and the law) plays a central role. Agriculture is an essential economic base, but it tends to be relegated to a second, then a third order of importance by two successive waves of non-land-based investment – i.e., an investment sheltered from the most direct ecological determinations by technological innovation in the first instance, and by commercial and financial strategies in the second. In his view, French economists dissociate the benefits of the free market from the opportunities for profit constituted by the new economic sectors, even when these latter promise higher profit rates.

But the Scottish economist is perfectly clear about the real driving forces behind Quesnay and his school, which are political and social. In the last pages of the chapter that he devotes to them, he directs the discussion of the agricultural system to the ideological structures which bring together the different agrarian systems known to history. It is by a comparison with China, India and Egypt that this reflection on the agrarian political economy begins.<sup>21</sup> Smith makes of these great empires the unconscious reference points of Physiocracy; in his view, only by analysing them can we grasp the French model. He then depicts the self-limitation of markets and of growth that is imposed in political systems when they are slowed down by various inhibiting superstitions,<sup>22</sup> but above all by the tendency to prefer the direct supervision of a population of peasants paying rent to the dominant class, rather than fostering the openness of trade routes at sea and the joint development of the division of labour and industrial profit. The political security guaranteed by these systems intervenes in Smith's argument in a rather discreet manner, but it constitutes the only apparent rational justification for such an economic contradiction.

Every man, as long as he does not violate the laws of justice, is left perfectly free to pursue his own interest his own way, and to

bring both his industry and capital into competition with those of any other man, or order of men. The sovereign is completely discharged from a duty, in the attempting to perform which he must always be exposed to innumerable delusions, and for the proper performance of which no human wisdom or knowledge could ever be sufficient; the duty of superintending the industry of private people, and of directing it towards the employments most suitable to the interest of the society.<sup>23</sup>

In other words, the agrarian empires are driven by the ambition to directly organize and supervise the productive functions of their population by placing them under a tutelage that tends towards oppression. This ideal is therefore economically suboptimal, since it unjustifiably prevents the circulation of capital towards new profit opportunities; it is intellectually impossible, because it supposes state competences that border on omniscience; and it is politically not modern, since economic liberty and civil liberty are here conflated. The alleviation of state charges to which the policy of free trade spontaneously leads thus delegates the responsibility for stewardship to individual industry and know-how: the state no longer has the task of directly regulating the supervision of the territory, and the exercise of sovereignty is dissociated from the territorial and substantial matrix which it possessed in ancient systems. Good use of the land ceases to be conflated with the exercise of sovereignty, and is delegated to private actors. The economic common sense of these actors constitutes a sufficiently reliable and autonomous mediation to develop the land and other territorial resources, with the state retaining only the regulatory, higher-order, regalian functions: the protection of the individual against violence (the police and the army), the organization of justice and the maintenance of transport infrastructure and equipment.<sup>24</sup>

Presenting the France of Quesnay as a vestige of the ancient agrarian empires undoubtedly fails to account for some of the originality of the Physiocratic modernizing project. But for Smith, who represents English economic greatness, this assimilation was a form of deliberate diplomatic humiliation inflicted on its main rival, exacerbated by an epistemological operation. Indeed, from the perspective of an environmental history of ideas, the negative paradigm of the agrarian empire makes it possible to understand not only how the state could find itself stripped of the ecological and territorial prerogatives that it possessed, but also how the institution of the free market concretized the desire for opulence and prosperity in the ecological and technological conditions of the eighteenth century. The concept of the division of labour, with which *The Wealth of Nations* opens, finds its economic and political value only if we remember that, for Smith as for his contemporaries

and his close heirs such as Ricardo and Malthus, optimizing labour performance was part of a fight against the objective limitation of available resources. Much emphasis has been placed on the cooperative dimension of the division of labour, interpreting the parable of the pin factory as an illustration of the benefits obtained by optimizing the distribution of tasks; in this sense, the idea of the autonomy of the economic sphere here came up with its founding myth. But, as certain historians attentive to the material dimension of thought have noted, the inaugural character of this short story must be understood as the answer to a question, to a permanent anxiety in 'organic' economies, namely that of the compatibility between the prospects for improving the lot of human beings and the horizon of a limitation of resources, mainly of the land and its fruits.

Anthony Wrigley has shown that economic stagnation due to coming up against the intrinsic limits of nature constitutes a conceptual *a priori* for economic thought, which, if it is not expressed very often, poses a constant challenge to thought.<sup>25</sup> The entire economic system rests on the biocapacity of the soil as a source of energy and raw materials, so that agronomic improvements, the development of larger areas and technological innovations appear to be as limited as they are strategic when it comes to room for manoeuvre. While the Physiocrats respond to this problem by devoting their efforts to maintaining a solid agriculture, capable of guaranteeing a long-term secure food supply, Smith hypothesizes that, sooner or later, agricultural improvement must meet a threshold; it is other factors of progress that will allow access to more wealth. Thus, rather than seeking abundance in things directly useful for life, it is better to seek an optimal use of the available working time and a maximum valuation of the rare gifts that nature is willing to provide.

The elasticity of agrarian profits is low, in particular because of the mechanism that Ricardo later called 'differential rent' and which aligns profits with the yields of the lowest-quality land cultivated; thus it is from the increase in the division of labour that the most optimistic prospects are to be sought, especially when the delegation of certain tasks to the machine further increases the competitiveness of the industrial sector. It is therefore the very concept of division of labour that must be understood as the effect of a conscious integration of material coordinates in the conception of social relations, in this case social relations insofar as they constitute the basis of subsistence.

The characteristics of the relationships between environment, capital and labour in the context of the organic economy therefore had a decisive influence on the nature of the economic problem. The social ideal of opulence and the epistemological ideal of economics as a science were made possible by taking into account the limits of

natural resources. The relentless logic that connects the increase in the division of labour, the orientation of production towards the market, the enlargement of commercial networks and the accumulation of capital is rooted in what some historians and economists today call the Malthusian trap, i.e., the ecological ceiling that keeps access to useful resources, and therefore to comfort, security and well-being, within strict limits. If we commonly associate this phenomenon with Malthus, who theorized the demographic dimension of the problem by comparing the rate of reproduction of the social body with the increase in its productive capacities, and also with Ricardo, who formulated in a synthetic way the problem through the law of diminishing returns, Smith's thought was actually already immersed in this question, which provided him with his initial impetus.

### Two types of growth

We must therefore clarify the meaning we give to the concept of growth in a preindustrial, or proto-industrial context. The ideology of progress constantly endorsed by Smith<sup>26</sup> is in harmony with the evolutionary philosophy established in his writings, one that arranges the dignity of the different social groups in accordance with their capacity to take advantage of their environment.<sup>27</sup> But if Smith and his contemporaries did not think that the England of their time had actualized the potential for development included in its soil and its commercial capacities, the historical horizon that unfolded before them could be better understood as a resistance to lack than as the conquest of infinite resources.

So we need to give the more specific name of *intensive growth* (sometimes also aptly called 'Smithian growth') to the sociological phenomenon that best defines the framework in which the classical economy is established.<sup>28</sup> The faith in the potential for improvement contained in the division of labour stems from the fact that it must make it possible to perform better with a stable, limited quantity of initial goods. The gradual improvement in the human lot, under the impact of the division of labour and the extension of markets, is essentially due to the intensification of labour and its productivity, i.e., to factors that are independent (or almost) of material or energy input. Intensive growth, which maximizes the implementation of labour and the introduction of value into things through organizational and technological apparatuses, represented both the main prospect for concrete improvement for the men and women of the eighteenth century and the implicit paradigm of classical liberalism – both in its economic dimension, which promotes the free market, and

in its political dimension, which highlights the virtues of economic selfishness and the protection of the rights of the individual engaged in these interdependencies.

Shortly after, some commentators on Smith's work could already see the limits of a theory of liberty based on these economic drivers. Adolphe Blanqui, who translated *The Wealth of Nations* into French, wrote:

The division of labor and the perfecting of machinery, which should realize for the great working family of the human race the conquest of a certain amount of leisure to the advantage of its dignity, have produced at many points nothing but degradation and misery. ... When A. Smith wrote, liberty had not yet come with its embarrassments and its abuses, and the Glasgow professor foresaw only its blessings.<sup>29</sup>

Already in 1842, when Blanqui's translation was first published, the manufacturing industry had changed enough for commercial emancipation to appear as a false promise made by its founders. And if this was so, the reason was that Smith's intensive growth was not the main driver of economic growth in general for very long. *Extensive growth*, which combines with the former by counting on an increase in the gross quantity of raw materials and the energy made available to the system of production and trade, had completely changed the situation. Yet it was extensive growth that, in the opinion of the greatest number at a time when industry and the machine system were reaching their fullest development, made necessary a critical examination of the relations between economic modernization and the project of autonomy.

The distinction between these two forms of growth makes it possible to treat the formation of classical liberal economic and political thought as an epistemological space within which certain material characteristics of the environment play a formative role, whether consciously or not. The challenge is to show that, in this context, access to land, grain and energy, and to the general conditions of production and reproduction of society and the world, is indeed a factor that needs to be taken into account if this intellectual development is to be clarified. But here the intensification of civil relations by the division of labour is a very singular way of thinking about the incorporation of the natural into the social.

Intensive growth, in other words the material base that Smith considers to be relevant, also involves the concept of 'industrious revolution' introduced into the debates on the economic take-off of the West by the historian Jan de Vries. This is the guiding concept in a reinterpretation of the gradual development of the economies of



Northwest Europe in what he calls the 'long eighteenth century', and which in reality covers the two centuries between 1650 and 1850. The research brought together under this term aims to relativize the technological and properly industrial factors in this social transformation which saw the market for consumer goods becoming the focus for the economic behaviour of Western households. In other words, while the common view of the industrial revolution gave hegemonic explanatory power to *supply-driven growth*,<sup>30</sup> de Vries wanted to show that internal transformations in the dynamics of demand – i.e., the modification of collective attitudes to the manufactured goods produced within the framework of an advanced division of labour and the integration of families into the market – helps to explain the beginnings of a growth economy from the eighteenth century onwards. The economic development of England is explained, in his view, by the diversification of consumer choice made possible by the division of labour, i.e., by the increasingly broad way in which individuals actively sought to tie productive activities to the market.<sup>31</sup>

It is striking to note how much this interpretive framework agrees with Smith's theory of the division of labour. De Vries's analysis suggests that the industrial phase of development, which intervenes later in the phenomena he describes, is only a secondary development in relation to economic structures (the market, the allocation of time working in the family unit, commercial circuits) that were already mature at the time when extensive growth factors were introduced. If de Vries, like Smith, tends to limit the material and ecological factors in the emergence of modernity, this is not just an error of perspective: intensive growth has indeed been the mainspring of major social transformations, in particular individualism, but the question that arises is whether or not this process constitutes a 'revolution'. In other words, do the institutional, commercial and domestic forms that appeared at that time and in these conditions adequately capture the historical orientation of modernity?

Kenneth Pomeranz's *The Great Divergence* is partly a response to the model of the industrious revolution. It seeks to show that the *intensive* growth typical of the classical liberal phase did not lead to a significant difference in living standards between Western Europe and other centres of development, such as certain regions of China or Japan. It was only the *extensive* contributions represented by the 'ghost hectares' of the colonies and the exosomatic energy of coal that set England, then the rest of Europe, on the path to a development that really was divergent from the constraints of organic economies.<sup>32</sup> The rest of our reflections will consist in a philosophical interpretation of this transition, which makes the ecological costs of modernity a fundamental question for the present. What still resists our grasp is the



way in which the political values generated in the context of the search for intensive growth, notably proprietary individualism and its legal protection, were superimposed onto and confronted by what a new type of development, a new type of ecological and social orientation, would impose – one that was now inseparable from the extensive contributions of fossil fuels and the capture of colonial lands.

Thus, the main question left unanswered at the end of this analysis of English liberalism is the question of the tensions likely to hamper the gradual, continuous deployment of sociality conceived as a theoretical realization of the possibilities offered by intensive growth. Is Smith's more or less deliberate ignoring of the consequences of extensive growth – in particular the colonial factor, and soon the fossil factor that he certainly could not have foreseen – likely to trap the liberal creed in its own contradictions, before it is even fully deployed? The whole problem, in fact, lies in the coherence or incoherence between, on the one hand, the project of individual and collective autonomy – i.e., the political rationality that tends to impose itself in a movement that culminates with the Enlightenment – and, on the other, the acquisitive orientation of the main nations engaged in the game of globalized commercial competition. How are we to understand a system where the state is justified by a lowering of the level of constraint, while in its effective material structure it increases its territorial projections through trade? In other words, was there already, before the industrial revolution properly speaking, a tension between autonomy and, if not affluence, at least an intensified dependence on the land?

### **Fichte: the ubiquity of the moderns**

Elements of the answer can be found in the thought of the German philosopher Johann G. Fichte (1762–1814). Best known as the founder of subjective idealism and the inspirer of German national feelings, eternally overshadowed by the two monumental thinkers of his time, Kant and Hegel, Fichte nevertheless glimpsed the geo-ecological aspects of English political economy that had been left unthought. *The Closed Commercial State*, published in 1800, is a radical questioning of the liberal order conducted in the name of its own values. This is, without doubt for the first time in the history of political ideas, a reinterpretation of political autonomy based on a questioning of the spatial and territorial dimension of the project of acquisition.<sup>33</sup>

*The Closed Commercial State* is a defence of the economic measures associated with German cameralism against the gradual opening up to the free market: developed in particular by Von Justi in the middle of the eighteenth century, cameralism designated an economic policy

within which the regulation of productive functions and trade was a direct prerogative of the political powers and the police, which took care to administer the territory without distinction between public order and prosperity. Often regarded as a close cousin of Physiocracy, cameralism shares with the latter the concern for material wealth, the balance between town and country and the view that productive territory is a central element of the economy.<sup>34</sup> In 1800, the influence of English political economy in the various German states tended to relegate this intellectual tradition to the margins, however widely it was established in areas dominated by Prussian power, and Fichte intervened in the debate by radicalizing certain recommendations typical of the cameral sciences against what he perceived as the risk of a loss of sovereignty.

The treaty of 1800 can therefore be read as a defence of German interests in the interplay of economic rivalries of its time, but it is above all a reflection on the consequences of the Enlightenment and the principles of the French Revolution in matters of economic politics. As one of Kant's heirs, Fichte aimed to realize 'the rational state', i.e., a political form fully ordered by law, both with regard to interindividual relations and to the relations between the ruled and the rulers<sup>35</sup> – that is, a state observing the rule of law. What he calls 'the actual state', by contrast, is the product of historical contingencies (princely marriages, dynastic and diplomatic alliances of circumstances, military adventures) and power relations, which need gradually to be incorporated into the order of law. The sole legitimate subordination is that based on rational principles; thus, the vestiges of contingency and violence which remain in political life must be neutralized.

According to Fichte, this transition involves the reconfiguration of property relationships. Indeed, he recognizes that it is the question of yours and mine, of everyone's right over things, which makes it necessary to abandon the free play of private wills and their subordination to the law. Property is both the central instrument of political autonomy and the basis for applying laws guaranteeing the right of everyone to have their 'own property'.<sup>36</sup> Fichte adds that the forms of the division of labour must also involve a contract, since each professional body must certify that it has relinquished the activities of the others, with each undertaking to supply to the others a sufficient quantity of the products of their labour. In other words, if the state really wants to be the mediator of the property system, and more broadly of the harmonious meeting of needs, it must ask where this property comes from and how trade comes into being, and not simply accept an economic status quo. The arbitrariness of possession is untenable; the state must be a direct administrator of property, like a grand steward who governs the allocation of things to people on

an equal basis. For Fichte, the contractual protection of individual rights cannot be dissociated from a highly elaborate system of corporations and commercial rules, since it is the economic, productive and commercial relations that give their content to this protection. Contrary to the English political and economic thought of the time, economic relations are therefore never delegated to a free private actor in possession of property by a state that refuses to act as a steward – the contrast with Smith is total.

Fichte then draws the logical consequence of the established principles: in order for the state to fulfil its task of achieving economic justice, it must exercise control over all the goods in circulation within it. In other words, the state must be closed commercially, and international trade must be discouraged as much as possible and even prohibited. Insofar as the legal relationships between people are inseparable from their economic commitments, the things produced and exchanged fall under a jurisdiction that is imposed on people and goods without distinction: economic borders must be as clear and distinct as legal and political borders are; they must strictly coincide, otherwise the fragile balance of economic equality is inevitably disturbed by foreign acquisitions impossible to regulate. Imagine a local industry coming under the control of a foreign investor; in this case, part of the wealth produced passes from one nation to another, depriving the former of part of the benefits of its labour and therefore of access to its own assets, all the more so as this industry will rely on locally funded infrastructures. Conversely, if German goods seek an outlet abroad, they will suffer from taxes that will inevitably increase their value, once again hampering the fair allocation of wealth.

Fichte summarizes his position thus: '[T]he rational state is a closed realm of laws and individuals [as well as being] an entirely *closed commercial state*. Every living human being is either a citizen of the state, or he is not. Likewise, every product of human activity either belongs within the compass of its commerce, or it does not. There is no third possibility.'<sup>37</sup>

This statement has one destabilizing effect: it is deduced from the general principles of political equality guaranteed by contract, while constituting an obvious subversion of the economic order being established in Europe. Since legal and power relationships are mutually exclusive, only the state is empowered to establish and enforce the former, and the state exists only within borders that circumscribe the legitimacy of its action. Therefore, in order to integrate the interdependence of men when it comes to the satisfaction of their needs into the field of law, it is necessary to eliminate the commercial rules interposed between one state and another, between one geographical area and another – rules based solely on the balance of power.<sup>38</sup> Fichte

wants to bring together two spatial regimes, the dissociation of which in his eyes indicates a culpable incompleteness in the order of the law: the regime of the law and that of exchange. In so doing, he reveals that European nations have illegitimate access to spaces and resources outside their territory through trade; this access is inevitably extra-legal and the ecological and legal reality of these nations are thus separated. It is this situation, of which Fichte was the first critic, that we propose to call *the ubiquity of the moderns*, since they claim to live in two different spaces at the same time: the space of the law enforced within the borders of a given state, and the space of economics and ecology, a space that goes beyond these borders and constitutes a playing field where the principles of reason cannot be expressed.<sup>39</sup>

In the brief preface to his text, Fichte discusses the colonial problem, describing the practical reasons that lead the most powerful states to accommodate themselves to this ubiquity. He here concedes that his plan has no chance of success and will remain purely speculative, since it runs up against interests that have already become too consolidated:

The reason for this unwillingness, be it thought through clearly or be it not, is that Europe has a great advantage in trade over the remaining parts of the world, whose forces and products it takes for its own use without giving anywhere near a sufficient return payment. Every single European state ... still draws some advantage from this common exploitation of the rest of the world ... . With its departure from the greater European commercial society it would have to renounce all this. If we are to remove the reason for this unwillingness, we must show that a relation like that which Europe has to the rest of the world – a relation grounded neither in Right nor in fairness – cannot possibly continue. The proof of this lies beyond the limits of my present intention.<sup>40</sup>

This final declaration corresponds to an admission of failure on the part of German idealism in the face of English pragmatism. The maritime empire of cotton and sugar cane plantations constitutes for Fichte a factual triviality ‘beyond the limits of my present intention’, but it defined the era much more deeply than the speculative protectionism he advocated. This solution even has, from a logical point of view, a provocative value with regard to Fichte’s system. Imperial England was undoubtedly on the point of implementing one theoretical possibility contained in this system, namely a world state: if it is necessary to belong to the same state to trade, and under English leadership the whole world is trading, then the single state on a global scale, the universal state, might well take shape. But it would be English and not German; it would also be a military state, not a rule of law,

unless all of the colonial dispossessions that made the economy work were abandoned.

It is quite fascinating that, in 1800, a thinker as favourable to the French Revolution and to the self-affirmation of nations such as Fichte should propose that the West renounce all imperial pretensions so that his own political ideal, that of rational and just sovereignty, could come into being. The more properly ecological dimension of the problem appears at the end of the book, when the question of 'natural boundaries' is tackled. He describes what the ideal spatial extension of a closed state should be for it to be viable, i.e., so that it can reach 'productive independence'.<sup>41</sup> For the social body to be harmoniously contained within its borders, there must be, he says, a certain internal harmony of the territory. Fichte is here joining the debate provoked by the French Revolution over the nation's natural borders, in this case the territories west of the Rhine. He admits that, before closing the state in on itself, one must make sure that this closure is not detrimental to national prosperity. It is therefore a geopolitical problem that arises for the closed commercial state, especially at the beginning of the nineteenth century: should we adjust the economy to the political territory as we find it already constituted, or should we give the sovereign state the space necessary for its economic well-being? Fichte remains elusive on this point, but both interpretations are permissible: those that, like the later theories of 'living space', link territorial sovereignty to an original and extensible 'land grab', to use Carl Schmitt's terms; and those that accept as a fundamental geopolitical principle the guarantee given by a state to its neighbours that it 'will not expand itself in any way'.<sup>42</sup>

Fichte, a proto-socialist and anticolonial thinker, above all brought to light the implicit territorial arrangements of the liberal pact – the extraordinary ecological and geographic misjudgement that props up the thesis of intensive growth. To increase the division of labour and the sociality that comes with it, we need to obtain at low prices the raw materials which enter the circuit of value formation, and thus to repudiate any universalist promises. Regardless of the normative value that can be attributed to it, Fichte's proposition is radical insofar as it reveals the fundamental territorial ambiguity of modern societies. In asserting the need to make the legal-political territory converge with the economic territory, the territory of resources, Fichte highlights a feature of Europe that escaped most political thinkers at the time, but which would not escape the thinkers of the colonial margins: Europe actually lives off a space that it does not own. The commercial interdependence of nations hides a set of strategies for ecological advantage, and the constitution of imperial or colonial spaces on a planetary scale reveals in all its violence the structural inequality of the exchange.

The latter is the clearest manifestation of an inability of the moderns to stick to their own principles, since these ecological inequalities are also political – and people living under colonial or imperial control are most often excluded from a legal protection deemed to be universal.

This theory thus forces European states to face their invisible constitution, their inability to keep to the rule of law which they nevertheless proclaim so loudly: the spatial question is only the tangible manifestation of an incompleteness in the legal ideal, whose necessary geographic closure is immediately put into perspective by commercial openness. The ubiquity of the moderns results from a questioning of the relationships between the legal framework supposed to give European civilization its properly modern historical orientation, that of individual and collective autonomy, and the economic forces that tend to shatter this framework of territorial sovereignty by absorbing the energy and resources of the land according to a logic absolutely heterogeneous to that of the law. *The Closed Commercial State* simply brings us to another contradiction of modern liberty: the achievement of the rational state seems inseparable from an integral supervision of the economic order by an all-powerful state, which one can hardly imagine as not abusing this supreme authority. Resizing the economy against its extraterritorial and extra-legal projections could require an almost omniscient administration with the right to scrutinize every transaction and every movement. This autonomy is therefore very fragile. It curls up into a geo-ecological capsule that tends to fetishize the nation as a homogeneous space, and even to instrumentalize the economic argument to constitute an essentially identity-based political group. In other words, Fichte is less interesting for his conclusion than for the question he addresses to the harnessing of affluence and freedom.

## *The New Ecological Regime*

### **From one liberalism to another**

At the moment when a new ecological and political outlook is about to transform the destiny of Europe and the world, the space of political reflexivity can be understood as the superposition of a territorial matrix defined by the sovereign state onto a commercial and acquisitive matrix. The political-legal framework stemming from natural law and classical political economy ensures the intellectual legitimization of each stratum, in a superposition that (as we have just seen in the case of Fichte) then poses more problems than it offers solutions. However, the concept of property, strategically located at the intersection of these two matrices, played an increasingly important role in the nineteenth century, that long political experiment on a world scale based on the liberal pact and the ubiquity it engendered.

This dynamic finds some of its most significant and violent expressions in the condescending certainties that structure our apprehension of societies deemed to be simultaneously materially underdeveloped, ideologically tyrannical and historically retarded, and doomed to imperial and colonial bondage. As has been noted by many works in the history of ideas, the development of liberalism is inseparable from the strategies of conquest deployed in the eighteenth and nineteenth centuries, and one can go so far as to see the heteronomy imposed on the rest of the world by the West, and notably by the British Empire, as one of the central problems facing the progressivist matrix.<sup>1</sup> The legal universalism propounded by the liberal Enlightenment, for example, was made compatible with a double political standard which considered the colonized as subjects, and not citizens.<sup>2</sup>

But the material universe in which the liberal pact was formed was soon turned upside down, and with it the recently established bond between political liberty, property rights and the intensive growth achieved within the limits of the organic economy. At the heart of this



transformation was the massive incorporation of fossil fuels, including coal, into the British economy and then into the rest of Europe and North America. The heat and the driving force resulting from the combustion of coal, converted by successive generations of steam engines, brought about a radical modification of the productive system. The development of the relationships between cities and countryside, forms of labour, and family organization, but also the concomitant modifications of agricultural production – all those phenomena that made the long nineteenth century a period of profound change – had something to do with the new energy system and the new ecological regime being put in place.<sup>3</sup> What happened at different times in the nineteenth century, depending on the regions of the world, was a reconfiguration of the ecological bases of modern societies by the extraction of an energy that was essentially presented in the form of stocks, and was thus partly independent of the organic fluxes from solar energy characteristic of the old energy system.<sup>4</sup> One of the main effects of the large-scale extraction and combustion of coal was to free the economic sphere from the intrinsic limitations of the organic regime, the Malthusian trap: the concentration of energy contained in fossil ore made possible an extensive growth partly independent of spatial constraints, which raised a series of fundamental questions for nineteenth-century societies. How long would access to this key resource last? What would be the social benefit of this ecological and economic windfall? How would it transform the lives of workers? And how could the technological and productive system tapping into this energy to make it emancipatory be controlled?

The challenge is less to redefine the industrial revolution<sup>5</sup> in light of the climate crisis than to understand how the liberal ideological structure established in Europe in the eighteenth century responded to the series of events that are subsumed under the term ‘industrial revolution’. While the project of modernization by law and the ideal of civil equality were already constituted, while the French Revolution had already shown a glimpse of how such a project could materialize under the old organic ecological regime, the gradual installation of a new material regime could leave intact the fragile assets of the first revolution, the revolution of rights. In other words, we are led to suppose that *what we ordinarily identify as modernity was not born once, but twice*: the long process of maturation of anti-absolutist, republican and egalitarian ideals, their inclusion in the evolution of intellectual and commercial exchange that can be traced back to the Renaissance, the slow self-affirmation of the secularized elites – everything that, according to the dominant historiography, would have taken shape in the revolutions of the eighteenth and nineteenth centuries – was only the first wave of a movement quickly redefined by a second: the



opening up of material possibilities through access to new energies and new spaces.

In the collective consciousness, the emergence of egalitarian and commercial values, of the bourgeoisie and of manufacturing, appears as a single movement towards 'progress'. Technoscientific and energy changes specific to the nineteenth century are considered to be a consequence of the previous phase, even a confirmation of its visions for the future. But once we underline the massive character, partly due to historical contingency, of the geo-ecological reconfiguration induced by the availability of new lands and new energy resources, this unitary vision breaks down. To say that modernity was born twice means two things. First, the quest for improvement, which characterized modern political thought from the seventeenth century onwards, was something other than access to a tenfold driving force and to prospects for extensive growth never envisaged hitherto except as a fable. Then, the association between rights and industry, between freedom and enrichment, between democracy and affluence – an association that these days we take as self-evident – was in fact woven together by a process of intellectual and social labour that came *after* the genesis of the liberal pact.

As Kenneth Pomeranz has remarkably shown in *The Great Divergence*, the availability of coal and the spatial savings it made possible (i.e., equivalent areas of forest) comprised a massive ecological advantage from the 1830s onwards, from which England was able to benefit. And this advantage was partly due to the contingent reasons comprised by the geographical and geological possibilities, i.e., the morphology of England, not only as a historical and institutional formation, but also as an ecological reality. The identification of material contingencies in historiography cannot be reduced to a functionalist tendency: more deeply, it is a question of recognizing that societies never completely dominate the factors that push them in one direction or another, and that combining an explicit project with these contingent determinations produces singular effects. Thus, not only does the civilizational bloc called 'modernity' have two dates of birth (or, more precisely, can be related to two types of historical landmarks), in addition, these two births do not refer entirely to the same type of process. The second birth, the one in which the new ecological regime was introduced into the still fragile framework of the liberal and acquisitive project, makes it necessary to take into account quantitative, ecological, in short material factors with which modern history is uncomfortable – as evidenced by the hasty identification of such elements with Malthusian fears.<sup>6</sup>

If we now look simultaneously at the two characteristics of the industrial revolution – namely (1) the delay between the modern project and the material acceleration that makes it possible to give it

concrete form and (2) the contingent character of the irruption of the second wave – a truly philosophical problem arises. Indeed, the ideas of eighteenth-century philosophers were enabled to function, to be applied, in a world whose material characteristics had meanwhile become quite different from the old organic and cyclical economy. If these ideas were, as we have shown, integral with this system, because they were aimed in part at solving the specific problems posed by this ecological regime in which prevailed scarcity and the precariousness of life, what happened to them after the practical conditions in which free ownership, land improvement and moral and economic individualism had changed? Did this not mark the inevitable appearance of a discrepancy, a misalignment, between theory and practice?

How is it that the nineteenth century was the ‘century of property’,<sup>7</sup> of economic and political liberalism? How is it that these doctrines adapted so well to a world that was no longer the same as the world that had given them birth? Biology is familiar with this problem under the name of exaptation.<sup>8</sup> This term indicates the process in which a given form associated with an initial function (for example, a surface useful for the thermoregulation of the animal) assumes at the end of a series of transformations and contingent ecological encounters a new function (this surface becomes a wing), which completes or replaces the other. This kind of process can adequately be applied to the history of art and technology,<sup>9</sup> but in this case also to the history of political ideas, since liberalism has literally undergone an exaptative trajectory by rearranging its arguments in order to justify an economic system that did not belong to its original environment. Naturally, the application of this analytical tool to political thought reveals a problem that biologists are lucky to be able to ignore, which is the normative dimension of the issues: the exaptation of liberalism is not necessarily a success, i.e., it does not necessarily respond adequately to the problems posed by the new world of industry and coal.

Behind the multiplication of the productive forces that are due to access to new energies, there thus lurks a political question, irreducible to a functionalist approach to history. How has the ecological revolution represented by the building of industrial civilization affected the project of collective emancipation? And how is it that the fallout from this great transformation is forcing us again, in the twenty-first century, to rethink autonomy?

### **The paradoxes of autonomy: Guizot**

We would like to show how the two pivotal ideals of modernity, namely autonomy and affluence, gained traction in the nineteenth century, in

order to make more clear the enigma of their alliance. To do this, let us try to compare yet again two intellectual contributions. On the one hand, with Guizot, we will come back to the project of constructing political entities in control of their laws and their destiny, of which the democratic ideal is the main expression; on the other hand, with Jevons, we will focus on the physical forces and sources of energy that drive industrial civilization and represents a paradoxically increased servitude of societies that seek to be free.

Once the polarization of political thought in the nineteenth century has been posed in these terms, it is quite striking to note that one central concept seems to express a typically modern concern: that of limits, and their opposite, limitlessness. The demand for democracy, when pushed to its highest degree of conceptual and political radicalism (achieved in particular during the French Revolution and in the formulation of human rights), aims for the *unlimited* sovereignty of the people over themselves, a sovereignty whose achievements and pitfalls were the subject of much political philosophy in the nineteenth century. Marcel Gauchet, for example, underlined how the debates around the Declaration of the Rights of Man and the Citizen, and the subsequent reformulations of these rights, focused on the idea of a social reconstruction, metaphysical in scope, backed by this allegedly boundless power of the people over themselves.<sup>10</sup> At the same time, but in very different epistemological and political spheres, access to fossil fuels and to their driving force also seems to propel societies onto the path of a progress without apparent end, or at least in a dimension incommensurable with old times identified with limitations and scarcity. This time it was the energy resources of the British kingdom that were the subject of a reflection on both the political and the economic limits of modernity. These two analogous figures depict society breaking its barriers, that of absolutism, on the one hand, that of scarcity, on the other; in both cases, the humiliation of human reason and of the sense of justice by submission to exogenous instances of power and constraint (the king and the climate, to simplify matters) triggers a reaction that defines the collective consciousness at a very deep level. But in doing so, this collective consciousness also encounters new problems specific to the new emerging world.

\* \* \*

It was the French historian and statesman François Guizot (1787–1874) who provided us with the prototypical formulation of the problem that constitutes the limitlessness of the power of the people. Here it is, set out in a section of his *Essai sur l'histoire et sur l'état actuel de l'instruction publique en France* [*An Essay on the history and current state of public education in France*]:

The human spirit, at that time, had embraced the whole of society and social institutions with a force and extent hitherto unknown, but also with a pride far beyond its power. Man believed he had, like the god of Plato, conceived in his thought the true type of the universe, and he was impatient to shape the real world, which he considered only as an inert and disordered matter, according to the ideal forms and the primitive laws that he had just discovered. These mortal creators seized on society as the Lord had seized on chaos, and claimed to wield the power of the divine word. Political institutions, civil laws, religion, philosophy, ethics; commercial, diplomatic, and domestic opinions; interests, habits, customs, the state, families, and individuals; everything had to be rebuilt; everything had hitherto been the product of blind force; everything now had to be the work of reason. Then there appeared at the same time both all the progress that this superb reason had made, and all the secrets of its weakness; so both the source and the vanity of its pride were seen: the consequences of such a state of the human spirit were soon evident.<sup>11</sup>

The period to which Guizot refers at the beginning of the extract is that of the Constituent Assembly of 1791, in particular the measures aimed at the foundation of a system of free primary education common to all; the ‘consequences’ mentioned at the end obviously refer to the Terror.<sup>12</sup> Guizot makes the revolutionary movement an emblem of the ambition to completely reconstruct the social body on rational principles worked out by the mind, which the legislator would merely translate into this-worldly terms. In these lines, he expresses a feeling widely shared in his time, notably by Auguste Comte: with historical hindsight, revolutionary voluntarism and the project of radical reconstruction of society appear as an essentially negative, critical moment. Indeed, once the legacy of the *ancien régime* had been laid aside, the new man and his world, produced by reason, were still slow to come into being, as if the state of manners and institutions were condemned to be forever belated with regard to the ideal project of the ‘mortal creators’, namely the legislators of 1789.<sup>13</sup>

But this presentation of the revolutionary project nevertheless reveals a fundamental aspect of it, one that Guizot supports, and which is valid beyond the case of France. It is a matter of not recognizing any political authority exogenous to public reason, i.e., what the community of citizens is capable of recognizing by its own lights as defining a good and legitimate government. The combination of the principles of equality, which makes each reasonable subject the bearer of political aspirations to be recognized, and of liberty, which assigns to power the task of guaranteeing the emancipation of individual

faculties, leads to the assertion of a radical autonomy that becomes the rallying point for all the heirs of the French Revolution. It is easy to understand how the question of education crystallizes the ideal of autonomy, since citizens must now constantly live up to the ambitions set out at the time of the Revolution, and embody in their skills capacities initially defined in philosophical terms by the figure of public reason. In the first half of the nineteenth century, the concrete realization of revolutionary voluntarism needed to go beyond the abuses of this radical artificialism. The prospect of a rational politics, the rejection of the *ancien régime*, of the Terror and of Napoleon, constituted the programme of the liberals of whom Guizot was the main representative under the July Monarchy,<sup>14</sup> and it was the ambiguities of limitless popular sovereignty that then dominated political thought.

Guizot thus formulated a concern that would last throughout the nineteenth century, one he shared with certain socialist authors (such as Pierre Leroux and Pierre-Joseph Proudhon). No social body is capable of tolerating such a brutal reconstruction without damage, and the reorganization of customs and manners would have to take much more time than the simple affirmation of autonomy as a principle. In other words, it is society itself that obstructs the political will, and it is necessary to find the mediations capable of incorporating into the behaviour of the greatest number the provisions resulting from the revolutionary ideal. The limitless nature of the will collides violently with the nature of the social sphere (family, religion and habits, in Guizot's list), which changes at a much slower and more gradual pace, and this confrontation results in a paradox: to realize the principle of autonomy, its implementation must be slowed down, and the limits imposed by social life must be noted.

A few decades later, in 1859, John Stuart Mill still presented the conceptual knot of liberalism as an answer to the problem of the limitation of popular sovereignty:

The notion, that the people have no need to limit their power over themselves, might seem axiomatic, when popular government was a thing only dreamed about, or read of as having existed at some distant period of the past. Neither was that notion necessarily disturbed by such temporary aberrations as those of the French Revolution, the worst of which were the work of a usurping few, and which, in any case, belonged, not to the permanent working of popular institutions, but to a sudden and convulsive outbreak against monarchical and aristocratic despotism.<sup>15</sup>

The impossibility of instituting the power of the people over themselves just as they are does not appear to Mill as proof of the illusory

character of revolutionary (i.e., egalitarian and liberal) ideas, but as an incentive to find a peaceful realization of these ideals. This is why the liberal historiography of modernity insists so often on the need to *learn* democracy and autonomy, i.e., on the gradual incorporation by society of democratic and representative mechanisms. Contrary to the philosophers of the eighteenth century, who were driven to root the principle of political autonomy in the social contract, the nineteenth century set itself the task of putting this principle into practice and therefore absorbing the residual exogenous powers so that society could give itself institutions in accordance with its nature.

This was how the quest for autonomy imposed a distinction between what comes from within political society and what comes from outside. Inside are the forces that really determine the historical orientation of the collective, a knowledge and legal formalization of which promise access to a new status, which the concepts of liberty and equality best embody. The internal environment – i.e., society – has its own rules, which must not be confused with external determinations: theological authorities, the claim of a certain class to enjoy a higher dignity, but also material contingencies, which can certainly produce opulence or scarcity but must never affect the properly political identity of the associated collective. Obviously, the question arises here of the relationships between the ideal self-control that the social milieu must achieve and the equally integral and ideal control that society can exercise over nature, over exteriority.

However, we know that the technoscientific utopia of perfect mastery of the material world and its forces has very deep affinities with socio-political modernism, and they fuelled each other in the nineteenth century, especially in colonial and imperial contexts that provided the most obvious entry points for a ‘civilizing’ ideology.<sup>16</sup> And it is easy to understand how the ideal of the social body’s sovereignty over itself could maintain the project of sovereignty over nature, as its external concretization: in each case, the exogenous limitations that weighed on the social body, humiliated reason and flouted the demand for justice needed to be overcome. The human collective never controls itself as well as when it places under its tutelage the conduct of things external to it, since it thus frees up an entirely transparent internal space, the deployment of which can finally depend only on deliberately chosen determinations.

We find a convincing example of this connection between political autonomy and the rational externalization of the environment in the French post-revolutionary legal corpus. The revolutionary moment represented a turning point in social disinhibition with regard to the risks and damages induced by industry, through the massive withdrawal of the regulations that had previously organized productive activities

and their consequences for the environment. Judicial arbitrations clearly show how ‘the interest of the national industry is well worth the sacrifice of a few individuals’.<sup>17</sup> The principle of ‘public utility’, defined by the decree of 1810 on unsanitary establishments, affirmed the necessary compromise between industrial risks and a political project which, despite counter-arguments, aimed at the autonomy of the collective body. Thus, the usefulness of industry was not private, but public, as the rise in the level of production was considered to be closely tied to the actualization of republican ideals, in particular autonomy from the external forces. Society’s control over itself through public reason and law thus translated into support for the liberation brought by industry. Here, the concept of public utility brought out the material condition necessary for the realization of liberty as the separation between the social body and some of the properties of its world, the establishment of an essential discontinuity between political freedom and its ecological substrate.

Environmental history describes this alliance between the subordination of the environment and the attainment of political self-determination remarkably well. But it also leaves us with a philosophical question: while the neo-Baconian discourse of the government of nature was current at the time, revolutionary transitions could not be described unilaterally as the opening up of nature to conquest. The continuity manifested in the history of the will to control and of disinhibition in the face of risk<sup>18</sup> came into tension with the emergence of new political justifications, which, while they welcomed the transformation of the world, also gave it an emancipatory significance that could not be ignored. This is why we must now return to the way in which the overstepping of the material limits of the old ecological regime was thought of.

### **The paradoxes of affluence: Jevons**

This time, it was an economist who provided us with the prototypical expression of the problem of material affluence and the heteronomy that it highlights. In *The Coal Question* (published in 1865),<sup>19</sup> William Stanley Jevons (1835–82) presented the most remarkable and complete exploration of the situation of radical dependence into which England, and more generally industrial civilization, had placed themselves by making fossil resources the key to economic development. Here is what the economist wrote at the opening of his treatise:

Day by day it becomes more evident that the Coal we happily possess in excellent quality and abundance is the mainspring of



modern material civilization. As the source of fire, it is the source at once of mechanical motion and of chemical change. ... But coal alone can command in sufficient abundance either the iron or the steam; and coal, therefore, commands this age – the Age of Coal. Coal in truth stands not beside but entirely above all other commodities. It is the material energy of the country – the universal aid – the factor in everything we do. With coal almost any feat is possible or easy; without it we are thrown back into the laborious poverty of early times.<sup>20</sup>

And now here are the last lines of the same work, whose tone is diametrically opposed to the beginning:

When our great spring is here run down, our fires half burnt out, may we not look for an increasing flame of civilization elsewhere? Ours are not the only stores of fuel. Britain may contract to her former littleness, and her people be again distinguished for homely and hardy virtues, for a clear intellect and a regard for law, rather than for brilliancy and power. But our name and race, our language, history, and literature, our love of freedom and our instincts of self-government, will live in a world-wide sphere. ... The alternatives before us are simple. ... If we lavishly and boldly push forward in the creation and distribution of our riches, it is hard to over-estimate the pitch of beneficial influence to which we may attain in the present. *But the maintenance of such a position is physically impossible. We have to make the momentous choice between brief greatness and longer continued mediocrity.*<sup>21</sup>

How can Jevons first celebrate the tremendous historical and economic opportunity of easy access to an abundant driving force, which assists all of our activities ('the universal aid') and is apparently able all by itself to define an era, and then sketch the dark future of an inevitable decline, which varies only in its brutality? Why, more simply, is the end of ecological limits not a sign of material autonomy, but rather of increased dependencies? In any case, these declarations are enough to put into perspective the widely held idea of modern ecological sovereignty, of total domination of the environment by industry.

The riddle that Jevons seeks to solve first involves the quantification of the kingdom's coal resources, and above all the period during which England can count on them to fuel its economic, military and political domination over the world. The problem that arises takes the form of an equation with three unknowns: first, the estimation of the gross quantities of coal contained in the subsoil, i.e., a geological problem; second, the estimation of the growth rate of the population and the



per capita consumption of this resource, i.e., the speed at which the stock will run out; and finally, the engineering problem posed by the accessibility of resources, in particular the depth of the seams, which influences the cost price of coal by increasing the investment required. These questions, which the economics of natural resources and their exhaustion did not encounter again until much later, after having been ignored for some time,<sup>22</sup> converge in a forecast from which Jevons concludes that England must expect to see its techno-industrial ascendancy fade within a century.<sup>23</sup> In addition to the fact that this forecast turned out to be quite realistic, it must be remembered from these calculations that the political monitoring of coal stands out as a crucial question for the present and the future of the nation. Jevons noted that by 1865 it was already impossible to find a sphere of economic activity that did not depend directly or indirectly on coal, the truly universal aid, the essential mediator of the most characteristic mechanical and chemical operations of modern life.<sup>24</sup> Coal was the starting point of an extremely vast and plural technological network which linked industrial processes, the transport system (especially rail and sea), but also ancillary technology such as the pumps necessary in the mines themselves; it also led to a series of secondary innovations made necessary for the exploitation of these basic technologies, such as the development of railway bridges.<sup>25</sup>

This factual dependence, the subject of an entire chapter of the book, is then taken up more conceptually in one of its most important connections. Jevons claims that, more than coal itself, it is the economics of its use that is the central element of his investigation. This point directly depends on what economists call the 'rebound effect' theory, or the 'Jevons paradox': it shows that the fuel savings achieved through the improvement of the steam engine from Savery and Newcomen up to Watt and his successors did not lead to a net reduction in consumption, but to an increase. Indeed, the steam engine went from the stage of experimental object to that of functional instrument via a series of technological improvements that made it commercially viable by increasing ten- to fifteen-fold its energy efficiency between the mid-eighteenth and the mid-nineteenth century. The coal that powered the machinery thus became economically interesting only once the machines were sufficiently economical to compete with other driving forces, such as human or animal force, wind or water. But since savings were thus made, an equivalent capital was made available and oriented towards new technological investments. This is what led to this counterintuitive statement, which would then assume a more general value in economic theories: the more we save on coal, the more we consume. Jevons writes: 'It is the very economy of its use which leads to its extensive consumption.'<sup>26</sup> The abundance of stocks and the

ease with which they could be used were therefore themselves subject to a sparing use, which alone entailed a relative advantage compared to other energy systems and other competing economies and to the time perspective of the depletion of the resource or its skyrocketing price. But this necessary parsimony, which made the resource competitive and the technological system functional, at the same time freed up a process of increasing consumption. Industrial civilization was thus set on a very singular path to a paradoxical servitude to that which released power.

This is why Jevons is also interested in the question of the substitution of alternative energies for coal. He first notes the advantage, from the point of view of economic efficiency, of coal over hydroelectric power,<sup>27</sup> but above all highlights the way that the attainment of a very high level of material development constituted a kind of ecological booby trap for England. Admittedly, the Malthusian limitations of the organic economy were exceeded, but the trajectory of rapid material development and the need to maintain and feed an increasingly massive technostucture made it all the more dangerous to put the energy system out of action. However, when this system is decoupled from the cycles which associate the land with the living components that capture energy and restore it (plants, animals, men), it can completely collapse and bring down the edifice of industrial civilization with it. Jevons makes this energy lock-in perfectly clear when he writes that the energy supply of coal in 1865 was equivalent to the exploitation of a forest with a surface area two and a half times that of the United Kingdom.<sup>28</sup> Recalling Fichte's analyses of modern ubiquity and foreshadowing current calculations of our carbon footprint and our ecological debt, Jevons undoubtedly provides here, for the first time, a spatial equivalent of the overspending of the energy budget for which England was responsible because of the new metabolic pace that the country was setting. Jevons shows that England was in a difficult position with respect to the carrying capacity of its internal space and that while the new regime of extensive growth was not strictly speaking an illusion, it *would* be illusory to think that there was no energy bill for fossil abundance. In short, once the coal had been used up or made commercially unsustainable, England would never be able to sustain this growth on the basis of its own resources. Industrial civilization was faced with a major problem.

Jevons adds two aggravating factors to this finding. First, he notes that the extensive growth made possible by fossil fuels essentially results in a population explosion. It is therefore human beings, the population, who absorb the net increase in available resources (to which we must add the improvements in medicine): abundance, if it exists, mainly consists of an abundance in men and in women, rather

than a greater and more equal availability of resources to the overall population. This problem, which obviously echoes Malthus's analyses, was resolved, at the time he was writing, by migration, in which the 'surplus' population left to settle on the edges of the British Empire.<sup>29</sup> The second point relates to the relationship between trade and energy. In his view, the strategic nature of the resource, the fact that it cannot be replaced, makes it unsuitable for international trade. Who, in fact, would like to exchange the very engine of civilization for money? Jevons explains France's backwardness by its lack of coal, which condemns it to buying it at a high price from its rivals, to the detriment of its general development. But independence is only a temporary relief: once the period of the high rate of a return on mines has passed, the capital accumulated in the kingdom will not be able to function as a substitute. Indeed, insofar as coal is what allows England to import other raw materials, in particular food, in mass, it cannot also import coal, which makes this ecological-economic asymmetry possible.<sup>30</sup> These demographic and commercial factors constitute the two fundamental forms of the irreversible character of the fossil economy – the trap it will make England fall into.

The state of servitude that Jevons is trying to describe and analyse contains an absolutely crucial reflection on modern industrial civilization. The relaxation of Malthusian pressure made possible by access to new energies, combined with the arrangements for intensive growth set in place before, represents an unlimited economy, bringing with it the realization of the cornucopian imaginary as it has been constructed since at least the seventeenth century.<sup>31</sup> But the resource itself is finite, and the technological and ecological sovereignty of the industrial empire appears to be dependent on a headlong rush: the economy is doomed to grow in order to keep demographic pressure at bay, and technological and commercial substitutes are unreliable, so that the horizon of the geological exhaustion of the coal seams suspends modern history itself. 'We are no longer independent', writes Jevons; British economic power is dependent on a temporary comparative geological advantage, and, most importantly, 'while other nations subsist on annual and sustainable income from crops, we are increasingly dependent on a capital which does not reproduce from year to year, which, once consumed in the form of heat and motive force, is dissipated forever in space'.<sup>32</sup> Jevons notes the peculiarity of an unprecedented situation in which almost the entire operational and productive technological network depends on a single energy source, whose stocks are moreover limited. What is at stake, Jevons says in the final lines of his book, is 'our love of liberty and our instincts for self-government'. The idea that emerges is that of a tension between the ideal of liberty and the ideal of self-government, in other words autonomy, and the

means it has used to realize itself and spread throughout the world. As it will inevitably be deprived of these means in the near future, the ideal of English autonomy is doomed to a bleak future.

When viewed in the wake of a geological and economic advantage, autonomy takes on a very different hue from what eighteenth-century thinkers had conceptualized, and was also very different from what the French Revolution sought to embody. And yet, the English way would very quickly spread across Europe, and soon there would exist, in matters of political autonomy, only this perfectly strange variant that in reality stemmed from the radical heteronomy of massive energy resources. This is the most striking feature of the exaptation of liberalism discussed above: the political autonomy of a community dependent on coal is both greater and more majestic than that of a community mired in old organic limitations, but it also comes up against another type of ceiling, another type of dependence. Once again, it is impossible to completely and ideally separate the political conquest of liberty, as an endogenous process, from the conquest of affluence: they inevitably intermingle.

Let's put it simply: if, with Guizot, you scratch a little below the surface of the ideal of autonomy, you will find in it a difficulty related to affluence; if, with Jevons, you scratch a little below the surface of the ideal of affluence, you will find there, conversely, a difficulty linked to autonomy.

### **Colonial extractions**

This constitutive ambiguity of modern ideals can be explained, as suggested above, by the historical gap between a first wave defined by the improvement of living conditions within the limits of the organic economy, and a second made possible by the development opened up by coal. It is in the gap between the organic Enlightenment and fossil liberalism that the enigma of modern politics might lie. But it must also be related to a spatial, geographical shift, which tended to increase and to be systematized during the nineteenth century, although it was rooted in the era of the 'great discoveries'.<sup>33</sup> The development of a global division of labour, combined with the technological, political and military asymmetries of the colonial system, was indeed one of the most striking phenomena of the time, and it was inseparable from the industrial and political revolution that we have just described. Obviously, the massive projection of economic, technological and human resources beyond the borders of Europe by the great imperial nations was closely connected with the modernization of collective human relationships with nature.

In an important work, the historian William Cronon has shown that the construction of the prototypical landscape of modernity took place in a colonial context: the elimination of large predators, the clearing of forests and the modification of the climate, the genocide of native populations deemed not to be landowners: all these processes were deployed in New England over several decades.<sup>34</sup> This brutal reconfiguration of the land and its occupants, which in a way reprised a few millennia of European history, left the field open to the exploitation of colonial resources, an exploitation that was particularly intense in tropical areas. Since Eric Williams and C. L. R. James,<sup>35</sup> who have had a decisive impact, links between the plantation economy and the slave system have laid bare the extraordinary gap that compromises the liberal pact. It is obviously no coincidence that the emergence of movements for independence, justice and equality took place in slave societies, in the Caribbean and elsewhere, on the basis of this observation. The superimposition, in small spaces, of colonial and racial violence, of techniques for appropriating the value of land and labour, and the dissemination of the revolutionary idiom, gave rise to explosive situations emblematic of the contradictions of modernity. Here again, the ecological dimension and the question of land were, much later, the subject of a more specific analysis. The anthropologist Sidney Mintz, for example, has described the affinity between the development of a production intended for distant markets (sugar), the establishment of risk-resistant financing circuits that could tolerate deferred returns on investment, the extreme rationalization of labour in the plantation, and the model of industrial monoculture. The exclamation of the Surinamese slave in Voltaire – ‘It is at this price that you eat sugar in Europe’ – foreshadowed the revolutionary explosion of the extractive peripheries of modernity.<sup>36</sup>

Later, important studies in the field of global, or colonial, environmental history shifted attention elsewhere. Many scientists and engineers found themselves embarked on expeditions of discovery and colonization, and their role was often fundamental in the construction of the domination of colonial territories and their resources.<sup>37</sup> They found themselves, alongside lawyers and, of course, various civil and military administrators, at the forefront of the modernization of the world. The climatic, zoological, botanical difference of the regions targeted by colonial expansion provided these naturalists and the knowledge they developed with abundant material and opportunities for ‘life-size’ experimentation on environments and human beings.<sup>38</sup> And even if colonial science was not reducible to its immediate economic applications, since it also had the function of constructing the popular imperial imaginary, the sheer biological variety of the world was obviously exploited by large-scale commerce, whether to

supply Europe with new goods, particularly sugar and cotton, which soon became essential, or to lower the price of certain necessities such as grain or wood. The great history of political and material autonomy, considered from the point of view of its peripheries, presents itself in a completely new guise.<sup>39</sup>

All this work on colonial economics and science raises a terrifying question. To what extent is the political autonomy of Western nations, as a project but also to the extent that it has been partly achieved, dependent on these asymmetries of power and knowledge? Is autonomy something you buy, a luxury that you can afford when you illegally profit from the riches of others? The intersection between the history of science, environmental history and colonial history is indeed most often based on the identification of the project to rationalize collective human relationships with nature with the project to impose a political and economic domination of the peripheries. The constant back and forth between the imperial 'laboratories' of botany and zoology, but also between the discipline of labour and extraction, on the one hand, and the modernizing poles where this knowledge and these techniques are put to use, on the other, in fact means it is no longer possible to separate emancipatory Enlightenment in its domestic dimension from its dark side, which takes the form of domination and colonial violence. It is the modern project which, in the harsh light of an environmental and decentred approach, appears as a structurally asymmetrical mechanism.

Now, if we make the assumption that a certain prosperity is necessary to pacify the social body and create a fairer distribution of rights and possessions, we are entitled to assume that this prosperity, and therefore the resulting gain in political autonomy, owes something to the violent appropriation of peripheral wealth, which fuelled economic centres that were thus relieved of part of the ecological burden of development. The fact that the industrial democracies of the twentieth century were also the colonial states of the nineteenth, or their heirs, lends support to this hypothesis, whose conceptual significance is of exceptional importance. This means that the order of law, political equality and liberty, which Europe claims to have developed within itself and then, in some cases, to have granted to the rest of the world, is itself the product of an illegitimate initial appropriation. The suspicion weighs heavily, the elements in its favour are massive: autonomy and affluence in the West mean heteronomy and precariousness in the rest of the world.

We also know that the colonized peoples very often exploited the modernist rhetoric of rights and their universality to free themselves from their condition, thus introducing a higher level of complexity into the problem posed.<sup>40</sup> These processes require that we recognize

a non-Western use of so-called 'modern' political concepts, which leads us to believe that the ideal of autonomy cannot be reduced to the false colonial conscience occupied in concealing its own crimes. In its strategic transposition by the movements of emancipation in the periphery, of which Toussaint Louverture is one of the main symbols as regards the nineteenth century, this ideal comes up against the modes of construction of affluence, of the productive and extractive relationship to the land and to labour. This does not, of course, limit the suspicion raised above, but it does presuppose that we envisage a modern – albeit not necessarily Western – critique of the liberal pact and development.

The connection between autonomy and affluence therefore poses a particularly keen problem if one analyses it from the point of view of the geographic and political asymmetries of the nineteenth century. What relationship can we establish between the success of the liberal paradigm in the nineteenth century and the geo-ecological structure of trade? More precisely: how could a system of values and political representations born in the context of an organic economy, still only marginally integrated into a globalized market and division of labour, have persisted without major modifications in a completely different material and political context? Nineteenth-century liberals, who theorized and promoted commercial and industrial modernity, in fact for the most part insisted on the endogenous and self-sustaining character of technoscientific inventiveness, the high quality of their institutions and the gains in productivity achieved through the division of labour, and the spirit of thrift and sacrifice. The factors of development were therefore the same as in the eighteenth century, and the gradual emergence of a world economy and mass industry did not affect the conditions for the achievement of individual and collective liberty, any more that they implied a debt – moral and material – with regard to the 'peripheries'. The individualist ethics of the first liberals, which was to contain in germ both the improvement of the material fate of the population and their access to a higher degree of civility, was thus transported into a new world, which it did not entirely suit.

The hypothesis that needs to be made is therefore the following: if the liberal meaning of liberty was able to maintain itself as the dominant form of the modern political project in the nineteenth century, it is because the global geo-ecological asymmetries, in parallel with the new conditions of production, were not taken into account. There was a gap between ideas and practices, a gap that can be related to a temporal and spatial imbalance: everything that took place far from European economic and intellectual centres lay somehow outside the perceptual horizon of the theorists of modernity, concerned as



they were with the elimination of institutional obstacles to innovation and the movement of goods.

### **Extraction-autonomy: Tocqueville**

Rather than seeing the modern political project as an intrinsically colonial ideological formation, i.e., as a veiled instrument for the domination and subjugation of non-moderns, I wish to point out the discrepancy between two elements. On the one hand, a critical liberalism, which in the eighteenth century was able to identify the immanent rationality of the social body and to re-found politics on the will of all – sometimes including non-European peoples; on the other, a consolidated liberalism, which in the nineteenth century reduced this social reflexivity to a march towards progress understood as an endogenous and self-sustaining process on the part of the West, one that often became the vehicle of a ‘scientific’ racism intended to justify the double colonial standard.<sup>41</sup> However, this difference between two generations can be partly explained by the non-integration of the specificities of industrial production, and also by the absence of colonial reflexivity. By this, we mean a deepening and a displacement of the categories of modern thought in the light of the geographic asymmetries in the process of constitution and solidification, whether in their strictly political dimension or more broadly in their socio-ecological aspects. The inhibition of this reflexivity is easy to understand: how, in fact, could it be admitted at the time that the movement imparted to society by measures of improvement and by technoscientific innovation was, as Pomeranz shows, brought about only with the help of largely contingent, and in any case exogenous, historical factors? This would have been to return to an unacceptable form of heteronomy, of dependence. How could they have warded off the narcissistic tendency to claim credit for a success which, related to this contingency and to geo-ecological dependencies, appears in a much less flattering light? Ironically, it was precisely at the very moment when the great European nations could consider themselves masters of their history, certain that they could completely determine the rhythm and the direction of their advance, that history underwent two major changes. As Jevons has shown, access to fossil fuels represented a major compromise with classically defined autonomy, but even before that, borrowing from colonized spaces and people was a compromise with the liberal ideology of self-control and control of one’s history.

It is in this context that was established a concept of autonomy that we will call here *extraction-autonomy*. The project of autonomy consists, it should be remembered, in forming a political community transparent

to itself, which determines its laws and its orientations according to this knowledge, this representation. Thus, special interests, theological authorities and natural contingencies can no longer dictate their law to this community, which maintains with itself a privileged relationship of transparency and radical constitution, from which the liberation of individuals ensues. But this is only a concept, an ideal. Its 'extractive' character is characterized by a growing gap between this project and the conditions in which it manages to be realized: as soon as access to new productive processes and inexpensive and abundant energy sources, combined with violent appropriation of land and labour placed under colonial authority, becomes a determining factor in the pursuit of the project of autonomy, any conception that does not take these geo-ecological conditions seriously is ruled out of court. One of its most striking theoretical expressions is Tocqueville's extraction-autonomy, which we will contrast later with *integration-autonomy*.

From his trip to America, Tocqueville brought back one of the founding tales of the second wave of liberalism, *Democracy in America*. The society he describes has integrated the republican and democratic values of liberty and equality as second nature: born from the rejection of the domination exercised by the English aristocracy, the United States immediately enters history as an autonomous nation, unlike the continental republics. Liberty is their *raison d'être*, equality is in principle the condition of the men who live there, wherever they come from. *Democracy in America* is not known as an essay on the economic dimension of liberalism: Tocqueville focuses on the institutional and moral factors that explain American success and that make it a model both for Europe and for political science in general. He recognizes, however, like most liberals, that one of the main benefits that a people derives from the removal of tyrants is the opening up of economic opportunity.<sup>42</sup> Limited government, respect for rights and equal opportunities – these are things that find no better expression than the development of business and industry. Successive waves of migrants then settle on a continent-state where freedom and affluence seem inseparable. A rich and prosperous nation, citizens capable of placing their hopes in the enjoyment of the goods of this world and of not allowing hunger to inspire them with tumultuous passions they cannot resist – all this stems from a healthy resolution to apply liberal principles literally, including the establishment of institutions to protect property.

Tocqueville mentions, however, in one strange chapter, a radically different hypothesis. What if it was, on the contrary, the natural wealth of the American territory that made possible the emergence of a democratic society? In other words, are there ecological conditions for equality and liberty? Our author calls these causes 'Accidental or

Providential',<sup>43</sup> designating thereby the almost unlimited extent of available fertile land, the presence of minerals, forests, etc.<sup>44</sup> Except for such details as the elimination of the Amerindian populations – who in any case 'took no thought of the natural riches of the soil' – and the deportation of millions of slaves to the plantations of the great South, the Americans have a treasure that they simply need to exploit.<sup>45</sup> 'Their ancestors', wrote Tocqueville, 'gave them the love of equality and of freedom, but God himself gave them the means of remaining equal and free, by placing them upon a boundless continent, which is open to their exertions.' Then: '[I]n the United States not only is legislation democratic, but nature herself favors the cause of the people.'<sup>46</sup> Finally: 'Everything is extraordinary in America, the social condition of the inhabitants, as well as the laws; but the soil upon which these institutions are founded is more extraordinary than all the rest.'<sup>47</sup> So perhaps it is American geography that reveals the secret of the prosperity and the democratic spirit of its new inhabitants.

For a nineteenth-century liberal such as Tocqueville, this admission is not self-evident. Democratic arrangements are not so much the cause of prosperity as the side-effect of natural abundance, of a Providence whose fruits simply need to be reaped. In other words, it is legitimate to interpret the other causality, going from the land to autonomy, as the betrayal of a well-kept secret. Let us summarize this secret: the pact that was forged between economic growth and democratization of society, of which the political economy of the eighteenth century was undoubtedly the first substantial formulation, presupposes that abundant reserves of land and riches be made available. The virtuous dynamic of individual interests and egalitarian institutions, which is the pride of the liberals, formerly as today, cannot function durably if it is not fuelled by an adequate material influx. No prosperity without property and market – is this the official doctrine of liberalism? The unofficial doctrine suggests the opposite: it is the intensive exploitation of natural resources that makes possible the genesis of an egalitarian society. Thus, the liberation of human beings lies above all in the disinhibition of the productive instincts, which cannot be achieved without some room for ecological manoeuvre.

Tocqueville's reflections on the relationship between democratization and affluence clearly express the extractive concept of liberty. While fully aware of the fact that collective autonomy is *de facto* fuelled by an ideally unlimited access to material wealth, he maintains a theory in which the democratic spirit is *de jure* the generator of its own movement. Tocqueville is not unaware of what it costs to take the fruits from such a generous soil – in particular in terms of cultural destruction – and he is not unaware of what this affluence makes possible on the economic and moral level, but he registers these phenomena only as a

series of peripheral accompaniments to a fundamentally institutional process. The pervasive ambiguity in his reflection on the relationship between the natural environment and democracy is indicative of how important it was at the time, for a liberal, not to say explicitly how greatly political autonomy was ecologically constrained, while showing himself perfectly capable of explaining these processes. In this sense, Tocqueville reveals one of the most striking blind spots of what others have called ‘providential republicanism’:<sup>48</sup> if it goes without saying for the American civil consciousness that the consolidation of political rights goes hand in hand with wider access to consumer goods, the idea that the former have a causal power over the latter falters as soon as one pays attention to its actual formulation. The alliance between ‘physical good’ and ‘moral good’, to which Mill also refers in the last lines of his *Principles of Political Economy*,<sup>49</sup> ultimately appears to be a conviction that is all the more firmly held because it contravenes known facts.

\* \* \*

But let us leave Tocqueville and his contemporaries and bring this chapter to a conclusion. The development of a social reflexivity, which made the cause of the people appear as a now inevitable actor, able to change the course of history, occupied most philosophical endeavours long after 1776 and 1789.<sup>50</sup> The concretization of this political reason rested to a huge degree on an alliance between the political and legal modernism of the republicans and the political economy of property, of profit: for many, the autonomy of the community and its historical power are most manifested in the increase in wealth and control of the environment, in the government of nature. But the association between property, the market and the selective representation of individuals, which forms the dominant ideological foundation of liberal modernity and its interpretation, captures only a very small part of the interdependencies that make up this world. The decisive contribution of economic and environmental history, and of the history of science and technology, makes it possible to extend the range of the social and socio-ecological relations that play a part in our understanding of this modernity. The notion of extraction-autonomy catalyses these critical historical contributions in a conceptual formula that expresses the imbalance between freedom and its world.

Smith’s proto-industrial liberal model provided a stylized version of the conquest of freedom and wealth based on a conscious selection of the moral, practical and material determinants that it involved. But the necessarily partial nature of this model, and especially the radical transformation of the material base of modern societies between the 1770s and the end of the nineteenth century, caused a break between the

experimental model of liberal emancipation and the environment with which it was to be associated. The emergence of extraction-autonomy was the consequence of the inability to reconsider the relationships between collective action and the prevalent material determinants: the system of rights, when detached from the geo-ecological transformations that came with industry and the colonial system, no longer had the same meaning in the middle of the nineteenth century as it had a few decades earlier, since it had remained the same in a completely different world.

The ideally closed relationship with itself that society was obliged to construct therefore ended up functioning as an obstacle to the identification of this ecological slide. The complementary anxieties of Guizot and Jevons, the inability to absorb the colonial system politically already perceived by Fichte, resulted from these tensions internal to the ideal of autonomy. The concealment of the material dimension of liberty, which would need the rise of the socialist movement to be understood, was therefore not due to the all-powerful ideology of domination and control of nature, as most environmental historiography asserts. It was, more precisely, the inability to give political meaning to the interdependencies between modern society and its world, its resources, its environments, and its spaces, which left the field open to ecological predation. The political question of ecology is thus deeply rooted in the tensions and contradictions of the modern project, and not only in the initial error that apparently constitutes the instrumental, domineering attitude.

## *Industrial Democracy: From Proudhon to Durkheim*

### **Revolutions and industry**

The following three chapters are devoted to the study of socialist thought from the perspective of an environmental history of ideas. It is not a question of knowing whether or not socialism was a precursor of ecological thought, but of understanding how the relationships between affluence and freedom are worked out in authors such as Saint-Simon, Proudhon and Marx, followed by Durkheim, Veblen and Polanyi. More precisely, we will investigate how the characteristics of the new industrial ecological regime were integrated into a resumption of emancipatory thinking. We will therefore here define as ‘socialist’ *a conceptual effort for which the achievement of political modernity depends on taking into account the social effects of material affluence, of the productive and industrial orientation of civilization*. Socialists are those authors and actors who conceive of liberty and equality in direct reference to the industrial organization proper to their time and to the pathologies that it induces on the collective body and its way of relating to the world. They are those for whom the conquest of autonomy by the political body is connected to the question of collective relationships with the physical living world and the status of the mediations that relate us to it. While in the different varieties of liberal thought the ideal of liberty is insensible to the transformation of the new technological and economic conditions specific to the nineteenth century, socialism takes structural charge, in the form of a political and sociological problem, of the tension inherent in the new world of the market and industry.

In 1846, Proudhon wrote: ‘The French Revolution was effected for industrial liberty as well as for political liberty: and although France in 1789 had not seen all the consequences of the principle for the realization of which she asked, – let us say it boldly, – she was mistaken neither in her wishes nor in her expectation.’<sup>1</sup> ‘Industrial liberty’ is

indeed a new challenge for political philosophy, but this, Proudhon tells us, can be thought of in the heritage of the great Revolution, beyond the economic and technological developments that distinguished the nineteenth from the eighteenth century. From one revolution to another, from the revolution of rights to the industrial revolution, the aspiration to autonomy has been transposed into a new world, and must be redefined in its political substance – and not simply as an extension of political rights to social rights.

The line of thought that unites Proudhon (1809–65) and Durkheim (1858–1917), first-generation socialism to scientific sociology, finds its coherence in the response to the challenge that industry poses to democracy – in other words, in the problem of the social rebalancing necessary to prevent the increase in productive forces from leading to the disintegration of the social body and the forms of solidarity on which it is based. Beyond a doctrinal and ideological kinship that links socialism with sociology, beyond the close historical link that makes the latter a re-elaboration of the former,<sup>2</sup> their coherence is to be sought in the common enigma which they seek to resolve: the political domestication of a seemingly irreversible forward march, that of the acquisition and circulation of things. If sociology can assert the consistency of an object of study called ‘society’, it is first of all because this object has revealed itself to itself in the experience of the revolutionary break and transformations of labour. This new kind of political question, which would preside over the birth of a new science, presented itself as a break with the liberal conception of liberty, i.e., extraction-autonomy. Proudhon and Durkheim have industrial liberty as the base and horizon of their thought, and the new paradigm they promote is that of integration-autonomy: a politicization of collective relations with the material world that effects an essential reversal of modern political grammar. However, in identifying the affinity between the incompleteness of the Revolution and the emergence of a new economic regime, it was Proudhon who most clearly developed this question around the 1840s. An autodidact from Franche-Comté,<sup>3</sup> described by Marx as ‘without embarrassment’ and a little ‘boastful’,<sup>3</sup> Proudhon is an author whose importance in the history of political thought deserves to be reconsidered.

### **Property and labour**

It has been said that the years between 1789 and 1848 constituted the ‘age of property’.<sup>4</sup> Defined in the French Civil Code as the ‘right to enjoy and dispose of things in the most absolute manner, provided that one does not make a use of them prohibited by law or by regulation’,<sup>5</sup>



property was in fact conceived as the legal base of equality and liberty, i.e., as the practical condition of an equalization of conditions and a liberation of all from the servitudes affecting both human beings and the land under the *ancien régime*.

It was in this context that the rigorous defence of property could appear to the young workers' movement as the instrumentalization of revolutionary political grammar in the service of a new established order. Jurists at that time acquired significant intellectual prestige and high positions in the administrative apparatus of the various successive political systems. Characters such as Portalis, Troplong and even Jean-Baptiste-Victor Proudhon, a distant relative of Pierre-Joseph, exercised an almost unrivalled authority in the space of political thought. So they could, for example, reaffirm that 'property and the law were born together and will die together',<sup>6</sup> and therefore equate public order with the maintenance of property. The jurist Belime wrote: 'Once the principle of property is attacked in its legitimacy, the law itself is called into question, because it is on property that society, laws and even morality rest.'<sup>7</sup> In 1848, Adolphe Thiers devoted a monumental study to the defence of this principle, in response to what appeared to him, too, as the most serious of all threats against the social and republican order.<sup>8</sup>

But the economists were not to be outdone. Thus, Jean-Baptiste Say writes:

The speculative philosopher can occupy himself with seeking the true foundations of the right of property; the legal specialist can establish the rules which govern the transmission of possessions; political science can show what are the surest guarantees of this right; as for political economy, it considers property only as the most powerful incentive for the multiplication of wealth.<sup>9</sup>

Viewing property in this way, as an economic lever, was in line with the law of expropriation for public utility of 7 July 1833, which defined what one might call the law of industrial arbitration. This law was drawn up and passed in response to the problem posed by the installation of the railways: the new transport infrastructures were doomed to encroach on private plots, cultivated fields and dwellings, and investments could be made only if common ground were found between the owners to be compensated and the project promoters. These arbitrations were indicative of the power relations between the different economic actors and the subjects of law in the context of the technological modernization of France, because the criterion of 'public utility', already established in the decree of 1810 mentioned above, tended over time to benefit large-scale investment (sometimes,

as in the case of the railways, at the instigation of the state), to the detriment of small properties and small-scale manufacture.

‘Under the pressure of “industrialism”,’ write Kelley and Smith, ‘the idea of private property assumed an importance never before attained and was distorted to the point where it was no longer possible to recognize it.’<sup>10</sup> Individual ownership of the land had been put forward to guarantee the economic and political autonomy of the majority peasant class, but the conditions of industrial activity entailed a complete transformation of this legal and social structure. Indeed, capital was never valued as highly as in the form of a massive investment, but on the condition that a certain number of guarantees were combined to secure this profitability. Exclusive private property, and the criterion of social utility, associated with mechanisms such as the joint stock company, played a preponderant role in this shift in the principle of property from a protective function to a function subordinated to the trend to accumulation. It was now easier to understand why Proudhon’s claim that ‘property is theft’ was a bombshell in the context of the social and political debates of the time. Beyond the manifest provocation, which saw the bourgeoisie as just as heavily implicated in illegality as the so-called ‘dangerous’ classes, this declaration sought to draw attention to the growing tension between the promise brought by property rights in their classic formulation and the injustice of the actual social relationships enshrined in this legal system. In short, the inclusive nature of the ideal of private property contradicted the reality of the exclusions that it most often organized.

Proudhon’s 1840 essay on property expressed in the clearest possible terms the economic and political slippage made possible by property.<sup>11</sup> The historical reconstruction that Proudhon proposed passed first through the constitutive myth of natural law, already mentioned in connection with Grotius: it is necessary to extract the essential goods from the primitive commons in order to guarantee the security of each person and ‘to secure to the farmer the fruit of his labor’.<sup>12</sup> But what appeared to be a principle of protecting labour from depredation gradually changed dimension and took the form of a dogma fanatically defended by the landed class and its heirs. After the substitution of labour for land as a key factor in enrichment, the paradigm of property retained its constraining and structuring force in the legal sphere, neglecting both the social asymmetries made possible by this concept and the manifest obsolescence of an ideological principle out of kilter with the current economic regime.

The persistence of the exclusive relationship to the land as a prototype of a proper relationship to things, and incidentally of the proper relationship between human beings, obscures other possible relationships. ‘The land is indispensable to our existence, – consequently a

common thing, consequently insusceptible of appropriation'; land is like 'water, air, and light', which are 'common things, not because they are *inexhaustible*, but because they are *indispensable*'.<sup>13</sup> Proudhon specifies:

Thus the law, in establishing property, has not been the expression of a psychological fact, the development of a natural law, the application of a moral principle. It has literally *created* a right outside of its own province. It has realized an abstraction, a metaphor, a fiction; and that without deigning to look at the consequences, without considering the disadvantages, without inquiring whether it was right or wrong.<sup>14</sup>

The obsession with property therefore translates the dominant class's strategic maintenance of a fantasized spatial and economic order, in clear contrast with the material conditions of industrial societies; and the internal contradictions of this arrangement, which has become an ideal, merely prefigure the opening of a reshaping and reconfiguring of people's social relations to things.

Parallel to the question of property was the question of labour, as the main cutting-edge problematization of the present; property and labour taken together form the 'labour question'. If property is meant to regulate the form of economic and social relations, it is labour that gives them content. Indeed, for the dominant political economy as well as for its critics, the productive relationship appears as the practical instance that realizes the specific vocation of human beings to exploit and transform the world. Before Proudhon, it was mainly Louis Blanc who, in *L'Organisation du travail* [*The Organization of Labour*], most profoundly developed the question of labour as a testing ground for the capacities of liberal political economy to effectively provide democratic society with its structure. The objective of this book is to show that the opening of economic possibilities by the market and technological investment have consequences that are the complete opposite of those to which its defenders point. The case of the railways provides a remarkable example: in an organized society, they comprise

an immense progress, [but] in ours they are nothing but a new calamity. They tend to make lonely those places where there is a lack of manpower, and to pack people together where many ask in vain for a little place in the sun; they tend to complicate the horrible disorder that has arisen in the classification of workers, in the division of labour, and in the distribution of products.<sup>15</sup>

The railway ideally embodies the association between political autonomy (external disturbances linked to the environment are held

at a distance) and the quest for prosperity, but, in its concrete application, this innovation leads, according to Louis Blanc, to breaking up the previous coordination of the various activities in space, since it makes job opportunities disappear as much as it creates them – all the professions of portage and the need to care for horses linked to the old system were doomed to disappear without financial or statutory compensation. The railways massively redrew the economic landscape of nineteenth-century France, and redistributed opportunities and obstacles by concentrating activity on nodal points and simultaneously creating devitalized zones. The interests associated with the railway, interests that claim to embody public utility, therefore come into tension with the public sphere because the means they employ have properties irreducible to the fetishized status of ‘engine of progress’. Their effects on space, on the structuring of professions, on the relationships between infrastructure and labour are heterogeneous to the desire they purportedly seek to embody – it is this ‘agency’ of the railways that causes disruption in an industrial society of which, however, they are the symbol.

The observation that labour, a central element of post-revolutionary society, finds itself in a state of total disorganization is linked to the failure of what Joseph Schumpeter would later describe as the process of ‘creative destruction’:<sup>16</sup> technological evolution and the transformation of the structures of capital certainly bring new economic opportunities to light, but the destruction of old trades and social dynamics is still clearly visible. There must be victims,<sup>17</sup> concludes Proudhon from a similar analysis, because if all the losers in a period of economic and technological transition are compensated by the investor, then the latter can never realize a profit. In the transitional period of the early nineteenth century, when the industrial form of society has not yet been translated into solid regulatory institutions, destruction still prevails over creation, and it is the social order overall that suffers.

Louis Blanc sees perfectly well that the advent of the modern political subject is dependent on a lack of organization of labour: ‘Wherever the certainty of living from one’s labour does not result from the very essence of social institutions, iniquity reigns.’<sup>18</sup> With him and after him, the whole socialist movement would work out this contradiction between two ways of conceiving labour and property. On the one hand, they are considered as universal anthropological givens that are deployed without any collective will needing to intervene, and it is the market form that imposes itself as a structuring institution. On the other, property and labour are conceived as the central elements of a dynamic both social and material, of a conscious interrelating of individuals with each other and of their collective integration into the

outside world through the relationship of production. Under these conditions, the technological evolution and business cycles brought about by the interplay of competition and monopolistic tendencies are incapable of achieving on their own the type of association that suits the social body: Whoever, in order to 'organize labour', appeals to 'power and capital' has lied, as Proudhon put it.<sup>19</sup> Labour and capital are not called into question as productive forces, or as the means of gaining an increasing control over the world, but as symbols of the self-organization of society by economic means.

### **Proudhon as critic of the liberal pact**

Proudhon took the radical critique of the fundamental concepts of modern political economy – property and labour – very far, notably in the diptych constituted by *What is Property?*, published in 1840, and the *System of Economic Contradictions*, subtitled *The Philosophy of Poverty*, published in 1846.<sup>20</sup> Not only does he set himself the objective of thinking out the conditions for 'industrial solidarity',<sup>21</sup> but he focuses his efforts on the paradox of the liberal pact: 'Machines promised us an increase of wealth; they have kept their word, but at the same time endowing us with an increase of poverty. They promised us liberty; I am going to prove that they have brought us slavery.'<sup>22</sup> So not only do poverty and wealth develop at the same time and from the same causes, but the unequal distribution of the benefits of progress compromises access to the nonmaterial, social good of autonomy. What is affected, over and above the physical state of the lower classes, is the association between freedom and wealth that had been established by liberal thought in the eighteenth century, and it is the symbiosis between two tendencies which, at the time, everyone thought of as one: progress under the law of property.

This idea itself has two corollaries. On the one hand, Proudhon makes the refusal of the Malthusian clause an essential conceptual criterion for social thought. By this I mean the subordination of the modern project to the limiting of the population, in other words the physical elimination or the banishment of supernumerary individuals. If material affluence is not to be absorbed by an overabundance of humans, the reproduction of the body social must be kept within strict limits guaranteed by a pruning of the portion of the population incapable of ensuring its subsistence. Proudhon, who obviously had only a limited knowledge of Malthus,<sup>23</sup> nevertheless granted him a crucial significance: socialism proclaims '*Everyone must live!*'<sup>24</sup> And the tension between affluence and freedom cannot be resolved by resorting to death. In the modern age, the patrician class has lost all rights of life

and death over the proletariat, even when delegated to the mechanisms of the market, so regulating the social sphere by mortality is quite simply contradictory. In return, the proletariat is granted a right to life that imposes a thoroughgoing organization to promote solidarity, an organization in which the improvement of material conditions has the preservation of all lives as its aim.

The second corollary to the breaking of the liberal pact is that the technological and scientific understanding of progress must be maintained, if only to guarantee the balance between population and production. Some of Proudhon's statements are consistent with liberal progressivism: 'With the introduction of machinery into economy, wings are given to LIBERTY. The machine is the symbol of human liberty, the sign of our domination over nature, the attribute of our power, the expression of our right, the emblem of our personality.'<sup>25</sup> Science and productive art are already incorporated into the legitimate demands that an educated subject can make in a context of material progress. If a solution to modern contradictions can be found, it will not involve the abandonment of relations of production, but rather the intensification of their political significance. Affluence and autonomy are put in tension, but no logical contradiction, no simple opposition can replace the inadequate liberal symbiosis. Affluence must be socialized, i.e., reoriented within the framework of an integration of the whole social body into the project of emancipation. Proudhon does not deny that there is a link between wealth and freedom, but nor does he accept the idea that this link imposes itself by the direct play of economic forces. The conflict in modernity between the aims of affluence and autonomy is therefore conceived by Proudhon as due to the backwardness of the forces of organization as compared to the state of the forces of production.

For example, Proudhon devotes one chapter in the *Philosophy of Poverty* to the tension between use value and exchange value, and thus highlights the mechanisms by which a logic of prices, i.e., of scarcity, replaces a logic of utility. He thus touches on the elementary principle of complex economies, one that is both absurd and, he says, 'insoluble':<sup>26</sup> commercial interdependencies, which develop at the same time as the gross increase in labour productivity, create an extremely severe distortion in the modes of access to useful resources. In other words, the interplay of commercial exchange and universal competition between sellers and buyers in a market where everyone seeks their interest cancels out the benefits of the material improvement obtained elsewhere. Proudhon clearly describes the consequences of this price system, something to which we will be returning when we discuss Veblen: depending on the circumstances, the massive harvesting of a particular useful good can cause the impoverishment

of its producers through the effect of lower prices, and, symmetrically, the scarcity artificially created by a monopoly or simply by storage and a slowdown in distribution can drive up prices, and therefore generate shortages for consumers.<sup>27</sup> Proudhon establishes that scarcity is not the opposite of material abundance, but its correlate:<sup>28</sup> the modern economy certainly produces more goods, but at the same time it organizes an increased rivalry for access to these goods, which leads to tensions in social relationships. The genesis of poverty amid affluence is therefore due to the priority given to exchange value, which can vary quite independently of the objective availability of subsistence goods.

Later in Proudhon's book, the antinomies of value resurface when he reflects on the difference between the cycle of needs and the business cycle. One of the clearest manifestations of the transition from one to the other is provided by the establishment of the railway system. Transport infrastructure is indeed a condition of material possibility for the development of an activity freed from geographic vagaries, and henceforth capable of forming part of a spatiality and a temporality that are specific to it, and over which it exercises an ideal level of control:

The railway, eliminating physical intervals, means that human beings can coexist with each other despite distance ... . Thus, just as the railway is free from the periodicity of the seasons seen everywhere in trade as well as in the extractive and agricultural industries, so it also erases and levels all the inequalities of position and climate, and makes no distinction between the hamlet lost in the plain and the manufacturing centre majestically seated on the rivers.<sup>29</sup>

While canals freeze, while overland roads are mired and congested and animals and men are fallible, the train owes its driving force only to an energy independent of climate, effort and disease. Merchandise is thus in a way freed from the 'frictions of the terrain',<sup>30</sup> it circulates without passing through the warehouse, and gives geographical primacy to crossing points rather than to stocking points, which are more characteristic of older economies. The railway is the channel through which the fossil order of coal most spectacularly enters socialist debates, because there is a close affinity between the flexibility of rail transport and the emergence of an autonomous business cycle. Its material characteristics make it a symbol of liberty seeking to escape from the environment and its constraints.

The concept of 'business cycle' is therefore the product of a mode of administration of nature which, by softening the physical



barriers that impede mobility, allows the economic sphere to partially extricate itself from territorial, morphological and climatic coordinates. Liberty is now deployed in the space defined and constrained by economic laws, by the march of time in which the oscillations of prosperity are certainly not completely stifled, but where they obey established dispositions, ideally under the control of autonomous actors. Constraint is not abolished as such, but – and this marks its difference from the old economic and ecological regime – it is endogenous to the social world, it is reintegrated into the heart of collective existence and no longer appears as a divine sanction or an effect of chance. This business cycle, an expression of the self-determination of human history, can be considered as beneficial or unfair, but by common consent it can be recognized by its heterogeneity with regard to the old ‘natural’ cycles from which the economy struggled to distinguish itself.

Proudhon himself established the link between the modern conception of emancipation embodied in the business cycle and the material possibilities of industry when he discussed a definition of liberty given by the liberal jurist Charles Dunoyer:

I call liberty that power which man acquires of using his forces more easily in proportion as he frees himself from the obstacles which originally hindered the exercise thereof. I say that he is the freer the more thoroughly delivered he is from the causes which prevented him from making use of his forces, the farther from him he has driven these causes, the more he has extended and cleared the sphere of his action. ... Thus it is said that a man has a free mind, that he enjoys great liberty of mind, not only when his intelligence is not disturbed by any external violence, but also when it is neither obscured by intoxication, nor changed by disease, nor kept in impotence by lack of exercise.<sup>31</sup>

This is a prototypical expression of what I have called extraction-autonomy. And Proudhon sees it as a negative, and therefore poor, conception of liberty: when it is ‘synonymous with freedom from obstacles’,<sup>32</sup> liberty merely reflects certain properties of the modern economic system which allow exogenous burdens to be kept at bay.

### **The fraternal idiom**

In the middle of the nineteenth century, the ideological and ecological earthquake that placed productive relations with the physical world at the centre of society had not yet sufficiently penetrated the legal

instruments of the young French Republic, which was still too attached to the regime of land-based property. The political language that Proudhon was trying to forge, and which would find its culminating point in the revolutionary episode of 1848, aimed, contra the economists, to have the functional interdependencies that develop within industry recognized as the centre of gravity of social solidarity. These functional interdependencies form the basis of social solidarity, and of the socialist reformulation of the principle of autonomy, since individuals find the medium for their emancipation not against, but within, differentiated professional groups, themselves autonomous from central power.

This ultimate development of socialist political thought is fundamental from our perspective, because it seems to be looking in two opposite historical directions at the same time, the past and the future. In some of its characteristics, the fraternal or mutualist organization that Proudhon calls for is a reactivation of professional solidarities prior to the constitution of an economy based on the accumulation of wealth and investment in technoscientific progress; but, from another angle, it is also an actualization of forward-looking liberal progressivism and the abandonment of archaic statutory constraints. Socialism therefore promotes forms of association historically attached to what we have called intensive growth, linked to an agrarian and artisanal economy, and yet it is at the same time a response to the metabolic shock of industry, to extensive growth. The interest shown by Proudhon and other socialists for machinery, railways and coal is sufficient evidence of this. This divergent squint in socialism is linked to a more general historiographical and political debate, one that has found a new urgency with the ecological question: in what way is the counter-movement to protect the social body against the pathologies of the market and industry a step backwards? How can anyone carry out a radical critique of the most spectacular modernization, namely the deployment of technology and acquisitive and competitive forms of organization, and at the same time defend values of progress? These questions, which are resolved only in Polanyi's work, already formed the background of Proudhon's thought.

The hypothesis of a perpetuation of the 'corporative idiom' was explored by the historian William Sewell in a work that describes very precisely how the workers reactivated the language of confraternities and such bodies as craft guilds, forms of solidarity founded on the internal regulation of crafts in the context of predominantly agrarian and artisanal societies. This conceptual repertoire underpinned the movements opposed to the competition and individualism increasingly associated with liberalism. Under these conditions,

socialist thought was permeated by this paradoxical reactivation of the past which, leaping over the French Revolution, more or less consciously turned back to the *ancien régime* for instruments to overcome liberalism. Sewell thematizes this alliance between socialism and corporative language through a reading of Louis Blanc,<sup>33</sup> but the hypothesis applies as well, if not better, to Proudhon and to the mutualist paradigm of the contractual protection of professional solidarities. Socialism therefore proceeds to borrow from the past in order to ward off social atomization.<sup>34</sup> From a different perspective, this persistence of the old world in the new also raised questions about forms of property. Throughout Europe, and in particular in Italy, the natural and civilizing character of exclusive individual property was questioned. The alternative of forms of collective property, evidenced by more or less 'primitive' legal corpuses, also questioned the arrow of time promoted by the liberal Enlightenment. The investigations carried out in Italy on customary systems of land management and on the possibility of integrating them into positive law thus represented another mode of the twofold historical focus of the critique of modernity:<sup>35</sup> to protect oneself from the pathological effects of market progressiveness, traditional functional solidarities would need to be reactivated, and modernizing tendencies curbed by resorting to the past.

The tanners, shoemakers, tailors and typographers who filled the ranks of the workers' protest of 1848 drew on practical knowledge related to their profession and the immanent regulation of labour in the crafts and medium-sized manufactures. Among the factors that gave these skills their specific character, the link to an intermediate stage of the division of labour was central: these craftsmen generally supervised a significant portion of the production process and cultivated a clear awareness of their interdependencies with the extractive spheres (they needed to stock up on leather, paper and cut stone) and commercial supplies. In this way, labour could both be conceived as a productive activity in which the physical and living world intervened essentially as an external force to control and to dominate, and as a lever of socialization irreducible to making a profit. The modernist component, which promoted emancipation by the war waged against the parsimony of nature, i.e., by affluence, was thus linked to a component which problematized this modern trend by maintaining a model of communal integration refocused on labour. This model, however, was not a residual neo-feudal spectre, but a true reinvention of tradition. In other words, the protection of autonomy in the context of industrialization seems to involve the resumption of pre-revolutionary political schemas such as the corporation and collective property, or the commons.

**Durkheim: 'carbon sociology'**

To follow the question of industrial democracy through to its ultimate theoretical and political consequences, we need to make something of a leap in the history of ideas and extend the thread of French social thought to the advent of sociology. This may seem surprising, as Durkheim often appears as one of the most spectacular expressions of the modernist concealment of nature as a social issue. The consecration of society as a collective entity, within which symbolic exchange reigns, represents for many authors of the ecological galaxy the most complete blindness towards environmental problems. The concept of 'sociocentrism', often used to designate Durkheimian thought, is used to label an anthropocentric prejudice projected into science. The transcendence of the individual by the social sphere is then only the repetition of a deeper transcendence of the world by human beings. At the turn of the twentieth century, however, ecological risks and damage had already been abundantly noted, sometimes even within socialism,<sup>36</sup> suggesting that we reconsider this schema of emancipation as separation.

However, Durkheim's thought is very inadequately described by this model of the consecration of the social sphere in its separation from the world, from things. The sociologist was writing at a time when the French republic had stabilized, when advances had been made in terms of social rights, in parallel with the continuous growth of industry. He was also the contemporary of the consecration in the political lexicon of the phrase 'industrial democracy', in particular under the influence of Beatrice and Sidney Webb.<sup>37</sup> For Durkheim, social integration based on principles established and recognized by law, in a society defined by the division of labour and oriented towards the regulation of the effects of the market, thus constituted the objective reference point for an investigation into the successful and the pathological forms of this type of collective existence.<sup>38</sup> In other words, *the social sphere as Durkheim thinks of it and objectifies it cannot even enter the realm of the thinkable without the conflict between affluence and freedom playing a part.* The organic forms of solidarity are obviously a by-product of the productive orientation of the social sphere, and their democratic regulation can be conceived only as the maintenance of the autonomy of individuals and groups in this context. It is the forces of acquisition and production that control and condition the balance of the whole – this balance of which sociology is the science.

Once again, it is not a question of seeing sociology as a good or a bad instrument of thought by contemporary ecological ideals, but simply a theoretical object deeply attached to the material and political

configuration of its time. The absolutely central importance given during the twentieth century to the idea that collective processes can be tackled by science encourages us to underline yet again the role that we are asking the social sphere to play in our narrative. It cannot in fact be a matter of chance that the idea of a truth specific to the social world emerged at the very moment when the machinery of liberating growth was starting to deliver its most remarkable effects, notably in the form of the appearance of a middle class and the significant rise in most indicators of living standards, including among the working classes.<sup>39</sup>

The scientific ambition fostered by the socialist movement was fulfilled by Durkheim. The empirical framework of the institutions, collective representations and moral and cognitive facts that structure collective existence can be detached from the private data of consciousness, but also from biophysical mechanisms, to form the substrate of a new type of truth and verification.<sup>40</sup> The social totality that the sociologist has in view, even if it has its own order of reality, includes complex relationships with processes that the mere collective will struggles to dominate. This is the case with certain inertias peculiar to moral and religious life, but also with deep trends in economics and technology, the pathological forms of which indicate that the establishment of an ideally controlled social environment is always compromised. In the spirit of Timothy Mitchell's analyses of the relationships between energy infrastructure and forms of knowledge, we will therefore suggest reading Durkheim, and more broadly the system of sociological knowledge, as an apparatus dependent on industrial economies. We could thus speak of a 'carbon sociology', to ring the changes on 'carbon democracy'.

In a striking passage from *Suicide*, Durkheim himself draws a connection between the characteristics of modern industry and the very possibility of sociological knowledge:

First, it is not true that society is made up only of individuals; it also includes material things, which play an essential role in the common life. The social fact is sometimes so far materialized as to become an element of the external world. ... It is the same with the avenues of communication and transportation, with instruments and machines used in industry or private life which express the state of technology at any moment in history, of written language, etc. Social life, which is thus crystallized, as it were, and fixed on material supports, is by just so much externalized, and acts upon us from without. Avenues of communication which have been constructed before our time give a definite direction to our activities, depending on whether they connect us with one or another country.<sup>41</sup>

He is here suggesting an objective spirit materialized in the form of technological structures which in turn provide some highly important points of purchase for political thought. The inscription of the sociological project in the context of industrialization is therefore obvious: the division of labour ‘combines both the productive power and the ability of the worker, it is the necessary condition of development in societies, both intellectual and material development. It is the source of civilization.’<sup>42</sup> Language, and even more the law, are, for Durkheim, the central elements of the exteriorization of the collective consciousness, but the same is true of machines and infrastructures. This is why the epistemological ideal of sociology must be understood as a consequence of the social forms associated with the productive system and the mode of labour organization in force in Western Europe at the turn of the twentieth century. The stabilization in time and space of a productive apparatus fuelled by an energy which presents itself as a commodity that can be transported from one point to another without severe environmental constraints but through the empowerment of a working class in quest of democracy; the high level of industrial profits that this system can guarantee; and finally the rapid densification of transport networks: these are the fundamental material coordinates that classical sociology echoes.

In *The Division of Labour in Society*, the distinction between mechanical solidarity and organic solidarity makes it possible to question the promise of the liberal pact between emancipation and growth from the perspective of a reflection on the psychosocial consequences of enrichment. The growing internal complexity of the modern social environment favours the sense of interdependency and the genesis of a social conception of liberty, but it also poses the risk of a disaffection of the social spirit by the development of an individualist culture, of which consumerism appears as a central manifestation, as was already evident at the end of the nineteenth century. Durkheim devotes a complete chapter (Book II, chapter 1) to this problem, which also contains his reflections on the subject of affluence. Indeed, the original – in this case utilitarian – equation makes the increase of resources available per person the aim of the division of labour, and therefore sees hedonism as the driving force behind this very division.<sup>43</sup>

Herbert Spencer is taken to be the target of this critique, since he was responsible for the most recent version of this equating of happiness and economic reason. But beyond Spencer, it is the whole utilitarian tradition, the tradition of Bentham and Mill, and therefore the extractive concept of autonomy, that is coming under fire. Spencer, for example, is credited with a concise formulation of extraction-autonomy, in which ‘happiness increases with the productive power of work’.<sup>44</sup> Intensive growth, combined with extensive growth, is

invariably welcome, not only because it gives content to collective cooperation, but also and above all because it is the only reason for it. For Durkheim, the adoption by modern political economy of the rationality of pleasures and pains developed by Bentham at the end of the eighteenth century has no other meaning than this legitimization of an acquisitive civilization, since it does not recognize any intrinsically social purposes of action or judgement.

Thus, more than a century after this alliance was formed, and half a century after the socialist counter-movement placed the problem of the material conditions for the exercise of liberty on the political agenda, Durkheim raised the tension between affluence and the ideal of collective emancipation to the rank of a sociological problem. Moreover, the exceeding of natural limits by the process of acquisition appears in this context as the main testimony of a historical break, identified with modernity. On the specific question of the elimination of limits to the economy, Durkheim adopts the dominant modernist position:

No rational limit can be assigned to the productive power of work. To be sure, it depends upon technique, capital, etc. But these obstacles are never anything but provisional, as experience proves, and each generation pushes ever further back the boundary which stopped the preceding generation. Even were it to achieve a maximum one day that it could not surpass – gratuitous supposition – at least, it certainly has a field of immense development behind it.<sup>45</sup>

It is clear to him, as to all his contemporaries, that the emergence of an autonomous business cycle signals the removal of natural constraints, of climatic and ecological vicissitudes. But where the liberal economists are mistaken is when they suppose that the increase in happiness can, in a way unlimited in time, fuel the consent to cooperation, or even more, the active search for social interactions. Durkheim refers to Wundt's psychophysical research, as well as the Weber–Fechner law,<sup>46</sup> to suggest that material abundance and subjective happiness are not directly proportional to each other, in the same way as the intensity of a behavioural response is not proportionate to that of the stimulus. He is indeed very happy to find an experimental validation of what is first and foremost a moral and social hypothesis: the pleasures of commodity consumption have a ceiling, and the 'production of pleasure'<sup>47</sup> by means of the economy alone comes up against limits, a threshold. Durkheim adds that this limit had already been reached at the time of writing, in 1893. He concludes that if the division of labour had really progressed simply to increase our happiness, it would long



ago have reached its extreme limit, as would the civilization that results from it, and both would have come to a halt. The indefinite accumulation of 'stimulants', in Durkheim's term, thus changes function over time, and its perpetuation beyond meeting the elementary needs of the body can no longer be interpreted as a tendency towards happiness.<sup>48</sup>

On this view, the civilizing force of the division of labour, if we understand this in a hedonistic and utilitarian sense, reached its conclusion at the end of the nineteenth century. Logically, a stationary condition should have ensued, but this is not what was observed. The continuation of this process beyond its functional reason proved that the division of labour could continue beyond a strictly necessary threshold, implying harmful consequences. For Durkheim, the need to compose richer, more differentiated social relationships, which provided more opportunities for the conquest of individual and social liberty, was a political and moral force, not a functional instrument of development. If it resulted in extra efficiency in the ways resources were exploited, this was a contingent advantage. The genesis of organic solidarity was driven by moral and social motors, and this was also the reason why its manifestations could be observed in spheres that had no direct relation to the satisfaction of needs. Transformations in family structures, new relationships to inheritance and transmission, the dissolution of segmental forms of social organization, the construction of a contractual legal structure and the erasure of the repressive paradigm: all these processes were the very essence of the transition from the mechanical to the organic. Efficiency and economic rationality were apparently secondary accompaniments.

But if the process of division of labour was identified with its economic consequences, and if it was conceived as a limitless dynamic, its pathological forms should not be long in coming to light. Durkheim indeed suggests that the reign of consumption provokes what one might call an overshoot phenomenon: the economic sphere is gradually disconnected from its function of subsistence – it feeds desires separate from needs, and causes an abnormal rise in the level of excitement necessary to obtain satisfaction. For Durkheim, this downgrading of pleasures,<sup>49</sup> which provides the acquisitive economy with its commercial outlets, is both a loss of moral sensitivity in individuals and the trigger for the self-maintenance of productive ends outside any social control. The other sign of a pathological state of the division of labour is the appearance of a deeper social malaise, which is reflected in the rise in crime and suicide rates.<sup>50</sup> A few years later, Durkheim would include wealth itself among the causes of anomic suicide, understood as the gradual elimination of the constraints weighing on the individual, without which the latter no longer manages to gain a foothold in the group and in the world: 'Poverty protects against suicide because it is a

restraint in itself. ... So the less one has the less he is tempted to extend the range of his needs indefinitely. ... Wealth, on the other hand, by the power it bestows, deceives us into believing that we depend on ourselves only.<sup>51</sup>

These lines are of the utmost importance. We can see in them a summary of classical sociological morality, for which the radical autonomy of the individual (the person who is alone responsible for him- or herself) is identified with immorality. But we can also see it as an essential stage in the evolution of the problem whose history we are trying to capture. The psychopathological profile linked to material abundance emerged at the end of the nineteenth century and reflected a major sociopolitical problem: accustomed by well-established ideological structures to finding the engine of their emancipation in the combination of desire and the economy, modern individuals suffer a form of depression linked to economic overshoot. For as soon as the material conditions of autonomy lose their socializing force, their capacity to integrate people into the properties of the world and the social group, then the incorporation of the acquisitive disposition functions as a source of discomfort. Durkheim undoubtedly underestimated the capacity of people to find pleasure, and even an existential satisfaction, in market consumption, but he remarkably clearly identified the social and political impasse constituted over the long term by the extractive conception of autonomy.

If the collective and individual labour of man boils down to the removal of natural constraints by the economy, then he is seeking his own moral, social and political loss. Only *integrative autonomy* has a future, and this can only happen through the reshaping of the economy in society. The topic of the harmful effects of luxury is probably the most archaic theme in social thought, and Durkheim himself points this out by connecting it to the celebration of poverty in ancient religions, but it takes on a radically new meaning in a historical context where the possibility of conceiving the absence of any external limit to the will becomes a reality for a significant part of the population. As soon as you no longer feel the effect of the world and of other people weighing on you, liberty loses its substance and changes into its opposite. This proves that social integration and material/ecological integration go hand in hand, and the link between growth and autonomy is broken even more clearly than in Proudhon.

The meaning that social autonomy assumes in Durkheim then becomes clear: it is in no way a separation from the outside world, but the result of the relative internalization of constraints thanks to progress, an internalization that frees up a space where society's project of self-transformation can find a place. The modern ideal of autonomy therefore has to do with the transformation of the material conditions

of existence; it is clearly linked to the possibility of limiting the impact of natural vicissitudes on the formation of collective identity. What opens up, with this gradual limitation of external causes impacting on the formation of society, is a zone of indeterminacy of the collective destiny, which society will immediately occupy by forging irreducible ideals to functional needs. The emergence of the social as its 'own environment' does not in the least have the function of making society impervious to the world, but rather of blocking (with what may be viewed as limited success) the liberal political ecology and the deadly pursuit of acquisitive and adaptive incentives in a material context where they have become obsolete. Against this, sociological thought envisages a model of integration-autonomy in which, once the most severe environmental factors have been held off, society must find other reasons for coexistence.

Durkheim was unwittingly writing an *environmental history of autonomy*. The ideals that appear among people are largely due to the way they organize themselves to access things, the way they respond to material affordances. Scientific knowledge, technological control, the legal and political regulation of the external environment all play a decisive role in the appearance of the zone of ecological indeterminacy necessary for the constitution of society as its own environment. Durkheim never says so, and we will see the consequences of this blind spot below, but the ecological conditions for autonomy are not all met always and everywhere. As long as environmental uncertainty prevails over economic activity, as long as the prospect of lack arises, the social sphere cannot become self-aware as a *sui generis* reality, and modern ideals cannot take shape. A certain level of prosperity is, from this point of view, a precondition of autonomy. Conversely, if overabundance looms, i.e., if the purely economic motives of action continue to occupy the heart of collective ideals, then the delicate balance of the collective body is compromised. *The mobilization of the world's resources can, if too great or too small, affect the fine-tuning of political autonomy*, which comes about only if the dose is mixed very precisely. Historically, we are therefore led to think that integration-autonomy, the only valid kind, was not possible before the great agro-industrial revolution of the nineteenth century (or perhaps in the Mediterranean city-states of Antiquity and the Mediterranean Renaissance), and that only a few decades later, it had already met its upper limit.

But if Durkheim clearly conceptualizes the consequences of an uncontrolled division of labour by identifying the pathologies of individualism with the taste for consumption, he does not pay specific attention to the pathologies induced by the extensive dimension of growth, i.e., to the social unrest created not by specialization, but by the acceleration of the social metabolism. Indeed, the democratization

of modern society was even more dependent in 1893 than in 1848 on the development of industry, because only the involvement of a critical mass of the population in productive activity guaranteed a political balance of forces in its favour. By this, we do not mean that the proletariat was now in power, but that it was in a position to obtain significant political concessions. Democracy demands industry, not only as a critical motive force, but as a force for stabilizing the social order. So Durkheim clearly sees the impasse represented by unreservedly adopting a purely economic or adaptive conception of liberty, but he is also obliged to admit that the fulfilment of the desire for autonomy cannot take place outside the framework of the productive, industrial trend. In the sociological critique of political economy, the tension between affluence and freedom therefore assumes a more complex form than was the case with mid-century socialists: even if Durkheim senses the need to go beyond the paradigm of affluence, democratization is ever more indebted to the technological structures induced by coal, because it is this form of energy that ensures the stabilization, or organic wholeness, of society. In other words, for Durkheim, the pre-empting of the democratic ideal by industry goes a step further than in the socialist tradition strictly speaking.

### **The political affordances of coal**

Durkheim's great strength was that he transformed a pronounced trend of his time into science: everyone was claiming their share of the material power developed by society. It was in this form that the political energies of the people were made manifest, with growth constituting the main historical opportunity for an equalization of power and status. As we have just seen, Durkheim shows that collective consciousness is objectified in many institutions, which in turn play a guiding role in the formulation of social ideals. This is particularly the case with the law. But the law does not have the emancipatory power of material institutions because it remains a specialized technology, a language whose twists and turns are beyond the reach of the greatest number. That is why we can grant to the techno-economic system associated with coal, and secondarily to the other new forms of mass production, a specific affinity with sociological epistemology. This material system means that the exteriority of the social does not exclusively take the form of arbitrary constraint: the homogeneity and the internal regulation of the collective owe some of their features to this set of machines, resources and productive capacities which place individuals in hitherto unknown relationships with one another. As

long as a significant part of the population is directly involved in the extraction, rerouting and transformation of energies and things that are connected to the social order, everyone can feel part of a whole that must be regulated. This material system is then a catalyst that facilitates the incorporation of the will of the people into political normativity. The blind spot of this sociological reflection on the political affordances of coal is of course the problem of waste and risk, all the pathologies associated with this extensive system of production, but it is clear that, for Durkheim, all this negative fallout from industry is trivial in relation to its social benefit: socializing progress does not yet mean that its ecological consequences must be limited, but that the purely economic motives for social cooperation must be neutralized.

\* \* \*

Many commentators on Durkheim have been struck by the political conclusion that he himself gave to his research, namely a project for corporate reform intended to reintegrate workers into a system of trades and to offset the effects of the atomization of individuals.<sup>52</sup> This project is presented in the second preface of *The Division of Labour in Society* written in 1902. Despite the blurring created by the positive enhancement of corporations under subsequent conservative political regimes, and in particular in Vichy France, the reform proposed by Durkheim was his most direct contribution to the ideal of industrial democracy. However, the revival of corporations ‘does not consist in a restoration of the past: on the contrary, it conforms to modern requisites of organic wholeness, which it institutionalizes by organizing specialized functions into public, national and mixed bodies’, and Durkheim even envisages an ‘internal democratic organization leading, on elective and deliberative principles, to a sharing of decision-making power between employees and employers’.<sup>53</sup> Corporative organization is presented as the main instrument for limiting the unequal and individualist tendencies of the modern economy. It would encourage workers to identify with their comrades through the similarity of their practices and would make this similarity the substrate of a renewed solidarity. However, the necessary limitation of the division of labour, while not turned towards the past, does take the form of a re-establishment of traits considered by Durkheim as ‘elementary’, that is to say premodern.

This aspect of Durkheim’s political thought is reminiscent of his work as an anthropologist. Indeed, corporations can be understood as castes emptied of their religious and ritual dimension, castes to which one does not belong by inheritance, and which of course are not hierarchical. The desire to extend communitarian traits into the modern organization of society will haunt all modern political ideologies and,

as we have seen, this was already the case with Proudhon. Indeed, the idea that a purely individualist organization is untenable, and therefore impossible, has aroused numerous counter-movements, most often conceived as reactivations of an old traditional schema. Religious affiliations very often play a central role in this movement aimed at preserving anti-individualist solidarity, especially in the regions where the various branches of Protestantism predominate. But other resurgent or persistent communitarian forms are possible in societies with an individualist tendency, and can sometimes be radically violent: a sense of belonging to a place, to a terroir, or to an ethnocultural or even racial group, have sometimes appeared as attractive forces able to preserve the archaic in the modern.<sup>54</sup> But these formulas are obviously tainted by inegalitarian ideas which, by naturalizing historical forms of domination and by functioning as exclusionary devices, only preserve the repressive content of the segmental order in order to better sanctify the productive order. Corporate organization, from this point of view, is a neo-segmentary, nonrepressive, nonsubstantialist arrangement, and in this respect it is truly socialist: it aims to draw from the organization of production certain vectors of solidarity that can curb social atomization.

Thus, while the restoration of a political order within societies eminently regulated by the economy more often than not takes the form of nationalist violence, when it does not simply manifest itself in the form of war – as in 1914 and 1939 – Durkheim basically proposed to forestall the pathological tendencies of market society before catastrophe could ensue. Whatever the content of this proposal, it therefore imposes on us a conceptual horizon of expectation. The tension at the heart of modernity between autonomy and affluence reached such an intensity at the end of the nineteenth century that the mechanisms facilitating productive development were perceived as obstacles to a well-conceived autonomy. What was in question was the ability of the modernizing paradigm to emerge unscathed from this contradiction. At the beginning of the twentieth century, it did not yet take an ‘ecological’ form, since material development still appeared to a very great extent as a condition for the possibility of autonomy, but a gap was opening up among those authors who perceived the destructive potential of unlimited affluence and were already thinking about the need to apply the emergency brakes.

\* \* \*

The conceptual lineage that goes from Proudhon to Durkheim, from socialism to sociology, is a fundamental stage in the history of the contradiction that drives modern productive societies, insofar as it makes visible the pact between affluence and autonomy as a contingent

sociopolitical choice linked to a very particular era, to very specific interests, and very soon coming up against dead ends. This tension, which these days is grasped in the form of an ecological problem, took on a different form in the nineteenth century: that of the labour question. And we can see the continuity between the labour question and the ecological question, beyond the transformation of the political vocabulary that has come into play in the meantime, only if we suspend the project of a history of the preference for 'nature'. For the apparent discontinuity between the social problem and the ecological problem actually hides a more essential continuity, that of a tension which pervades societies that want to be free and prosperous, a tension between the desire for autonomy and the desire for emancipation from geoclimatic cycles and their constraints. Beneath political ecology, in the lower strata of the history of ideas, ideas that can be seen only through the prism of their current transformations, there lies the question of society's resistance to its subordination to an economic order. The latter, explicitly set up to achieve emancipation through an alliance with productive effort, reveals its weaknesses through the voice of a new generation of thinkers who link liberty and equality to the technological conditions in which they developed.

One of the most striking characteristics of this intellectual tradition, moreover, is the constant ambiguity of its relations with the technological world. One of its central affirmations consists in refusing the extractive concept of liberty: the individual and the collective cannot claim to achieve a pure and simple separation from the constraints of this world, liberty cannot be understood as a final distancing from physical and material burdens, because the productive effort is at the heart of collective life. The modern project of giving oneself one's own norms, the idea that history is the product of this autonomy, involves the integration of effective relationships with the world. The energy of fire, machinery, the division of labour, the exploitation of the land and labour in any shape or form comprise the frame of reference necessary for the ideas of equality and liberty. In other words, and contrary to what happens in the liberal tradition, collective relationships with the world take on a political significance. But at the same time, this politicization of relationships with the world means that the project of autonomy becomes dependent on the productive relationship. The industrial system is both a testing ground for the promises of emancipation and the condition of a response to this test: without a working class – i.e., without the appearance of a social group directly involved in the productive relationship, a group which thinks of its condition on the basis of its practice – the critique of liberalism is not even possible. Beyond the problem posed by the 'productivism' of socialist thought, the paradigm of integration-autonomy needs to be seen as dependent



on a partnership with things where these latter intervene essentially as resources, where the aim is one of subsistence supported by scientific knowledge.

The politicization of collective relations to matter is therefore a two-way street. The first consequence of this ambiguity is the identification of 'nature' with a productive partner conceived as an exploitable resource, ontologically homogeneous and insensible, not putting up any fundamental resistance (apart from inertia) to its use or management, and liable, finally, to be involved in large-scale, long-term projects. As we have noted, this aspect of the natural world is already unsuited to many philosophical and aesthetic aspirations. But if it is an aspect on which the strongest and most effective critiques of the liberal pact insist, this is also because it corresponds to a dominant conception common to liberals and socialists. The question that then arises is a simple one: what would a social thinking freed from this implicit ontology look like? The second consequence is linked to the dependence of democracy on industry. If the social relationships that are constructed in the age of coal and big industry are erased – either because productive activity is established elsewhere in the world, or because the energy system changes, or because people deliberately choose to slow down the productive pace – what will happen to the demand for democracy? In what form should we think of the equality of rights when its technological and economic substrate is lacking?

## *The Technocratic Hypothesis: Saint-Simon and Veblen*

### **Material flows and market arrangements**

We have defined socialism as the tradition of thought for which the new ecological regime must make its presence felt at the political level by a transformation of at least equal magnitude. In other words, the people's cause is to be gained by the construction of a society in which nobody's position in the interplay of industrial rivalries presages their access to rights and to the conditions of a satisfactory life. But there are several variants of this strategy of attaching a political philosophy to the awareness of the determinations imposed on the deployment of liberty by the new technoscientific conditions. In particular, along with the variant we have just studied, we need to give what I propose to call the 'technocratic hypothesis' its fullest importance. This hypothesis has a complex relationship with the majority form of socialism, especially as structured in the political struggles to which we are the heirs; but it constitutes an original approach to the relations between affluence and freedom, and as such it cannot be overlooked.

The most eloquent representatives of this hypothesis are the French philosopher Saint-Simon (1760–1825) and the American economist and sociologist Thorstein Veblen (1857–1929). A century apart, they placed the challenge posed by the emergence of a people of producers at the heart of their considerations. These two intellectual figures, too often forgotten – or reduced to slogans and soundbites – share an idea that can be summed up in simple terms.

The new social order inaugurated by the political and economic revolutions of the turn of the nineteenth century was characterized by a confusion between two types of motives attributed to action. On the one hand, we find the virtues attributed to trade – virtues linked to the genesis of individual property owners independent of one another, and independent of any sovereign authority that might intervene in their economic initiatives. On this view, the economy

is first and foremost a set of finally emancipated relations between sellers and buyers, within the framework of a competition that is purportedly healthy and peaceful, because it is depoliticized. On the other hand, there is the project of a rationalized, efficient, large-scale, and abundantly equipped conduct of common affairs. In principle, this project highlights the practical skills used in the rational use of things, environments and resources, in collective access to improved living conditions and in the forms of association induced by this mode of relationship to the world. The construction of a large-scale industrial system at the service of human beings, capable of accommodating their material and social aspirations, can and must be distinguished from the spirit of enterprise, from the motive of gain. *And the entire work of both Saint-Simon and Veblen lies in the desire to separate these two aspects of modernity that history has inadvertently confused, the spirit of commerce and the spirit of industry, and in the desire to put an end to the subordination of the latter to the former.*

The confusion between these two dimensions of industrial capitalism was indeed a consequence of liberal thought. As the American economist John R. Commons points out, the trajectory of economic thought gradually isolated and highlighted the psychological motives of economic action: whereas, in the eighteenth century and in the first half of the nineteenth, the techniques for improving human beings' relationship to resources inform in depth the analysis of wealth, economics proceeds to argue mainly on the basis of the subjective will and its expectations of the future. By becoming essentially behavioural, economic rationality maintains an affinity with capital management systems as an abstraction, rather than with the management of things.<sup>1</sup> The sphere of production and consumption, the sphere of resources, the question of their limits and their value – all these gradually emerge from the field of economic analysis, and the specific features of the industrial world cease to be integrated into its epistemology. The transaction of one human subject with another becomes the fundamental atom of the economy, and the metabolic exchanges between them and their environment, the energies and spaces involved, are projected onto the periphery of analysis and concerns.

For Saint-Simon and Veblen, the challenge is to identify the divergence between these two registers of analysis and to show that a rationality backed by material and productive interdependencies can work perfectly autonomously. Facing up to the industrial transformation of society, in other words, requires for both thinkers that one can 'find a legal way for great political power to come into the hands of industry'.<sup>2</sup> The latter is no longer the blind, poorly coordinated movement that drives societies to create ever more alienating, inefficient and waste-generating productive processes, but a form of

government where technoscientific instruments are fully part of the general social regulation.

This technocratic hypothesis can be broken down into two aspects. First, it is an interpretative assumption about the internal coherence of capitalism. As we have just seen, Saint-Simon and Veblen propose to conceive as heterogeneous two dimensions of this system which, in the official language that modern economies apply to themselves, appear as inseparable. The defenders of technocratic socialism oppose the commonly accepted idea that the stimulation of private exchanges, the liberation of private property and its identification with the exercise of liberty go hand in hand with the deployment of the means that allow people to know and to systematically exploit the world. According to them, the raising of the material conditions of existence and the conquest of prosperity are linked to the march to equality and liberty, but, to achieve this end, the process must remain completely independent of the mechanisms aimed at freely manipulating capital and investing it in profitmaking companies. We can indeed show that the conduct of economic affairs under the responsibility of accountants and financiers, i.e., professional groups dedicated to maximizing pecuniary profit, very often contradicts the rational management of material resources and humans. Certain productive forces can thus be underemployed or overemployed depending on the perspectives dictated by a particular market; a resource can be squandered for an immediate gain at the expense of security and well-being; food stocks can be wasted in the interplay of speculation and bottlenecks in supply; inefficient and dangerous technologies can be maintained in the name of economic interests against others that are more efficient or less wasteful.

The first part of the technocratic hypothesis, then, consists in suggesting that, in the deployment of the modern economy as we observe it, science and technology have no power of their own: contrary to what is asserted by several critics of modernity, and most environmental historians, modernity is not the age of technological power, but that of its powerlessness. The technosciences most often do *not* have the capacity to impose standards on the economic order that stem directly from the contact between the productive classes and engineers, on the one hand, and the material characteristics of things, on the other. This knowledge and know-how, on the contrary, is subject to reasons external to the industrial project strictly speaking, namely the financial component of the economic system. This component actually renews a regime of domination which, for Saint-Simon as for Veblen, has nothing specifically modern about it: within the most apparently liberal, most rationalist modernity, the interests of the idle classes detached from productive tasks tend to take over. While

Saint-Simon relies on the spirit of 1789 to make the emancipation of the productive classes the culminating point of the marginalization of the clergy and the nobility, Veblen, a century later, sees a rentier elite (namely shareholders) coming back into being and compromising the project of an industrialist government.<sup>3</sup>

The specificity of technocratic education is the way in which it gives the people the ability to find the norms of their action in things – the way they are taken into account, used and shared. The second aspect of the technocratic hypothesis then consists in wagering on the autonomy of industrial normativity so as to regulate the social relationships induced by technoscientific progress and the emergence of a desire for emancipation. The analytical proposition thus leads further, to the construction of an action plan intended to put an end to the forms of domination that profit from the subordination of the productive arts to nonindustrial interests. This plan of social organization involves the identification of a key player, the repository of practical and moral skills both emblematic of the modern spirit and capable of leading the march of progress in a fair and egalitarian manner: the engineer. He is the designer and prime contractor of the large technological structures that fulfil the promise of power over the material conditions of existence. So he reigns in the factories and in the planning of transport networks, but he also plays a part in the regulatory bodies of the state since he is at the intersection of the nation's legal, executive and economic systems. Neither strictly an entrepreneur nor a mere technological expert summoned by the public authorities, the technocratic engineer is a conceptual character whose historical equivalents are difficult to find. However, Chaptal, a follower of Saint-Simon, and Frederick Taylor (the introducer of 'Taylorism'), who was close to Veblen, offer instructive examples of what these new technocratic elites are *not*.

### **Saint-Simon: a new social art**

Born in 1760, Saint-Simon did not turn to philosophical studies until late: the first part of his life, until 1800, was devoted to a series of military and industrial adventures, first in America, then in Spain. Coming from an aristocratic family, enriched thanks to the sale of national goods, Saint-Simon ended this period ruined and with the feeling of not having achieved the remarkable things that his destiny had commanded him to pursue.<sup>4</sup> Under the influence of Cabanis he then turned his attention to the biological and medical sciences, which in his view were furthering a rationalist utopia in which rulers and ruled submitted themselves together and quite naturally to an

organizing power of which scientists were the mediators, located at the crossroads of all the functional interdependencies that ensured the cohesion of the whole.<sup>5</sup> The art of governing, conceived by Sieyès and Condorcet as the heart of modern political reason, was modelled on physiology, and in this perspective the depositaries of the new social authority would 'no longer consider the problems they have to resolve as anything but questions of hygiene'.<sup>6</sup> These words from the *Mémoire sur la science de l'homme* [*Memoir on the Science of Man*] perfectly sum up the early views of Saint-Simon. The social medicine that he proposes is the art of creating an environment favourable to the expression of the active behavioural tendencies of the people. This medicine sees man as a material reality associated with an environment, and politics as the adequate organization of their mutual relations, in the same way that health depends on the good order of internal functions.

The authority of doctors represented the scientific side of the revolutionary spirit, but Saint-Simon would go on to abandon the idiom of social medicine to capture the internal rationality of the social body on the basis of the people conceived as a set of *producers*. Production, industry, was indeed the cardinal function of the collective that sought to establish itself after the revolutionary moment, which had not yet stated clearly enough on what the new legitimacy should rest. The ability to root the principles of positive politics in customs could not be entirely delegated to a learned elite, and it was now industrial activity that would constitute the main reference point of modern political thought. Sieyès indeed had already indicated as much in 1789 in *What Is the Third Estate?* The rejection of the system of privileges that had characterized the *ancien régime* was, in his view, based on the idea of an unequal contribution of social groups to collective labour, coupled with an accumulation of power and legal and economic protection on the part of those who contributed the least. The Third Estate, in which Sieyès grouped workers dedicated to the production of goods, their trade and the whole maintenance of the social environment, constituted what he called the 'true nation'.

The challenge, then, was to find the sociological foundations of a legal and moral regime that represented this body of associates dedicated to industrious activity. This break with feudal tradition gave Saint-Simon his framework, but the latter reformulated the principle of the Third Estate by emphasizing the reference to material labour. The term 'industry' became central to Saint-Simon after 1814–15, since he saw in the operations of a deliberate and educated transformation of the natural world a decisive source of socialization and normative production, capable of removing from the social body any elements considered to be parasitic. Freed from its former masters, society

does not lose all its bearings, contrary to what counter-revolutionary thinkers such as Bonald or de Maistre said, since it refocused on what it had always done, even though those practices had not previously had any legislative value.

It was on this basis that the split between the idle and the active would play a structuring role in the thought of Saint-Simon. One of its most well-known formulations is the parable found at the beginning of *L'Organisateur* [*The Organizer*]. This parable asks us to imagine the sudden loss, in France, of the industrial, commercial, artistic and learned elites, and to compare its effects with the equally sudden loss of the great aristocratic families, the clergy and the public administrators – prefects, ministers, advisers. If the latter event would have no noticeable effect on the state and social prosperity, since it affected the idle classes alone, the former radically compromised the conduct of collective affairs and the pursuit of economic and social progress. The common fund of know-how necessary for an industrious republic had been lost, so it was society itself that was cut off from its most emblematic and most useful members. This thought experiment aimed to highlight the parasitism of the idle elites, who cost the nation a great deal of money while providing no real leadership.<sup>7</sup> Saint-Simon concluded from this that it was necessary to officially give power to those who exercised it *de facto* if not *de jure*, under penalty of perpetuating the subordination of the industrial functions that suit the modern social state to parasitic symbolic functions.

The emancipatory vocation of Saint-Simonism is due, if not to the effective elimination of the idle classes, at least to the wager that it is possible to compose a stable and just political association on the exclusive basis of practical skills and their scientific foundations. The idler must not be eliminated as much as reintegrated into the industrial association, in particular if he possesses capital: his wealth must be invested in projects to promote the common good, and the mechanisms of credit can and must prove socially useful. The prevalence of industrious activity over idleness and the illegitimate capture of wealth therefore includes a component that can truly be said to be liberal: if idlers divert some of the social forces, they must be brought back into the network of practical interdependencies rather than purely and simply excluded, in the name of the fundamental unity of the social body. In the manuscripts of *L'Industrie*, Saint-Simon took such ideas a long way, since he deduced from his own principles that industry should not be given exogenous rules. The doctrine of the least government, then defended in France by Say, thus temporarily met with a favourable echo in Saint-Simon's work.<sup>8</sup>

Industry is self-regulating, says Saint-Simon, because the activities it brings together provide economic benefits (satisfaction of needs) and



moral benefits (production of common ideas, unifying values). It is the introduction into the social body of new productive processes and new land-use planning capacities that provides an opportunity to hand over the political reins to the producers. The science-informed industry that developed at the turn of the nineteenth century was more complete than that of previous centuries, because it could handle collective relationships to the environment in a methodical, forward-looking way, and also because it could give meaning to the action of all men and women: for Saint-Simon, the intensification of technological means corresponds to an increase in the social virtues of industry, since an increasing number of individuals can find an outlet for their knowledge and skills and, in so doing, accumulate opportunities to interact with others. But the condition for this achievement of the people's cause in the industry is to ensure the alliance and the active participation of the new social categories: innovators and investors – in other words engineers and the big financial bourgeoisie. However, this will never materialize.

At that time, Saint-Simon was deploying considerable efforts to forge an alliance with bankers and industrialists, with the new elites who, between Napoleon's Hundred Days [les Cent-Jours] and the July monarchy, would assume a hitherto unknown political importance.<sup>9</sup> Laffitte and Hottinguer, the bankers, as well as Chaptal and Perregaux, the industrialists, were among the regular subscribers to the initiatives promoted by Saint-Simon. But at the same time, Saint-Simon aimed to subject these actors to a political plan that could not be reduced to *laissez-faire*. The fine integration of the different parts of the industrial world, the structuring functions (transport in particular) and the productive functions, left to the appreciation and initiative of civil engineers, in principle gives us an overview of the integration, also ideal, of human wishes and aspirations. Technology and science appear as universal mediations, since they are the ones that guarantee effective control over the world, and in return it is they that teach us what it is possible to do with the world. The identification of society with industry<sup>10</sup> leads to the desire to limit the extension of political power: the famous maxim saying that one passes 'from the government of men to the administration of things', i.e., the gradual elimination of the state, fits into this context.

In other words, if Saint-Simon developed in *L'Industrie* a first version of the technocratic ideal that we can still describe as liberal, the self-limitation of politics which he turned into his creed was not enough to mobilize the economic elites in the democratic and technocratic project. The big figures in innovation and banking mentioned above would gradually stop supporting Saint-Simon's plans, and this would completely change the political colouring of his project.

### **The technological normativity of the moderns**

Whereas for liberal economics it must be possible to invest capital in any promising enterprise, the prospects of profit cannot always be identified with the prospects of general prosperity. The dissociation between industry, on the one hand, in the sense of the efficient management of things, and government by the economy, on the other, based on the maximization of profit to impose order on the material world, will therefore become central in later texts. If the liberal pact aims to combine freedom and prosperity, it is through market mechanisms that spontaneously ensure the convertibility of liberty into material improvement, and vice versa. But as soon as these mechanisms prove to be materially ineffective, creating congestion and destruction, hard labour and poverty, then the pact is broken. The technocratic proposal consists in adding a clause to this pact: it will withdraw authority from economic elites so as to entrust it to properly industrial elites, whose aim is the planning of the world and the organization of human beings.

The change of tone in Saint-Simon's thought and its rapprochement with socialist ideals can be understood from the problem of exploitation. The Saint-Simonians tried after the fact to sum things up by asserting that the exploitation of man by man must be replaced by the exploitation of nature by man.<sup>11</sup> What actually happens when men exploit nature more extensively? On the one hand, they must improve the forms of cooperation that make this extension of exploitation possible, and, at the same time, they must invent political means to maintain social integration against individualist tendencies. But if labour is the subject of an increasingly advanced division, Saint-Simon reminds us that all the arts and crafts, all the functions that frame and facilitate them, are engaged in a dialogue with the same world. So if the tasks are divided, something unifies all of these different tasks beyond their specialization, namely the fact that they have the world as their object and society as their subject. The natural world therefore assumes two functions closely associated in their social and historical dynamics: first, it constitutes the privileged interlocutor of the active faculties of human beings, and therefore the base of the relationships they establish with others; and second, it represents the only authority capable of giving a tangible, material aim to a society determined to get rid of the supernatural or individualistic justifications for collective coexistence.

In the liberal-individualist framework, productive techniques are essentially there to increase the quantity of goods available, to lower their prices, and thus to make manufactured consumer goods accessible. In the technocratic framework, the productive relationship is of

course important, but it tends to be subordinated to a constructive, planning relationship. We can assume without great risk of error that the prototypical technological object for Saint-Simon is less the machine that takes its place in the factory than the network infrastructures: the canals, railways, water supply and systems of communication. And besides, until the time of his death in 1825, the thermal machine responsible for driving the mass production of consumer goods had not yet made its large-scale appearance in France: Saint-Simon was a contemporary of transport and public health infrastructural projects, of small factories based on chemical rather than mechanical techniques – an intermediate stage of industrial development still very different from what would fascinate Marx in England a few years later.

What is central to an industrial nation is what we would today call ‘equipment’, which, once installed, provides a structural service for the whole population: the ability to project oneself into a long-term future, typical of the modernizing will, is in fact largely due to the construction of those material infrastructures that collect and channel wills and bring them together. The territory, both as a geographical reality and as a set of resources, must be administered and supervised, and its exploitation is only one of the facets of a broader rational organization of the material phenomena relevant to social action. The modernist vision of the planning engineer therefore aims to be realized in a socially accessible form, and not only in goods for private consumption. That is the reason why technology has an organizing power, linked to its potential to improve effective living conditions: it intervenes in the network of interdependencies and interactions, and positively contributes to structuring it. In their introduction to the *Doctrine de Saint-Simon*, Célestin Bouglé and Élie Halévy thus report that, under the action of the industrialist government, the whole world will become ‘travelable and inhabitable like another Europe’:<sup>12</sup> the degree of Europe’s territorial and cultural integration, which implicitly makes it the privileged site for the emergence of modern ideals, will inevitably spread across the world, this time as a prerequisite for social development.

In Saint-Simon’s view, this conscious structuring of productive relationships is a heritage of the Italian republics of the late Middle Ages and the Renaissance, where government was concerned ‘solely with acting on nature, so as to modify it as much as possible in the most advantageous manner for the human species; it would tend to exert action on human beings only to impel them to contribute to this general action on things’.<sup>13</sup> While the old political and religious power sought to uphold a divine providence, which determined both human existence and economic opportunity, good government is justified by

the positive action it imposes on the course of things. Acting on nature to modify it thus becomes the instrument and criterion of modern politics and its power to determine history.

The political-historical autonomy of these republics and the conquest of prosperity are closely associated:

In the old system, the people were regimented in relation to their leaders. In the new one, it is combined with them. On the part of the military leaders, there was command. On the part of the industrial leaders, there is only management [*direction*]. In the first case, the people were subject. In the second, the people are members. Such indeed is the admirable character of industrial schemes, that those who compete in them are actually all collaborators, all associates, from the simplest labourer to the most opulent manufacturer, and to the most enlightened engineer. ... Finally, let us observe that the progress of industry, science and the fine arts, by multiplying the means of subsistence, by reducing the number of the unoccupied, by enlightening men's minds and polishing their manners, tend increasingly to remove the three biggest causes of disorder: poverty, idleness and ignorance.<sup>14</sup>

Saint-Simon puts forward a particularly powerful hypothesis about the conditions for the formation of regimes where a vertical, authoritarian system prevails: the use of force, i.e., arbitrary coercion, is the only means available to an authority not tied to the testing ground of the natural world to be recognized and obeyed. The statutory inequality that characterizes old-style societies is based on the need to naturalize authority in the absence of a tangible normative principle, or at least a principle developed on the basis of specific practices. Conversely, the equality of members is based on the joint recognition of each person's contribution to the collective labour, an essentially material contribution linked to practical capacities. An authority alert to the economic and organizational possibilities contained in the course of events provides itself with a tangible standard that everyone can observe: without dissolving any relationship of authority or any inequality, this standard constitutes a principle of integration where the combination of practices takes precedence over simple command. In other words, the insufficiency of technological and scientific mediations with nature had previously exposed human beings to a power that had no other criterion and no other justification than pure ideological constructions. Conversely, the intensification of, and confidence, in technoscientific mediations gives access to a legitimate authority, a constraint which is *the right constraint*.

### Laying bare the productive schema

Before continuing the history of the technocratic hypothesis in its later developments, we should consider a possible objection. One of the fundamental characteristics of industrial development in Western Europe is that it had to face very early challenges, based on the realization that the chemical processes used were harmful, and machines could cause physical damage to workers' bodies. Through the concept of disinhibition, Jean-Baptiste Fressoz explores, for example, the mechanisms that made it possible to 'overcome' objections to a form of production centred on the technosciences as early as the eighteenth century. If we focus on this deafness to health and environmental alarms, then industry takes on a completely different aspect from what Saint-Simon and his heirs envisioned. Bodies and environments are, from this point of view, the victims of a process that tends to marginalize its own consequences and that can actually only work by proceeding to what in contemporary terms might be called the externalization of risks.<sup>15</sup>

What is at stake is basically the idea of the social responsibility of industry. In Saint-Simon, this responsibility is obvious because it enables the proper integration of the ideals of affluence and liberty. The sociological and historical centrality of productive labour continues in the form of a technocratic government that prevents a harmful split between economics and politics. However, recent historical studies have signalled not only that industry never actually assumed this responsibility, but above all that it must be viewed from a completely different angle. Real industrial responsibility would have consisted in listening to health and environmental alarms and in carrying out an economic modernization capable of limiting itself and listening to protests. This argument, perfectly correct in itself, misses two aspects of industrialist thought.

First, it must be remembered that industrial structures have profoundly affected our social relationship with time. Even if the mechanical and productive universe caused physical and moral suffering among its operators, the idea of a universal march of progress made it possible to justify, even in the eyes of its most obvious victims, the sacrifices made. In other words, the industry declared itself responsible for the present *and the future* by designing a future world where the *guarantees* of increased well-being and the forms of liberty offered were worth more than present *uncertainties* and *prejudices*. If we lose sight of this aspect in favour of a contemporary critique in which the relationship between these guarantees and these uncertainties has been reversed, we are no longer able to account for the configuration of the relationships between nature and society in the nineteenth century, including

in politically progressive ideologies. The traction of the autonomy–affluence couple was so great at that time that it required critical thinking essentially to break away from within its own framework. Even if certain utopian dreams, at this early stage, sometimes broke the stranglehold of this configuration so as to index private and public happiness on the preservation, at all costs, of an environmental status quo, most actually promoted a more or less explicit renunciation of the principle of autonomy.<sup>16</sup> The ecological critique of industrialist progressivism belongs to a late epistemic configuration, which it may be useful to project back onto the nineteenth century, but which does not fully account for the way in which nature and politics intersected at that time. The reason for this is that the extent to which the project of autonomy was monopolized by the adherence to the idea that progress would be brought about by the technosciences cannot be underestimated.

The other point is that technocratic socialism was primarily aimed at undoing the ideological and practical grip of the extractive concept of modern autonomy. This is why the technocratic hypothesis belongs to the socialist family: the ideal of extraction, of a complete break with the constraining force of physical and living things, is really found only in the liberal tradition, for which the question of emancipation arises only at the level of government and representative bodies. From this point of view, we can say that a politics of representation, validating on an ontological level the difference between what must be represented (people) and what cannot be represented (things), clashes with the requirements specific to an industrial society, where the conditions of liberty are essentially technological.<sup>17</sup> For Saint-Simon, the value of liberty is not incommensurable with the value of the world, and we can promote emancipation only to the extent that it goes hand in hand with an active and conscious regulation of collective relationships with nature and resources. Integration-autonomy is a critical paradigm whose scope must be measured quite independently of its conformity with the ecological expectations of contemporary critiques.

It is certain that the process of industrialization is inseparable from the marginalization of its victims (human and nonhuman) and the appropriation of the future by the present, which is generally called risk, or catastrophe. In other words, the development of integration-autonomy, in its technocratic version, has given industry a form of responsibility and reflexivity that it never previously had. Was it an unforgivable naivety on the part of Saint-Simon about what was happening in the industrial world, or should we see it as the *a posteriori* demonstration of what he proposed, namely that the deployment of industry without the application of a technocratic filter leads to catastrophe? The totalizing character attributed by Saint-Simon to

industrial experience is accompanied by a lacuna in his ideas about this very experience: *identifying the fundamental socializing practice of modern peoples with the production and development of a space for mobility and connections renders the corollary of these actions invisible: the accumulation of waste, pollution, risks, diseases.* In other words, the centrality of industry is both positive and negative. There is no doubt that Saint-Simon did not give the problem the importance it deserves, and that it already deserved in its time. But the most important lesson of the technocratic hypothesis is the *laying bare* of this productive planning schema. Saint-Simon analysed his own age in such a way as to make it possible to isolate the nucleus of practices on the basis of which history was reorienting itself: the emancipatory force of progress, of growth and of development was in his view merely the visible manifestation of a more fundamental principle, which is the productive schema of relationships now inscribed within the heart of society. What is more, it is this nucleus of practices that makes sense today whenever we try to develop an ecological political thinking: the questioning of current agronomic, energy and commercial structures does indeed require an increase in technological reflexivity and a questioning of the meaning of productive operations.<sup>18</sup> Saint-Simon's current relevance is therefore not due to the fact that he invested all his hopes in industry. First, it is due to the fact that he gave us instruments to understand the trajectory of modernity on the basis of the new type of socialization of nature which it implements; second, it stems from his idea that this type of socialization of nature cannot be a vehicle for democratization unless it is governed for what it is, on the basis of its own standards, and no longer through the distorting veil of old symbolic forms of politics.

### **Veblen and the cult of efficiency**

What about technocracy in the twentieth century? Thorstein Veblen's view is part of what the historiography of the United States has named the 'progressive era': this period, between the last years of the nineteenth century and the 1920s, was marked by the combination of an economic optimism fed by measures of control over monopolies and the democratic consolidation of the nation around social, moral and educational measures.<sup>19</sup> But, however progressive the zeitgeist might have been, the economist asserted himself as one of the most incisive critics of the existing mode of development and political structures. Throughout his career, he described the forms and consequences of a tension at work in American society. From his first book, *The Theory of the Leisure Class* (published in 1899), to the works published



in the 1920s, *The Vested Interests* and *The Engineers and the Price System*, which will provide the main references for our analyses, the split between the spirit of industry and the spirit of commerce is the main obsession of an unclassifiable work whose analytical and critical potential still remains insufficiently explored.

In *The Theory of the Leisure Class*, Veblen engages in an archaeology of the symbolic competition practised by the dominant classes to justify the appropriation of agrarian surpluses, and thus the maintenance of a position that is both economically marginal (because it is freed of the responsibilities of subsistence) and socially central. The book thus unveils the mechanism by which the substantial foundations of social reproduction are overturned, and at the end of which an elite cultivates its distinction, its honour, by indulging in excessive expenditure – what Veblen calls conspicuous consumption. While the artisan instinct, still dominant among the lower classes, aims to optimize the use of scarce (human and natural) resources and to aggregate individual wills in a common destiny, idle elites legitimize their prestige by accumulating and squandering wealth. We then see the emergence of a theme that will remain predominant in his work until its last discussions, that of waste.<sup>20</sup> We can summarize the distinctions Veblen draws in his work in the form of a series of simple oppositions: between financial and industrial institutions, between selfish and altruistic instincts, between ceremonial and instrumental values.<sup>21</sup> Veblen first sees the symbolic distinction of the ruling classes as part of a natural history of the human species, but in the rest of his work this naturalist framework will become much more discreet. The contradiction between business and industry takes on another hue, and these naturalistic coordinates are translated into an authentic sociological and historical problem.

The first factor that provided Veblen with a potentially new framework was the wide-ranging debate in the United States at the start of the twentieth century on the efficiency of the economy.<sup>22</sup> Since the time when Saint-Simon was writing, history had basically confirmed Stanley Jevons's predictions: North America had become a leading economic power, and it was probably here more than anywhere else that the formula of liberating growth had deployed itself to the fullest extent. More precisely, the issue of 'saving energy' is crucial: after a long period when the myth of the frontier worked as a symbol of the inexhaustible natural gifts with which the continent was endowed, the question of limits and the rational use of resources has surfaced in American political and economic consciousness. This concern comes in the progressive context mentioned above: it is not about a good government just promoting common interest, but also ensuring an equivalent well-being for generations to come. A certain economic prudence is thus necessary so that natural opulence can

be converted into public happiness, so that predation and waste are avoided, as is short-termism. Here again, Jevons's spirit hovers over economic thought, since the threat foreseen is that of a rebound effect in the other direction, affecting the nation's strategic resources: perceived as abundant, they are not managed efficiently.

During Theodore Roosevelt's presidency, this question was promoted to the rank of national priority, and the so-called 'conservationist' trend, which then included forest engineers, established itself as a key actor in public policies.<sup>23</sup> Gifford Pinchot in particular, its leader, instigated a policy for conserving remarkable natural sites, but also introduced a series of measures promoting the rational use of forest and water resources. It was at this time that conservationists took over the so-called 'preservationist' school, mainly represented by John Muir, amidst a vast controversy over the value of nature.<sup>24</sup> While the latter argued for the value of wilderness as such, irreducible to its utilitarian use, the former won out by adopting a dual strategy: wilderness can be protected as such, but without this implying outright opposition to improvement projects or economic development based on its rational exploitation.<sup>25</sup>

Veblen was involved in public policies carried out in the name of these principles. In the aftermath of the war, unable to count on a stable university job, he worked for the Statistical Department of the Food Administration, where he became aware, in a context of economic recovery, of the problem of food supply chains.<sup>26</sup> The lack of fluidity in the relationships between production, transport and distribution, the disastrous effect of strategies aimed at maintaining high prices, everything that more generally hindered the harmonious integration of the business cycle into technological infrastructure, appeared to him as a betrayal by the industrial elites of the promise of prosperity they were promoting. While the conflict between business and workmanship had previously occurred at the level of human instincts, Veblen deepened his understanding of the institutional mechanisms that led to the persistence of archaic traits in a society that claimed to be governed by an empirical and scientifically informed consideration of simple facts, and by the integration into human behaviour of certain constraints specific to things.

At the same time, the question of efficiency would produce theoretical and practical outcomes of a completely different order, especially when it came to integrating human labour into the general schema of rationalization. Published in 1911, Frederick Taylor's essay on the principles of scientific management<sup>27</sup> borrows abundantly from conservationist rhetoric and takes place within the framework set in place by Roosevelt a few years earlier. But in at least two ways, it contradicts the meaning that Veblen seeks to give to the project of efficiency. Taylor starts from

the observation that workers sabotage the production process, and therefore capital, by performing their tasks lazily. The very old issue of discipline at work is then reformulated, and its justification now lies in the fact that it in principle benefits both the entrepreneur and the employee. Indeed, the rationalization of tasks, i.e., the saving of time, makes it possible to increase profits as well as wages, while theoretically guaranteeing a better quality of working conditions. But according to Veblen, the search for efficiency involves a comparison between the pecuniary gains obtained by the activity of the market and the rational use of human and physical forces in a process leading to the prosperity of all. So labour is not the primary target of rationalization, and it is mainly in machinery and resources that there is room for improvement.

The second point concerns the economic and social structure implicitly defended by Taylor. The emerging figure of the manager, as he describes it, plays an intermediary role between the entrepreneur and the worker. By making it possible to save time, that precious resource, it provides a new justification for the income generated by capital: this income is no longer a mere idle rent, but the effect of a central logistical know-how, which must therefore be remunerated. Although the worker indirectly benefits from the comparative advantage that his company enjoys in the competitive market, Taylor first addresses the businessman in search of new forms of legitimacy in the latent conflict which sets him against the workers and their capacity to hinder the productive process. The scientific management of labour is thus seen as an instrument for limiting the political leverage of workers. For Veblen, on the contrary, it goes without saying that any saving of resources must exclusively benefit the social categories directly involved in the productive process; thus, the alliance between managers and the owners of capital once again undermines the sociopolitical significance of efficiency by reinstating symbolic distinction in social organization.

These ambiguities inherent in the search for efficiency were exposed during Veblen's lifetime when, in the 1920s, he gave the New School for Social Research in New York a series of lectures on the relationship between technology and economics. He then gathered around him several members of the American Society of Mechanical Engineers, who would soon form the Technological Alliance, including Howard Scott.<sup>28</sup> Even if it was only after his death, in 1929, that a technocratic movement was structured in the United States to meet the challenges of the Great Depression,<sup>29</sup> Veblen was from that time onwards considered a guardian figure for the emancipation of engineers. It was indeed in his wake that the slogan 'technocracy is science applied to the social order' was promoted, albeit leaving open the question of what form this application would take. American technocratic thought can indeed be considered as scientist, authoritarian, even millenarian, but also

as utopian<sup>30</sup> or reformist: the flexibility of the meanings that can be attributed to the control of society by science allows interpretations of this project as being closer to industrial democracy as thought of by socialists at the time in Europe, but it also allows militaristic, even proto-fascist interpretations, in which the autonomy of individuals appears as the main factor that might get in the way of an ideal order.<sup>31</sup> Beyond these ideological uncertainties, one conceptual trait remains: the technocratic organization of society aims to replace the price system (i.e., the competitive market) by a substantial metric indexed to the objective reality of material flows produced and exchanged. On this point, the revolutionary character of technocracy is not in doubt, nor is the affinity with the Soviet project being implemented at the same time on the other side of the world.

### **The engineer and property**

The intellectual efforts that Veblen would deploy were therefore all linked to the ambition to respond to the obstacles that contrasted the financial management of the economy with the realization of a technological democracy. These efforts culminated in 1919 in *The Vested Interests and the Common Man*, and in 1921 in *The Engineers and the Price System*.<sup>32</sup>

The work on engineers immediately raises the question of the historical origins of the subordination of the technological norm to that of financial flows, or of the metabolic cycle to the business cycle. It is with a reinterpretation of the concept of sabotage that this analysis opens. Veblen first describes the ordinary use of this concept, linked to the techniques by which unions aim to slow down or even paralyse the productive process in order to establish a balance of power for their benefit. It is clear to him that these strategies, though illegal, are at the same time legitimate insofar as they constitute the only means for the working classes to assert their rights. But he immediately balances out the analysis of the use of sabotage by describing the more or less conscious activity of industrial entrepreneurs who slow down and obstruct the efficient use of human and material forces in order to optimize profit. And if these procedures are generally not conceived as sabotage, it is not only because they are legal, but mainly because they arise from the right to dispose of one's property in a completely free manner. 'Capitalist sabotage',<sup>33</sup> unlike that carried out by workers, is therefore legal but illegitimate – from the point of view of the standard of industrial efficiency that Veblen sets for himself. And it lends this phenomenon a structural value: insofar as the search for pecuniary profit depends on opportunities fixed by the market, there is no longer

any correlation between the material rhythm of the exchanges in which different actors take part in a chain of production, transport and consumption, and the assessment of a good or service in monetary metrics.

Industrial underefficiency is thus not sought as an end in itself by investors and captains of industry, but it is the inevitable consequence of an economic organization that responds mainly to price stimuli. In the context of the postwar economic recovery, and as will be the case later at the time of the Great Depression, the antagonism between market rationality and industrial rationality becomes evident, and the subordination of the latter to the former assumes a capital importance. Veblen does not, however, attribute this type of sabotage to autonomous private economic elites, since they can count for these purposes on the support of a large number of legal provisions at state level. Customs tariffs, for example, can protect national economic interests to the detriment of the geographic complementarity of knowledge and skills; restrictions or even prohibitions can delay the development of a productive sector so as to guarantee the profitability of an influential competitor, even if the latter lags behind in terms of the quality and efficiency of the processes of production.<sup>34</sup>

Veblen then demonstrates the historical relevance of his analysis by proposing a genealogy of the domination of business over industry. In *The Vested Interests*, he shows how the ethical and legal systems specific to the liberal culture founded in the eighteenth century were gradually made obsolete by industrialization, while retaining their power to legitimize the economic order. In Locke, Montesquieu and Smith, to use the figures of the Liberal Enlightenment that he himself emphasizes, the connection between civility and property is anchored in the context of the necessary protection of natural rights in the face of the abuse of power. Individual autonomy, enshrined in law, therefore appears as a progressive force, because the relationship between the private individuals and their capital still expresses something of their inalienable right to protect their life and their liberty. But the wisdom and the legal corpus of liberalism suffered over time from a phenomenon of tectonic drift: the more complex the productive forces and the arrangements of capital became, and the less relevant the structure of legal protection previously established, the less concrete arrangements between people and things were reflected. The virtues attributed to property thus functioned in a world very different from that which had witnessed its identification with liberty, mainly because property, in the mature capitalist system of the nineteenth century and the beginning of the twentieth, usually took the shape of the investment of private capital without direct industrial responsibility.<sup>35</sup>

Veblen here foreshadows Wrigley's reflections on Smith and on the exaptation of liberalism: the raising of capital and the productive process typical of the nineteenth century rule out the supposed natural affinity between property and technological responsibility. On the contrary, the return on capital rests on the ability to delegate material management to specialized operators so as to turn to increasingly autonomous investment strategies. Personal rights, which initially had an eminently political meaning, gradually shift towards an economic meaning: they are the rights to conduct one's business freely, through inheritance and free contract. Once they have been fixed in stable legal structures, the ideals of rationality, equality and autonomy, first promoted by liberal thought, lose their grip on the concrete forms of social and economic organization and betray themselves. The venerable principle of self-help has lost nothing of its value, writes Veblen, but it is the order of things to which it applies that has been irreversibly transformed.<sup>36</sup> The facts here refer to the evolution of science and technology, of our modes of control over the world – the very thing that the organization of the market claimed to exploit in order to create emancipation. However, for Veblen, it may happen that the material conditions of existence change at such a rate that they conflict with the principles of law, and in particular the connection between property and autonomy.<sup>37</sup>

By identifying the triumphant authority of anonymous capital over economic organization, Veblen can also radicalize the split identified as early as his first work between business and industry. He notes that in the first phases of economic modernization, it was the innovators, the technicians, who most often took the initiative in creating businesses, and it was in line with a technological rationality that they deployed their activity.<sup>38</sup> Then, gradually, the technological functions and the accounting, financial and commercial functions followed a specialization process during which they separated from each other and became independent. It was at this time that corporation finance intervened in the productive sphere in order to regulate the pace and modes of development. While the 'factors of production' were commonly reduced to the trilogy of labour, land and capital, a fourth factor emerged: the entrepreneur, in charge of the financial aspects of the economy, asserted himself as a central actor in the creation of value, since he became able, on the basis of a know-how totally disconnected from the productive process itself, to value capital without any increase in the quantity of raw products produced and sold. The very high degree of specialization of financial activities, inversely proportional to their involvement in the effective conduct of things, is therefore comparable to the emergence of a new regime of production in which industry as such is merely a substrate devoid of normative power.

Capitalism thus completely changed its meaning when its combination with technological skills was relegated to the background and the valuation of capital by instruments specifically related to market and credit mechanisms became not just a predominant occupation, but in particular one that was liable to erode the valuation of labour and the specifically industrial interactions that characterize developed societies.

On a sociological level, Veblen describes the high cultural status – very clear in the United States – of the classes linked to the market: banking and finance, and also the servants of capital who, through marketing, advertising and sales techniques, give the fourth factor of production its full scope. Ironically, Veblen erects these social categories into a new clergy, a ‘bureaucratic clergy’:<sup>39</sup> under the grey and anonymous exterior of the ‘office manager’, we witness the re-emergence of a group of dominant idlers who manage to legitimize their authority by making marginal gains that were much sought after at a time when profit rates were already very low. Veblen also associates the emergence of financial control with the weakening of prospects for growth and the spectre of overproduction. The autonomy of business cycles was already nothing new at this time, and the temporary contraction of the economy, which regularly causes the elimination of a ‘useless’ swathe of labour and industrial equipment, is accepted as an inherent component of the modern order. But he shows that some of the social legitimacy of managers lies in their capacity to postpone, rather than simply avoid, crises of overproduction. Among the functions born of the increased specialization of administrative tasks we find the artificial creation of outlets, supported by advertising and marketing.

Veblen basically allows us to clarify the above-mentioned hypothesis about the loss of material reflexivity between the agrarian phase of liberalism and its resumption and re-elaboration in an industrial context. If we accept with him that the moral and legal structures developed in the eighteenth century were obliged to subsist in a world whose material coordinates changed under the impact of industrialization, and that these coordinates were not integrated afterwards in a correction of the paradigm of *laissez-faire* and property, we can understand the turn of the twentieth century as a world turned upside down. The interests associated with private investment (Veblen’s ‘vested interests’), henceforth freed from the material responsibilities that now fall upon industrial engineers hidden in the depths of factories, in fact entail the formation of fictitious, even mythological entities, which are no less effective for being so. The main institution to express this fictitious character of the dominant economic system is what was then called absentee property – i.e., the fact that the entrepreneur was now under the orders of investors who kept away from the productive process and its constraints.



The main consequence is that a large part of the profit – i.e., what results from ‘the technological efficiency of the community’,<sup>40</sup> – is diverted by the business community, which manages portfolios of shares. The idea imposes itself in cultural terms that economic activity is equally structured by the importance given to tangible and intangible assets. The creation of a guaranteed income from the holding of financial assets traded on a market is perceived as just as legitimate as the extraction of an industrial profit from mechanical, productive know-how.<sup>41</sup> It even tends to become the norm for enrichment and value creation, in part because the national accounts established at that time made no distinction between this type of profit and the other. Veblen gives the name ‘free income’ to the gain obtained in these stock market transactions which contribute to derailment of the economy and to the erosion of both the industrial culture of modern societies and the material reflexivity with which they are likely to provide themselves.

Obviously, no income is in itself independent of the productive industrial process, i.e., an instrumental exchange with resources; but under certain institutional and legal conditions, depending on a certain type of division of labour, certain types of income appear to be created by magic.<sup>42</sup> Veblen often uses the expression ‘getting something for nothing’ to express this magical spell of finance, which brings to light the fundamental ambiguity of modern property rights: while it should endorse the virtues of the improvement and prudent enhancement of a source of production (in particular the land), it has been gradually developed into a form that will guarantee pecuniary profits.<sup>43</sup>

That is the reason why a stock market crisis like that of 1929 could lead to a massive destruction of capital, and thereby endanger the way of life of a whole nation, without it being possible to attribute physical or ecological causes to it. The regulation of needs, and more generally the maintenance of subsistence functions and their territorial substrate (resources, transport infrastructure, etc.) are at the mercy of the regulation of capital flows, the fragility of which was already well known at the time. While Veblen did not experience the Great Depression, we can still say that his analyses foreshadowed the scenario of the 1930s, and this was why he experienced posthumous glory at the time of the New Deal.

He noted the centrality of the engineer in the maintenance of industrial society, emphasizing that the demands of efficiency dictated placing social control in the hands of qualified and selfless technological experts rather than captains of finance.<sup>44</sup> The conquest of affluence by the theoretically indefinite extension of the productive forces is here accompanied by a very strong conception of the political responsibility entailed by this orientation. While Veblen clarifies how a

social elite is freed from any industrial involvement, and how it comes to embody a pseudo-emancipation, he also indicates the growing divergence between this illusory self-representation of the society and the norm on which it is nevertheless based. Socialization never springs *ex nihilo*: it needs a ternary relationship between a subject, the group to which he or she belongs and with which he or she exchanges knowledge and goods, and a natural and spatial exteriority. For Veblen, the centre of gravity of the coming social reorganization is thus to be found in the alliance between engineers and workers, since, beyond the sociological divide that may separate them, both oppose the sovereignty of the market. Since they are responsible for effectively organizing the points of contact between the environment, the technosphere and society, engineers find themselves in a position to appreciate the network of industrial interdependencies in a holistic way. It is the strategic position of their action, and the fact that it requires great knowledge and skill, which empowers them to take on dominant responsibilities. Second, in Veblen's view, the assumption of industrial functions by state engineers emancipated from pecuniary interests liberates the debate on civil liberties and social justice in general from being parasitized by the landowning classes, and therefore plays a role in preserving the democratic spirit by limiting the corruption of power.

In other words, in this framework democratization transcends the traditional separation between proletariat and bourgeoisie, as among the latter we find agents who, knowing the specific requirements for the management of a state forest or an automobile factory, or for improving agricultural land, become the servants of the common interest, while the bank employee or the advertiser is complicit in the way money turns industrial values topsy-turvy. Veblen thought that the conquest of autonomy by affluence caused a dislocation between common interests and those of a new idle class, and thus endeavoured to imagine ways in which to restore conformity between the substance of society and the way it represents itself to itself.

\* \* \*

One of the problems with this critique is, of course, the meaning that it attributes to the notion of efficiency. If the achievement of a fair and egalitarian modernity is due to the free deployment of productive capacities, we are entitled to wonder about the consequences of a political system that will take the promise of emancipation by a now unhampered affluence literally. Certain statements by Veblen leave no doubt about the desire for a total liberation of the productive forces. The common good, insofar as it depends on material well-being, is ideally served by the development of an industrial system that does

not suffer from any interruption or hindrance, and thus reaches its maximum capacity.<sup>45</sup> And we must place ourselves in the context of an economy of reconstruction, in which material poverty remained widespread and would be further increased by the great crisis of 1929. The challenge of meeting basic needs remains central, and the idea of a pathology of overconsumption, as Durkheim envisions it for example, seems to be foreign to Veblen's empirical horizon.

However, it is not possible to make this search for productive intensity autonomous, an end in itself, because the justification for a socialization by technology always oscillates between three vectors. First, the vector that strives to maintain a fragile balance between the various components, human and technological, of the industrial infrastructure; second, the vector embodied in the common fund of knowledge and productive know-how; and third, the vector of pure and simple efficiency, i.e., the rational and sustainable use of resources. Efficiency, conceived as one of the three points of a triangle, is therefore not an unequivocal submission of society to the motive for growth, but rather the integration – as harmonious as possible – of the objective of growth with expectations of social integration and justice, as well as with the specific requirements of modern infrastructure and the proper use of resources and territory. All this entails connecting multiple parts, spaces and functions into a coherent whole.

The performance of the productive system is therefore tempered by an in-depth understanding of collective expectations and a sensitivity specific to the natural and technological environment. For example, efficiency thus defined does not require immediate and maximum exploitation of the forests or the fertility of the soil, but rather the spread of techniques of exploitation over time and space, a process that make possible the gradual rebuilding of these stocks and the regeneration of this fertility. Veblen in this sense is indeed a conservationist author; he is guided by the prudent long-term use of resources, aware of the need to know the regulatory principles specific to the environment in order to comply with them. Efficiency and adaptation are the two aspects, the two moments of a dynamic in which technological, ecological and sociological norms are integrated most harmoniously. This is why we should not see any contradiction between the principle of performance, or of the intensification and extension of the productive bases of society, and the avoidance of waste: a large proportion of the productive gains expected by technocratic thinking is in fact due to the economic use of resources, the possibility of integrating large quantities of material into the cycle of production and consumption without the waste products accumulating at the periphery of this process. While Veblen did not develop this aspect of things himself, no doubt because the economic and

health dangers posed by pollution were not yet obvious, it was one of the most important prospects that he opened up.

Waste, indeed, is for him the tangible testimony of the underefficiency of an industrial system subordinated to the logic of prices and private property: as soon as the by-products of the activity are considered as being outside the chain of value – insofar as the cost of their management is not reflected in a firm's balance sheet – their accumulation can extend over time while going unnoticed. If, as some economists later showed, it is ultimately the community that bears these maintenance and repair costs, and if an essential part of industrial profit is therefore due to this delegation of responsibility, Veblen foreshadows the challenges of an economics of externalities by requiring the economic order to integrate itself into the sphere of material transactions between society and its environment. This idea that the price system is structurally incapable of making explicit the dependence of the productive system on the constraints imposed on it by the environment and machines – an incapacity that results in injustice and ineffectiveness – has led to many highly influential developments in the formation of ecological thought, of which Veblen is the unknown pioneer.

On the one hand, we have ecological economics – that is, wealth analysis based on the idea that the economy is a subsystem of global ecological interdependencies.<sup>46</sup> First implemented by the Romanian economist Nicholas Georgescu-Roegen in the context of thermodynamics and systems theory,<sup>47</sup> this approach was then taken up in the form of a methodological convergence between economic analysis and functional ecology.<sup>48</sup> The elimination of monetary metrics then becomes radical in scope, leaving the field open to a reintegration of metabolic relationships into economic reflexivity, which will later give rise to the development of the concept of 'ecosystemic service',<sup>49</sup> to which we will return. On the other hand, the environmental critique of global financial institutions and the dominant economic rationality also radicalized, albeit in other respects, the relationship established by Veblen between the concept of value as price and the decline in attention to the social consequences of industry.<sup>50</sup> Thus what we now have, dispersed in very different epistemological universes, are conceptual and empirical operations that inherit the technocratic tradition without always being aware of it, but that reactivate the technocratic vein in updated forms, in the guise of an economy of sustainability and environmental justice.

## *Nature in a Market Society*

### **Marx as a thinker of autonomy**

For socialists, the new ecological regime of industry calls for new political principles. The development of a landscape punctuated by mines, rationally administered agrosystems, railways and vast urban entities dedicated to market production would be complete only if placed under the authority of principles of justice ensuring that the conquest of affluence was not to the detriment of the people and their aspirations.

But it must be recognized that, in this context, the operation that society imposes on nature has been perceived as an unprecedented historical opportunity to overcome alienation once and for all, and to celebrate the coronation of a finally autonomous humanity. If the pure market cannot guarantee this conquest, the direct organization of the productive forces claims to achieve this same end by other means. It is this aspect of the problem that we still need to examine. Can socialism present itself as a transcendence of liberalism on its own terrain, as the fulfilment of a promise hitherto fostered by a combination of the economy and representative government, and which now requires another form of organization of relationships between human beings and wealth?

It was undoubtedly Karl Marx (1818–83) who, in the middle of the nineteenth century, took this hypothesis furthest. One can find in *The Manifesto of the Communist Party* (1848) a general overview of the role that historical materialism plays in collective relationships with nature. Among the characteristics that make the bourgeoisie a revolutionary class is its ability to transform the face of the physical world from top to bottom:

The bourgeoisie, during its rule of scarce one hundred years, has created more massive and more colossal productive forces than

have all preceding generations together. Subjection of Nature's forces to man, machinery, application of chemistry to industry and agriculture, steam-navigation, railways, electric telegraphs, clearing of whole continents for cultivation, canalisation of rivers, whole populations conjured out of the ground – what earlier century had even a presentiment that such productive forces slumbered in the lap of social labour?<sup>1</sup>

While feudal domination rested on productive forces that were deliberately limited by a power that sought to respect an immutable order, the bourgeoisie drew its power from the permanent upheaval of the forms of subsistence. The multiplication of the productive forces and the means of communication symbolized the advent of a new world, since this procession of machines and industrial processes highlighted the destruction of the landowning order, fixed in its ways and ignorant of the extraordinary potential latent in the injunction to produce both means of subsistence and the historic conditions of existence. This is why the opening up of a world market, even if it temporarily forced workers to compete and therefore acted against their interests, was seen by Marx as a strategic ally against the still living remains of the feudal regime. In a famous speech, 'On the Question of Free Trade', also dating from 1848, Marx declared that the 'protective system', what was not yet called protectionism, was conservative:<sup>2</sup> the reassertion of economic borders as a means of restricting the importing of foreign capital, and therefore of promoting the development of a national bourgeoisie, was simply a useless relic of the *ancien régime* and, as such, it delayed the revolutionary upheaval.

Marx and Engels had merely to underline the historical irony of such a situation, since, if the 'subjection of Nature's forces' had guaranteed the success of the landowning class for a few decades, this class was doomed to disappear because of this very process. Indeed, by giving a central role to the crises of overproduction which occur in the capitalist business cycle, the authors of the *Manifesto* describe the collapse of industrial society. Unable to absorb its own production, the system is the victim of a headlong rush which reveals its essential impossibility: the indefinite accumulation of wealth is incompatible with the monopolization of capital by a minority of owners. 'The ever-increasing frequency of crises of overproduction', writes Gareth Stedman Jones, 'showed that beyond the threshold of affluence, capitalism was no longer useful.'<sup>3</sup> In other words, '[t]he conditions of bourgeois society are too narrow to comprise the wealth created by them'.<sup>4</sup> Thus, the abolition of private property ultimately guarantees that the rights of the working class are respected, while allowing the industrial dynamic

to unfold without contradiction, now that it is freed from the restrictions that weighed on it via property.

This summary of the communist dramaturgy raises two questions. The first is due to the coexistence in Marx's thought of two heterogeneous historical engines: on the one hand the class struggle; on the other, the determinations imposed by the state of the productive forces. Can history be consistently defined by either process, or is there a choice to be made?<sup>5</sup> For Marx, it is a matter of being able to synthesize previous socialist traditions, since the class struggle corresponds to the legacy of Proudhon, and Saint-Simon is to some extent absorbed in the theme of a government backed by the capacities of science and technology. In this context, the technological fatalism that appeared, for example, in the famous declaration in *The Poverty of Philosophy* ('The hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist')<sup>6</sup> is an enigma. If it is easy to see how relations of domination can be counted among the possibilities opened up by this or that state of the productive forces, it is unclear how the subversion of this domination can be achieved in the absence of a new technological transition (a hypothesis made by the Luddites at the time). However, the revolutionary horizon described by Marx precludes such a transition: the conquest of emancipation takes place against the political forces generated by industry, but on the same technological and material bases which previously fostered them.

The second question is that of autonomy. While Marx is often presented as a thinker indifferent to the ideal of autonomy, which is essentially a legal and therefore liberal matter, he actually puts forward a completely radical conception of this ideal. He is attached to the elimination of forces external to society, and the third thesis on Feuerbach clearly expresses this concept of autonomy: 'The coincidence of the changing of circumstances and of human activity or self-changing (*Selbstveränderung*) can be conceived and rationally understood only as *revolutionary practice*.'<sup>7</sup> Here, autonomy no longer involves only the social body, i.e., the form assumed by the association of human beings among themselves: the construction of social norms and the education of humanity by itself, its self-determination as a historical subject, go hand in hand with the technoscientific reconstruction of the world. This is also why the conquest of autonomy is revolutionary: the transformation of the world is the ferment of social self-transformation, and each drags the other along with it until the breaking point when the legal framework that had accompanied the development of the productive forces collapses. Once the revolution is complete, the tension we saw at work between the sociological determinations of history (class struggle) and its technological determinations (by the productive forces) is resolved, and the conditions under which



society accesses the world are finally adequate to its internal structuring. The horizon of an industrial society freed from liberal legal forms and the inequalities it dictates therefore imposes a very great responsibility on the conception of the productive partnership between human beings and their environment, which cannot fail to find an echo on the theoretical level.

In order for all these issues to emerge clearly, we need to explore Marx's thinking from the perspective of the problem of the institutionalization of natural environments through law, technology and science. Marx was extremely attentive throughout his life to the political problems posed by the physical and living characteristics of the world in which the market ideology unfolds, and he partly conceived the communist response as a transformation in the relations between these characteristics and social organization. This does not make him a proto-ecologist, any more than were Proudhon or Saint-Simon, but it is enough to give him an important place in the history of material reflexivity.

### Putting the forest to good use

In 1842, Marx had already reacted to the initiative taken by the Rhine Diet to stiffen the legal provisions governing the use of forests and their resources. Until then, the collection of fallen wood, certain fruits and even small animals was tolerated by the owners. Peasant customs established an informal distinction between the resources fixed to the ground and legitimately exploited by their owner, and a set of things that belonged, by default, to the 'commons'. The collecting of fallen wood played a significant role in the subsistence of peasant communities, which thereby partly escaped the impact of fluctuations in grain prices. In 1842, the legislator sought to put an end to these practices and resorted to a literal meaning of individual and exclusive land ownership.<sup>8</sup> A forest police force was set up to enforce these provisions, and with it came the redefinition of gleaning as theft.<sup>9</sup> This reform immediately triggered popular protests, which Marx reported on in the *Rheinische Zeitung* newspaper. For example, he wrote: 'The gatherer of fallen wood only carries out a sentence already pronounced by the very nature of the property, for the owner possesses only the tree, but the tree no longer possesses the branches that have fallen from it.'<sup>10</sup> It is thus the physical structure and the lifecycle of the tree that legitimize peasant practices by letting inappropriate things fall to the ground, and from this point of view the strict application of property rights as the enclosure of a cadastral space appears artificial.

But from behind the controversy over the definition of property emerges a debate on the modernization of human relationships to nature, resources and space. Indeed, legal formalization has the consequence of seeing peasant practices as simply a form of archaism: by resorting to the argument that their customs are very ancient, they appear incapable of reforming themselves, and seem to be dependent on traditionalist values, those ordinarily defended by conservative forces. Worse, by not aiming to optimize the use of resources under the responsibility of an owner whose interest is best served by selling his wood on the market, the populations attached to the principle of the commons are forced to present themselves as premodern. When Marx defends the nonmarket regulation of the wealth of the forest and the products of gleaning, he steps into a social conflict where class interests are opposed, but also into a debate in which the historical orientation of each of the two camps is the point at issue.

As property embodies progress, the commons and the forms of life connected to them are in a way indigenized – seen as old-fashioned, as part of the clumsy daily struggle against poverty of social groups ignorant of their interests and the logic of history. In his articles, Marx clearly shows how nature has become a space of controversy in its own right, a battlefield, and that it has assumed this dimension in a context of the rapid transformation of the social forms for supervising the productive power of the land. He thus reproaches the legislator for thinking that, ‘in connection with the law concerning wood he should think only of wood and forest and should solve each material problem in a non-political way, i.e., without any connection with the whole of the reason and morality of the state’.<sup>11</sup> Marx sees these provisions as a way of evading the principles of distributive justice implicitly contained in community forest management. But by failing to oppose the rational calculation of owners, and defending what today would be called community-based management, i.e., a set of techniques that are equally modern but not aligned with the short-term rationality of landowners, Marx implicitly accepts that the sharing of commons embodies resistance to modernization.<sup>12</sup>

With regard to the positions defended in the *Manifesto*, his defence of the Rhenish commons reveals ambiguities. On the one hand, he saw the entrenchment of social inequalities in the institutions that established the conditions for access to resources. From this point of view, there is no doubt that control of the law amounts to control of the resources, and the class-based dimension of legal authority, of which Marx would always be convinced, appears clearly. On the other hand, if the revolutionary overcoming of the capitalist structuring of society proceeds from a dynamic in which accumulation plays a positive role, then we must conclude that the model of the commons is irremediably

on the wrong side of the history, and that, in the name of historical teleology, we must give free rein to the optimization of forest resources. The defence of the lower classes and the idea of a totalization of the historical experience by the capitalist organization of production are thus temporarily placed in tension with one another. And it is not only a problem of doctrinal coherence: the main issue is the possibility of involving the peasant masses in a revolutionary movement conceived as a product of the historical engine that is progress.

If belonging to modern citizenship was at that time conceived, in the republican and social camp, as a 'breaking away from all natural and psycho-social determinations', as a full and complete integration into the order of reason and history, insofar as this order can be distinguished from the domestic sphere and from the reproduction of daily needs, then the peasant can easily be relegated to immediate and immemorial dependence on the seasons, the climate, the care of beasts and the whims of nature.<sup>13</sup> After 1848, the massive support in French rural districts for Bonapartism and then the Empire, served to confirm the political disqualification of the peasants by the very same people who were promoting equality. And Marx was part of this movement, as evidenced by a famous passage from *The Eighteenth Brumaire of Louis Bonaparte*, in which he depicted the peasantry as an aggregate of individuals incapable of forming a class, fiercely attached to their small properties, ready to submit to any providential personality.<sup>14</sup> The empowerment of peasant families through access to what he calls 'plot ownership', following the French Revolution, produced a paradoxical or hybrid social class, since it was economically bourgeois and politically conservative, seeking nothing other than protection by traditional authorities. Resistant to economic rationalization and alien to social ideals, the peasantry fell into the limbo of history, neither really attached to the landed aristocracy nor embarked on a movement of emancipation.

The social groups that owe most of their economic and social coordinates to the land thus seem to be relegated to the fringes of a historical process considered as universal. Whether they embody a resistance on the part of premodern forms of community, prior to the separation between man and nature, or a melancholy compromise between bourgeois law and ideological backwardness, these social groups are very difficult to assimilate into the logic of the overcoming of capitalism. Even if Marx was at the end of his life to accept the hypothesis of a historic leap made by Russian peasants, from attachment to the land to communism, without going through capitalism, this idea remained in contradiction with the logic of historical materialism: neither the principle of class struggle nor that of infrastructural determinations seems to support it.<sup>15</sup>

### **Technology and agronomy**

If we turn to Marx's *Capital* (published in 1864), we will see that the analysis of the exploitation of labour also raises difficulties when it comes to giving a political meaning to human beings' collective relationships with nature.

At this stage of his thinking, these mediations were less legal than technological and organizational (the control of labour time). Marx first defined labour as 'the necessary condition for effecting exchange of matter between man and Nature; it is the everlasting Nature-imposed condition of human existence'.<sup>16</sup> The minimal mediation comprised by bodily equipment is then relayed by a series of technological innovations that isolate an exosomatic mediation. Through technology, humans increase their grip on the world and express their specific condition as craftsmen of their own historical development. This process culminates with second-degree techniques that no longer contribute only to perfecting the acquisition or extraction of natural wealth, but make it possible to produce things, including the means of production: the chemical industry, by breaking up and reconstructing the given state of matter, and also the industrial infrastructures (canals, roads, etc.), by transforming the morphology of the territory, make the difference between the external conditions of production and the product of human action almost imperceptible.<sup>17</sup> It is particularly notable that the land itself, as a factor of production and a *locus standi* of the worker, is integrated into this dialectic of the socialization of the environment.

At the same time, the increasing complexity of technological mediations increases the division of labour and makes the species even more dependent on cooperation. But it is in these new forms of cooperation that the possibility of economic domination also lies. Since the means of production can be subject to exclusive control by a segment of the population, part of the contribution to the effort of subsistence comes under the direct responsibility of a particular class. Then labour itself becomes one technological mediation among others in the production process, since it is subordinated to control over technology. And in a context where the land itself, the habitat of humans, is the product of such a process, this alienation becomes systematic: the human substance of the activity by which nature is socialized does indeed become the object of economic transactions.<sup>18</sup>

By integrating human force into the production process he controls, the capitalist can appropriate the fruits of the efforts of others in the same way that he benefits from the productivity gains of a machine or an infrastructural investment. At this stage of development of the productive organization, the profit realized appears as a natural

gain. The uneven distribution of technological instruments in society is of course the real explanation for the genesis of surplus value, but Marx recalls that classical political economics has always naturalized profit, it has always seen it as the result of a 'natural' fermentation of the capital invested. In the synthesis of his chapters on surplus value, Marx attributes to Ricardo and James Mill the fundamental error of political economy: 'Ricardo never concerns himself about the origin of surplus-value. He treats it as a thing inherent in the capitalist mode of production, which mode, in his eyes, is the natural form of social production'; and '[Mill says] the cause of profit is that labour produces more than is required for its support.'<sup>19</sup>

The naturalization of surplus value by political economy clears the ground for a critical analysis that reconstructs the process by which wealth is concentrated and sucked in by the owners of the means of production. However, this mechanism is largely due to the properties of technology, and in particular so-called 'second-degree' technology. By producing conditions of production (improved land, infrastructure), the owners of capital impose their power on the living environment of the workers; they turn the space of the countryside and the city into sources of profit. Technology is therefore immediately political, because by authorizing productivity gains, by making it possible to delegate a certain number of functions to secondary operators and by promoting the spatiotemporal concentration of the production process, it provides capitalist exploitation with its essential substrate. Modern technology makes it possible both to channel capital flows to investors and to mistakenly conceive of this flow as a spontaneous fermentation of capital. In the same way that the preindustrial economic, social and political structure took advantage of the affordances of the land, the structure associated with the new ecological regime brought about by industry takes advantage of the affordances of the machine: its automatic character in a way makes permissible the intellectual confusion that leads profit to be considered as an almost metaphysical virtue of capital, quite simply because an impersonal reality makes it possible.

We too often forget that the reading by Marx of technicians and engineers, in particular Babbage and Ure, played an essential role in the construction of this critique.<sup>20</sup> Babbage insists on the driving efficiency of the modern technological system, on the consequences of the economy of forces allowed by the machine. The contraction and delegation of effort, the acceleration that is made possible and the marginalization of human action in the technological chain are all characteristics of the new productive system, summed up well in the idea of an economy of means, naturally converted into profits. As Babbage himself indicates, these reflections are intended to extend

Smith's parable about the manufacture of pins: what first appears as a philosophical thesis on the productivity gains generated by the division of labour is taken up in the form of an agenda intended for the entrepreneur concerned with rationalizing his production costs. Andrew Ure's contribution relates rather to the disciplinary dimension of factory labour, the application of methods for the optimization of coordination and prioritization of tasks, the fine adjustment of actions and mechanical forces in a harmonious and, here too, economical whole.<sup>21</sup> By drawing on the categories introduced above, one could say that Babbage studies the consequences of extensive growth and Ure those of intensive growth.

But Marx is also interested in the technoscientific revolutions that apply to the agricultural world. For the incorporation of land into capital, the development of German agricultural chemistry plays a role analogous to Babbage and Ure for the mechanical factory. If the conscious organization of industrial productive forces is made possible by the application of labour-saving processes, the conscious organization of agricultural production (and therefore its integration into the capitalist logic) also relies on a scientific authority, in this case, a little later, that of the work of Liebig. Although Liebig's contributions have only a fairly limited place in the economy of *Capital*, they should be mentioned because this reference to agricultural chemistry provides the basis for an important swathe of the contemporary ecological interpretation of Marx.<sup>22</sup> The discovery of Liebig by Marx took place in the 1860s, in a dialogue with Engels.<sup>23</sup> The knowledge of the mechanisms that govern soil fertility, and therefore the partial mastery of processes allowing one to reconstruct this 'natural' productivity artificially, quite logically fit within the framework of historical materialism. Engels and Marx see it as a welcome component of modern sciences, which, while playing a role in the intensification of production, reveal its tensions and contradictions. The short section devoted to the industrialization of agriculture describes a transformation in which 'the most routine and irrational mode of exploitation is replaced by the conscious technological application of science'. In a key passage, Marx then specifies that, as the urban population grows, capitalism both amasses the driving forces of society (i.e., these masses) and, at the same time, disturbs the metabolism between human beings and the land, since the elements of food and clothes are no longer returned to the soil and cannot contribute to its fertility.<sup>24</sup>

The massive transfer of materials from the countryside to the cities, but also from the colonial peripheries to the industrial and commercial centres (in particular guano, an important fertilizer), leads on the one hand to the accumulation of waste, material residues from human activity that do not return to the ground, and, on the other, to the

sterilization of entire portions of domestic or external territory. The contribution of nitrates and phosphates from the colonial peripheries, made necessary by the increased pressure on European and particularly English soil, to compensate for the erosion of their fertility, here plays an important role in the awareness of chemical and organic interdependencies. All these processes, as Marx writes, disrupt the metabolism (*Stoffwechsel*) that has long structured the incorporation of human activities into relatively localized and self-contained, and therefore self-sustaining, biochemical cycles.

The economy of accumulation then reveals a dimension that had hitherto been little studied, which Marx sums up by writing that ‘all progress in capitalistic agriculture is a progress in the art, not only of robbing the labourer, but of robbing the soil; all progress in increasing the fertility of the soil for a given time, is a progress towards ruining the lasting sources of that fertility’.<sup>25</sup> The equivalence of two forms of looting is based on the affinity between the process of extracting surplus value from human labour by extorting unpaid working time and the process of extracting surplus value from land by the chemical forcing of soil and the accumulation of pollution.

But if we return to the passage on the metabolic rift, and more generally on the industrialization of agriculture, it should be noted that Marx does not simply point to the risk of a destabilization of the fundamental processes of agrarian ecology; what is at stake is also the modernization of social practices in the countryside, the elimination of the ‘routine’ and ‘irrationality’ that dominate the peasant way of life. At the same time as it hampers the harmonious reconstitution of the soil, and therefore entails its own ruin, capitalist development amasses in the city what Marx unambiguously calls ‘the historical force of society’. Its civilizing labour, even if it compromises the sustainability of history, is not ruled out: the conversion of the peasant to productive rationality, when the peasant represents the element of the social body most resistant to revolution, remains a priority objective whatever its ecological cost, and in this sense the use of scientific processes plays a positive role. Thus, the metabolic rift is indeed an emerging contradiction of the capitalist mode of production, but it can be said that it is inherent in the constitution of a more massive urban class, as well as in the integration of residual peasants into the practices of a rational division of labour – to an experience of alienation that will enable them, too, to enter history.

\* \* \*

If we now consider Marx’s reflections on technology and agricultural chemistry together, it becomes clear that freeing up surplus value requires a planned, coordinated, highly informed reorganization of



collective relationships to natural forces and space. Capitalist exploitation, before being a political scandal, is a complex arrangement of resources, machines and organizational processes that manages to obtain more from the human and nonhuman forces already available. This surplus, identified with profit and hidden as such by the naturalizing economic rationality of liberalism, is what constitutes the *difference* of capitalism in human history. If we are dealing with a specific mode of production, this is first of all because the partnership between man and things is controlled by new forms of knowledge and know-how onto which are grafted social asymmetries. For most of Marx's ecologically minded heirs, this is a reason to find in historical materialism a theme marginalized by official Marxism, which consists in associating the exploitation of nature with the exploitation of man. This parallel is not only founded in the texts, but also makes a powerful contribution to any critique. However, it tends to neglect an internal tension in the Marxist system, insofar as it intends to integrate the spatial and ecological rearrangement of human activities into a reflection on post-capitalism.

It has in fact been observed that, from the political texts of his youth to the economic texts of the 1850s and 1860s, the conditions in which the socialization of nature takes place are frequently in tension with the general conditions of emancipation – with the way in which Marx depicts access to real autonomy. The subaltern peasant who is forbidden to collect dead wood from the Rhineland forests is both the symbol of popular resistance to the exclusive appropriation of resources and a figure of premodern and community sociality; the peasant owner made possible by the French Revolution and agrarian reform embodies the compromise between bourgeois forms of law and the most obvious political conservatism; and later, the application of technoscientific processes to agriculture will accelerate the integration of the countryside into industrial rationality, but it will also threaten to ruin the natural support of production, and therefore of history. Whatever the level at which we place ourselves, the territorial and economic reorganization that conditions the historic movement jams up. Either it is a question of protecting pre-industrial socioeconomic relations, and the dialectical operation for which capital is responsible is hampered, or capital is effectively incorporated into the land, but the peasant classes strategically ally themselves with the dominant forces, and moreover the ecological cost of this process is such that it compromises social development in its entirety.

The absolutely central socializing value that Marx confers on the transformation of nature thus hangs on a series of quite striking contradictions, which constantly threaten to disrupt the dialectical logic of history.

### Conquering the globe

Another aspect of Marx's thought reveals these tensions within the critique of political economy: namely, his reflections on the global future of the capitalist mode of production, recorded in the *Grundrisse* of 1857–8. Among the forms of knowledge and scholarly representations of the world propounded by liberalism, Marx is not interested solely in political economy and technology. Historical anthropology, this great narrative that places human nature in an evolutionary trajectory leading to a free society, is also the subject of a subversive reappropriation, which can be summarized as follows: while Smith and his heirs tell the story of a humanity that is gradually getting rid of its communitarian barriers to give free rein to individualism and peaceful commercial exchange as well as to the industrial arts, Marx considers this apparent aim as a transitory and negative stage. It is merely preparing for the abolition of private property and the confiscation of capital by a minority elite, an overcoming that conditions access to real emancipation. Socialism therefore generates a counter-history of humanity, just as conjectural as the one it is attacking, but one that leads to a redefinition of the mechanisms for achieving autonomy.

This counter-history is based on a very elaborate conception of the original social conditions 'which precede capitalist production', where a primordial unity between human beings and natural conditions prevails.<sup>26</sup> When he sets out this anthropological and historical framework, Marx does not just describe a primitive mode of production: he gives an overview of what form social reflexivity can take in this context. This reflexivity, in his view, is dominated by the idea of a natural society,<sup>27</sup> of an immediate belonging to a community 'of blood, language, customs' that rests on 'natural or *divine* presuppositions'.<sup>28</sup> The spontaneous ideology of self-subsisting communities is therefore a landowning naturalism dominated by the awareness that a group and its *Grund und Boden*<sup>29</sup> belong together and merge.

When the dissolution of the relationship with the land considered as a natural condition of production then intervenes<sup>30</sup> – i.e., when technological and political mediations come between the associated producers and exteriority – the memory of this primordial unity nevertheless persists. The experience of modern alienation from nature does not completely eliminate the spectre of substantial communities, of religious attachment to the land; it even fuels, by its violence, the hope of a return to primordial unity. Marx then implicitly poses questions that will no longer appear in *Capital*: how can the economic and legal alienation of men and women in a natural and technological environment that has nothing to do with that of primitive communities be transfigured? How can one do justice to the need for unity, and

thus exorcise the dispossession caused by the techno-political arrangements identified with 'civilization' without compromising the gains of progress?

These questions surprisingly find an answer in some ideas of Marx about the economy as a vector of conquest, of unlimited extension of the productive forces, to the point where the logic of capital merges with the world order itself. For example, Marx writes: 'The tendency to create the world market is directly given in the concept of capital itself. Every limit appears as a barrier to be overcome.'<sup>31</sup> Nothing can resist the totalizing logic of capital, and, one would be tempted to add, there is no point in trying to resist it. It is at this point that he presents capitalist logic as territorial, geographical. He describes it as

[the] exploration of the earth in all directions, to discover new things of use as well as new useful qualities of the old; ... likewise the discovery, creation and satisfaction of new needs arising from society itself; the cultivation of all the qualities of the social human being, production of the same in a form as rich as possible in needs, because rich in qualities and relations – production of this being as the most total and universal possible social product.

He analyses capital, more often than elsewhere in his work, as a 'general exploitation of the natural and human qualities, a system of general utility, utilizing science itself just as much as all the physical and mental qualities'. This is the sign of 'the great civilizing influence of capital; its production of a stage of society in comparison to which all earlier ones appear as mere *local developments* of humanity and as *nature-idolatry*'.<sup>32</sup>

Marx is here describing the appearance of a second envelope to be added to the natural terrestrial envelope: an artificial sphere that includes all things and activities, henceforth caught up in a network of production and exchange which no longer refers to anything outside itself. The variety of climates and spaces offers a decisive path to this total conquest of the globe by creating ever more opportunities to produce and enjoy, and making the interconnection of places and humans necessary. In this context, the formation of new needs represents the cultural response to the requirements of the techno-structure as it builds on itself: the human being of capital is the one who entrusts his or her personal realization to the world market order and who guarantees the implicit association between the deepening of cultivation and the universal achievement of exchange. It is difficult to envisage a more radical negation of localist aspirations, of rootedness in the land, even though Marx detected this latter in the European social consciousness. Under the guidance of productive conquest,

human beings are supposed to honour themselves with a universality that supplants a sense of belonging to the community and the land, and even humiliates it: where 'the civilizing influence of capital' has not arrived and where theological and traditionalist prejudices still reign, backwardness is punished by the inability to join the universal movement of humans and nature. But at the same time, the search for a fundamental unity between them is satisfied. It will no longer take the form of the immediacy of communities of blood and race, but through widespread participation in a productive sociality on a planetary scale.

Obviously, all of this refutes the identification of an ecological contradiction inherent in the project of incorporating capital into the land. If productive soil and inhabited territory cannot, in the long term and without serious pathologies, withstand the technoscientific forcing they are forced to endure, and these provisions nevertheless conceal the secret of a new universality, then access to autonomy seems compromised. When he thinks through the consequences of the 'metabolic rift', Marx seems to realize belatedly how much he depends on a mode of relation to the world dominated by the schema of production: the irreversibility of the processes that this relation entails, on both a sociopolitical level (producing, i.e., making history) and a material and ecological level (producing, i.e., accumulating waste), leaves no room for manoeuvre for any relationship *other than productive*, even *non-productive*. Whether it is necessary to encourage this productive relationship so as to actualize its full potential, or to slow it down to preserve the ecological base of social reproduction, it is always this productive relationship that determines the conception of a post-capitalist horizon.

The main interest of this spectacular narrativization of an entirely capitalist civilization, which is at the same time a civilization granting itself an exceptional status in relation to original nature and to societies stuck in unproductive relationships, is that it brings to light the internal tensions in the Marxist system. It lays bare the effort that must be made by human society to adapt to the conditions of existence that it is itself putting in place, in other words the Anthropocene, an effort that must culminate in the abolition of capitalist *forms*, the only way to preserve their *force*, i.e., affluence finally reconciled with autonomy. Since his very first writings, Marx has tried to think simultaneously of the way a society organizes its relationships with the things on which it lives (production) and the way it sees itself as a collective body turned towards the future (reproduction). Now, there are only two stable states of this relationship: the primitive form dominated by the unity of humans and their conditions of existence, and the post-capitalist form, where this unity is found in the achievement of the socialization of nature – whatever this costs ecologically.

The second terrestrial envelope, produced by the full development of productive relationships, is a convenient ecological fiction intended to welcome the new humanity, but a fiction above all: it abolishes space, cultural differentiation, ecological constraints (especially the depletion of resources to which Jevons drew attention at the same time) – i.e., everything characteristic of human beings as landowning creatures. Neither territoriality, nor cultural variation, nor the environment constitutes an obstacle to the labour of the universal: according to Marx, the only real obstacle that capitalism encounters in its progress is its own political and legal form – private property. However, as his heirs would soon perceive, history would not confirm these forecasts, and the intellectual task of linking the struggle for autonomy and the economy of affluence would have to be resumed on different bases.

### **Karl Polanyi: protecting society, protecting nature**

In the mid-twentieth century, the critique of political economy unfolded in a context in which the great progressive and utopian aspirations suffered greatly from the devastations of global military violence. Karl Polanyi's work is characteristic of this new sociopolitical context, and in many ways it takes up the problem of the socialization of nature by capitalist economy where Marx had left it.

In the philosophical essay that concludes *The Great Transformation*, 'Freedom in a Complex Society', he discusses a series of steps that industrial nations should take to protect nature from the effects of its commodification. He mentions the renewal of rural farms and cooperatives, but also and more radically the exclusion of basic resources from the logic of the market, the creation of parks and natural reserves and finally the idea of the collective management of spaces and wealth.<sup>33</sup> All these elements indicate that, according to Polanyi, the control of nature should be placed under the supervision of genuinely political institutions, i.e., institutions that manage to reflect the fact that a collective attachment to the outside world is irreducible to the profit motive.<sup>34</sup>

Polanyi formulates a very prescient conception of the ecological movement, which echoes the way he problematizes the history of the nineteenth century: the reign of the market has never negated society's tendency to protect itself, and the counter-movement by which the collective endeavours to resist generalized competition is very deeply linked to the way it understands its relationships to the material world and territory. In other words, the value of nature is not reduced to the problem of its overexploitation, because it also affects the collective attachments to space that define social relationships. The productive

order of capitalism also upsets the spatial order (the order we discussed at the beginning of our journey through the question of sovereignty), and it is this destabilization that has raised the question – as vital as it is toxic – of these attachments to territory, to identity.

What is most striking, if we return to the list of environmental protection measures given above, is that it figures on the same level as the measures taken by democratic states to guarantee a definite right to labour as well as to stable currencies. The protection of collective relationships with nature, with the land, is therefore of the same rank, in Polanyi's view, as the protection that must be applied to the two other 'fictitious goods', namely labour and money: it brings in what is most singular as well as most fragile about modern societies, i.e., their ability to subordinate their very foundations to an economic *ratio* or reason. This realization brings us back to a radical questioning of what we are talking about when we speak of 'protection' and, above all, of the very nature of the agent who is protecting him- or herself. What is this *self* that is being attacked by the economic order? Why should this entity be grasped at the level of a collective attachment to nature? Does this attachment pre-exist this attack, or is it made real in this very ordeal?

Basically, if *The Great Transformation* makes it possible to link nature and politics closely, this is because Polanyi invites us to conceive of this link not as a response to the emergence of environmental risks in late industrial civilization, but as an element already integral to democratic politics. Socialism, which according to him is best fitted to carry out this programme, is defined by the ambition to 'transcend the self-regulating market by consciously subordinating it to a democratic society',<sup>35</sup> a subordination that expresses a spontaneous tendency of the social body to protect itself against whatever attacks it. The socialist ideal is therefore a norm immanent within the social sphere, but it is a norm dependent on contingent historical determinations, insofar as the self-protection of society is catalysed by very specific historical and economic conditions, but also because this movement, as we will see, can assume catastrophic forms that are even more dangerous than the market structure itself.

Thus, among the authors of the socialist tradition, and among the thinkers of the transformations of capitalism in the context of the two world wars of the twentieth century, Polanyi is the only one to have explicitly linked the idea of going beyond the self-regulating market to the jeopardizing of collective relationships with nature. For him, *the philosophical and political identity of the socialist tradition lies in the way it has left open the question of relationships with nature understood in the sense of the external conditions of human sociality, at a time when this question was tending to be irreparably shut down.* The liberal heirs

of Hobbes and Locke conceive the worker's appropriation of a portion of ideally free land as the engine of socialization, even more radically than trading tendencies. This fundamental relationship is then realized in political economy, which has ensured the impermeability of the border between, on the one hand, the political ideal of autonomy, which could be achieved only once the problem of the relations of human beings to the outside world had been settled, and, on the other, the ordinary necessities of material subsistence. If the liberal paradigm has not eliminated the question of nature, it has nevertheless strictly limited its scope. In contrast, *socialist reflection has sought to establish itself in a conceptual place which retains all its problematic character vis-à-vis the forms of subsistence, and more generally with the modes of collective relation to the world – and this against the tendency to consider as political only issues arising from a prior resolution of the problem of subsistence.*

We can therefore give ourselves a more precise idea of the difference that socialism endeavours to introduce into philosophy: it is a thought in which the conquest of autonomy by the political body does not presume that the question of collective relationships with nature has been settled (and is thus external). It is this idea, more or less explicitly structuring the theoretical efforts of Saint-Simon, Durkheim, Proudhon and Veblen, which is taken up, this time without the least ambiguity, in *The Great Transformation*. When Polanyi defines land as a 'fictitious commodity', i.e., when he sees the political awareness of modern societies as a protective reaction against the effects induced by the market at this level of reality, he consecrates the socialist movement not only as a material philosophy, but as the main vehicle of modern environmental reflexivity. The book is built on the great economic and political crises that led to the two world wars, definitively including within its framework the frictions induced by the market regulation of collective relationships with nature, and in particular with land. When Polanyi writes, in a striking summary of his general thesis, that 'to understand German fascism, we must return to the England of Ricardo',<sup>36</sup> that means two things: first, that we must consider the genesis of the market economy on the basis of the economic and legal arrangements which constituted land as a commodity (of which Ricardo, through the theory of differential rent, is in Polanyi's view the best example), then, that the landowning genealogy of the liberal pact helps to explain how its historical degeneration is again taking the form of a destabilization of collective relations with productive, lived space. The specific arrangement between the social body, technological mediations and economic institutions, which the socialist tradition had placed at the centre of its considerations since the beginning of the nineteenth century, is taken up by Polanyi in a form free from



the historical teleology previously imposed by Marx, who tended to overestimate the productive destiny of global civilization.

The industrial revolution, writes Polanyi:

was simply the result of a single fundamental change, the creation of a market economy ... [and] we cannot fully grasp the nature of this institution if we do not understand the effect of the machine on a trading company. Our intention is not to assert that the machine was the cause of what happened, but to insist that once complex machines and facilities had been used for production in a trading company, the idea of a self-regulating market could not fail to take shape.<sup>37</sup>

The intervention of machinery is thus integrated into a more general transformation of the conditions of access to subsistence, of which the market, as an impersonal and specifically economic institutional form, is the main analyst. In the integral reshaping of the geo-ecological conditions of life that characterizes modernity, land and machinery appear as the main focal points of liberal government, as they constitute solid material supports for triggering the logic of exclusion and intensification on which it rests.

Polanyi basically offers a historical analysis of the transformation undergone by agrarian liberalism at the time of the industrial revolution. In this respect, he provides one of the most important contributions to a political history of nature – or a material history of liberty – in modern times. But in the same gesture, he also offers a response to the reconstruction of the liberal paradigm, which was at that time, in the mid-twentieth century, already being developed. Its main representatives are well known: Friedrich Hayek, in *The Road to Serfdom*, and Karl Popper, in *The Open Society and Its Enemies*, published in 1944 and 1945 respectively, had endeavoured to show that the liberal project of emancipation remained the best guarantee against the establishment of coercive powers, which resulted from a desire for social control characteristic of the war effort. Planning and social regimentation, which according to Hayek and Popper are the common characteristics of socialism and totalitarianism, are described in these works as the effects of an autonomy of the technostructure which tends to dictate, via the authority of technocratic experts, its law to a civil society reduced to the project of complete industrial mobilization.<sup>38</sup>

This argument, actually developed a little earlier by the American journalist Walter Lippmann,<sup>39</sup> is an astute one in that it makes it possible to make the liberal pact an instrument of protection against industrial tendencies, against the myth of affluence. Hayek,

in particular, interprets socialist and totalitarian dogma as a way of forcibly, not spontaneously, achieving a material prosperity that comes to be decoupled from the project of autonomy. Drunk with the potential for improvement initially brought by the liberal political economy, and impatient to fulfil all its promises, Western peoples have finally accommodated themselves to a system guaranteeing them the unlimited conquest of wealth at the sacrifice of public and personal liberties – a system first developed during the war. Faced with this culpable excess of human greed, liberals can then reconstruct the classic Tocquevillian argument: the promise of liberty, says Hayek, was often coupled with reckless promises of a great increase in material wealth in socialist society. But it was not this absolute conquest of the goods of nature that was expected to achieve economic liberty.<sup>40</sup> Put more simply: liberalism never promised absolute affluence, because it is above all a doctrine of the limitation of power, both political and economic. Tocqueville's denials about the cost of American emancipation to the land and to the ecosystem were still valid in the mid-twentieth century; only the free market is able to put the spiritual interests of individuals above their material interests, because it has its own pace, one that can be slowed down or moderated. Only with Polanyi's patient analysis could it be shown, on the contrary, how much the market society established during Ricardo's era and intensified by the industrial revolution was inseparable from a decisive geo-ecological transformation.

### **Disembedding**

According to Polanyi, among the political developments of early modernity, the enclosure movement in England in the seventeenth and eighteenth centuries played a decisive role, since it created the legal and demographic conditions for the separation between labour and land. The conversion of village commons into grazing land for sheep, the construction of an economy based on land rent and trade and the subordination of subsistence economies to market rationality were the different aspects of a reform movement that defined early modernity. According to Polanyi – and it is on this point that he differs from the analysis of primitive accumulation in Marx – it was a succession of deliberate decisions on the part of the state that gave rise to the formation of market society, which was thus not reducible to the accumulation of capital by the economy's own means. It was this reflection on the relationship between the state and the economy that put Polanyi on the trail of a crucial idea: public power simultaneously appears as the decisive impetus for commodification and as the body

which is then called upon to establish protective measures against its consequences.

But the disembedding of the economy was not, according to Polanyi, really completed until 1834. It was then that, following an ideological campaign which mobilized the main representatives of the political economy, in particular Townsend, Malthus, Ricardo and James Mill, the poor laws were definitively abolished.<sup>41</sup> These very ancient laws guaranteed a minimum income, mainly financed by the parishes, to workers who found themselves excluded both from the peasant economy and from the opportunities provided for proto-industrial wage earners. Economists, basing most of their arguments on the negative incentive that these social safety nets constituted and on the productivity losses they entailed in the name of charity, set out to demonstrate that the strict application of 'natural laws' deducted from the individual search for profit guaranteed a social optimum. By abandoning the principles of assistance that hindered the emergence of a real job market and led the authorities to intervene in the economy, the right relationship between affluence and freedom would appear.

These natural laws of exchange, which formed the background of the struggle against systems aimed at protecting against extreme poverty, were at the same time, as already mentioned, the laws of life and death. The trial of poverty did not call for compensation based on the unconditional value of people and life, but for submission to the impersonal rules of nature, which just happened to be those of land rent.

Poverty was nature that survived in society; the fact that the question of the limited quantity of food and the unlimited number of human beings arose at the very moment when we were being promised a boundless increase in our wealth merely made the irony more bitter. It was thus that the discovery of society became part of the spiritual universe of human beings.<sup>42</sup>

The 'discovery of society' here refers to the effort economists made to give an intellectual consistency to the law of the market, i.e., to bring under the authority of science the principles of justice and the processes of veridiction that it governs. As Townsend's analysis in particular shows,<sup>43</sup> the spontaneous regulation of the population by access (or not) to resources constitutes the unsurpassable biological fabric that the economy should not seek to ignore, lest it introduce even greater pathologies.

But, for this reputedly natural law to become a material reality, the state must first guarantee that capital has optimal access to nature and its resources. Rent laws must be applicable without exception,

without excessive tax pressure. In other words, the conception of nature as a resource was contemporaneous with the establishment of the market society and constituted one of its conditions of possibility. This explains the centrality of enclosures in this history: it is, admittedly, from a strictly empirical point of view, just one facet of social modernization, but it is one of those facets that best highlight the focus of very different actors and social institutions on a specific reality, namely the land. If the environment came to constitute the central stake for modernizers, this was because the liberation of the land's riches provided the rulers with most room for manoeuvre compared to a feudal model burdened with serfdom and constraints.<sup>44</sup> In a finite nature, political economy must draw maximum profit from the land to compensate for its intrinsic greed in the form of generous rents. The improvement of the land, already theorized by Locke, and which Polanyi presents as the central objective of modern economic policies,<sup>45</sup> is eloquent testimony of the way the formation of a new attitude towards the soil and its productive properties played a key role in seventeenth- and eighteenth-century Europe.

In a 1947 text, 'Our Obsolete Market Mentality',<sup>46</sup> Polanyi made scarcity the key concept for grasping this phenomenon. Indeed, the market institutes a specific form of social relationship where the commodity is a primordial mediation between individuals defined by their interests and their capacity to satisfy them. In these conditions, scarcity is indeed, as André Orléan recently pointed out, 'the generic form of dependence on objects such that market separation establishes this dependence'.<sup>47</sup> If we adopt Polanyi's interpretation, this means that scarcity makes it possible to appeal to the motive of lack even when subsistence is not at stake – for example, when we build up stocks. Even though the modern economy is formulated as liberation, by political, legal and technological means, of the productive capacities of the land, it makes lack the central spring of economic action, even when survival is not at stake.<sup>48</sup> The relative material abundance made possible by the optimization of land use is therefore not a socially realized affluence, since access to vital goods is conditioned by a market where needs compete with each other.

The environmental, technological and legal system of scarcity simply developed in increasing proportions with the transition to a coal economy from the middle of the nineteenth century onwards. Indeed, the thermal energy drawn from the combustion of coal does not only start up the machines, but, through them, economic deployment overall becomes linked to coal. For the first time in the history of human societies, energy becomes a commodity, a reified reality that can be manipulated as such, independently of the organic or technological supports to which it was previously attached. Coal therefore

makes it possible to subordinate energy itself to the logic of the market and of scarcity, i.e., to condition the material deployment of the economy to the logic described above, which previously was not possible.<sup>49</sup> This configuration, however, largely confirms Polanyi's analysis: bringing nature into economics appears to be the central issue of modern policies, all the more so as technological means soon massively increases the raw quantity of socially available energy, and therefore of what is taken from the environment. Agricultural transformations and industrial transformations are separated by a time lag of several decades, even several centuries, but beyond these technological and chronological differences, it is the same logic whose effects are amplified.

Even if socialism made industry its main reference point in the nineteenth century, the way it stuck, in its historical analysis, to the problem of land, brings out a problem that Marx could not have foreseen any more than the liberals: the way the protection of the land was taken over by the conservative movement.

### **Socialism, liberalism, conservatism**

We must now return to this enigmatic statement: 'To understand German fascism, we have to go back to Ricardo's England.'

The naturalization of society by the liberal creed, which organized most of the relationships between states and markets during the 'hundred years peace', which dictated the development of modern property rights, but also, let us not forget, a large proportion of the colonial adventures of the British Empire,<sup>50</sup> induces what Polanyi calls a counter-movement. By this term, he designates all the mechanisms engaged in the protection of the social collective against market pathologies. This counter-movement is both the theme and the sociological basis of all socialist literature, which basically captures the collective desire to institute human, economic and social rights against submission to the economic order. Beyond the emergence of a workers' culture of resistance, the demands for justice, which are heard against the background of the suffering of workers, lead to a rediscovery of society, which this time asserts itself as the need to transcend the laws of the market. Laid bare for the first time by economists in the form of a naturalized collective entity, society is reconceptualized by the social movement, and appears in entirely new guises. The collective entity later manipulated by sociologists, in reference to which one must understand the moral and intellectual solidarities which ensure the cohesion of a group, finds its root in the pressure exerted on these ties of cooperation by the economic order.

Polanyi therefore sees the birth of the social sciences themselves as one of the consequences of this somewhat split historical process. By the 'birth of the social sciences', we must here understand the appearance of a new epistemic space whose centre of gravity is the idea of a human order in the grip of immanent regularities, i.e., regularities irreducible to the exercise of a repressive external power, or to the deployment of a natural providence. The testing of living conditions under the principle of the commodification of labour and land, which was sometimes taken to an extreme when these conditions were reduced to mere survival, brought out by contrast the implacable nature of a social law neglected by economists: society seeks to defend itself against whatever attacks it. Now available as a category of thought and action, the idea of society was born out of the observation that the sometimes dramatic variations imprinted on the collective body only highlight a specific level of reality. If anything can and should react to ongoing changes in order to adjust to them, it is because this thing exists and sets its own standards. This sociological cogito was reformulated by Polanyi at the end of his life, in a text that more precisely designates technology as what imposes the test: 'The fabric of society was invisible before it was revealed by its contact with machines.'<sup>51</sup> In other words, only the very rapid technological and geo-ecological developments experienced in the nineteenth century were able to impose the test of truth on the social world, and to highlight the fact that 'it is no longer a question of a simple aggregate of people' but of a reality that we can envisage 'in its permanence'.<sup>52</sup>

Socialist critique links a certain truth about the collective to a concrete historical experience of dispossession. In doing so, it reveals the inability of the liberal paradigm to account for the forms of socialization of the world that prevail under a productive and market regime. This is what we called (above) the exaptation of the liberalism that is in question here, the imbalance between the material base on which the classic conception of autonomy, supported by the Enlightenment and the economists, was built, and the new material base that appeared in the nineteenth century. This is the reason why the thesis of the discovery of the social sphere when its relations with the world are subject to upheaval takes on an even deeper meaning. For if a link is established between the socialist-sociological system of thought and the brutal reconfiguration of collective relationships with nature, the political organization of the counter-movement – the effective form that will be taken by the rediscovery and self-protection of society – is realized only imperfectly.

Polanyi writes: 'The opposition to the mobilization of the land forms the sociological basis of this struggle between liberalism and the reaction which made the political history of continental Europe

in the nineteenth century.<sup>53</sup> The term 'reaction' in principle refers to both socialism and conservatism, which are the two political embodiments of opposition to the liberal creed, but the whole point is that the conservative, reactionary variant systematically gained the upper hand over socialism when it came to bringing land into the sphere of politics.

Indeed, the pressure exerted on land by the economy affects not only its intrinsic capacities for reconstitution, i.e., its long-term fertility, but also the capacity of human beings to think about their social organization in the form of a collective relationship to a common space. In accordance with the idea that society is discovered only through the modifications of its relations to the world, Polanyi affirms that 'the land is an element of nature which is inextricably intertwined with the institutions of man': as a factor of production, nature is 'indistinguishable from the elements that constitute human institutions'.<sup>54</sup> If 'man and nature are practically one in the cultural sphere',<sup>55</sup> it is this unity that is put on hold by modern economic transformations, which impose on the environment constraints incompatible with the pursuit of balanced and, in a word, lasting relationships. But Polanyi immediately complements his remarks by writing that 'the economic function is only one of the many vital functions of the land' for the worker. It must also be seen as 'the place where he lives' and 'a condition of his material security'. In other words, a social conception of nature is split between two different meanings: on the one hand, an economic schema makes nature a productive power, something whose fruits can be taken; on the other, nature is conceived according to a spatial, territorial schema, with various dimensions of housing and development. It is these two dimensions that the contemporary generalization of the term 'environment' has blurred, and while it seems necessary to think of them together, as Polanyi seeks to do, it is just as important to note the effects that may have been produced by their long dissociation.

In reality, it is the interpolation of productive nature into spatial nature that lies at the root of the difficulties experienced in giving political expression to the will to protect collective relationships with the outside world. Indeed, to bring the land into a market system is to undermine traditional modes of production which played a central role in social cohesion, quite simply because it was through them that the masses interpreted both their economic condition and their social condition. The dissolution of this historical regime at the time of the enclosures entailed as a side-effect that individuals lived their lives as linked to a soil, to a place – i.e., the dimension that could, albeit very problematically, be called the 'identity' problematic of nature-space. As soon as land is incorporated into the social world exclusively through contracts, and therefore via capitalist property, the traditional link between the place of production and the symbolic attachment to a



'local area' breaks down, and makes way for a world in which the political relationship with nature must be experienced in a radically new way. What could be called the cultural geography of European societies in the eighteenth century, which is not unrelated to the system of communal solidarity and obligations that E. P. Thompson called the 'moral economy',<sup>56</sup> is central to the way they understand themselves and interpret their vulnerability to economic transformations. It is on the basis of this observation that Polanyi makes his diagnosis: *the aristocratic landed class was in a position to embody the protection of the land, not because it developed a discourse on the vulnerability of the environment or its overexploitation, but because it reactivated the traditionalist themes of local identity and customary law to make use of its native soil, at a time when the archaic link between the conditions of subsistence and the place with which a person identified was under attack.*

The historic movement detected by Polanyi is utterly tragic in its irony. Even though the landed classes were at the forefront of the enclosure movement, and therefore the commodification of the land, in the seventeenth century, they succeeded, two centuries later, in becoming the voice of resistance to the capitalist economy in the name of collective attachment to the land. This ideological reversal is interpreted by Polanyi as an ability on the part of the aristocracy to find a new function in a world profoundly affected by modernization – i.e., to reinvent a political vocation at a time when its authority had been more than just questioned. Thus, from the point of view of the industrial classes, i.e., of the bourgeoisie, but also of the workers' movements, the peasantry worldwide appeared 'as an indistinct mass of reactionaries'.<sup>57</sup> This is clearly illustrated in Marx's comments on rural life. In the political configurations of the nineteenth century in Europe, the protection of the soil as a productive base and the foundation of people's identities was associated with the defence of aristocratic interests, but also more broadly with the reactionary forces of the clergy and the army – two social functions safeguarded by the former elites deprived of their political functions. In other words, the new interplay of alliances of interests and conceptual associations threw the land into the arms of conservative forces, even though social relationships with nature constitute a fundamental dimension of the collective experience, and are one of the items on the agenda of the democratic institution of society.

More simply, the democratic potential contained in the critique of the nature-market combination has been hijacked by forces representing nothing but well-understood interests, and the vulnerability of land as an economic function and a place of life has been reduced to a fear for the integrity of the nation, mythologically defined as the unity of a soil and a people. We can now better understand how the

search for a landowning sociality in the face of the excesses of financial globalism could have led to such a blurring of political and intellectual landmarks: the 'return to the land' was always susceptible, as Georges Canguilhem had also seen, to slipping into a conservative rhetoric: 'The honour of the peasantry lies in the feeling that it has to guarantee the junction between nature and society',<sup>58</sup> and if this honour is humiliated by the subordination (real or perceived) of this population to profit-driven urban elites, then the shift from the countryside to reactionary ideologies soon follows.

We have often noted the contradictory nature of the 'twofold movement' which characterizes the relations between state and market: the first sets up the legal conditions for the second to become autonomous (in other words, as Polanyi basically puts it, *laissez-faire* was planned), so as then to impose limits on this autonomy and protect the weakened social fabric by imposing a certain discipline on capital and by protecting labour and health. Now, with regard to the land, these contradictions are doubled: not only is the movement of a 'return to the land' historically compromised with what it presents as its enemy (the aristocracy, at least in England, was responsible for the enclosures and has largely benefited from it), but it presents as a critical force a social group that recruits its main representatives from the small minority of landowners. Added to this is the fact that the protective movement grafted onto the land gradually ceases to target the specific effects of the market and instead attacks the emergence of a new political actor that poses a potential danger to its own interests, namely the workers' movement. Thus, according to Polanyi, from the First World War onwards, the protection of the land was identified with agrarian protectionism, whose main objective was emancipation from external economic dependencies. After 1917, the spectre of the Bolshevik enemy further radicalized these fears and the measures taken to guard against them: whereas self-sufficiency had 'haunted the market economy from the start',<sup>59</sup> since the ideal of affluence and progress entailed tying together the fates of different nations for better or for worse, this horizon then became the explicit ambition of many European governments.

The emergence of fascism – i.e., of the unprecedented alliance between the capitalist interests of the big landowners, the affirmation of the nation as an unsurpassable space of sovereignty, and anti-parliamentarism – was therefore the most disastrous movement whose aim was to protect against the disintegrating effects of the market, not only because it led to the catastrophe of the Second World War, but also because it corresponded to the abandonment of the land, of nature, as a legitimate dimension of the self-protection of society, i.e., as the basis for a democratic political culture. The failure of the socialist project

as understood by Polanyi, and more broadly of the resistance to the fascist temptation, is thus due to the fact that it failed to incorporate enduringly into its political ratio the fact that 'the land is an element of nature which is inextricably intertwined with the institutions of man'. In reality, it was prevented from so doing by the appropriation and the diversion of this problematic by a class socially opposed to those who voiced the demand to limit the market and by the dominant conviction in its ranks that land was, in itself and eternally, a reactionary concern. Abandonment of the political stake comprised by nature on the part of democratic movements, and in particular socialism, thus left the field open to a recuperation of this stake by the movements that opposed socialism. But what makes Polanyi's thinking so effective is that it manages to hold together the idea of a fundamental alliance of society and nature, of human beings as economic and political actors with their environment, and the fortuitous sociological contrast between the promoters of agrarian conservatism and the socialist movements. This contrast translates the harmful alternative between, on the one hand, a movement that aims at protecting society against the effects of the market but sacrifices all that binds society to land, and, on the other, a movement that aims to protect society and is formulated as an illusory return to premodern social structures that have however become strangely compatible with capitalism.<sup>60</sup> What is implicitly at stake here is also the link between socialism in its broadest and most ambitious form and the workers' question *stricto sensu*, or, more precisely, the opportunity to define socialism on the basis of society's industrial functions alone – as Marx had done.

It must be recognized that there was at the time something quite spectacular in the formation of a class exclusively turned towards industrial production, and this mainly explains the focus of critics of political economy on the problem of production and the fate reserved for its operators: from Saint-Simon onwards, it was through and for production that the emancipation of subordinate groups must take place. Beyond the simple strategic interest that there might be in designating a particular category of the population as the engine of future transformations, the conceptual light shed by this move is obvious: for Marx, the concept of production allows us to grasp in a single sweep the historical trajectory of humanity, the division of labour as it emerged in the nineteenth century and the economic rationality that best fitted it. Consequently, the dramatic gap that widened between the historical (and philosophical) role devolved to the proletariat, and its real conditions of existence was enough to justify the critical enterprise. But this relationship between philosophy and politics is the source of a significant tension in Marx, reflected in the status reserved for the peasant classes. If the agricultural world was

the first to undergo the effects of capitalism, in its phase of primitive accumulation, the absence of collective consciousness ascribed to the peasantry relativized its involvement in the self-conscious and critical process, and, in a performative way, this intellectual neglect led to very real effects. In other words, the relationship to land as an indiscriminately productive and spatial body, as an economic and territorial reality, fades away in Marx and gives way to a conceptual synthesis based on industrial wage earners, whose historical scope encountered drastic limitations from the early twentieth century onwards. We could, moreover, generalize this observation by showing that the scientific, technological, legal and even religious modes of relationship with nature are also underestimated in historical materialism, even though they had occupied centre stage in earlier French socialism and in its sociological heritage.

\* \* \*

From these analyses, three main lessons can be learned. First, every reader who is even a little bit aware of current environmental concerns will have the legitimate feeling that the rendezvous between socialist thought and the question of nature has been largely missed. The protection of society against the destructive effects of the free market and mass production has not always been able to extend into a specific protection of arrangements between people and things that guarantees a democratic balance. This can be explained, as we have just suggested, by the fact that the productive partnership was endowed with an eminent, almost metaphysical, value, in the nineteenth century: it is from within the relationship of regulated exploitation that the socialists had imagined moving beyond the liberal pact, and this framework was unable to satisfactorily integrate the demands for justice arising from the disruption of relations with the land. The risk here was not simply antagonizing the working and peasant classes, which in any case was not as unequivocal as Polanyi claims, but giving space for reactionary discourse, which flourished on equating land as productive soil with land as a space for collective integration of memory and identity. What we have called the political affordances of the land has thus proven to be explosive in an industrial context where the autonomy of the productive cycle and relative material abundance seemed to spare us our archaic need for roots: the moral economy of peasant communities, that network of nonmarket obligations and solidarities which had provided the foundation for a sense of justice before the great transformation and which did not find an adequate successor in the social movement, ended up in the interwar period being drawn to conservatism. And the attractiveness of the latter was all the more powerful because it was based on a very old political rationality in

which sovereignty and territoriality were backed by one another. One of the most important phenomena of modernity played out in this shift, which can be summarized as follows: political ecology wasted a century – i.e., roughly the time it needed for a sense of justice linked to the sense of environmental relations to be created anew outside the zone of attraction of conservatism.

The second lesson concerns the very nature of the ecological problem. It becomes evident with Polanyi that the political history of nature in modern societies gives a new meaning to the division of the terrain between liberalism, socialism and conservatism. Advocates of the market, social justice and the nation supported divergent conceptions of collective relationships to the physical and living world. More radically, one could say that it was on this issue that they diverged: *the liberal pact, its socialist reorientation and the conservative confiscation of the political affordances of the land can be read as distinct strategies aimed at building a normative system based on relationships of subsistence, habitation and knowledge of the world.* The stakes of political ecology thus appear in a completely different light from what mainstream historiography teaches us. This, as we recalled in the first chapter, focuses on the ethical movement born from the observation that the industrial order requires a mutilation of the very environments in which any life worthy of the name must develop. Environmental ethics, the critique of pervasive technostructures – all these movements whose history has been abundantly written – therefore share one of the reasons for the anger of the social movement, namely the broken promises of the liberal project of emancipation. The cult of wilderness, born in the context of the American colonial frontier, and which, from Aldo Leopold onwards, was nourished by a fine knowledge of the fragile ecological relationships that define a landscape,<sup>61</sup> gave rise to the quest for a new alliance with the living, which explicitly involved a revocation of the hegemony of the market. But in this intellectual universe, the environmental demand was paradoxically formulated as the desire to no longer play in the same space as the participants of the political debate as it had been shaped before the discovery of ecology in the strict sense – i.e., as a desire to revoke the ideal of autonomy as such. This is a paradox, because, as we have just noted, the emergence and development of the great philosophical and political paradigms of the modern age are far from indifferent to the problem of collective relationships with nonhumans. So we cannot conclude that the ethical movement for the protection or preservation of nature is ruled out by a more political reading, but rather that it is reclassified as one of the manifestations of the tension between autonomy and affluence.

The third lesson, finally, consists simply in taking up and summarizing the main threats that appear in the area of friction between

autonomy and affluence. The former, as identified by the thinkers of industrial democracy, stems from the difficulty of giving societies an organization adjusted to their new geo-ecological structure. If the political benefit of the sudden rise in the provision of energy and material was judged unsatisfactory by the lower and middle classes, this is because the liberal hypothesis that the limitation of political power and the delegation of social regulation to the economy would have emancipatory effects did not turn out to be verified. The emergence of conflicts related to economic justice (Proudhon), and the horizon of individualist anomie (Durkheim), can be conceived as the consequences of a mismatch between, on the one hand, the pace of economic growth and the intensity of the social sacrifices which it requires, and, on the other, the extent of the upheavals which the social and moral fabric can tolerate without falling apart. The second threat, identified by those who put forward the technocratic hypothesis, is the recomposition of an elite disconnected from the requirements specific to the organization of a technological society. Through institutions such as the right to property, and the subordination of the technological reflexivity of engineers to the rationality of immediate profit, a gap started to yawn between the complexity of the technostructure and the collective ability to make it socially and materially effective. The persistence of scarcity, the crises of overproduction and the irrationality of the stock market were thus only apparently heterogeneous, as they each reveal in their own way the defeat of industrial solidarity. The third and last threat, finally, is the one we have just indicated through our reading of Polanyi: the conservative confiscation of the protection of the land.

Each of these tensions constitutes a horizon of expectations to which the rest of this history must endeavour to respond.

## *The Great Acceleration and the Eclipse of Nature*

### **Freedom from want**

The period from the formation of the liberal pact, to when it was called into question by socialism, to its temporary collapse during the Second World War is marked by the very strong presence in political thought of the new material universe imposed by industrialization. During this period, the social order and its evolution can quite easily be read in terms of the rapid technoscientific upheavals that affected relations to land, resources and territory; political ideologies were all based on a knowledge and narration of these relations to identify the conditions for a linear and shared progress. After the political and moral trauma of 1945, a new period opened, which, from the point of view of an environmental history of political ideas, can be characterized by a paradox. While, in the regions of the first wave of industrialization, material and political reconstruction gave rise to an unparalleled acceleration of the extractive and productive effort, the social and critical knowledge developed during this period testifies to what one might call an eclipse of material consciousness. During a transitional phase, which corresponds to what in France is called the *Trente Glorieuses* [*Thirty Glorious Years*] of prosperity (1945–75), sociological and historical knowledge, as well as the dominant critical constructions that supported the project of emancipation, did not create any paradigm capable of recording, on an epistemic and political level, the specific form of the geo-ecological regime that was contemporary to them.

For reasons that we would like briefly to explain, the majority social conscience at the time remained dominated by the horizon of ‘democratic capitalism’.<sup>1</sup> Wherever the shock of war had been felt, the conjunction between the establishment of minimum social protections in the fields of health, labour and education, and the hope of a definitive liquidation of the spectre of totalitarianism, imposed liberal democracy as a historic destiny that it was difficult to circumvent



– for the benefit, moreover, of the millions of people who made up the middle class. The famous speech given by F. D. Roosevelt on 6 January 1941 on the four fundamental liberties that were to govern democracies once the fascist enemy had been defeated gave an absolute value to the principle of ‘freedom from want’ (alongside freedom of speech and worship, and protection against political violence): being free from want meant that the vital functions of the citizens, the industrial productive apparatus and political regulation were associated in a common dynamic which sanctified the overcoming of the harshness of nature. The following year, the document written by Beveridge that would provide the framework for the English welfare system employed the same rhetoric: ‘The objective of the Social Security Plan is to abolish shortage by ensuring that every citizen willing to serve to the extent of his capacities will receive an income sufficient to assume his responsibilities.’<sup>2</sup> A little later, in 1963, J. F. Kennedy reformulated the mystique of democratic growth by stating: ‘a rising tide lifts all boats’.<sup>3</sup>

The power exerted by the ideals of progress over the collective consciousness of the postwar period goes hand in hand with the eclipse of material preoccupations, with the lowering of the collective sensitivity to the constraints that technology imposes on liberty. However, that does not mean that the Thirty Glorious Years should be put on trial unilaterally from the environmental point of view.<sup>4</sup> The idea that a whole generation, the ‘baby boomers’, obsessed with prosperity and consumption, sacrificed the ecological balance of the whole planet for an immediate and temporary benefit is obviously attractive – and it is often found expressed in environmental literature. For our part, we will simply take note of the enigma that this eclipse constitutes. We can indeed intuitively understand that the masses were seduced by the manifest improvement of living conditions, generally symbolized by the accessibility of household equipment and by the maintenance of a certain social mobility, synonymous with opportunities for climbing the social ladder. The relief felt after the end of totalitarian terror made the protection of human and social rights a top priority – and access to a high standard of living was perhaps a good way to extinguish the dangerous political passions of the 1930s. In this context, politico-legal emancipation and the acceleration of the technoscientific project were associated as never before in history, and the first forms of a questioning of progress expressed in the environmental idiom were pushed to the margins of social critique.<sup>5</sup> The trap of ‘progressiveness’, which tends to equate the guarantee of rights with material abundance, was closing in on Western political life.

In France, one of the most striking intellectual expressions of this era of confidence in economic and social progress was provided by Jean Fourastié. Not only was it he who introduced the expression

*Trente Glorieuses*, but, above all, he was one of the prime movers in the revival of the French economy, through his participation after 1944 in the Planning Commission and through his published works. *Machinisme et bien-être* [*Machinery and Well-being*], published in 1951, meticulously identified the arguments that could fuel the optimism of the middle and working classes. He described the material improvements in which it was legitimate to invest one's hopes. His argument was based on the idea of increased labour productivity, made possible by technology, and a subsequent fall in the prices of basic consumer goods. According to Fourastié, a series of consequences followed this increase in the standard of living, and it was really on this level that the ideological effort was produced. He insisted on technologies that made it possible to conquer private comfort, i.e., the formation of family entities protected both from external threats due to exposure to nature (Fourastié emphasizes that urbanization frees man from the land)<sup>6</sup> and internal threats from promiscuity: architecture, the quality of materials, the spatial organization of buildings, heating and insulation, household arts – all these seemingly trivial innovations hold the secret of 'modern life' as it was experienced in middle-class homes. Fourastié describes what one might call the 'infrastructures of intimacy': the set of technological instruments and networks that guarantee the closure of the private and domestic universe on itself.<sup>7</sup>

However, what we these days call the 'great acceleration'<sup>8</sup> appears retrospectively as an irreducible historical moment to this melody of happiness. Its spectacular nature has been highlighted by the sciences of the Earth system, which are now able to aggregate extremely varied and representative (if not complete) data on a series of indicators that are both socioeconomic and geoclimatic. If we consider the GDP, or more concretely the amount of energy, water or fertilizers consumed annually by the global economy, we get graphs shaped like a hockey stick: the year 1950 marks the shift from a slow and continuous growth of all these curves, from the start of industrial take-off, to their brutal acceleration. This is not simply due to recovery after the war years, because the direction of the curve changes durably, over several decades. But the most interesting is that the geoclimatic indicators follow the same trajectory: the accumulation of atmospheric CO<sub>2</sub> in particular, as well as other residues from industrial activity, samples of marine resources, loss of biodiversity, etc. – all this shows a striking parallelism with the economic rhythm. Seen from a historically distanced point of view, all these characteristics, admittedly, turn the immediate postwar period into an event that is in principle easily identifiable – even, frankly, impossible to overlook, since it was recorded in the very body of planet Earth, namely the Anthropocene. The question therefore arises of the mark left by this completely unique historical and ecological sequence

on the intellectual world, and all the more so since this mark seems, *a priori*, essentially negative: the great acceleration was undoubtedly a moment in which the economic development of the industrial world functioned as a reassuring envelope, keeping threats, risks and crises at bay, while preparing a new regime of risks, crises and catastrophes that did not come fully to light until later.

### **Emancipation and acceleration: Herbert Marcuse**

To understand this eclipse of environmental reflexivity, we must take seriously the trauma inflicted by the totalitarian experience on European and Western collective consciousness. Political philosophy responded by giving priority to the definitive elimination of political violence and of the repression of fundamental liberties, i.e., by putting at the top of the political agenda the struggle for the emancipation of the masses. It thus turned away from the old problems resulting from the metabolic shock of the first wave of industrialization. This trend is very visible among theorists who endeavoured to reconstruct the conditions of a just society, such as Rawls, but also and more surprisingly among the theorists of the pathologies of advanced capitalism. In both cases (though it is on the second that we will focus here), the horizon of extraction-autonomy still largely determines the most fashionable conceptual operations of the movement of emancipation.

Herbert Marcuse's work is emblematic of the ambiguities inherent in the critique of 'advanced industrial society'.<sup>9</sup> Marcuse was of course one of the most influential thinkers of the counter-cultural movement of the 1960s, but he is also the one who, within this movement, most explicitly based his reflections on the dynamics of affluence and autonomy. He claimed from the start that this society 'tends to totalitarianism' in a form that may indeed not include systematic violence, but that treats needs in terms of a false general interest within the framework of an apparent political pluralism. Given that Marcuse himself lived through the two world wars, one cannot suspect him of giving the concept of totalitarianism a diminished, attenuated value. When he asserts that the consolidation of capitalism by welfare<sup>10</sup> and the consumer society 'tends to totalitarianism', this is not for him a mere figure of speech – the term is used with all its historical and axiological weight. However, it takes on a singular meaning, coloured by the philosophical influence of Adorno and Horkheimer<sup>11</sup> – one that consists in lending capitalism the scale and historical pervasiveness of a totalizing form of life, from which no dimension of individual and collective existence escapes. What the capitalism of postwar

reconstruction achieves, by setting out to conquer the instinctual apparatus of individuals, is functionally similar to what the pre-war totalitarian regimes intended to put in place, except that the former succeeds by apparently peaceful means.

It is on this point that the question of material abundance enters onto the theoretical stage. Marcuse readily admits that the societies rebuilt after the war do not display 'open terror' and are characterized by their unequalled prosperity.<sup>12</sup> But this appearance of peace paradoxically hides the deployment of a project all the more pernicious as it manages to gain acceptance by the greatest number and to 'deaden critique'. So, in the first chapters of his book, he describes the neutralizing effect of a technological organization that greatly increases the productive power of humans and seems to meet their most legitimate needs, including the elimination of political violence. The absence of any critique, a critique to which Marcuse's political and prophetic gesture is meant as a spur, is explained by the ability of the technological organization to parasitize and orient the desires of the members of advanced industrial societies in a direction that makes it impossible to challenge that organization. The latter succeeds, as a total and therefore quasi-totalitarian system, in establishing itself as a court of needs:<sup>13</sup> the needs of possession, which provide an outlet for the organs of production, are promoted as genuine and legitimate; the others are repressed, and their sublimated compensation (in art in particular) itself is inhibited. Thus, regulated by a repressive whole, liberty can become a powerful instrument of domination.<sup>14</sup>

If hell lies behind prosperity,<sup>15</sup> if the libidinal relation to merchandise gives the masses a simulacrum of liberty by which they are kept in a state of euphoria that is easy to govern, this is because the project of affluence has achieved its final consummation. Marcuse does not embark either on any historical analyses of the emergence of this project, or on how it has come to be equated with the empowerment of groups and the individuals within them, but he rigorously articulates a counter-analysis of the potential for fascination included in solving the economic problem. The unlimited nature of economic forces has this dimension of radical alienation only because it involves a total reconfiguration of a person's psycho-emotional aspirations, a reconfiguration that serves an economic organization of scarcity. The initial Marxist framework is therefore overwhelmed by a Freudian schema which defines the equilibrium of the instincts as a primitive scene on which historical forces are deployed.<sup>16</sup> Finally, a third framework of analysis complements that of psychoanalysis: by affirming that capitalist totalization is essentially due to the appearance of objectivity conferred on it by the technological system on which it is based, Marcuse borrows from Husserl and Heidegger the theme of a technoscientific mutilation

of any authentic relationship to the world.<sup>17</sup> The productive regime put in place in the aftermath of the war according to a compromise between state and markets, the general aspiration for comfort and peaceful political passions, the search for minimal social harmony in the emergence of a popular culture: these sociological phenomena are all ultimately reduced to the universal application of formal and quantifying rationality.

The horizon of emancipation that unfolds from these observations seems to be caught in the contradictions of the 'system' which he intends to denounce. Marcuse indeed describes quite precisely the contours of a society free of totalitarianism proper to the Keynesian model and to the petty-bourgeois aspirations that accompany it – and this is undoubtedly what has ensured its success. On the economic level, the emancipatory movement must, according to Marcuse, reappropriate the technological power to withdraw its purely productive function, and make technological mediations the substrate of a free game that will regulate in the mode of aesthetics the relationships with the natural world. He describes how this step will be reached when material production is automated to such an extent that all vital needs can be met in the minimum time. Technological progress will transcend the realm of necessity in which it was actually used as an instrument of domination (and was in any case of limited rationality).<sup>18</sup>

Emancipation is therefore conceived as the end of the economic dimension of existence. Economic liberty should mean being freed from the constraints exerted by economic forces and relationships, and from the daily struggle for existence. Given this liberty, no one would be forced to earn a living by means involving exploitation.<sup>19</sup> The elimination of objective scarcity must therefore be prolonged by the elimination of the scarcity artificially maintained by economic organization. The pacification of the relationships with the world that Marcuse intends to defend nevertheless takes on an ambivalent meaning. On the one hand, it is perfectly legitimate to see it as one of the sources of contemporary political ecology: by asserting that capitalism is accompanied by a deleterious promotion of the race for exploitation, it links social pathologies with environmental pathologies – a lesson that André Gorz, in France, learnt well. Numerous passages in the book testify to this idea of a war against nature, of a joint alienation of human beings and their environments, now reduced to their functional characteristics.<sup>20</sup> Prosperous societies thus hide the increasing waste, planned obsolescence and destruction at a time of mass poverty.<sup>21</sup> The aestheticization of the relationship with nature then replaces the economic imperative, and everyone in this context is able to reclaim the world as a space where their sensibilities

can be deployed: playing games, seeking beauty, do indeed have the appearance of being less destructive social goals.<sup>22</sup>

But on the other hand, the relief brought by access to a post-economic universe is not due to the slowing down of the productive machine: while the delegation of productive functions to machines frees up space and time for the reconquest of a now emancipated psyche, this reconquest is still conceived as a marginalization of anxieties about subsistence. Autonomy is not thought of from within these tasks, from the opportunities that the use of the world offers for action at its most emancipatory and socializing, but as what is obtained once we prune social relationships of all that stems from our organic existence, from our needs.

In his 1967 speech on the societies of affluence, Marcuse defined the historical horizon of critique by the idea of a society as a 'work of art'. This society can be called 'ecological' insofar as it allows the restoration of nature after the elimination of violence and the destruction caused by capitalist industrialization.<sup>23</sup> But if the aestheticization of our relationships with others and with the world does appear as a contrast to economic hell, it nevertheless rests on an opposition between necessity and freedom that is not unrelated to the geo-ecological regime of the time. Society as a work of art, i.e., as a set of relationships that are not subservient to production and instrumental purposes, suggests a conception of liberty akin to luxury, to the protection of the private sphere against the painful and alienating nature of labour as it is organized in the capitalist world, but more broadly against any form of obligation that is not explicitly agreed, which is exogenous to the sphere of social ties. This ambivalence of radical liberty was inherent in the counter-cultural movements of the 1960s and 1970s,<sup>24</sup> and we still find it in what some contemporary theorists today call 'fully automated luxury communism'.<sup>25</sup> The outside world, 'nature', are accepted as partners in an emancipated relationship only to the extent that this relationship is nonfunctional. It is quite striking to note that, in this technofuturistic vision, (human) individuals are the exclusive beneficiaries of relief from productive pressure: material needs are met for the greatest number by autonomous technological actors, and humans can give free rein to their extra-economic tendencies, those deemed to be the noblest. It goes without saying that this is only possible if the incorporation of resources and spaces into human subsistence continues at a high rate, even if the aesthetic relationship with nature promises to be less expensive, from an ecological point of view, than the relationship of pure consumption.

The problem is therefore not so much whether or not Marcuse unconsciously promotes a lifestyle based on the massive provision of consumer goods by robots, but that he still thinks of the autonomy of

individuals as the result of an ideally impermeable barrier between the sphere of action and the burden of necessities related to subsistence. It is understandable that, from his point of view, the emancipation of needs from 'useless' material goods required by ostentatious consumption corresponds to a slowdown in economic life. But if we compare the formulation of this ideal with classical socialist thought, there is a significant difference. In the nineteenth century, the liberation of collective life required the politicization of practices which tended to integrate things into social relationships (through corporative language, the high status of the engineer, the potential for socialization included in industrial labour, and relationships with the land). Marcuse, for his part, bases his reflection on a strict separation of activities between a sphere determined by needs, from which we need to be freed, and a sphere open to aesthetic and playful possibilities. Let us be clear: no society other than advanced industrial capitalism has ever made such a definition of liberty possible (or, let us say, conceivable).

This is the paradox of the Freudo-Marxist critique developed in the 1960s: whether it is genuinely ecological or not matters little; the main thing is that it does not give 'nature' a social value except insofar as the latter no longer appears as repressive. The old coding of nature as a constraint still works; it is only once the world no longer tests the individual and collective capacities to negotiate the conditions of their autonomy of living people, spaces and resources that it becomes an acceptable partner. Marcuse somehow accepts this paradox when he sees aristocratic leanings towards art as a paradigm for the free use of the faculties of the imaginary. This is because the aristocracy is like the popular masses of the postwar period: if their liberty is defined as an exemption from utilitarian tasks, then these tasks must be delegated to others. Admittedly, in the second case, machines (virtually) replace peasants crushed by their servitude, but in both cases this is an outsourcing of functional relationships to the world, relationships deemed to be devoid of any socializing or emancipatory value. With Marcuse, *the paradigm of extraction-autonomy therefore passes over into social critique*, and – what is even more striking – *into a critique that resembles an ecological critique of modernity*.

### **Oil and atomic power: invisible energies**

To understand the eclipse of ecological reflexivity, it is possible to put forward a second hypothesis. This consists of seeking, in the technological and institutional arrangements specific to the postwar period, the characteristics that partly made the acceleration of the economic rhythm, and therefore the revival of an extractive concept of political



liberty, to a certain degree invisible. Talking about invisibility here is not without its difficulties: as we have said, the spectacle of material improvement and mass consumption specific to the aftermath of the war is obvious to all, whether we are talking about this spectacle's most vocal advocates or its loudest objectors. Rather, what is invisible, or rendered such, is the network of material dependencies that configured this era. It then becomes clear that a series of factors, both social and material, feed into ecological insensitivity: the adoption of an energy system apparently without constraints or limits – dominated by oil and nuclear power – leads to massive outsourcing of the ecological costs of development in space and time, i.e., the transferring of these costs and risks to marginal regions and their postponement to the future.

As many historians and sociologists have shown, for many decades growth worked as the main legitimization of capitalism: at a high rate, it indeed permits an acceptable compensation for the inequalities of wealth induced by the allocation of income according to market mechanisms, and Western states have found one of their *raison d'être* in this redistributive and regulatory function. Associated with the context of the Cold War and the totalitarian nightmare that was still very recent, this socioeconomic configuration weighed decisively on the formation of postwar political thought: on the one hand, the classical liberal pact could still be defended by making economic liberties a constitutive dimension of democracy and a factor of social progress; on the other, the demand for radical emancipation rested on a separation between the sphere of free activities and that of material servitudes – associated with the capitalist repressive apparatus. Thus, both the legitimization of the capitalist order and its critique depend on the same structuring phenomenon of a higher, more important level: that of growth. Critical theory and liberalism shared the same fear of heteronomy, which was embodied for the former in the colonization of desire by commodities, and for the latter in the excesses of state power and individualist conformism. But whatever the conclusion drawn, the social order had to take refuge in its internal dynamics, all the more protected from harmful exogenous influences now that it had the technological and economic means to do so.

These means, indeed, deserve to be set out and clarified as such. Not only because, unless we take this step, we cannot adequately grasp the sense of autonomy proper to the period of rapid growth of the Thirty Glorious Years, but also because the social forms of material affluence are not self-evident. As certain studies in the history of science and technology have shown, in particular those interested in energy resources, the perception of unlimited material means after the Second World War is not due to a pure and simple increase of productive effort (by men and machines), but rather to new technopolitical

arrangements, the characteristics of which explain their relative invisibility in the eyes of Euro-American intellectuals.<sup>26</sup>

Timothy Mitchell's probing of the concept of affluence in *Carbon Democracy*, for example, sheds light on the links between the solidity of the democratic order in the postwar years and all the technological and institutional arrangements put in place to secure the energy supply. While coal was the dominant resource until the 1930s, oil, which was already the subject of intense struggles between the economic and colonial powers between the two world wars, became the key to the world economic system after 1945. The reconstruction of this system, of which the Bretton-Woods agreements and the contribution of Keynes were essential components, rested on the ambition to protect markets and national economies against the anarchic tendencies of financial speculation: the gold standard was restored, but if the dollar was chosen as the reference currency, this was mainly because it was the currency in which oil was bought and sold. The regulation of world trade, and therefore incidentally of growth and employment, was thus inseparable from control exercised over financial activities, and from a reserve of fossil energy that functioned as a guarantee of the value of money over a long period of time.<sup>27</sup>

But beyond these banking and monetary institutions, which were basically responding to the insecurity of the 1920s and 1930s, postwar economic stability also required the material properties of oil. Unlike coal, oil is a fluid substance, easily transportable, and is extracted from the ground under the effect of negative pressure. In other words, it does not require the same labour force as coal (geologists and engineers rather than miners), whether at the time of extraction, transport or refining, and it lends itself more easily to global competition (thanks to the development of tankers). These are the reasons why the colonial powers (or ex-colonial powers) in the West had to set up transnational oil firms, capable of operating locally but also, and above all, on external production sites, in particular in the Middle East. Without this, local operators would have been able to compete strenuously, with a negative impact on profits. These physical and technological characteristics of the oil supply, coupled with the determination to rebuild the world economy and with the capacity of the major powers to project their power beyond their borders, brought to light a very complex network of banks, states, mines, supply channels and technological norms which was unique to the Thirty Glorious Years. According to Mitchell, it was this unique arrangement that explains the world from which, for example, Marcuse was trying to escape.

Even if, soon enough, the gold standard would no longer be enough to control an economy into which extraordinary quantities of fossil fuel were being poured, the Keynesian experience would imprint in the

collective conscience, as well as in the concrete economic possibilities of the time, the idea of an unlimited economy. Rather counterintuitively, Mitchell puts the effort to redistribute wealth that was inseparable from these policies into perspective, so as to emphasize the affinity between the creation of national economies based on rigorous accounting and expressed in abstract terms (of which GDP was the emblem) and the security provided by access to very abundant fossil resources. Democratic politics developed, thanks to oil, by seeing in the future a horizon of unlimited growth. These expectations were not based on any 'natural' idea of a time of abundance, but the result of a particular way of organizing expert knowledge and its objects, in a new world called 'the economy'.<sup>28</sup> We need to fully grasp Mitchell's claim: the limitlessness of the economy is inseparable from the paradigm of redistribution and social protection associated with Keynes – not just because it takes the wealth from oil to finance this system, but because the consolidation of capitalism by the projection of postcolonial power and the construction of growth indicators disconnected from the metabolism of raw materials are its main instruments.

The coal economy described in 1865 by Jevons, in which the supervision of domestic stocks was of paramount importance, was gradually supplanted by an oil economy in which the abundance of stocks was ideally combined with industrial and financial strategies intended to maintain a relative scarcity (and therefore fairly high prices). The strategic nature of raw materials was essentially due to this subtle combination: enough was needed to supply a rapidly growing technostructure, but not enough to guarantee the profitability of the extractive industry. The appearance of an 'economy' closed in on itself, centred on movements of capital conceived as an order of reality independent of material cycles, was both the condition and the effect of this politics of scarcity – and Mitchell gives the name 'petro-knowledge' to the intellectual efforts invested in the development of this policy.

If economics thus became a science of money,<sup>29</sup> this was because the balance between abundance and scarcity was skilfully maintained. On a sociological level, it was also because the conditions for extracting and transporting oil had limited the emergence of a movement for economic justice similar to that which, in the last third of the nineteenth century in Europe, won a number of social victories. It is in this way that we can establish an initial link between the order of oil and the forms of critique voiced in the 1960s. Since it was no longer possible to orchestrate the stand-off between the dominant and the dominated by relying on a critical mass of operators directly involved in the energy supply – i.e., on a class that had its hand on the tiller of the economy – the challenge to economic authority needed to

change its form. Deprived of the negative force indirectly conferred on the coal proletariat by pre-war industry, criticism needed to be repositioned, reconfigured on another level.<sup>30</sup> Marcuse put it well: it was not that the lower classes had defected to the counter-movement out of laziness or lack of lucidity, but they had clearly seen that they could expect more from the trickle-down of wealth from growth than from pursuit of a social showdown. Postwar democratic pacification was less about a balance of power between classes than about cautious measures to socialize industrial profits, measures that were seen as a condition for perpetuating the economy. In these conditions, it was an artistic elite originating in the bourgeoisie that had been invested with the critical mission, since it alone was able to give a political meaning to its disillusionments: the enhancement of the aesthetic and playful relationship with the material world and the aristocratic delegation of functional tasks to automata were perfectly well understood as consequences of a weakening of the material reflexivity previously fostered by the productive classes in the coal economy. From this point of view, Marcuse comes across as a thinker who was, if not entirely lucid, at least perfectly symptomatic of the historical configuration in which he was caught up – that of oil.

There is also a second type of light that can be shed on these questions, one made possible by the history and sociology of science and technology. Indeed, the economy of the Thirty Glorious Years was characterized by a profound distortion in the space–time reference points in which the partnership between humans, machines and environments had previously been deployed. We have seen above that the development of a market society had already affected the essentially local universe of agrarian economies – but this happened in only limited proportions: space and time still remained, in this context, factors determining the value of goods (via transport and insurance costs, the spoiling of materials, and so on), and national borders still formed the backbone of economic exchanges. One of the characteristics of postwar modernization, notably under the effect of the large supranational organizations that were being set up, was that it involved the definition of technological and commercial standards indifferent to geography and languages. The oil production and supply chain, for example, combined instruments, standards, forms of knowledge, calculations and contractual arrangements that were largely independent of national discontinuities. These assemblages, into which multinational corporations ideally fitted, were neither local nor universal, but they extended out into a network in accordance with a spatiality proper to them.<sup>31</sup> It then became very difficult to know where one actually was in the chain, how the spatial distribution of activities and contributions to wealth was organized, since the old model of the state administration

of the territory, which to some extent made it possible to read the relations between economy, society and space, found itself largely facing competition from the indirect and nonlegal administration run by industrial firms and supranational regulatory institutions.

The main effect of this spatial logjam, where the space of sovereignty and the modes of economic regulation no longer coincided (or not as much as before), was a drastic limitation in the ability of political actors to adequately identify where the material effort required for development came from, and under what concrete conditions this effort was produced. Typically, the idea that material abundance could trigger emancipation from labour and the creation of a leisure society was inconceivable without neglecting the forced contribution of non-Western territories and the real cost of the geostrategic and military ventures that made it possible. In other words, the antimaterialist critique missed an important part of the material conditions in which it was deployed. Here, Fichte's intuition about the ubiquity of the moderns was extended in a new form – one that will be discussed again below: it was only much later that the outsourcing of the ecological and health costs of development would become a central element of environmental critique, but we can immediately underline how the spatiotemporal reorganization of the economy imbued the political imaginary of the postwar period. Mitchell notes, for example, that the economic indicators put in place at the time, GDP and GNP in particular, functioned as devices for rendering invisible the increased expenditure involved as a result of the need to repair the damage caused by fossil fuels.<sup>32</sup> And since the bulk of this spending was virtual, the need for an inevitable correction to the measuring of development hung menacingly over an invisible future. In other words, time was also affected by the economic regime of those years.

But the most striking example of the temporal dislocation that ran through postwar societies came less from the oil economy than from major nuclear projects, of which France was the main example. The establishment of a civilian nuclear industry shows that the outsourcing of development costs into the future was not just a mere accounting phenomenon of value transfer – it had a more general political significance. National identity and pride, after the humiliation of 1940, were ideally based on an essentially technological project, which, even as it promised that the nation would enjoy independence in energy, also provided the substrate for a discourse of autonomy and progress.<sup>33</sup> The involvement of large state bodies and the formation of a new technological elite, the establishment of a specifically French industrial sector, the assimilation of nuclear control to national sovereignty and the spread of an imaginary of technological prestige: these were the various components of a technopolitical whole in which the

material properties of nuclear energy were invested so as to build a self-confident political consciousness. But while the government of France in the 1950s was largely committed to these arrangements, we can again say that this was inextricably linked to establishing control over the future. The question of waste and the fate of power plants after use was overwhelmingly treated as a problem for the future,<sup>34</sup> and – more broadly – as the long-term fallout from an industry that was competitive and defensible as an economic and political model only if it rejected its consequences for the future, even though these were well known.<sup>35</sup> While catastrophist thought dramatized this temporal dimension of the nuclear system by affirming that it could be maintained only by euphemizing the horizon of a possible (or even probable) accident, we can say more generally that the policy of atomic power depended on an optimistic attitude towards the future. This was government by promise. More precisely, this policy constructed the future as the indefinite repetition of the present (energy security and national pride), even though it paradoxically compromised this very repetition.

\* \* \*

If we now set these elements of the political history of energy technologies into a slightly longer time frame, we can get an idea of the transformations undergone after the Second World War by the geo-ecological partnership between society and the world. The modernization process that began with the material and political revolution of the nineteenth century took the form of a distancing from the affordances of the land that had previously structured social life. These, as Polanyi showed, were not purely and simply abolished; nor could they be. Their muting by the spectacular emergence of the affordances of the machine and the market raises the question of their persistence and their compatibility with an ideal of autonomy increasingly attached to the aspirations of the industrial classes. After 1945, the great acceleration consisted in relaunching the modernization project in more massive proportions, though this relaunch was also subject to more powerful regulatory mechanisms – of which the social state of growth was the main embodiment. But while the involvement in the nineteenth century of the ‘people of producers’, to use the Saint-Simonian lexicon, contributed to the formation of a political conscience that explicitly linked the quest for affluence to the independence of a collective subject now called ‘society’, this link was then severely tested.

The first test lay in the way the protection of society was equated with repressive structures (whether of communist or fascist inspiration): the liberal and neoliberal discourse thus found in the critique



of totalitarianism the main argument in its defence of market justice against state abuse. But this was simply the sign of a deeper transformation of the landscape. Indeed, the oil order and (to a lesser extent on the global scale) the nuclear order were characterized by what one might call *negative* affordances. Land, like the thermal machines of the first wave of industrialization, provided social agenthood with effective opportunities, fairly widely localized in space and situated in time: humans and nonhumans cooperated in a common environment where they confronted each other directly, where they were in almost immediate contact with each other. Oil and atomic power, in contrast, required technopolitical arrangements to make them socially effective and thus encouraged a reduction in material reflexivity – what has been called (above) its eclipse. The spatiotemporal outsourcing of costs, the construction of a political imaginary geared towards the limitlessness of the economic order, the apparently ‘free’ nature of abundant resources, the confusion of classical territorial landmarks by the construction of transnational technological, financial and normative networks: all these elements of which we certainly find traces from the nineteenth century onwards assumed a crucial importance after 1945. Now it is *this* that constitutes a network of negative affordances: it becomes much more difficult than before to use the effective manipulation of resources, wealth and environments to form political awareness – and in particular critical awareness.

The stagnation of critique during the Thirty Glorious Years that Marcuse and many other critical theorists deplored was certainly due to the power of conviction of growth and comfort. But, more deeply, it was connected to this negativity of material affordances, to this paradoxical capacity of the geo-ecological order then being set up to make the effective conditions of collective integration into ecological dynamics something abstract, distant, even immaterial. Politically, the literally ungraspable, invisible character of the material conditions of common existence explains the transformation of critical thinking. And from this point of view, the counter-cultural gesture of Marcuse and many other contemporary authors was itself part of this eclipse of material reflexivity. Obviously, the environmental alarms launched in the nineteenth century were not completely forgotten, so it would be excessive to deny any ecological awareness during this period. But from a more distanced point of view, it clearly appears as a transitional phase in the evolution of the relationships between autonomy and affluence, marked by the negative nature of the political affordances of oil and atomic power. The consolidation of the market and the technological conquest of the world, made possible by the temporary establishment of effective counterweights, thus made it possible to prolong the promises, however old, of the liberal pact.



# *Risks and Limits: The End of Certainties*

## **Alarms and controversies**

At the end of the Second World War, defenders of the liberal pact and also its apparently harshest critics were both subjugated by the power of affluence. The spectacular increase in material possibilities then provided the conceptualization of liberty with its most solid basis, regardless of which side people took. The modernizing project experienced a prosperous period during which the industrialist faith assured a very powerful structuring role, one that also had the effect of limiting intellectual and political horizons. But that period did not last – or at least it quickly led to serious questioning.

Very quickly, certainties with regard to the future forged in the combination of affluence and freedom faced critiques that then took the form of research programmes, and which thus found their real place in the history of knowledge. On the one hand, there was a new concern for the finite, limited nature of natural resources and a series of alarms targeting the dogma of unlimited growth. Along with Malthusian fears about the world's population, the ecological limits of the spaceship Earth seemed closer than ever and the dream of prosperity compromised. On the other hand, there was also some very deep probing of the regulation of risks and catastrophes and the political dimension of the technosciences. Nuclear accidents, notably Chernobyl, and major episodes of chemical contamination, then fuelled the uncertainties of late modernity. This chapter intends to explore in turn the issues raised in each of these paradigms – the paradigm of limits and of risk – in order to identify the general characteristics of the questioning of affluence and autonomy during this period.

For the proponents of the paradigm of limits, whose most famous expression was the 1972 Club of Rome report *The Limits to Growth*,<sup>1</sup> it was a question of showing to what extent the project of political autonomy understood as emancipation from nature was paradoxically

dependent on material conditions that lead to an impasse. By collecting data relating to metabolic exchanges and the energy dependencies that were formed between the social world and nature from the industrial revolution onwards, a very large body of work helped to shape a counternarrative. The general idea was quite simple: it is possible to contrast the cornucopian ideal born in the eighteenth century with all the ecosystemic disturbances that this ideal ended up triggering, consciously or not. The culmination of these disturbances, the prospect of a demographic and political collapse caused by the return of scarcity and the degradation of the environments that support us, acted as the keystone to the system of thought organized around limits. Thus, thinking in terms of limits to grasp the embedding of society in pre-existing geo-ecological balances requires the adoption of a systemic and holistic scale of analysis, one that sees human societies as material realities engaged in physical, chemical and biological exchanges with their environment.

The other great paradigm on the basis of which nature made its return in modernity revolved around the concept of risk, which emerged in the social sciences around the same time. This was not simply a matter of pointing to the accumulation of catastrophes induced by new technologies, but rather to give meaning to the transformation of the relationship to the future that these catastrophes triggered. While the modernist creed par excellence consisted in granting itself the possibility of controlling this future and of orienting it according to reasonable principles, the irruption of risk blurred this confidence and turned uncertainty into a central component of our social existence. Initially conceived as factors that stabilized humans' relationship to the future, in the age of Chernobyl the technosciences assumed a completely different guise, as a factor of uncertainty and conflict linked to a slowdown and a crisis – by now a structural crisis – of the mechanisms of social protection put in place after the Second World War in market economies. In the words of Ulrich Beck, one of the main representatives of this paradigm, we must speak of a 'risk society', i.e., of a stage of development of modernity where collective exposure to these risks becomes the central criterion that defines the present.<sup>2</sup>

According to Beck, what collapsed from the 1980s was not only the model of linear progress inherited from the first wave of industrial modernity, but also the set of categories of thought attached to it and which formed the conceptual apparatus of the traditional social sciences: national sovereignty, class, merit, nature, reality, science and above all the commodity. The prospect sketched in his work *Risk Society* (originally published in German in 1986) is striking: according to Beck, there would soon be no more borders (as Chernobyl showed),

no more classes (because exposure to risk does not follow income inequalities), no more external nature (because the ideal of mastery had been simultaneously realized and annulled) and no more science (it was the end of the age of certainties, and access to the world was political right from the start). Regardless of the validity of this thesis as a forecast, its ability to capture an ongoing social transformation has been decisive.

Contrary to what the whole of political economy and its critics had established, the commodity would, in a regime of generalized risk, no longer be the sole and irreplaceable object of trade, since the lateral effects of productive activities now involved heavier costs and preventive measures, more able to impose constraints on the economic world in general. Yet it was precisely because nature had been thought of as a reality prior to and external to the economy, as a simple reservoir from which to draw wealth, raw materials and other factors of production, that its return produced such devastating effects. According to Beck, the need for postmodern societies to incorporate these externalities into their economic and intellectual systems amounted to crossing a threshold of reflexivity previously unknown, or deliberately rendered invisible. Integrating risk into the social model inherited from the industrial era thus made modernity 'reflexive', insofar as it would now have to conceive as its own what it had previously located outside of itself. While the belief in the domination of nature had projected society out of the world, the surge of risks and the need to regulate them put an end to this separation, and reconnected, in a more uncertain but also more peaceful form, the natural and the social.

The deep affinity between the paradigm of risks and that of limits lies in the relation to time. To transcend limits, or geo-ecological thresholds, is inevitably to leave the calm and predictable framework that modern technological and political structures had imagined they had built forever. Soils, atmosphere, environments in general began to respond in an unpredictable way to activity; material support for a development deemed to be continuous and indefinite began to fail, bringing down with them forms of life and institutional models. This new relationship to time, as we have said, was also central in the perspective of risk, since this time it was a question of forging a new rationality intended to incorporate this uncertainty and make it ideally calculable. We might say that, from this point of view, the two paradigms involved helped to reveal how modernity was a *chronopolitics*. The pre-emption of the future constituted by the creed of improvement and the myth of progress is perhaps the most striking component of our world. It is at the same time the most robust component, that which captures individual and collective aspirations

in the most powerful and lasting way and makes them enter into vast ideal and material structures, and the most vulnerable, susceptible to the most serious dysfunctions and the bitterest disappointments. The regularity of conduct guaranteed by the administrative and material structures of modernity, and thus the chronopolitics inherited from the age of revolutions, seems to come up against risk and limits.

### **The critique of development and political naturalism**

In the early 1970s, only a few months apart, several texts laying the ground for a new critical approach to growth appeared: Nicholas Georgescu-Roegen's *The Entropy Law and the Economic Process*, the Club of Rome report, *The Limits to Growth*, by Donella Meadows and others and, to a lesser extent, *Steady-State Economics*, by Herman Daly. While the first operates from within economic science by incorporating the contributions of Odum's scientific ecology, thermodynamics and systems theory, the second was the work of an interdisciplinary collective of researchers who were aiming more directly at a reorientation of industrial (and demographic) policies on an international scale, using avant-garde computer modelling. In addition to these publications, a literature warning of the abuses of industrial civilization and the ecological cost of economic growth started to develop. Books by Paul Ehrlich, Barry Commoner and Ernst Friedrich Schumacher<sup>3</sup> were all part of the specific moment of the 1970s: whether in terms of demographic danger for the first of these authors, of the saturation of ecosystems by the residues of industrial activity for the second, or of a more general critique of consumer society for the third, all provided material for an indictment against pathological affluence, in phase with numerous counter-cultural movements then in vogue. Then there was the work of Howard Odum, who, after having developed the principles of contemporary functional ecology with his brother Eugene, in 1971 published *Environment, Power and Society*, a work that highlights certain links between the idea of limits and the technocratic thinking of Veblen and his heirs.

As studies on the intellectual origins of degrowth have shown, the emergence of a critical attitude to the limitlessness of the industrial productive system has its roots quite far back in history.<sup>4</sup> From a sociopolitical point of view, the 1972 Club of Rome report was nevertheless a turning point. This text was the result of a meeting between a group of industrial reformers from different disciplines, first brought together in 1968 in Rome by Aurelio Peccei – hence its name – and the systems theorist and computer scientist from the Massachusetts Institute of Technology, Jay Forrester. It was actually the latter

who developed the modelling techniques necessary to represent in quantified and graphical form the different predictive scenarios on which the critique of growth was based.<sup>5</sup> The report was presented as the result of a thought experiment which retained the following five factors as elementary components: population, resource stocks, the level of agricultural and industrial production (or, in more technical terms, the rate of return of the capital invested in each of these two sectors) and the pollution rate. Each of these variables incorporated into Forrester's algorithm was itself the result of the aggregation of numerous demographic, economic, biological and technological data, detailed at the beginning of the text. Each component had relations of positive or negative reinforcing with the others, which were formalized in a humble diagram called 'The World Model'.<sup>6</sup> For example, population growth leads to increased pressure on resource stocks, which increases pollution, and vice versa. It should also be noted that a significant part of the prestige garnered by *The Limits to Growth* (but also of the criticism it has attracted) is due to the techno-scientific prowess behind this heterogeneous assembly of data into a synthetic and heuristic, if not representative, model. The ecological sciences were then taking their first steps in the world of big science, with intricate and powerful modelling devices.

The 'standard run' of the model designed by Forrester is obtained by conjecturing the perpetuation of the growth rates of the five components maintained at the same rate as that observed over the period from 1900 to 1970. This scenario, which foreshadows a world without deliberate changes, leads to a major demographic and ecological catastrophe by 2000: demographic growth has a positive feedback on the growth of productive activities, so the overall pressure on resources and the accumulation of pollution follow an exponential curve which soon comes up against the limits of the load capacity of the planetary system. It is the result of a mutual reinforcement of the causes behind the depletion of resources and the damage to the regenerative capacities of the environment. The report then multiplies the alternative 'runs' by playing with the variables – deliberately overestimating the stocks available to cover possible future geological discoveries, playing on the ability to intensify agricultural and industrial efficiency, envisaging a partial control of demographic growth, imagining the emergence of alternative technologies, etc. But each of these virtual scenarios reveals either a failure of the rescue attempt, as the exponential dynamic is too strong, or the unrealistic nature of the hypothesis being tested.

*The Limits to Growth* is an intellectual project that strikes the reader with its ambiguities and the different facets it presents to analysis. In a sense, it is a prototype of Cold War sciences:<sup>7</sup> the product of a strong technological and intellectual commitment to solve in a

top-to-bottom way global challenges perceived in an undifferentiated fashion by policymakers without any precise ideological orientation, as well as being the product of technoscientific structures that largely result from military research. We can also see it as a reactivation of classical Malthusian rationality, since in the end it is still a question of confronting population growth with limited natural resources, bounded by an uncontrolled rise in the mortality rate. More seriously, it is legitimate to see the alert launched in 1972 as an effect of the fear aroused by the access to development of regions of the world hitherto left 'behind', Africa and Asia in particular – and therefore of a Malthusianism understood as an exacerbation of the struggle for resources between competing social and geographic groups. What distinguishes the Club of Rome from Malthusianism is that it is no longer a question of highlighting the dramatic outcome of an encounter between two incompatible growth rates, since it is the accumulation of pollution which this time constitutes a pathological excess. The human and economic system deviates from the norm – the baseline state in which it can grow innocently – by adding to the environment organic and chemical compounds that do not degrade harmoniously, and not only by taking from that environment what it needs.

If the name of Malthus is referred to incessantly in such works as these, based on the paradigm of limits, the two underlying intellectual operations were completely different. Malthus and his school, while emphasizing the dismal horizon of an economy confined to an organic regime, in Wrigley's sense,<sup>8</sup> stimulated a liberation of productive forces that was aimed entirely at making this prospect less daunting. The finite nature of land was to be met by the development of commerce and manufacture, that is, in a certain way, by replacing a limited land-based capital with other forms of capital – a replacement inseparable from drawing directly or indirectly on foreign lands by importing grain and other raw materials. Here, the process was reversed: far from wanting to accelerate production, the point was to slow down the economic machinery. If the fight against population explosion is a premise shared by Malthus and the Club of Rome in their desire to evade ecological limits, Meadows and her colleagues explicitly target the very idea that economic art consists in increasing the gross quantity of wealth produced and traded. Neither Malthus nor Ricardo is an advocate of 'global balance', simply because they never faced the negative consequences of economic growth, but rather the consequences of the glut of human beings. Once the organic ceiling has been broken through, and above all once the analysis of limits has been raised to the global level, the problem arises in a completely new form.

While the Club of Rome mainly pursues political objectives by alerting us to the depletion of resources and the regenerative capacities

of the natural environment, the metabolic perspective has served as the basis for another scientific endeavour, of much greater intellectual scale. The project of a naturalist critique of political economy has been carried out in different ways, but its most successful developments stem from the work of Nicholas Georgescu-Roegen. Bioeconomics, whose current heritage is to be sought in ecological economics and certain branches of degrowth,<sup>9</sup> does indeed become, in *The Entropy Law and the Economic Process* as well as in a series of peripheral texts, a complete overhaul of economic reason.<sup>10</sup> But the whole question is whether this overhaul can respond to the challenge inherited from Polanyi, re-socializing economic thought while making it sensitive to attachments to land.

Georgescu-Roegen does not merely point out that the economy has a substantial meaning, that it consists in circulating a set of materials and energy through the channels of production and consumption and that the gross volume manipulated in modern economies is greater than the carrying capacity of the global environment. He also shows that, if the neoclassical economy in particular has become incapable of taking this dimension into account, it is because of the presence of a physical metaphor at the heart of its epistemological ideal: the system of exchange becomes analogous to a large mechanism in which movement (here, the circulation of the exchange value via prices) is always reversible. This Newtonian economy, where action and reaction are harmoniously balanced, is not viewed as the ideological product of social relations, but as an epistemic idealization of abstract value flows, which has the effect of making invisible, or more exactly extra-economic, the connection between these exchanges and the ecological metabolism. It is therefore necessary to reconstruct economic reason on a theoretical basis that recognizes the second law of thermodynamics, in other words the principle of entropy: to maintain the order of a given system, and to fight against the entropy that ensues by dissipation (whether this involves living beings or a large-scale network of subsistence), there must be an external input of energy. The social organization of subsistence is above all a struggle against the decay of order, a struggle for the preservation of life, and the economy is therefore subject to the irreversible temporality of organic processes.<sup>11</sup>

There can be no compromise between the neoclassical mechanism and the harsh lesson of thermodynamics: economics is not a closed system where order and heat are miraculously preserved, one that can grow indefinitely without an external input of energy; furthermore, the processes by which the fight against entropy is waged are inevitably imperfect. In other words, the energy balance of our economic systems cannot be zero. To maintain order and life, energy must be consumed, and part of this effort is lost in the form of heat, pollution, untreated



residues. Contrary to what a cyclical conception of the economy might suggest, one that sees it as a deliberate tendency to restore to the environment all that is first borrowed from it, Georgescu-Roegen claims that 'recycling cannot be complete'.<sup>12</sup> If the rigorous control of productive externalities is part of the implicit programme of this bioeconomics, the idea of perfect circularity contradicts the lessons of thermodynamics. Whether there is growth or not, the decay of the system is inevitable.

Georgescu-Roegen's work introduces a certain tension into the dominant concept of growth, especially in a context where indicators such as GDP have been developed. The measurement of monetary flows and the aggregation of economic transactions thus have the twofold drawback of setting growth thus understood as a norm for public action (and therefore of confusing the prospects for social development with the continuous increase of this abstract indicator),<sup>13</sup> but also of concealing the very thing it claims to identify. Limitless growth is indeed perceived as desirable and possible only because it is the product of a form of accounting based, if we take Georgescu-Roegen seriously, on a fictitious reference point. Compared to the work of the Club of Rome, bioeconomics grasps the myth of growth at its roots and redefines the central objective of economics as a maintenance of collective life whose thermodynamic outcome is optimized.

Georgescu-Roegen's viewpoint is fundamentally pessimistic, since death is inevitable at the end of organic temporality; nevertheless, it is of capital importance. This is particularly because he himself anticipated and circumvented the critiques addressed to the whistleblowers of the Club of Rome. The idea that the economic order will meet the limits of the ecological system on which it is dependent very quickly spread panic among proponents of the orthodox viewpoint. So as to prevent this point of view, so deleterious for the business world, from becoming rooted in the collective consciousness, three main arguments have been used. First, it is claimed that the stocks of raw materials have been underestimated in the report; second, future technological improvements (mainly in the nuclear field) give credibility to a new abundance of energy and better treatment of waste; and third, the substitution of new materials and energies for the old ones will relieve the pressure on resources that become scarce.<sup>14</sup> It must be recognized that catastrophic forecasts have a particular weakness: by basing their arguments on the persistence of present trends, they are vulnerable to any argument that wagers on the creativity of the future – i.e., any fundamentally modernist argument. And to the extent that economics is the most vigorous heir to this progressive ideal, the critical riposte was fatal to the Club of Rome, and the controversy it stirred died out as quickly as it had been ignited.

However, if properly conceived, bioeconomics does not consist simply in slowing down the economic rhythm to avoid the next Malthusian shock, but in eliminating the economic conceptualization of our relationship to the world from modern self-consciousness. This radicalization of critique obviously does not guarantee success, but at least it has the merit of being based on the right issues. While the Club of Rome sought to be politically provocative, at the same time remaining epistemologically conservative, Georgescu-Roegen's work leads to an incomparably more demanding position. Whereas the dominant critique of political economy, stemming from Marxism, rests on a projected resocialization of the 'dismal science' through the denunciation of the power of capital, the new bioeconomics draws attention to the relationship between the different sectors of economic activity and entropy. Extractive activities, for example, appear from Georgescu-Roegen's point of view as areas where the increase in entropy is found in an almost pure state – as accelerators of dissipation of order. In other words, the monetary value 'created' in these sectors appears as a negative quantity for an economics rethought in terms of thermodynamics.

Georgescu-Roegen himself insists on the affinity between orthodox economics and Marxist-inspired critique, since there is no real difference between them from this point of view. If justice is not obtained except in the context of affluence, then the problem of social equality makes sense only if the economy is limited. It is precisely this reasoning that Georgescu-Roegen attacks head-on. By giving the postulate of limitlessness a radical meaning that defines the whole of modern economic rationality, and by bringing the limits within the deployment of the economy itself, in even its most innocent aspects, Georgescu-Roegen takes a risky wager on the ability of modern reflexivity to align with this demanding programme. And in fact, it is no exaggeration to say that this wager was lost despite the important legacy he has left behind.

As we have just noted, there are external factors behind this failure, which are to be found in the efforts of orthodox political economics to maintain its authority. But it must be recognized that these efforts are not based on anything: one of the main weaknesses of the paradigm of limits is its substantialist character, which gives stocks, and flows of matter and energy, a quasi-sovereign reality, so that modern political economy is interested solely in the organizational and technological capacity of human beings to evaluate these things in terms of market relations. Political economy is much more constructivist than its metabolic critique, and that is why it can always relativize ecological limits presented as absolute – we need simply recall that value has meaning only in the context of a process of positive assessment. The plea for an active recognition of natural processes as factors that rule

out the postulate of limitlessness thus runs up against a modernist coalition which rests on two powerful claims: nature has economic value only through the effective construction of this value; and we do not know what the potential is for these processes of construction. Bioeconomics, in other words, runs the risk of dislodging economics, cutting its links with social reflexivity by forcing it over towards natural history. Very simply, the question arises as to whether we can initiate a critical approach to the idea of submission to nature – as the radical critique of the productive order unfolds in a compromising political vacuum.

\* \* \*

Postponement of the metabolic alert is therefore due to the way in which it exposes itself to a critique that reactivates the modernist ideals that are part and parcel of economics. We can take stock of these specifically political difficulties in bioeconomics if we take a quick look at the work produced by Howard Odum at the same time. *Environment, Power and Society*, published in 1971, sets out much more directly to follow the path of a political theory of bioeconomic inspiration. Odum develops a programme of ecological engineering focused on optimizing the use of energy and the rational management of material flows, which recalls the attempts made by the technocratic movement before the war.

Like Georgescu-Roegen, Odum gives a central place to thermodynamics by showing that the human quest for useful energy (i.e., energy that is available for use and relatively concentrated) necessarily has a cost for the overall system. The technocratic heritage of this approach is clearly felt when Odum introduces the concept of ‘emergy’. This term designates a unit of natural value that refers to the quantity of primary energy contained, converted and concentrated in a given commodity.<sup>15</sup> Emergy is conceived as an alternative metric to money, which is clearly not only incapable of accounting for the metabolic dependencies of the economy, but actively obscures any shared ecological reflexivity by imposing fictitious quantities. Thus oil extraction generates money, while causing a gigantic loss of available energy. For Odum, the ability to concentrate large amounts of energy in technological systems must be compared with the loss of corresponding ecological functions: a hydroelectric dam,<sup>16</sup> for example, channels electricity flows at the cost of a deterioration in watercourses and the services they render to a wide range of living species and more broadly to the maintenance of an ecosystem on which, ultimately, humans are dependent. The disruption of these regulations by the energy system (and the same would apply here to the relationship between the motor function of a fossil fuel and the deterioration of the climate regulations that it

entails) is reflected in the form of an ecological debt contracted by the electrical operator to all of the beings affected by the hydroelectric installation.

The way these energy and ecological transfers are rendered invisible, a phenomenon made possible by monetary symbolization, then becomes manifest. Odum draws some quite radical conclusions from this theoretical mechanism, since he envisages reconsidering North–South relationships on the basis of the massive ecological debt that the North, as investor-consumer, contracts with regard to the extractive South.<sup>17</sup> But this brief foray into geopolitics is quickly obscured by the description of a plan for an ‘energy organization of society’,<sup>18</sup> which recalls the earlier work of Wilhelm Ostwald. The ferociously functionalist nature of this programme, whose watchword is adaptation, gives it a very vertical appearance. What disappears from the theoretical horizon is nothing less than the politico-legal structure of the protections granted to individuals and groups, their autonomy as actors engaged in the co-construction of social liberty. The programme that he calls ‘prosperous descent’, by which he means a braking of the overaccumulating tendencies of advanced civilizations, seems intent on settling the tensions between affluence and freedom without having to enter the political and institutional field, the field of social conflict.

The drastic limitation of waste and obsolescence, and also the incentive to ensure the ecological restoration of territories damaged by overexploitation, coexist in this programme with measures in which functionalism borders on naturalistic utopia – such as eugenic tendencies.<sup>19</sup> Odum’s silence on the way the sense of liberty overlaps with the material economy cannot be interpreted as a lack of interest in the legal and institutional issues raised by the construction of a democratic space disconnected from the regime of affluence. Rather, it reflects the inability of the paradigm of limits, in this version as in the others, to deal politically with the problem of affluence. The Malthusian spectre rises once more when we understand that the promoters of bioeconomics, or at least its main representatives in the effervescent 1970s, are renewing the old idea of a political art taking as its object not society, but the population. The possibility opened up by Veblen, and before him Saint-Simon, which consisted in reconstructing the social order on the basis of the socializing skills induced by technology and science, is here closed. Veblen’s critique of money is repeated, but merely gives way to an equally hegemonic alternative measure. The social relations of property, the independence of the industrial classes with regard to the market, the search for political equality as the division of labour becomes deeper – all these themes disappear from the literature on limits. The properly socialist component of technocracy seems to have been lost in this historical and epistemological trajectory, as if the

introduction of the ecological sciences into political thought had the effect of neutralizing the aspiration to autonomy underlying political modernity.

The inability of the paradigm of limits to be formulated within socio-political coordinates is in itself instructive. At the start of the last quarter of the twentieth century, when environmental pathologies become unavoidable, there was such a degree of co-optation of the emancipatory imaginary through material abundance that any thought of limits took the form of a crash landing. This brutal ecological rebalancing of modernity, this reminder of the pre-social norms that supposedly preside over the destiny of humans, was akin to the reactivation of an ideal of integral sovereignty exercised indifferently over space and humans. This fetishization of energy matters was obviously no response to the fundamental problem posed by Polanyi twenty-five years earlier. Indeed, nobody knows what collective subject is seeking its autonomy in the form of a reintegration of territory into political thought: regulation here takes on an essentially biological and energy-based meaning, it is an engineer's dream in which nothing is said of our social capacities to reinvent autonomy without the economy being viewed as limitless.

What was at stake in the attempts of the Club of Rome and of the various authors who put forward the paradigm of limits was the first real attempt to *fit industrial societies within a finite world*, a world whose geo-ecological properties would not clash with their persistence, their durability over time. And it is no coincidence that the concept of limit was the vector of this first incomplete rediscovery of the world as a vulnerable partner in the historical deployment of modernity: after the geopolitical and moral catastrophe of the two world wars, which brought its ideals up against one first form of collapse, this modernity would need to prepare for a test of a new genre, a test due to its very ecological contradictions. How indeed would it be possible to maintain the antitotalitarian requirement, which concentrated its forces on the fight against the reconstitution of predatory arbitrary power while accommodating an ecological requirement whose clumsy formulation awakened, whether consciously or not, the old demon of heteronomy? In the absence (or almost) of a political ecology making credible the increase of autonomy *by* a response to the challenge of limits, space was abandoned to a farcical opposition between a utopian techno-fix and the maintenance of the ecological and economical status quo.

### **Risk and the reinvention of autonomy**

While for proponents of limits the threat was essentially linked to the depletion of resources and the disruption of fundamental

geo-ecological balances, the risk lay mainly in events that disturbed spontaneous confidence in science and technology. The Chernobyl accident in April 1986 quickly became the emblem of this epistemopolitical movement, but beyond that, it also became necessary to think about the problem of nuclear waste management, the accumulation of health and environmental scandals such as asbestos, mad cow disease and contaminated blood, and the emergence of the figure of the victim in the political controversies of late modernity. Thus, in the context of risk, it was not the technosciences as a *material force* but as a *political authority* that were indicted. It was their ability to produce a trustworthy discourse on the world, a discourse on which we can rely when it comes to our material aspirations, which was the target of critique, and with it the exclusion of laymen from the exercise of this authority. What was at stake in the studies on uncertainty, responsibility and precaution that marked the 1980s was the idea that the technosciences would create the world into which societies would settle comfortably and sustainably. It was also the idea that the formation of a well-identified scientific authority can be entrusted with the care of the material fate of men and women, negatively delimiting the specific space of the political realm.<sup>20</sup>

Thus, the emergence of risk tells us that the advent of extraction-autonomy is incompatible with the incessant ebb of doubt and uncertainty. What is the benefit of being modern and free if you have to constantly manage the consequences of progress, if you have to constantly debate its harmful effects and set behind each scientist and each engineer a moral conscience that reminds them of their responsibility, their fallibility and, ultimately, their faults? What is the benefit if the remoteness of want and disease implies a constant surveillance of the institutions in which we had placed our trust, and if the very means by which autonomy has been won entail new dependencies? What societies with a high level of innovation have gradually discovered is that the sciences, far from making it possible to abolish natural constraints, cause new ones to emerge in which it is impossible to discern what stems from Providence and what stems from the faulty design of the machines. As soon as the risk is induced by the very thing that was to exorcise it, it is therefore the entire ideological and ontological arrangement of modernity that falters.

To realize this, we need simply recall the structure of modern chronopolitics that was discussed above. The possibility of looking to a certain future, as we have seen, fostered support for the liberal pact at the time of its rebirth, after the Second World War. Capitalism consolidated under the leadership of welfare and the maintenance of high levels of growth went hand in hand in a precarious balance that was soon to be weakened, but which helped to root in people's

minds the idea of a progressive continuity of time. The accumulation of industrial, environmental and health accidents and risks, by introducing threat and chance into the existence of the greatest number and by casting suspicion on the almost sacred authority that the representatives of science had assumed, reaches into the very heart of this chronopolitical system. Risk has the constitutive ambiguity that we do not know when the accident, or at least the disruptive event, will strike; nor do we know exactly where it will come from (otherwise it would be possible to anticipate it) – but we do to some extent know that it will inevitably happen.<sup>21</sup> It is both contingent and inevitable, and the essential thing is not knowing whether it will happen, but where and when. It is this paradoxical fatedness that makes the time of risk a relation to the future totally different from the smooth continuity sought by the modernism that emerged from the Enlightenment.

From this angle, the emergence of a ‘risk society’ is inseparable from the more general transformations of political economy that took place at the same time, from the end of the 1970s onwards and a little later in France. While the compromise of ‘democratic capitalism’ had somehow ensured, not without upheavals, the integration and rise of the salaried masses through the development of a social insurance system, the crises of this model and the first attempts at adjustment severely attacked confidence in this system for stabilizing biographical and professional trajectories. Without exaggerating the stability of the social and fiscal pact established between capital and labour in the aftermath of the war, we can agree with Robert Castel,<sup>22</sup> for example, on the emergence of a new historic phase with the spread of deregulation and precariousness of the job market, which itself accompanied deindustrialization and the refocusing of the economy on the maintenance of ‘human capital’ or knowledge. The ‘principle of deferred satisfaction’,<sup>23</sup> which enabled the lower classes to envisage the future in the guise of improvement and social advancement despite the ongoing difficulties of the present, gradually gave way to a great uncertainty, which did not present itself only in the guise of mass unemployment, the individualization of career paths, the dismemberment of the wage earners’ condition and the gradual replacement of the model of protection by the model of welfare.<sup>24</sup> In fact, insofar as this uncertainty affected the relationship with the future, it was part of a larger social transformation, which included the intensification of environmental risks.

This comparison of two crises, that of social protection and that of scientific authority, was fundamental. The concomitant erosion of society as seen by classical sociology and the erosion of the technoscientific certainties on which it was based must be taken seriously: it is a question in both cases of describing the blows inflicted on the integrity



of the central political subject of modernity. What is at stake here is the conception of society as an organism that is perfected and protected only if it can exteriorize nature, delegate to science the regulation of relationships with the world, and find in material abundance the energy necessary to maintain its autonomy and give itself a future. Once the technosciences can no longer by themselves ensure this regulation (assuming that this has ever been the case) and the social compromise of redistributive growth begins to take effect, the modalities of this social achievement are endangered, and it is actually the very subject of this process that is rendered more fragile. What happens to society if the structures responsible for guaranteeing its future, i.e., scientific authority and the social state, are faulty?

Behind the accumulation of environmental risks and the studies that analyse them, we must therefore see a process of socioeconomic transformation much broader than the simple emergence of an ecological awareness. The relation to time, the division of tasks between science and politics, the forms of scientific authority, the protective apparatuses, are simultaneously put in crisis, and even if the factors of this crisis can be considered as heterogeneous, the emergence of the concept of risk as a central operator capable of organizing knowledge of these transformations must be taken seriously.

There are, however, several ways of connecting the crisis in the welfare state and the crisis of modern scientific authority. A first option is to make the extra reflexivity of late modern or postindustrial societies an unavoidable opportunity to take back the rudder of history after the convulsions of the 1970s and 1980s. Indeed, if we accept that the providential framework of the state and technoscientific promises are two sides of the same sin of pride, two twin versions of a discreet but overwhelming power, then the flexibilization of wage conditions (and the labour market), on the one hand, and the advent of negotiated rather than imposed progress, on the other, can be jointly celebrated as a new step in the long history of emancipation. As the expression 'risk society' itself suggests rather well, it is less a question of eliminating or minimizing the manufacture of risks than of accepting it as an inevitable dimension of the industrial condition, in the same way as the risks of unemployment or accident. Probably no one has been so explicit in the assumption of this argument than Anthony Giddens.<sup>25</sup>

He starts out from the general characteristics of reflexive modernity, which, according to him, rests on the abolition of nature as an entity external to society and taken over by science, and the abolition of tradition as a schema for the reproduction of existing social authorities. Wishing to give a positive meaning to the idea of risk, he associates it with an increase in the room for manoeuvre of individuals who are now freed from the shackles of a closed society, which determines limited

professional and biographical destinies, but also from the incontestable nature of the scientific authorities. Individuals in the reflective age, fully mobilized by risk-taking as a positive component of their social commitment and by their response to environmental threats, can be given greater responsibility, but also greater liberty.<sup>26</sup> In other words, they are given a new form of autonomy, which no longer consists in avoiding threats by all means, but in admitting the risk-taking inherent in a free existence. Giddens writes, in a decisive formula: 'The welfare state is linked to the basic presuppositions of modernity – to the idea that security is guaranteed by more and more effective control by human beings of their social and material environment.'<sup>27</sup> Thus, the overcoming of modernity in its first version must consist in limiting the powers vested in the institutions that inhibited conscious risk-taking. Identified with 'tradition', the welfare state is portrayed as a premodern survival, or at least as a modernity that does not fully accept its individualist commitment. And in this context, the accumulation of critiques levelled against sovereign science gives a certain consistency to this celebration of risk-taking. For risk, understood as a potential threat apprehended through a statistical rationality, can be controlled like any social reality, and even at a lower cost for public finances as for individual liberties.

The question is not so much about how to limit accidents with potentially harmful consequences as to know how to take an opportune risk. The ideal of security, both social and environmental, betrays a political and existential reluctance which reforms of the welfare state and of the great bodies of public engineering aim to get rid of. Once it has been accepted that risks are inherent in the industrial condition, social responsibility does not consist in eliminating them, but in managing them. The political consequence of this idea is huge: 'The idea of unconditional rights seems appropriate when individuals assume no responsibility for the risks they face, but this is no longer the case when risks are manufactured.' The rights in question here are of course social rights, those associated with the protection of the welfare state. Giddens thus makes a twofold conceptual move that captures a good part of the spirit of the 1990s: starting out from the same observation and the same theoretical instruments, he succeeds in politicizing the environmental question in the form of a new dimension of the art of governing (one consisting in governing risks), and in reconfiguring the welfare state, seen by a large part of the political elites as the enemy of liberties and balanced budgets.

The reconstruction of the labour question after the crises of democratic capitalism in the Thirty Glorious Years therefore took place largely at the intersection with the question of nature, or more exactly of the end of nature. Once the linear time of progress has been

desacralized, once the idea of a complete exteriorization of nature and a material confinement of society in its political-legal autonomy has been abandoned, risk regulation can appear as a way of meeting the minimum agenda of modernity (it is, all the same, a matter of being responsible for our future) without entering into an overly blatant contradiction with the material consequences and the 'human cost' of development.

In France, pragmatic sociology and the sociology of science and technology have resulted in a second option, notably in two important works: *Politics of Nature*, by Bruno Latour, and *Agir dans un monde incertain*, by Michel Callon, Pierre Lascoumes and Yannick Barthe. If we see the renegotiation of the pact between science and society as the main horizon of Latour's critique, we realize that the assertion 'science is political' never meant 'science is merely an ideological manipulation', but that the social authority entrusted in the spokespersons of nonhumans is one form of power like others. This authority is therefore not denied or denounced as illegitimate, but redefined as an organizing responsibility which can hold fast and endure only if it fully assumes this function.<sup>28</sup> The sciences, like any authority in a modern context, must respond to the examination of their legitimacy – which is not to be confused with challenging their very principle. However, the scientific authority of experts is not ready to assume this function by itself, because of the sacralization of which it was, in spite of itself, the object, and so it will gradually be constrained to do so when the publics concerned impose their tests on it – publics that include victims, local residents, lay investigators, etc.

The risk here is no longer at all presented as a factor of increase and re-enchantment of responsibility, but as an event that upsets the ordinary adequacy between science as the regulated description of a certain number of phenomena, and science as authority. Indeed, when an uncertainty arises, it is less the scientist's empirical claims that are questioned than his or her social or political claims: asbestos, radioactivity and prions, inter alia, do not suddenly become objects of ignorance when their harmfulness appears, but introduce a gap between what we know about these things and what we intend to do with them. With this link broken, or at least compromised, the confusion between the two dimensions of 'science' that had prevailed since the advent of modernity may appear as what it had been from the start: a fragile arrangement. However, the reconstruction of a true legitimacy for science and technology will not be able to take the form of a return to this modernist compromise which swept uncertainty under the carpet at the expense of its victims. Once the politicization of sciences has been triggered, one cannot backtrack and hope that science can speak again from its Olympian point of view. To persist as

an authority, the sciences must finally pass the test they had called for from the beginning, from the moment when they were announced as the instrument of collective liberation, i.e., as a constitutive dimension of the democratic project.

'Technological democracy' therefore maintains, despite appearances, a deep affinity with what we called (above) 'industrial democracy'. While the technological mediations peculiar to the industrial age had raised the serious problem of the inequality and disorganization of society, the traditional 'labour question' was reactivated at the end of the twentieth century in a new form. This time, it was uncertainty about the future that made it necessary to go beyond the classical liberal and modernist schema. While the ideal of equality and property was immediately problematized by the oligopolistic tendency of the processes of industrial production, this time it was the crisis of confidence in scientific expertise that crystallized a democratic remobilization. Technological democracy, or to use Latour's terms the 'parliament of things', is what one could call a *socialism of proof*: what needed to be socialized, in the crisis of the 1990s, was less wealth (or property) than epistemic responsibility – that is, the ability to engage in a demonstrative exchange with regard to the future. What needs to be re-socialized is the ability to say with which people we can engage in lasting relationships, and in what ways we may do so.

On the one hand, with the re-enchantment of risk in Giddens, we are witnessing the reinvention of the liberal pact in a postmodern regime. On the other, people count on the mobilization of citizens in technopolitical controversies, affairs and scandals to reconstitute a critical public space adapted to the developments of industry and its consequences. This second option has sometimes been considered naive:<sup>29</sup> the formation of 'hybrid forums' supposed to embody the delegation of scientific authority to the people assembled in new informal assemblies and once again assuming their epistemic task seems to underestimate the inevitable balance of power with industrial players. In other words: technological democracy inevitably turns into the democracy of lobbies – who assume without scruples or anxieties the political scope of the sciences.

### **The impasse: between collapse and resilience**

The question that must be asked now, before we embark on the last part of our reflection, is simple: why can the paradigm of risk and/or that of limits not be considered as satisfactory answers to the ecological crisis of modernity? Why can we not be content to combine bioeconomic warnings with postmodern reflexivity to reconstruct the

ideal of autonomy in the form of, say, *a responsible self-restraint of society*? This option is unfortunately not possible, in particular because the escalation of the climate problem in the twenty-first century raises new challenges that these two paradigms cannot face. More precisely, the repoliticization of the collectives resulting from the project of autonomy and abundance on a new base constituted by the response to the ecological crisis could not be achieved through risks and limits.

Climate change is obviously not, strictly speaking, a discovery of the 2000s. On a strictly geochemical level, the basic mechanisms that link the concentration of atmospheric CO<sub>2</sub> with the greenhouse effect have been familiar since the nineteenth century, and the first serious political alarms were sounded in the 1980s – the statements of climatologist James Hansen to the US Congress and the creation of the Intergovernmental Panel on Climate Change (IPCC) in 1988 were key landmarks in this story. After a long period of procrastination, fuelled by the constitution of a ‘climatosceptic’ front financed at great cost by the fossil fuel industry and exploiting the exacerbation of uncertainties inherent in climate modelling, the climate once again became a central subject of political and diplomatic controversy in the mid-2000s.<sup>30</sup> Two events can help us pinpoint the moments history accelerated: the publication in 2007 of the fourth report of the IPCC and, two years later, the Copenhagen Conference which was to lead to a global agreement defining the planned reduction of the emission of greenhouse gases able to contain the rise in average temperatures to 2°C above the pre-industrial era. With the Kyoto Protocol soon coming to an end – it had in any case been an obsolete commitment right from the start, due to the defection of the United States – the need for such an agreement was seen as a moment of truth in the formation of a demanding global climate policy.

The failure of these negotiations and the signing of a *trompe-l'oeil* treaty, which, since it could not be binding, enshrined an ‘incantatory governance’, gave a boost to militant approaches that hoped to make the climate the focus of geopolitical struggles and the heart of critique of the economic system. But this failure also exerted a significant pressure on the scientific community, understood in a very broad sense including the so-called natural sciences and the social sciences. The sciences of climate and biodiversity reoriented their demonstrative strategy by reformulating some of their conclusions in more striking language, intended to capture the general characteristics of the new planetary metabolism taking shape. ‘Tipping points’, ‘safe operating space’, more recently ‘hothouse earth’ and, of course, the concept, both obscure and symptomatic, of the Anthropocene<sup>31</sup> all played a central role in the emergence of an interdisciplinary science of the Earth system, one capable of assuming its role as a political whistleblower.

For their part, the social sciences and the humanities also experienced a fairly far-reaching phase of reorganization. This was linked to the properly political consideration of what geologists and, after them, the social sciences community called 'the Anthropocene', which caused the collapse of the paradigms of risk and limits in their capacity to organize the conception of the relationships between nature and modernity.

However, if we keep in mind the main empirical and normative aspects of these two theoretical and empirical regimes, there is reason to believe that the phenomenon of climate change is a boon for both. Indeed, metabolic rationality seems well prepared to welcome the biochemical and social upheaval that an increase in average temperatures on the planet would represent, if only because it is involved in its discovery, and the concept of risk is also a serious potential aid when it comes to thinking about catastrophes and the new forms of responsibility contemporary with this crisis. If this is so, it is because global climate change appears to be the perfect meeting and amalgamation of approaches in terms of limits and risks: it is a *global risk*, a risk caused by exceeding certain key biophysical thresholds, and there is apparently no reason why this encounter within things should not be repeated epistemologically. The rise in average global temperatures affects the physical and biological basis of social life as a whole, to the point that nothing can in principle be considered external to these disturbances. It is no longer a question here of pollution or contamination, those phenomena that provided the main material for thinking about risk, since it is now the global deployment of nature which functions as a pollution, in a pathological way. However, the emergence of this global risk, by blurring the empirical benchmarks of previous decades, has in reality caused a collapse of the pre-existing theoretical paradigms: their synthesis has proved to be unsuccessful and their individual extensions uncertain.

The worsening of the ecological and climatic crisis has caused what might be understood as a radicalization of the positions held by people on both sides of the polarization between risk and limits. When it comes to limits, each minute spent in a productive and demographic regime which intensifies the pressure on resources thereby increases the radical nature of the response required. Almost half a century after the first warnings, the march towards catastrophe has only accelerated, and with it the opportunities for a rationality of collapse. The success of 'collapsology' in France, and of various apocalyptic strategies there and elsewhere, must be understood in this context as a way of going beyond the phase of prevention to conceptualize and directly prepare for life in the ruins, in an environment definitively marked by precariousness and lack. Whether in the form of a reactivation of

religious millennialism or of a set of practical recipes for survival and adaptation (or even a mixture of the two), this social phenomenon which has been unleashed in recent years to some extent emphasizes the failure of the paradigm of limits to create a new bioeconomic foundation, and recycles the prophecy of the catastrophe in the form of a description of life *afterwards*.<sup>32</sup> And when it comes to risk, we can clearly see the creation of an industry of responsibility, one that both capitalizes on the worsening of uncertainties through increasingly complex insurance systems<sup>33</sup> and more or less directly propounds an ethics of resilience. The discourse of adaptation is essential as a market response to the ecological crisis, within a controversy in which the scenarios of ‘mitigation’ were appearing more and more fragile and less and less able to support the deployment of a promising economic sector.<sup>34</sup>

\* \* \*

*Collapse* and *resilience*, those two polarized versions of the reaction to the crisis, come across as a couple of concepts that reveal the dashed hopes of the political ecology of the previous generation. The Dionysian attitude of the collapsologists, celebrating collapse and destruction, sometimes with a certain zest, acts in counterpoint to the Apollonian market in insurance, which aims to channel in a peaceful and stable way the most serious events. But behind these desperate strategies, can we discern a new political and critical form of knowledge adjusted to the new climate regime? We had set off, under the inspiration of Polanyi’s interpretation of socialism, in search of an assemblage between political theory and ecological knowledge which would guarantee the re-founding of a critical political subject on the basis of a response to the new affordances of the land. We would like to know what will, today and tomorrow, play the role that ‘society’ has been able to play when it comes to responding to the aggressions of the market and industry. Now, it must be recognized that an answer does not emerge from either side: if the world has radically changed under the effect of the cornucopian dream, and if the aspiration to autonomy has been torn away from its material base, the more or less abstract invocation of responsibility and the new cults of the end of the world only translate the abandonment of such an intellectual and political programme. The assumption of global risk, whether depressive or triumphalist, largely fails to address the problem of restoring the democratic promise in the age of climate change.

To some degree, it consecrates the foreseeable decomposition of the social sphere as a central historical subject, but by allowing two well-known (and very melancholy) figures of the human collective to ebb away: on the one hand, naturalism, and even the Darwinism revitalized



by the prophets of apocalypse, a Darwinism that depicts a population struggling with its survival; on the other, the mechanisms of individual responsibility integrated into a market which, far from being contained, extends its hold on new spheres. Population and individual, i.e., the coordinates of classical political economy, are plunged into adventures of a new kind without their substance being truly questioned. However, if the end of society as a conceptual and political landmark is in some way dictated by the need to take into account nonhuman beings, their future and the mediations that associate us with them in a political reflection, the whole problem lies in knowing how to do away with that end, and with the confiscation of emancipation by growth, without doing away with the demand for self-protection.

# *The End of Modern Exception and Political Ecology*

## **Symmetrizations**

We will soon have arrived at the end of our journey. The broad movements of a shifting of intellectual tectonic plates lead us, if we go back in time, from the environmental warnings of the 1970s to the appropriation of democracy by growth during the Thirty Glorious Years; from the explosion of market societies between 1914 and 1945 to the constitution of an ideal for regulating industrial civilization; from technocratic hopes to the first shock waves of machinery and global trade; and from colonial asymmetries to the old affordances of the land, which have bequeathed to us the poisoned legacy of sovereignty and property. If we have learned anything about the centrality of the land, about resources and the way they are understood in the political thought of modern societies, we must recognize that we have also accumulated reasons for dissatisfaction, which are all future aspirations for any substantial political ecology.

However deeply rooted may be the couple formed by autonomy and affluence, it is nonetheless a contingent and precarious historical arrangement. It is embedded in modes of subsistence, in the spatial distribution of people and technological infrastructures, in forms of scientific and political reflexivity that have undergone major transformations over time. Indeed, the idea of a people of producers who find their autonomy in an exteriorization of nature which consecrates that people as a historical actor without equal compared to nonhumans and civilizations still stuck in premodernity has gradually ceased to form the indisputable foundation of the collective consciousness. It has also ceased to provide an epistemological consensus on the basis of which adequate and emancipatory knowledge can be formulated. Thus the productive relation to nature, a civilizing teleology and its key conceptual actor, namely society – all those elements that long embodied a vision for the future – were, at the end of the twentieth

century, changed by a huge process in which modernity was put to the test, especially by its colonial 'peripheries'.<sup>1</sup>

This critique of modernity has sometimes been presented as an attempt to liquidate a deeply rooted emancipatory heritage – the Enlightenment. However, it is much more classic in its reflection on the historicity and the contextual nature of expectations of justice. Indeed, the expectations of justice that have characterized the historic trajectory of the moderns since the eighteenth century are linked to the wager that there would be a mutual reinforcement of democratization and enrichment, in which political and economic heteronomies were exorcised at one and the same time. But the world constructed by this singular conjunction of ideals, in all its most concrete aspects, ended, after two centuries of development, by the constitution of an environment turned upside down, in which new aspirations were formed. The consequences of the capitalist regime of accumulation for the state of the land, the territorial distribution of economic and ecological functions, the partial unification of moral aspirations resulting from the global mobility of men and women, the new forms of collective consciousness and of politicization linked to decolonization – all these phenomena constituted a new material and historical scene on which fresh demands appeared, sometimes turned against those of the past. This historicity of the expectations of justice thus explains why claims of a different kind no longer coincide exactly with the Eurocentric liberal pact – if only because they often stem from a social experience that has developed *elsewhere*, or in a relationship to the land that no longer corresponds with the modern project.

The recent history of the social sciences is a good observation site when it comes to measuring this transformation of the horizon of moral and political expectations in the twentieth century, with its new ecological demands. The increasingly common challenges to the modern conceptual universe, and to the world that housed and made possible this conceptual universe, have ended up changing the meaning we may give to the search for autonomy. At the same time as challenging the narrative of modernization and re-evaluating the forgotten aspects of this history, a new concept of emancipation, of self-protection of the collective, was developed – one entirely freed from the political lexicon stemming from the liberal pact. This reinvention of autonomy brings into play the patterns of production and territorial sovereignty.

I propose here to use the term 'symmetrization' for the intellectual movement that accompanies these transformations. Symmetrizing, for the social sciences, means overturning the gravitational system of knowledge: while man, the West, and its society formed – until the mid-twentieth century – the fixed and organizing poles around which woman, the colonized world and nature respectively orbited, a

colossal collective effort was made to rebalance these asymmetries and to restore to the latter their role as full-fledged historical actors. The family, history and the technosciences then constituted the invisible threads that ensured the symbolic and material subordination of the satellites to the centres of gravity, whose logic now needs to be laid bare and unravelled. These three fronts of symmetrization naturally register the moral and social developments expressed in feminist, postcolonial and ecological struggles, which constitute the main spaces in which the movements for emancipation continue. In other words, the questioning of patriarchy, colonial empires and industrialist certainties has fuelled a profound reconfiguration of political knowledge, and we can make the principle of symmetry the main operator of this movement. Indeed, what needs to be put into perspective each time is the universal character of the conceptual benchmark supposed to organize knowledge and to show that the realities formerly placed under its control and its authority have a certain epistemic autonomy – or at least one that they can claim and win.

Within this very broad movement, an operation of a somewhat more limited scope can be performed, one devoted to the critical examination of the *twofold exception* by which this modernity has long been defined, and covering the symmetrization of the natural and the social domains on one side, and the modern and the nonmodern on the other.<sup>2</sup> Under the influence of subaltern studies, followed by postcolonial studies, as well as the anthropology of science and technology, critical geography, the ethnology of societies without nature, and environmental history, I aim to show that the moderns have carved out a special place in history by projecting outside of themselves two spheres which they thereby aim to govern and control more effectively: what they call ‘nature’, the set of objects and reified processes subject to appropriation and transformation, but also the ‘nonmoderns’, those parts of the world populated by women and men who lacked the capacity to govern themselves. However, as Timothy Mitchell rightly notes, this exteriorization is constitutive of the civilizational bloc known as modernity:

To view modernity less as a product of the West than of its interactions with the non-Western leaves us with a problem. We suppose in fact the existence of a split between the West and the rest of the world which would have preceded the sharing of global identities according to this Eurocentric dualism. It is therefore better to suggest that it was in the construction of colonial plantations in Martinique, in the Crimean prisons and in the schools of Calcutta that the decisive distinction between Europeans and non-Europeans was established.<sup>3</sup>

The consolidation of this position with regard to cultural otherness and nature, the importance of which we glimpsed in the axial period of modernity at the turn of the eighteenth and nineteenth centuries, forms one of the conditions of possibility of the project of autonomy. Indeed, we had to make an exception of ourselves on an ontological level, among the things of the world, by establishing ourselves as reflective things and, on a historical level, among the peoples of the world, by establishing ourselves as an autonomous people. Conversely, what characterized nonmodern peoples was that they did not have at their disposal the epistemological, legal and technological arrangements ensuring the exteriorization of what we call nature, which prevented them from demanding for themselves the radical emancipation that characterizes us modern people. The key to this twofold exception is nothing other than the matching of freedom and affluence: the assemblage of colonial lands as resources<sup>4</sup> provided decisive material support for a liberty conceived in the form of a distancing from, or even an elimination of, the brakes and contingencies that weigh down on the ideal of autonomy, but also acted as the exorcism of our own premodernity.

Putting an end to the twofold exception therefore supposes two joint movements: showing how the autonomy of some people has been linked to the heteronomy of others, how, in particular in the history of empires and colonies, Western emancipation has taken a decisively confiscatory form (or how the confiscation of the history of others was based on the idea of autonomy); and how the ecological burden of modern improvement was passed over in silence at the same time as the epistemological apparatus was being constructed, allowing us to convince ourselves of the silent objectivity of environments and territories. By using this notion of exception to describe the theoretical basis of modernity, we also want to break with the idea that the Western mode of development is the norm of history: the reference to which every other social trajectory is to be compared, and its greater or lesser degree of realization. We know today that this mode of development is by no means a norm because, on the one hand, several civilizational blocs exercised a power of political polarization before Europe,<sup>5</sup> and perhaps afterwards, and on the other hand, even during the period of the ecological and political hegemony of the modernist and industrial paradigm, this schema seems to be a quirk, an anomaly. In fact, there is nothing about the way of constructing the world that has prevailed since the industrial revolution which destines it to play forever the role of sociohistorical norm.

In other words, behind the alleged critique of universalism, behind the crisis in the notion of progress and more broadly the great emancipatory teleological accounts that emerged from the Enlightenment,

behind the erosion of confidence aroused by the technoscientific authorities, there is a deeper movement, namely the joint rebalancing of Western political reflexivity on the axis of the natural and the social domains and on the axis of the modern and the nonmodern (or North and South). Although they have given rise, as we will see, to very different, and sometimes divergent, theoretical and empirical elaborations, these two axes intersect exactly where we defined our initial problem: in the stake constituted by the political takeover of subsistence, territoriality and self-knowledge.

Modern asymmetry is not identified with simple misunderstanding, with simple disinterest or a contempt of the victors for the vanquished, from the centre to its periphery. Quite the contrary. To build this dominant position, it was necessary to investigate closely the world, the things it contains and the way other people live in it. As the history of science has shown, the construction of the modern exception was not achieved solely under threat of the cannon, but also through very subtle instruments of knowledge. The colonial empires engaged in botany and zoology, they invented comparative law and philology, they studied the religions of the peoples they aimed to dominate and their normative systems, less to discredit them en bloc and brutally replace them with new patterns than to find a way of making their presence unnoticed, tolerable and well-founded.<sup>6</sup> Knowing the other, but also knowing nature, were tirelessly repeated tasks to achieve a twofold victory: not only were large parts of the world and their inhabitants exploited and dominated, but all this simultaneously gave the moderns an increased symbolic prestige, of which the libraries and the museums of the European metropolises are still today clear evidence, since they owe much of their glory to collections 'taken' from the ex-peripheries. The twofold exception is therefore not only a matter of power relations – even if this dimension should of course not be overlooked – but also a relationship of authority, with all that this notion implies. The moderns claimed to know the nonmoderns, or the colonized peoples, better than they knew themselves, because they had convinced themselves of their monopoly on scientific authority by exploring, mapping and measuring out their world, counting the plant and animal varieties it contained, and ultimately trading in this diversity.

No knowledge embodies this permanent ambiguity of the modern twofold exception better than anthropology. The comparative analysis of societies, their laws, their rites, their relationship to the world, was – as we know – born at the heart of the colonial system, especially in the Victorian era.<sup>7</sup> As the daughter of imperial modernism, anthropology consecrates the centrifugal force of knowledge: by setting up a science of 'primitive' ways of life, it simultaneously moves a step forward in reflexivity, taking its place in the classic humanist heritage, and one

step further in the asymmetry between subject-societies and object-societies.<sup>8</sup> The ethnographic relationship remained non-reversible until a late date, so the permanent equivocation between scientific authority and political authority was reinforced.<sup>9</sup> Anthropology took written form as pure and simple military intelligence, as espionage, as a vector of national or racial religion, or as an art of comparison making it possible to administer the colonies on the basis of a correct knowledge of the laws in force among the other peoples. Yet it is also within anthropology that, gradually, the most serious doubts about the universal mission of the West were expressed and served as an epistemological and moral foundation for the first forms of symmetrization.

It is therefore often from within the colonial anthropological corpus, including in its most ethnocentric evolutionary and later diffusionist forms, that symmetrical subversion was born and gained in strength. Durkheim, then Mauss, for example, could, at the same time, consolidate the epistemic authority of modernity over the primitives via their sociological interpretation and see early religions as revelatory of human sociality – thus decentring the project of autonomy. In doing so, they were already testifying to the fact that cultural otherness contains a totally destabilizing element – namely, indifference to ‘nature’ as we understand it.<sup>10</sup> What was then called totemism, the bonds of identification between human groups and animal or plant species, kept open a question that later expressed itself as a suspension of the distinction between nature and society that had previously been deemed to be universal. As we can see, the twofold questioning of the modern/nonmodern and natural/social axis has a long history. Following the Durkheim school, it was Lévi-Strauss who raised this anthropological disquiet in a new way. By locating the heart of social mechanisms in the search for difference, in the desire manifested by a group or an individual to produce a logical distinction from those around him and their ways of thinking, Lévi-Strauss provides us with an extremely powerful instrument of symmetrization, able to dissociate universalism and modernity.<sup>11</sup> And at the same time, he clearly identified a form of cultural differentiation that tended to annihilate all the others, namely the difference that the moderns make when they explore and exploit the rest of the world. The damage caused by developmental pathologies therefore affects cultural dynamics at its most vulnerable point for Lévi-Strauss, since one difference manages to compromise all the others.

The desire to symmetrize was therefore born from a constant reworking of modern asymmetry, sometimes by its most central actors. And if we turn our gaze to the other side of the split created by modernity, this idea is confirmed. Among the main actors of the Indian independence movement, for example, we find a fair number



of elites who were first promoted by the British colonial empire (for example, Gandhi and Tagore) and educated in Europe, and who then appropriated nationalist and universalist rhetoric and turned it against their colonial tutelage. The same was already true of antislavery and anticolonial voices in the French Antilles, which, as Silyane Larcher has shown, subversively appropriated republican principles and successfully turned them against their masters – while redefining and decentring those same principles.<sup>12</sup> The geographic and cultural to and fro movement of emancipatory ideals thus blurs the image of their diffusion from a Western centre, so that the history of the last centuries can then be written from a symmetrical point of view. In other words, if the political reflexivity of the so-called ‘peripheral’ peoples has always been connected to modernity, this reflexivity ended up becoming a fundamental component of the social sciences only a few decades ago.

What is at stake in the questioning of the twofold exception is the fate of critical thinking after the collapse of its two pillars: on the one hand, the ideal of autonomy understood as the historic privilege of one people over others, and, on the other, the ideal of affluence as the material privilege of a people no longer responsible for observing ecological constraints. The problem, therefore, is not to narcissistically contemplate the ruins of a fallen grandeur, but to build the conditions for a collective autonomy that can no longer be captured by the Eurocentric liberal pact.

### **Authority and composition**

The environmental question has been impacting on social reflexivity for half a century or so. Not by accumulating alarming data on the state of the planet, by widening the spectrum of valuable things or by putting into perspective the place of humans in nature, but by placing on the epistemo-political agenda of critique an interrogation of the way scientific, technological and geographical authority has been constructed, of the great movement of exteriorization of the natural and the nonmodern which defines modern naturalism. This movement is diffuse and disorganized, but it is necessary to identify it clearly because it conditions what Bruno Latour recently called ‘landing’ on the ground of a new kind of politics.<sup>13</sup>

To find our bearings in this theoretical galaxy, let us immediately identify two essential components of the operation at stake. When this operation is successful, it plays out both on the level that we have already called *authority* and on the level of what we will now call *composition*. Symmetrizing means at the same time dismantling the

procedures by which a subject constitutes his authority over objects, his position of exception towards them, and initiating new arrangements, new possible compositions between humans and nonhumans on the basis of the abolition of the old intellectual regime where a subject exercised an incontestable authority over his vassalized objects (nature, nonmoderns).

Let us start by going back to the area in which the desire for the symmetrization of scientific authority was formed, namely the sociology of science. Since the late 1970s, and without this movement having been explicitly linked to postcolonial issues or the crisis of modern universalism, a group of researchers has attacked the autonomy that the scientific sphere claimed to enjoy in our societies – not, contrary to what has sometimes been said, to make room for a relativist discourse where everything is just a point of view, but to give scientific authority a foundation external to the deductive regime of science itself. In other words, it was a question of displacing the scientificity of science within the social world and of explaining by what methods of verification science must pass in order to state facts that are likely to last, to be recognized as valid, representative of states of things and, as such, authoritative. The sociology of science, following the ‘strong programme’ of David Bloor and the fieldwork carried out by Bruno Latour and Steve Woolgar in an endocrinology laboratory,<sup>14</sup> thus proposes to explore the singularity of scientific discourse not as a symbolic drama by which a truth wrenches itself away from the world of approximations and appearances by the very virtue of its conformity to reality, but as a particular way of organizing observations, notations, measurements and controversies, which results in stable beliefs. The sociology of science therefore does not attack the authority of scientific institutions, but a schema of self-legitimation that is based entirely on the metaphysical value of truth. Scientific authority is one form among others of social authority, one way among others of revealing lasting realities capable of aggregating practices and forms of association around themselves.

The promoters of this new kind of investigation, no doubt naive about the future reception of their work, did not at the time think it necessary to specify that by downgrading the metaphysical understanding of science as a power to reveal the true in itself, they were giving way to a genuinely democratic conception of it. Not because science should be subject to the opinion of lay people, but because it is not fundamentally different from the means by which a collective comes to an agreement so as to last as a collective. If classical epistemology thought it could honour the greatness of science by claiming that when things are true, they take hold, the reversal of this claim (when things take hold, they begin to be true)<sup>15</sup> makes the procedure

prevail over its result and opens to scientists the doors of the city – that space where the coordination between the true and the ends of action is played out. From this point of view, the sociology of science merely anticipated by a few years, or a few decades, a situation in which it has become manifest that the sciences can no longer be authoritative by themselves, by asserting their alleged monopoly on the truth about the world. We will come back to this, but the climate issue has proved *a posteriori* that the political dimension of the sciences is not something added to them from the outside and afterwards, when it comes to arguing in the public arena about this or that measure to be taken to avoid catastrophe, but that it is inherent in their approach, that it is inseparable from the way they present themselves as the legitimate representatives of the processes taking place in the atmosphere.

Once the sovereign position of the scientist as the spokesperson for nature was threatened, the mode of composition of relationships between humans and nonhumans predominant in the modern age also needed to be examined. From this point of view, *We Have Never Been Modern* constitutes the retrospective framework in which the critique of scientific authority and the redefinition of the modernist project must fit together – each one now involves the other.

The critique of the modern composition of the relationships between humans and nonhumans through scientific authority has been the subject of significant misunderstandings, because it short-circuited the old debate that polarized, on the one hand, epistemologists intent on ridding science of the residual imaginary or ideological elements within it, and, on the other, philosophers who claimed – and more or less accepted – that reason is one ideology among others. But the greatest risk faced by the sociology of science was actually less one of depoliticizing the debate than of sticking to a merely negative operation. Indeed, if we very liberally redistribute the minimum skills that give political weight to those involved, then we can quickly come to a form of ‘liberal cosmopolitanism’<sup>16</sup> that is as generous as it is impotent. Suspending the authority of science would result in freeing up the potential for association between heterogeneous beings, for imagining a democratic space including humans, machines and living things, in chains of association without any fixed organizing principle behind them. Since we cannot deprive anyone of an agency without committing a crime of ontological purification, to use the terms of *We Have Never Been Modern*, we are unable to define the conditions under which an association is politically desirable, valid and sustainable. Nothing, basically, can replace the role previously played by the so-called modern forms of epistemo-political authority.

This liberal cosmopolitanism is therefore the flexible order that would prevail in a period freed of great narratives: liberal because it

proceeds from a principle of non-discrimination between beings and because, like the thinkers of the eighteenth century on the subject of human beings, it ascribes to them the capacity to form virtuous alliances without the help of any external supervision predefining their roles; cosmopolitan, because as Bruno Latour has said so many times, you should never *a priori* limit the size of networks of actors and chains of translation. The problem is therefore not so much that we would have proclaimed a little too quickly the erasure of the classic dividing lines that defined the concept of class, but that, in the absence of any synthetic and normative, or at least organizing, principle, the political figure that emerges is what one might call a *metaphysical laissez-faire*. What used to be called ‘social relationships’, now resized and including machines, living things and all the hybrid assemblies they can put together, is said to be capable of finding in itself the norm of its optimal organization. But, as was suggested in Chapter 6, the idea that social organization can be backed by technoscientific normativity requires further reflection on the role of its prime contractors, namely engineers, and on the conditions under which they are likely to play the role of checks and balances and to work for the common (and not for the market). Thus, the redefinition of scientific authority could, and should, have resulted in a new focus on the technocratic tradition, but this has not been the case despite some moves in this direction.<sup>17</sup>

In the name of a simplified ontology, purged of modernist divisions and hierarchies, the equality of beings finds its culmination rather in the cosy, post-ideological framework of global networks which in principle leave no one by the wayside. In other words, the type of *composition* of the world that sociological symmetrization offers is not quite up to the operation that it has inflicted on scientific *authority*. Let us remember Polanyi and his two main lessons. In showing how society invented itself by resisting the universalization of market relations, he described a complex dynamic in which the material and technological properties of industry had catalysed the emergence of a demanding critical subject, and then partly achieved a democratic rebalancing. But he also showed that, without having taken into account the territorial or terrestrial dimension of social coexistence, this critical counter-movement abandoned to the conservative, nationalist and then fascist forces the protection of these links, that were just as political as the others, and no less targeted by the market. If, from now on, the explosion of society as a historical analyser and as a critical subject does not lead to the emergence of any counter-power whose force would be at least equal to the force that fuelled socialism, then, in plain and simple terms, we lose out. If we refuse to abandon the political scene to a new confrontation (or amalgam) between conservative roots and commercial globalism, then the symmetrization of modernity

must live up to the political expectations historically associated, in Europe, with socialism.

To give some heft to this programme for politicizing symmetry, we will now have to go through three theoretical mediations, which revolve respectively around the anthropology of nature, environmental history, and subaltern and postcolonial historiography.

### **Under naturalism lies production**

The dynamiting of conceptual benchmarks in the social sciences by Latour and his colleagues has not been – far from it – the only vector for the symmetrization of modernity. At the same time, the anthropology of nature has pursued similar ends through the ethnographic method, measuring it against other modes of composition of collective relationships in the world. This approach, mainly followed by Philippe Descola, Eduardo Viveiros de Castro, and Tim Ingold, continues the denaturalization of naturalism within a comparative framework.<sup>18</sup> One of its main objectives is to bring out the naturalistic arrangement of beings and the forms of authority on which it rests as a simple variant in a more or less extensive repertoire of possibilities which, from a comparative point of view, have a value equal to that with which we are familiar. The centrality of this intellectual enterprise in the framework that we are setting up is obvious, because it tackles more frontally than any other the twofold modern exception. The cultural exception of the moderns and their desire to extract themselves from ecological interdependencies are viewed as inseparable, and their dissolution is brought about in the same theoretical move.

The affinity between the sociology of science and the anthropology of nature is reflected in constant mutual references between them. Each assumes in its own way a gradual exhaustion of the epistemological and political resources of naturalism and tries to rush into the breach constituted by the opening of new cosmopolitical possibilities, including political ecology. But a major difference separates them. We have just seen that, for the sociology of science, the political horizon takes the form of a leap into the unknown fuelled by a deflationary attitude towards the great structuring forces at work in the social universe, which sometimes gives it the appearance of a rather confusing new *laissez-faire*. The anthropology of nature, for its part, is more modestly content to describe arrangements which, while being nonmodern, are no less durable (provided they are not eliminated by their contact with modernity) and are not deprived of the capacity to organize forms of behaviour and to bring them into schemas where norms, obligations and prohibitions apply, but also antagonisms and

domination. Faced with the ruined state of naturalism, then, we are not immediately setting up any more or less desirable political alternative, but structurally analogous material and symbolic forms of organization.

Studies on animism have played an essential role from this point of view, since they have revealed the main variant capable of decentring naturalism both as a base for the expression of knowledge, but also as a sociopolitical base. The ethnology of collectives scattered across what remains of the Amazon forest and in certain regions around the Arctic has indeed refocused on this old anthropological concept to designate an ontology indifferent to the split between subject and object as it prevails among us.<sup>19</sup> Despite the multitude of variants to which it is subject, animism can be defined as a tendency to attribute the characteristics of subjectivity to a very large body of nonhuman beings, and to make the shape of bodies play a differentiating role. Thus, the animist – and we are drawing here in particular on Descola's analyses – communicates via songs, rituals and dreams, with animals, plants and spirits; and many of the relationships we as Westerners habitually view as social take the form of symbolic relationships with nonhuman partners. Kinship, for example, extends to the hunter's prey and to cultivated plants, as we find from the ethnography of the Achuar. Animism also has its own forms of authority, notably shamanism, and if it does not regulate the resolution of conflict by ownership of the land (since most animist collectives are not totally sedentary), it responds in its way to the problem of social antagonisms (through a schema of predation by war and magic).

The animist collectives thus make manifest, by contrast, the inseparable link between social relations and ecological relations that we moderns have denied for so long, and that is why they have been invested with the role of spokespersons when it comes to the critique of the twofold exception. If it is possible to form cultural groups as worthy and respectable as ours without going through a form of social reflexivity, i.e., without considering that collective autonomy is based on the exteriorization of something called 'nature', then this means two things. First, as we already knew by other means, the duality of the natural and the social domains is a contingent and altogether recent historical construction – i.e., nature is not a universal reference point, transparent to human thought. Second, there is nothing universal about the way reflexivity fixates on the concept of society to organize the self-protection of a group against its enemies. Formulated in these terms, the ontological pluralism of anthropology assumes the scope of a political subversion, as Pierre Clastres had sought to do a few decades earlier:<sup>20</sup> the fact that there are collectives without nature (as there are of societies without a state) shows that the collective

identification with nonhuman beings can be a factor of solidarity, of integration.

Eduardo Viveiros de Castro, in particular, has given the split between naturalism and perspectivism (a term he prefers to that of animism) a political depth that resonates clearly in one of the watchwords of his work *Métaphysiques cannibales* [*Cannibal Metaphysics*]: what is at stake, he says, is that nonmodern collectives can reach ontological self-determination, obtained at the end of a 'process of decolonization of thought'.<sup>21</sup> This means that the dismemberment of the system of categories underlying modernity has resulted in ascribing to perspectivist collectives an epistemic authority equal to ours, and the modernist machinery is reduced to its own contingency, to its provincial character. Not only is their point of view on us at least as valid as that which we have on them, but if they are able to offer a counter-analysis of the symbolic and material relations that govern modernity, they are *a fortiori* capable of governing themselves as autonomous political groups within a state that regards them as equals, whether it be Brazil, Ecuador or any other political entity which acts as a home for this type of community.<sup>22</sup> The ontological analysis of collectives without nature thus conceals a contribution to the problem that was believed to be typically modern of autonomy: this autonomy, no longer focused on the myth of a people legislating for itself against natural hazards, can be conceived as a more universal ambition of self-preservation. In the wake of these analyses, the cause of indigenous communities has been seen as inseparable from the struggles generally described as 'environmental', since the cultural otherness of animism manifests itself essentially as a problematic alteration in the modern mode of our relation to nature.

Viveiros de Castro's work is the main result of a radicalized symmetrization that goes beyond the structural apparatus constructed by Descola in *Beyond Nature and Culture*. However, in this work, the political potential of symmetry sometimes appears to be hampered by the form of the alternative presented to us. Modern dualism is definitively compromised by its implication in the silencing of animist voices and by its objective alliance with the idea of the West's intellectual hegemony, so the only metaphysical, moral and political option left is perspectivism – or more broadly any subversion of the modern history of nature that operates at the level of the composition of the collective, of the extension of the limits of the community of similar people. 'Perspectivism or barbarism', one might say. Constituted as a theoretical paradigm, perspectivism gradually emerged from the Amazon forests in which it developed – partly in response to the singular affordances of this environment – to enter the libraries of philosophy alongside a phenomenology of the sensitive world which sees the reciprocity of points of view as a normative basis for ecology.<sup>23</sup>



It is also the object of a process of cultural appropriation that detaches it from the symbolic relationships specific to the Amazon basin – i.e., from the interplay of differentiation and demarcation between groups which gave it its strength, its depth, its creativity. Suffice to say that under these conditions, animist (or perspectivist) subversion is doomed to unfold on an essentially speculative, even aesthetic, level, since it is presented as radical otherness that slides smoothly into the modern political configuration. Indeed, we have to admit that we do not know what a system of rights indexed to the animist composition of the collective could be; we do not know whether it would really be a guarantee of social harmony and, above all, we cannot afford to wait for the centuries it would take for a possible conversion to animism, because time is running out.

If we look again at Descola's work, however, we will find another path that could give a political meaning to the anthropology of nature. This consists in using the comparative method not to orchestrate a critique of modernity elevated to the rank of ontological conflict, but to detect within a given historical and social context the seeds of its transformation. This is what happens, for example, when Descola describes, in *Beyond Nature and Culture*, the modes of relationship that ensure the integration of humans and nonhumans within one of the four major patterns of identification that he sets out.<sup>24</sup> In particular, he draws our attention to the role that the idea of production plays in the way that modern (naturalist) societies view the partnership that links them to the outside world. The pattern of production, he writes, was objectified only very late, in political economy and its critiques, notably in Marx – and on this point our previous analyses agree with him. However, it plunges its roots very far into the symbolic economy of technological societies, and we find its trace both in theological sources, which describe a craftsman god, the creator of a world subject to him, and in the Hellenistic tradition, which highlights the autonomy of an intentional agent responsible for his product.<sup>25</sup> Production, as a way of describing a technological act, thus results from what Haudricourt called 'positive direct action'<sup>26</sup> – i.e., a form of total control over things that leads to an object-product that is ontologically secondary, reflecting practical heteronomy. The schema of production is therefore the main vector of the asymmetry between humans and the world, its practical root.

This relationship between a generative subject and its object, which has become evident to us, is by no means universal, and ethnology provides many examples of technological relationships into which greater reciprocity is introduced. Even when the asymmetry between the different actors of a technological and economic process is maintained – i.e., without having to postulate the deep level of 'animation' in an animal, a plant and every element of the cosmos – roles do not

necessarily have to be divided up according to a brutal split between activity and passivity, autonomy and blind servitude. The polarization between subject and object, in other words, can be relaxed in practice and relativized ideologically, when attention to the characteristics of matter is increased and when the latter's participation in the emergence of a new form and new function is actively recognized. So it is not absolutely necessary to universalize the condition of personhood in order to accept the singular power of action possessed by nonhumans, whether living or not: the ontological closure constituted by the notion of 'thing', traditionally opposed to that of 'person', can perfectly well end in a framework where humans assume a singular responsibility towards their world. This is basically what happens when, under the influence of ecological economics, processes such as the filtering of water by the soil, the maintenance of the chemical equilibrium of the atmosphere by the forests, or, on another scale, the pollination of plants by bees, are recognized as ecological services – i.e., as non-produced conditions of human subsistence.<sup>27</sup> The development of an economic science that recognizes and enhances the anti-productive dimension of many ecological regulatory mechanisms follows the path indicated by Descola, because it puts an end to the incommensurability formerly established between interdependencies and the regulations which hold together the elements of the land, and the interdependencies and regulations that hold members of societies together. Understood in this way, the anthropology of nature denaturalizes the obviousness of the productive, or productionist, schema that has hitherto dominated the self-understanding of modernity.

Following in the path of some of Baptiste Morizot's work, we can go even further and see the schema of production as the distant source of a metaphysical confusion that reigns in our relationship to the world.<sup>28</sup> Indeed, the development of know-how that Ancient Greek expresses in the concept of *poiesis* tends to grant to the craftsman, insofar as he imposes his form on an initially inert matter, an almost exclusive responsibility in the genesis of objects. This figure of the creator exercising absolute sovereignty over passive things is still at work in the idea that the emancipation of humans relies on their ability to liberate themselves from natural dependencies. It has also functioned as the point of honour of 'civilized' as against 'primitive' people, and in particular against societies of hunter-gatherers where subsistence is only marginally due to the direct and planned transformation of matter and where a schema of predation prevails.<sup>29</sup> Producing is an act which, in our eyes, glorifies its operator, but at the cost of overemphasizing the producer's responsibility for the genesis of goods, and in particular subsistence goods. Indeed, if the techniques of pottery, and *a fortiori* of the mechanical arts typical of the industrial age, clearly

exemplify a relation in which matter is entirely reconfigured, even transfigured, by human know-how, the same is not true of agriculture. Because if, as we saw in Chapter 2, the modern farmer takes pride in improving the land and thereby making it profitable, this comes at the cost of underestimating very deep and ancient ecological interdependencies, eco-evolutionary strata sedimented in its practices and in its organic functioning, which led to the stabilization of a certain diet and, more generally, of an agrarian way of life. The contribution of nonhuman agents, i.e., of soils, plants and animals, to the genesis of a grain harvest is such that the lexicon of production now appears to be completely out of step with the nature of qualified processes. The productive schema therefore covers ecological partnerships that are very different from each other, and if we deconstruct the central value of this schema in the economy of modern thought it becomes possible to do justice to what, again with Morizot, we can call complex ‘alliances’ with the land and living beings.<sup>30</sup>

Anthropological knowledge makes it possible to identify what, within cosmological patterns that are very deeply rooted in our attitudes and our institutions, is already wavering, and opening naturalism up to some of its still dormant virtualities. Such is the case with this productionist mode of relationship, with its distant technological and theological sources, which seems to be losing some of its hegemony over our economic and political imaginary. What is emerging in the wake of the denaturalization of the productive partnership, more radically than the anti-productivism prevalent among most thinkers of alternatives to growth, is what one might call *anti-productionism*. The problem is not so much in the questioning of productivism, i.e., the way in which what is borrowed from nature is increasingly not returned to it by the modern economy, but in the very idea that the productive schema is a good description of what is going on between the nonhuman environment and us. Moving beyond this mode of relationship must, in other words, pave the way for the critique of productivism, without which we expose ourselves to an incomplete theoretical manoeuvre, one that simply requires the maintenance of the same relationship, only in slow motion. If we move beyond it, we may be able to reorient our political reflexivity – including socialist reflexivity, which, as we have seen, depended to a large degree on the concept of ‘production’ and a ‘people of producers’.

### **Unequal ecological exchange**

Anthropology is obviously central to the questioning of our relationships with others and with things. But it is not the only type of

knowledge involved in this great process of symmetrization. Alongside it, certain branches of environmental history, closest to the critique of political economy, allow us to consider the questions that have just been tackled from a different angle.

As we saw in Chapter 3, it is possible to describe the extension of commercial networks to a global scale not only as the projection of power, technology and human beings from a Western pole, but also and above all as the capture of spaces, labour forces, and mineral and biological resources, all decisive elements in the formation of the so-called centrality of Europe. As has been clearly described in the global history of capitalism, in Wallerstein in particular,<sup>31</sup> the deployment of the world system that made all human lives interdependent needed to be supplemented by studies which showed both the geographical structure of developmental inequalities induced by the imperial and colonial economy – i.e., the organic character of the development of some and the ‘underdevelopment’ of others<sup>32</sup> – and the material dimension of these inequalities, their embedding in the construction of a system that systematically erases the costs and ecological consequences of its trend to extraction. Environmental history is therefore not only the history of risks, of technoscientific instruments and their failures, or the history of emerging ecological sensitivities, but also a reflection on the specific methods of exploitation when it takes the form of the global division of labour and the organization of material flows from the essentially extractive regions to essentially consuming regions, a process in which technological superiority acts as an operator of differentiation. Basically, ever since the biological and political contact made between different continents, in what the historian Alfred Crosby has called the ‘Columbian exchange’, the organization of the balance of power and law between the different regions of the globe has been inseparable from the fate of the living, the territories and the resources that were now connected.<sup>33</sup>

The theory of ‘unequal ecological exchange’ appeared in this context, in the work of several authors concerned with integrating the apparently heterogeneous contributions of postcolonial symmetrization into the economy of subsistence, i.e., for much of the bioeconomics discussed in the previous chapter. The main contribution to this theory comes from the economist and historian of science Joan Martinez-Alier, who, in *The Environmentalism of the Poor*, proposes a very deep connection between the form of the flows of matter that structures the global economy and the emergence of critical social movements in regions oriented towards the extractive economy, whether mining or agrarian.<sup>34</sup> His argument is based on studies in ecological economics, that particular heirress of the bioeconomics of the 1970s which hopes to free itself from ordinary economic metrics based on market prices so

as to subordinate the analysis of wealth to a concept of value defined with reference to functional ecology.<sup>35</sup> Thus, we gain a completely different overview of a given national economy if we no longer refer to its trade balance (which takes into account only the relationships between different exchange values), but to its ecological balance.<sup>36</sup> In some cases, typically Latin America and South Asia, the adoption of an ecological benchmark highlights the uneven nature of trade, which does not appear in a standard balance sheet. This approach is a continuation of the studies on the historical formation of the global economy which placed the plantation economy at the centre of this process: the establishment of a sugar economy is indeed the historically paradigmatic case of this disjunction between market logic and the logic of material dependencies.<sup>37</sup>

The extractive economic profile of the different regions of the global South, for example, places their stocks of resources, their workers, but also the regenerative capacities of their territories (cycles of water, soil and air), under a very significant pressure, though this is not given any official economic expression. This is an essential characteristic common to all extractive activities: they are geared towards obtaining raw goods, the exchange value of which is deliberately maintained at very low prices, which does not reflect their true ecological cost. Insofar as the mining and agricultural industries, in particular, are not obliged to compensate for the consequences of the erosion of stocks, the transformation of environments and pollution – all of which are the conditions of their profitability – a huge gap appears between the measurement recorded by the trade balance and the measurement recorded by the ecological economy. The incommensurable nature of these two metrics is interpreted by Martinez-Alier as an effect of the strategic use by economic authorities of mechanisms designed to limit the cost of industrial investments, often of Western origin, and thus to maintain the differential between the North and the South. In other words, the theory of unequal ecological exchange does not conceive of ecological economy as providing an absolute truth about wealth (as was the case with Georgescu-Roegen and even more so with Odum), but as an instrument capable of bringing out the partiality of the price system. The incommensurability between the two metrics makes it possible to understand that economic rationality itself is at stake in the quest for symmetrization. It is in this sense that the symmetrization here at work respects our twofold criterion: it attacks both a form of scientific authority and a mode of composition of the world.

The philosophical significance of this theory is clear if one pays attention to the notion of raw material. An ore, fossil fuel or not, and a crude agricultural product (soybean meal, unrefined palm oil), are obtained by a process that to some degree embodies the exact opposite

of the modern economic and technological ideal. In this process, labour is low-skilled and unspecialized (so there is little real division of labour), technological innovation is minor and rarely crucial – and that is why, ultimately, these goods are deemed to represent low added value. As Jason Moore and Raj Patel have astutely shown, the economic unworthiness of the raw material stems from the processes by which it is deemed to be ‘cheap’ – i.e., not very representative of human technological capacities and, at the same time, obtained inexpensively; the low levels of capital and innovation behind these goods plunges them into the depths of our economic imaginary.<sup>38</sup> Labour, which can be considered as a cheap factor of production, is a special case, but it goes without saying that underinvestment in the fields of health, education and pensions is the social equivalent of nonpayment of externalities, or damaged ecological services. In other words, singling out certain goods as ‘raw materials’ expresses the paradox of an ecological dependence that is recognized but immediately denied.

On the other hand, we also know that these raw materials can be obtained only after a largely invisible process consisting, to use the words of anthropologist Tania Murray Li, in ‘assembling the land into a resource’.<sup>39</sup> The legal and economic systems that allow access to land in sufficient quantity to develop an industrial extractive activity geared towards export are directly linked to the structures of classical sovereignty, without which land is merely soil without any legal or economic qualities. It is the state that must be the prime contractor for these productive enterprises, or else must decide to delegate them to private interests; it is the association between territoriality and sovereignty that is set in motion when it comes to improving land previously considered underexploited, in what is now called a ‘land grab’, or ‘land rush’ – that great movement to capture profitable land.<sup>40</sup> The relationship with land as a resource is thus the end point of a process of social construction which mobilizes knowledge and institutions which range from geographic exploration to the most subtle bureaucracy: to obtain palm oil – in the example discussed by Murray Li – takes a whole world of knowledge and institutional tools, going back to the most massive of them all, the state. Raw materials are therefore located in an intermediate space that is both intensely political and also relegated to the margins of orthodox economic reflexivity.

Behind these paradoxes of raw material, we find the problem of the metaphysics of production, which has already been discussed, and which the anthropology of nature had already proposed to dislodge from its throne. The subsistence economy of Martinez-Alier and his colleagues allows us to flesh out our reflections on the modern productive schema by constructing instruments that account for the economic relationship without creating a gap between producer and

product. Since economic activities are conceived as a subsystem of metabolic relationships that first and foremost involve ecological, biotic and abiotic actors, the productive operation is re-envisioned on an ontological level. The exceptional nature of the human agent who appropriated causality and, with it, control over things, is seen as secondary, put into perspective, since that subject is now immersed in the complex relationships of co-dependencies. Pollination, carbon sinks, water filtration, soil constitution, etc.: the very long list of ecological functions that form the conditions for the possibility of subsistence allows us to shift our gaze to the institutional arrangements that currently ensure the cheapness of raw materials. It is because we have separated and glorified, under the name of production, a small proportion of the operations that play a part in the genesis of a commodity (in particular the fact of giving a form to a material) that we have forgotten how to see these functions and our dependence on them. We can therefore better understand the difference between productivism and productionism: the question does not arise only at the level of the speed and intensity of so-called productive processes, processes that should be curbed, but at the level of the mode of relation (in Descola's term) which we construct when we assert that we are producing. If we are to understand economic curbs, the simplest solution is therefore to admit that *we have never produced anything*. In the nineteenth century, the productive system proved, through the socialists, that it contained a subversive power, a protective power of mobilization. But in a context where the general conditions of life and subsistence are affected by a global threat such as climate change, which is nothing other than the harmful historical fallout of the myth of production, we need to push critical thinking beyond an additional threshold, and worry more seriously about productive rationality.

\* \* \*

The theory of unequal ecological exchange is very powerful when it comes to illuminating the grey areas of this dominant rationality. It is the main conceptual instrument so far developed that can bolster the idea of an economy that is political because it is ecological, and not, as was the case at the time of the alarms of the 1970s, an economy that depoliticizes itself by integrating ecology. In terms of political philosophy, this theoretical power can also be understood as a solution to the problem raised by Fichte at the turn of the nineteenth century in the context of his defence and illustration of protectionist socialism: the problem of the ubiquity of the moderns. Let us first recall its main features. One of the most striking characteristics of modern societies is that they exist in two totally heterogeneous territories. One is officially recognized and promoted as the space for the political and



legal emancipation of the individual, and kept within boundaries that limit the extension of a given national jurisdiction. The other has only an unofficial existence, since it consists of the geo-ecological space necessary for the material maintenance of subsistence; this space is much larger than the first and is generally accessed by extra-legal means (nebulous commercial contracts, colonization). Only a society caught in this territorial divergence, in this dream of ubiquity where freedom and affluence come to collapse into one another before they can even really unfold, is properly modern.

However, thanks to symmetrization, we have a tool capable of redrawing the map on which we actually live. If we take seriously the form of global supply chains, the tendency not to pay for the ecological services and environmental maintenance costs that allow certain regions to maintain their mode of development, then there is no other way out than to reverse the relationship established in the eighteenth century between political territory and ecological territory. Very simply: the geo-ecological dimension of dependencies between the regions of the world and their political projects must become the cardinal reference point of political philosophy, and it is on this new base map that interstate strategies are projected afterwards. The discontinuous and official order of sovereignty, itself a legacy of decolonization, is subordinated to the continuous and unofficial (but not for much longer) order of ecological partnerships between humans, machines, institutions, and environments.

This new base map is obviously very difficult to depict unambiguously, as it does not have the two-dimensional look of the classic political world map, with its interplay of lines and colours. But as long as one makes the necessary effort of imagination, it constitutes the space in which we need to be situated to understand that the ecological order and the political order are absolutely coextensive – and that they always have been. What is sometimes called environmental justice is nothing other than the response to the territorial projection of aspirations for material improvement that has driven modern history.

### **Provincializing critique**

The last point that requires clarification concerns the status of critique. We have studied at length how, in the nineteenth century, the industrial organization of the economy had resulted in the formation of a critical subject called ‘society’ – a collective subject, which won the ability to demand a deeper degree of democracy through the bias of social rights, which was scientifically shaped under the name of ‘sociology’, and which sought its standard in technological reflexivity,

but was also, ultimately, overwhelmed by the power of the markets and its complicity with modern self-destructive impulses. If we follow Polanyi on this ground, there can be a critical society only in the industrialist and commercial framework that gives rise to this reflexive counter-movement, as the very idea of society is coextensive with this historical conjuncture. However, the symmetrization that we are pursuing teaches us that the dissolution of 'society' (and therefore of 'nature') is not necessarily accompanied by a dissolution of critique: it displaces it, by depriving it of its usual base, but it does not necessarily dry up its political energy.

On a theoretical level, the question that arises is once again the universality of the historical experience of the West, except that the target of symmetrization is no longer the self-legitimation of the moderns as the centre of gravity of history, but the internal critique of the forms of power that accompany it. Can social reflexivity, whose paradigm for us is organized workers' resistance and its sedimentation in law, take other forms? In other words, can we provincialize critique as a form of intellectual authority? It turns out that this question has been the subject of many analyses by postcolonial thinkers, and is actually one of their main concerns. The group of Indian historians linked to Ranajit Guha and subaltern studies very soon took up this problem to establish the principles of an Indian historiography emancipated from the narrative produced by the British Empire itself, but also from that produced by the elites of the local 'nationalist bourgeoisie'.<sup>41</sup> 'History from below', as promoted by this new approach to the past inspired by Gramsci and E. P. Thompson, sees the popular masses of the peasants as its privileged object and tries to reconstruct the type of political practices which drove them, in particular during the great insurrections that sprang up here and there during the colonial period. These practices were in fact reducible neither to spontaneous and prepolitical movements, emanating from an amorphous crowd, nor to the political grammar stemming from the modes of organization proper to Western nation-states and industrialist schemas. A good description of these processes therefore required delving into the very original social ties which then conditioned these challenges.

Guha has studied at length the networks of traditional, religious, family and ethnic loyalties that structured peasant insurrections, the processes linked to the manipulation of rumour, threat and violence, but also of passive resistance – i.e., the repertoire of illegal activities that was deployed in the absence of a specifically European public space of protest.<sup>42</sup> Resistance to imperial taxation and to the land system established under British tutelage thus gave rise to the invention of a entirely political style, albeit one that cannot be grasped by the categories of European historiography, and ultimately those of

modern political consciousness – especially the category of class. As Dipesh Chakrabarty, himself a pupil of Guha, sums it up: ‘the peasant-as-citizen did not partake of the ontological assumptions that the social sciences take for granted.’<sup>43</sup> Here, then, is a new instance of modern scientific authority which has fallen under the blows of symmetrization: the link between sociological and critical reflexivity, a link that was formed with the emergence of the workers’ movement and the birth of sociology, is threatened by the existence, elsewhere in the world, of a language of protest that does not come within the framework of values and norms constituted in Western experience. The philosophical consequence of this discrepancy is absolutely crucial: the project of autonomy exists outside modernity and its political imaginary and, as we have already seen with Viveiros de Castro (who from this point of view applied subaltern methodology to Amazonian collectives), it is able to equip itself with the right critical instruments (even if these are not completely effective).

But the interest of subaltern studies does not stop there, since Guha was particularly interested in the local, territorial dimension of peasant insurrections. His analysis of the jacqueries (he uses the term himself), which broke out in the valley of the Ganges in 1857 and 1858, illustrates very well the role of political catalyst that common space plays in this kind of context. Indian society is in fact divided into different ethnic, professional and Hindu groups (castes), but also into religious groups, and these groups generally overlap considerably: the administrative entities are generally multifaith and multicultural, and each of these groups is distributed across several of them. Peasant uprisings thus bridge the gap between cultural and physical space, when the struggle against English administrators becomes the reason behind a rearrangement of traditional alliances. More precisely, these struggles bring out attachment to the land, as a habitat and source of subsistence, which forms the foundation of solidarities and loyalties whose political potential is expressed in acts of resistance.<sup>44</sup> The Indian labour question is therefore largely determined by this territoriality, which, according to Polanyi, was precisely the weak point of Western critical consciousness as it was consolidated around the concept of society. This question has cropped up several times on our journey: in Proudhon’s use of the language of corporations, in Marx’s analysis of the peasant classes, in the conservative tendencies of certain technocrats. Each time, the integration of land-based coordinates into the conception of the critical counter-movement occurs at the risk of a traditionalist tendency, or at least a tendency perceived as such by socialism. The symmetrization of critique, on the contrary, makes it possible to understand that this tension is peculiar to modernism and that resistance to the sovereignty of property and the market can

crystallize around symbolic and practical themes foreign to the split between the social and the natural.

\* \* \*

The theory of unequal ecological exchange later took up these elements and above all tried to activate their analytical potential in geo-ecological and political contexts different from colonial India. This is what Martinez-Alier is attempting in his description of what he calls 'conflicts of ecological distribution'.<sup>45</sup> These conflicts occur, so to speak, at the origin of any business cycle, at the root of value, when capital is incorporated into the land. This initial moment of production is characterized by the appropriation of lands, spaces and natural sites inhabited and/or exploited in the mode of the local subsistence economy and converted into resources subject to the new regime of the extraction of profit. This moment therefore corresponds to a social and ecological shock that Europe itself experienced between the sixteenth and the nineteenth century, depending on the region. The consecration of individual property and its unequal social distribution, the increased mobilization of human and natural productive forces, the deployment of industrial technology and the fixation of labour as well as capital by machinery, have lastingly configured the relations between society, power and nature in the modern world. But this inaugural moment was not the pure and simple catastrophe sometimes described: the counter-movement for the protection of social communities made it possible to build up the social state, the effects of which began to be felt at the end of the nineteenth century. Although vulnerable and temporary, the limitation of the destructive power of the market by the invention of social rights thus corresponded, according to Polanyi, to a time when the social world became aware of its vulnerabilities, of its internal tensions. The conception of society as a reflexive force capable of politicizing its pathologies and identifying their causes was thus, of course, the result of the shock caused by the utopia of the free market combined with the power of the machine, but more generally of the way the collective incorporated the tensions between society, political power and nature.

The whole problem is that this movement which took hold of industrial Europe does not, at least as yet, have any equivalent in the regions of the world that are today undergoing the ordeal of an extension of the market and the exploitation of nature. This is obviously not due to the inability of non-European societies to perform the reflexive movement described by Polanyi, since Guha has taught us to detect the existence of such phenomena, but to certain geographical and socio-logical characteristics of this extension. In fact, forests, mangroves, and mining and extractive peripheries in general are gradually being

mobilized and integrated into the global market, while remaining areas of low geopolitical intensity. These spaces are, depending on the case, sparsely populated, populated by indigenous groups already marginalized by the internal colonialism of states, poorly connected, or quite simply in the grip of productive technologies that make even minimal consultation between workers impossible. We can also cite as an example the extensive oil palm plantations in South Asia studied by Murray Li, where agricultural labour is disconnected from family structures, where techniques of management and the blackmail of unemployment prohibit any mobilization, and where the land is reduced to a pure factor of production separate from the collective human habitat. In the case of conflicts between indigenous groups and states, the situation is similar, since the recognition of cultural rights is being constantly postponed, especially when these rights involve modes of relation to living things and to space that are in contradiction with economic ambitions.<sup>46</sup>

The contrast with the European scenario, where the constitution of workers' consciousness resulted in the (slow, but effective) rise in the average standard of living, is striking: the ecological and economic shock affecting the regions of the South is slow to bring the societies concerned out of their marginality, and, in some respects, the situation even tends to worsen with the arrival of new economic actors and with the increase in ecological tensions linked to climate change and the scarcity of resources. In other words, conflicts over ecological distribution can be understood only on the basis of the metabolic map described above. They do not occur on the old map of nation-states in which the balance of power between social classes resulted in legal reforms through the politicization of the labour question. The characteristic of this new map and of the new conflicts that inhabit it is that a gigantic physical and social distance has inserted itself between contemporary subsistence communities and the economic and political forces against which they are fighting. The main obstacle to the success of these struggles is the fact that the spatial and biological cost of development is borne by social groups very far from those who benefit from it, both groups being geographically and politically as disconnected as they are ecologically connected. What is striking is the widening gap between, on the one hand, the vocation of the resources produced – a vocation to travel and to finish their journey in places where their consumption contributes to the construction of a social world where affluence reigns; and, on the other hand, the fact that the local communities affected by the shock of extraction are, on their side, doomed to remain marginal in the great world theatre of consumption.

The connection between these groups exists, and is being forged by many activist movements, but it does not take the form of an awareness

by the North of the fact that its political trajectory has long been based on this asymmetry. Ordinary economic measures do not perceive that, behind monetary economic exchange, space and time on the other side of the world are lost, habitat and subsistence destroyed. Of course, the market was already global in the nineteenth century, and colonial areas were even then not taking advantage of the dynamics of social protection that had been deployed in Europe. But this asymmetry is no longer found inside empires, which after all were created only to install and maintain it: it now gives rise to a tension in interstate relations which, from a legal point of view, are in principle symmetrical. The indefinite creativity of capital to reveal and seize new profit opportunities therefore unfolds, at the end of the twentieth century and into the twenty-first, as an increased pressure on resources, which is itself accompanied by a new geopolitical phenomenon: the separation between the territories newly conquered by capital (as well as the men and women who live there) and the territories where not only will this capital be increased, but where it will result in the reproduction of the industrial sociality typical of the early twentieth century. Land therefore becomes, more than ever, the main instance of social differentiation – but this time on a much more integrated global scale, because the capacity of capitalism to create sociality is perpetuated by drawing its material support from outside its historical foundations.<sup>47</sup>

### **A new conceptual cartography**

The symmetrization of knowledge aims at the destruction of the modern twofold exception, the suspension of the forms of authority and composition of the world that had prevailed since the nineteenth century. The seemingly separate continents of the sociology of science, postcolonial historiography, the anthropology of nature, and subsistence economics are thus all working towards the same goal. The denaturalization and provincialization of the West as a historical experience, a scientific authority and a mode of relations with the world then lead to the formation of an entirely new intellectual landscape. They lead to a conceptual cartography within which the old paradigms of sovereignty, property, production and autonomy as the freeing of a collective subject from nature become literally ‘foreign’: we perceive this organization of collective experience not only as the effect of a contingent construction, but also and above all as united in solidarity with a world that is no longer quite ours.

Such an upheaval had already occurred in the past, when the emergence of the new geo-ecological regime based on industry and empires had rendered the ideals of the Enlightenment partly

obsolete, condemned to wither in the form of a liberalism blind to these transformations. The exaptation of the liberal pact in the nineteenth century then gave birth to a socialism determined to give political meaning to the new world that was emerging. The fall of colonial empires and the recomposition of a global extractive order, the erosion of trust in classical scientific authorities and the accumulation of uncertainties at the very heart of naturalism – all these factors combined had similar effects about a century and a half later. Gradually, a new epistemic space was formed, and it is in this symmetrized space that we must now establish ourselves if we are to be able to face the world as it is – a world that can no longer be the playing field of productive Western expeditions. We must therefore resist the idea that objections to modernity are inevitably accompanied by an abandonment of the critical demands arising from the labour question, and that they give way only to relativism, to the renunciation of emancipatory ideals. On the contrary, it is only at the cost of a profound overhaul of the categories of thought stemming from the modernist adventure that we can once again grasp both the current ecological and political dynamics, as well as the counter-movements to which they give birth.

Symmetrization is the condition for a correct understanding of what comes after the labour question and is today playing a role analogous to the self-protection of society, a project that had dominated progressive political thought from the industrial revolution to the 1970s. It is within this framework that we can today talk about a political subject that is undergoing a new great transformation, and seeks to know itself. The best tribute that can be paid to socialism therefore consists in updating the conceptual and historical base on which the project of autonomy can be reconstituted, rather than at all costs reviving ideals linked to the industrial age. There is no longer any undisputed scientific authority, there is no longer any colonial or postcolonial hegemony that would form the basis of a satisfactory self-understanding of society, and above all, we can no longer ignore the way that critical counter-movements are embedded in a political economy of territories which overthrows the classical grammar of social classes.

It now remains to be seen how this new theoretical foundation makes it possible to respond to the specific political challenges raised by climate change, but we can at least, for the moment, characterize the coordinates of the problem negatively. The political autonomy of peoples is being played out, or will be played out, based on a response to the affordances of the land – a response that can circumvent the productive mode of relationship which has dominated naturalism since at least the industrial revolution, in an abandonment of the



regime of sovereignty based on the ubiquity and liberation of a critical collective subject that does not meet the traditional definition of society which involves its opposition to nature. This is the ground on which to build the new labour question, which is ultimately the question of the Earth.

## *Self-Protection of the Earth*

### **Changing expectations of justice**

Climate change is exploding one by one all the strata of modern political reflexivity. This is true of the juxtaposition of national and territorial sovereignties – already questioned by the nuclear risk – and which looks like a curious vestige of the past when it comes to regulating global productive and market structures in the hope of achieving the targets set by the IPCC in terms of greenhouse gas emissions. The political base map resulting from decolonization is also of little help when it comes to hearing the demands of nonstate political communities: islands or cities threatened with submersion, landless peasants – either indigenous peoples or bearers of alternatives to the agro-industrial system – defenders of the oceans and ice caps, territories exposed to fracking and other fossil experiments, and many others: these are all political entities that raise new problems for the political affordances of the Earth that are completely incompatible with the regime of classical sovereignty, just like the frameworks of international law. It is even, paradoxically, the political dimension of these movements that depends on their situation of bias in relation to the geography of recognized sovereignties and their systems of representation.

This redistribution of attachments and alliances also brings with it the modern imaginary of emancipation as extraction, as a negation of the natural burdens that hinder the free expression of the will. The image dear to Locke of the farmer improving his land, leaving to conquer new spaces available for appropriation, i.e., the liberal arrangement that, since the eighteenth century, has promoted autonomy by coding nature as an external constraint to be lifted – all of this is rendered obsolete by the need to regulate our relations with a vulnerable Earth and environment that are sensitive to our actions.<sup>1</sup> It is therefore the conceptual and political construction of liberty, of autonomy, that is at

stake in climate change – as it had been with the industrial revolution. Not, as is sometimes said, because infinite liberty is impossible in a finite world, but because what we free ourselves from when we claim autonomy no longer has the same shape: today, it is rather a question of incorporating into the collective subject, intent on defending itself, nonhuman beings, territories, ecological processes and regulations. The current transformations of the concept of property,<sup>2</sup> the reactivation of the language of the ‘commons’<sup>3</sup> and, above all, the emergence of a gradual degrowth<sup>4</sup> – which is no longer thought of as the abandonment of modernity but as the revival of the labour question – all signal a profound transformation in the benchmarks of political thought.

If climate change is upsetting our theoretical benchmarks, this is also because it brings to the surface elements hitherto present but barely visible from our common past – or in any case carefully left on the periphery of political thought. This is of course the case with affluence, which, while not being an explicit problem for modern political thought, is the horizon against which it is developed. If we bear in mind the theoretical debates and controversies covered in the preceding pages, we can see that much of the process of democratization of modern societies is dependent on a mode of relation to the world constructed as unequivocal: the nonhuman environment is to a huge extent conceived as a stock of available resources (whether renewable, like soil productivity, or not, like coal and oil reserves) and from which it is possible to draw the conditions of emancipation. We are now realizing, as this very possibility comes to an end, that living in affluence consists in developing a system that is both technological and economic and which tends to inhibit the attention paid to the maintenance and replenishment of stocks or ecological dynamics that govern the reproduction of the collective. The capture and improvement of land, followed by its submission to techniques for increasing yields, the mobilization of fossil resources and also the organization of a supply system that keeps these so-called ‘raw’ materials at a very low price, are all – when environmental reflexivity is taken seriously – akin to a forcing of the geo-ecological capacities of the Earth. Attention to the ecological regulations that make this Earth habitable and the development of a suitable way of life are therefore at the heart of our political history. And this for two reasons: first, because they are part of the history of the emancipation and democratization of society; and second, because the preservation of the project of autonomy now rests on the fastest possible elimination of these mechanisms of affluence.

Sovereignty and property, abundance and scarcity, autonomy and extraction, market and production – these dimensions of modern political reflexivity are all undergoing profound changes. The world in which this repertoire of categories and institutions now has to function

has changed so fundamentally since their establishment, and what is more under their direct or indirect influence, that it is imperative to take note of this transformation. However, curiously, and probably for the first time since humanity posed the question of the principles of its organization, our epistemo-political base has changed less quickly than the world it helped to build: the right to property, the productive schema, these cardinal elements in the arrangement between humans and nonhumans now prevalent in the world are all older than the geo-ecological reality that we inhabit. The latter emerged with industrialization and was consolidated with the great acceleration of the twentieth century, when this set of categories and standards was itself already several centuries old.

This discrepancy calls for corrections, the magnitude of which clearly emerges if we compare it with the long history of historical development that led to their stabilization. It is true that the mismatch between the liberal pact (with its own promises) and the material reality of the world is not new: universalism stemming from the Enlightenment accommodated itself to the slave system right from the start, and then pretended not to see the industrial, and capitalist, inequalities within it, and it is logical enough that the climate issue will still largely elude the heirs of this pact today. The ecological issue is thus part of the history of the demands for justice which aim to correct this discrepancy: antislavery, workers' and feminist struggles have focused on these flaws, have helped to redesign the modern political subject by integrating new beings and new relationships into it, and there is no reason why this process should stop today.

But the climate crisis does not allow us just to stick to the classic objections against liberalism, since it also sets the repertoire of critical thought at odds with ecology. Indeed, the self-protection of society against the market and the new forms of domination it has brought about has itself absorbed the productionist idiom and the decoupling of the social and the natural domains. One could even say that the socialist and sociological counter-movement has endorsed the social as a critical subject at the cost of maintaining the exteriority of nature. In this sense, the reaction triggered by the economic and political development of modernity, in particular among the categories of population hardest hit by its modalities, was formulated in terms largely subservient to the alliance between autonomy and affluence. The demand for a fair distribution of the fruits of progress has paradoxically consolidated the purpose of growth, so much so that the project of an emancipation decoupled from development, which is now spreading in the old poles of industrialization, often appears to be a contradiction. And unless we follow the suggestion made by Polanyi in *The Great Transformation*, where he notes that the self-protection of society

includes its links to conditions of subsistence and territories, links that are not exclusively of an economic nature, this contradiction is insurmountable. In other words, among the political categories brought into play by climate change, there are also and ultimately the notions of nature and society, since behind these terms lies hidden a particular way of politicizing oneself and politicizing the world. It is in this sense that the question of the critical collective subject must be raised again: who is it? How should we name it? Whom is it mobilizing?

Fortunately, in the history of political thought, the socialist tradition has also imposed a concept of autonomy as integration. Thanks to it, the demand to take into account the material characteristics of the world and how we access them has become sedimented in our history. The project of autonomy, while being fundamentally subordinated to the schema of productive conquest, has thus been alerted to the close links being formed between the exercise of political liberty and the conditions in which the conscious transformation of the world is taking place. The critique of exclusive individual property, the attention paid to the links between the division of labour and social solidarity, but also (in the technocratic tradition) the quest for an economic norm outside the logic of prices – all these aspects of the tradition have had the effect of consigning any specific consideration for the materiality of autonomy to the past memory of social struggles. By trying to curb the liberal tendency of delegating to the market the responsibility for organizing relations to resources and territory, socialism has made collective relations to the world a political issue. And this is its main legacy at a time marked by major ecological changes. Beyond its failures, and in particular its environmental failures, socialism has left a legacy that has absolutely no equivalent in the memory of political thought. And it is in this sense that the counter-movement now being triggered by climate change is situated in this tradition: it re-stages, in different terms and in an entirely new context, the collective capacity to identify a threat, to define the collective subject that rises against it, and make this ordeal into an opportunity for reformulating the ideal of the liberty of equals.

Thanks to the historical precedent constituted by socialism, understood as a deepening of the sense of liberty in a technological world, then in a world affected by climate change, and negatively affected by the project of autonomy itself, the development of a political response to climate change is not entirely without pointers. And these pointers are necessary in a context where the feeling of abandonment, loss and disorientation hovers over political ecology, especially once we begin to measure to what extent mainstream political concepts are found wanting by the challenge of climate change. It is on this feeling of loss that the prophets of the apocalypse, millennialism and other ideologies

of the end of the world thrive, since they all in their own way wager on the incommensurability between ecology and politics by passing straight on to the register of salvation or survival. But while bearing in mind the radical singularity that climate change constitutes as a historical and psychological experience, and while accepting that this change is no longer a distant prospect but a *fait accompli*, the reference to socialism tells us that the formation of a new critical subject is always possible. It is in this sense that political ecology remains an avatar of modernity: it presupposes a self-critique and a correction of political reflexivity, a deliberate transformation of the means by which the collective takes responsibility for itself – and not, especially not, any submission to external standards, whether ‘natural’ or theological.

So that is what we mean when we say that climate change is exploding all strata of modern political reflexivity. Beyond the disruption of geo-ecological balances, this transformation forces us to redefine the repertoire of our categories of thought. Climate change – i.e., every particle of greenhouse gas that is added to the Earth’s atmosphere and that takes us out of our ecological ‘safe operating space’<sup>5</sup> – is an entirely political reality, in two ways. First, because CO<sub>2</sub> emissions are the product of a technological and political past that had nothing necessary or inevitable about it; and second, because these emissions impose on us the task of unravelling the political arrangement that was established with the liberal pact and in its various modern reincarnations. Climate change is the name of the historic present because it is both a fact, established by geosciences, a heritage to bear, whether we like it or not, and an ordeal to be overcome – in other words, a political condition. And if this ordeal is so difficult to face up to, it is because the current deterioration of planetary ecological conditions is more than just the result of an error committed in the past and needing to be corrected later, or a figure of evil of which we have become aware in retrospect.

It is possible to make our task easier by affirming that the ‘capitalist mode of production’ and the ‘technoscientific objectification of the world’ are the ideal culprits behind this error, and thus need to be arraigned before the court of critique. These concepts stemming from modernity and sometimes set up as absolute categories of domination by theory are obviously connected to contemporary issues. But one of the conclusions of our investigation is also that neither of them captures historical reality correctly, for three reasons. First, both stem in part from very real collective desires for the improvement of the material conditions of life and security, which must be treated symmetrically and cannot be abandoned as a whole; second, because the critiques to which they have led have long been compromised by their own premises, in particular productionism; and finally, more

radically, because an environmental history of political ideas reveals other instances of domination, another way of looking at the pathologies of modernity, than those we inherit from the past. The critique of capitalism and the technosciences is thus to be understood as a critique of these categories themselves, which there is no reason to regard as more timeless or more absolute than the categories of property or sovereignty.

\* \* \*

The scale of the current upheavals is measured by the strength of the new counter-movements, but especially, alas, by the radicalization of the economic elites who are determined to continue full steam ahead to growth. Faced with the evidence now unanimously accepted, including and perhaps even especially by those whose plans it most disrupts, that the planet is no longer large enough or flexible enough to accommodate a limitless economy, the persistence of liberalism is becoming more obvious than ever. While the pact forged between affluence and freedom, between growth and democracy, had worked as a global project until quite late into the twentieth century (whatever one thinks of the value of this project), in the sense that it formed the basis for the discourse of progress, the search for growth is now turning against its old political ally and causing an extraordinary corruption of the democratic ideal. Naomi Klein and Bruno Latour,<sup>6</sup> even though they come from very different intellectual traditions, have drawn from it a common observation and working hypothesis: the exacerbation of political conservatisms, the consolidation of alliances between market forces and identitarian nativism and the electoral outlet that they find among populations seeking protection against offences, which, however, stem in large part from the logic of the markets, must all be understood in the context of the climate crisis. As Bruno Latour would put it, faced with the observation that there is no longer a world able to host the project of infinite economic growth, its defenders have preferred to liquidate the idea of a common world and to build illusory ideological lifeboats.<sup>7</sup>

This still risky hypothesis, which awaits further empirical investigation by the political sciences, nevertheless fits perfectly into the history that we have just reconstructed. The sense of political liberty, first boosted then trapped by its alliance with the mechanisms of growth and extraction, is today at a clearly identifiable historic turning point. Either it remains subservient to the old structures of the liberal pact, and is condemned to shrink, to surround itself with barriers to protect itself against the new contenders for development and affluence, or it is assumed that the history of this alliance must end. The systematization of the links between climate denial and the programme of aggressive



liberalization of the markets,<sup>8</sup> this worldless globalism that is spreading at an astounding speed, should in this respect indicate the path *not* to follow. This is because it represents an economic project based not only on the defence of established interests, but also and at the same time on the reactivation of the conservative spectre already described by Polanyi: when laissez-faire dissociates itself from multilateralism and takes refuge in little islands of prosperity, it again becomes the objective ally of the defence of the traditional soil and the exclusion of the foreigner, the vehicle of the identitarian and localist reduction of the political affordances of the Earth. Some try to draw reassurance by listening to those who promote the inclusion of ecological demands within the neoliberal framework, but the lack of ecological support for this project immediately makes such a framework seem empty and invalid. Either, therefore, the project of autonomy remains rooted in the dream of affluence, in which case it will sink with it in the great reactionary and authoritarian movement that we are already witnessing, or it frees itself from it by taking the form of a post-growth autonomy, i.e., of a new kind of integration-autonomy.

The assumption on which we are working here is fortunately corroborated by other studies of the exhaustion of global economic structures. Indeed, their inability to support peaceful and lasting political projects is at present remarkably well documented by the social sciences. It is essentially from the angle of debt, inequality and crises that this methodical process is carried out, and the historical logic of a certain destabilization emerges, the critical threshold of which has undoubtedly not yet quite been reached, but which certainly cannot be postponed indefinitely.<sup>9</sup> The reinvention of capitalism at stake in the spread of austerity, in the erasure of the mechanisms of redistribution, in the absolving of financial institutions from any responsibility, to some degree prolongs the death agony of this old paradigm, but every death agony comes to an end. And although equivalent work from a climatic point of view still needs to be carried out, political philosophy can already manage on the basis of this necessary decoupling between autonomy and affluence. In a context characterized by certain economists as 'permanent stagnation',<sup>10</sup> the objectives of growth can be obtained only by a series of accounting, fiscal, monetary and, of course, legislative forcings (one thinks here of the reforms of the labour market, or of the new enclosures),<sup>11</sup> which are inevitably envisaged as having to do with the more general forcing of the planet's ecological carrying capacities. Each time, these are mechanisms designed to overcome resistance to the reproduction and accumulation of private wealth. As regards the old poles of industrialization, all growth is thus pathological, since it is obtained only by means that irreversibly consume the human and nonhuman substance.

In *Où atterrir?* [*Where to Land?*], Latour presents these issues by asserting that the alliance between climate-scepticism and the return to localist, Barrès-type conservatism<sup>12</sup> reveals the definitive collapse of the ‘common world’ previously guaranteed, in his view, by the liberal project. Universalism breaks down when it appears that Gaia cannot provide shelter for the economic liberty of the wealthy and the aspirations of all the others. However, our analyses lead us to view the relationships between the liberal paradigm and the composition of a common world in a different way. Following in this respect the elements provided by the imperial and environmental historiography of liberalism, the least that can be said is that this tradition has always had conflicting relationships with the very idea of a shared world, since its implication in colonial adventures and the more general construction of modern ubiquity raise a big question mark over this promise. In other words, the current inability of the heirs of liberalism (whether or not they have crossed the sceptical and reactionary Rubicon) to meet the climate challenge is partly explained by this very long history and these many missed encounters between the ideal of emancipation, in its typical eighteenth-century formulation, and its geo-ecological conditions. In reality, and more broadly, honesty obliges us to say that no classic theoretical or political idiom is immediately up to the challenge of climate change, simply because this latter represents an event that, as Naomi Klein says, ‘changes everything’.

### **Autonomy without affluence**

Fortunately, the epistemo-political terrain has already been prepared by the series of symmetrizations described in the previous chapter. Even if the challenges to the twofold exception – i.e., the scientific and political authority of the moderns over nature and the non-moderns – have not been explicitly developed as a response to the climate challenge, they provide the only consistent and available theoretical framework for understanding contemporary transformations without lazily recycling a political grammar developed in and for another world. We must therefore take seriously the idea that the modernist gravitational system, which projected into its margins the sociohistorical otherness of non-Europeans as well as nonhumans, no longer exercises a monopoly on truth-telling. And with it a more positive corollary: the exhaustion of its authority goes hand in hand with the composition of new non-productionist political partnerships that remain to be developed. This new space opening up to the politicization of collective experience cannot therefore be reduced either to an end of history or to a situation of epistemological and social

anomie, since the answer to the ordeal of climate change must find a place within it.

When, according to the indications of climatologists, it is stated that the Earth is not large enough or flexible enough to host the autonomy conceived on the basis of affluence, this obviously sounds like the end of something, of something to which many of us are still attached. And this is indeed the case, in one sense: there are certain ordinary connotations of the idea of emancipation that cannot any longer be preserved – those linked to modes of consumption in particular, i.e., to the world of commodities. There are certain future projects that can no longer be realized – notably the ‘large projects’ linked to fossil extraction and the capture of agricultural land and forests. But if the ideal of autonomy is likely to be reformulated in terms less dependent on the mechanisms of extraction and accumulation, i.e., of affluence, then this transformation will not assume a merely negative meaning. The acceptance of liberty that must prevail in the twenty-first century, and which is already taking shape, will rearticulate itself in geographic, ecological and epistemological coordinates emancipated from the schemas produced by the modernist tradition. This new form of autonomy, and the political collective that enacts it, as its subject, will simply respond to territorial and ecological affordances hitherto silenced in our agricultural, colonial and industrial history, which for a very long time have imposed a certain vision of what a legitimate use of the Earth involves. And it is in this sense that symmetrization, even if it has for now an essentially theoretical meaning, is essential: by denaturalizing the ‘obviousness’ of certain aspects of the modern collective experience, by bringing out its singularity and its provincial character, as well as the asymmetries it dictated, it shows that it is possible to explode from the inside the association – long viewed as necessary – between autonomy and modernity, between the sense of freedom and the uses of the Earth which have led to the exhaustion of the latter.

For it is not enough to pay heed to climatological data to gain a foothold in the new political regime imposed by the ecological and climate crisis. It is not only a question of curbing, slowing down the pace of the economic machine, or of reminding men and women of the limits of the land-based system, so that the answer will be given as if by miracle. In political matters, as in biology, the change of scale of a system necessarily causes a transformation of its internal structure: one cannot have the same thing but smaller, a downsized industrial modernity, miniaturized to meet ecological demands, as the meaning of our sociopolitical benchmarks has been so greatly affected by the increase of our power to act in the world. It is in this respect that the ‘eco-modernist’ programme falls below the necessary level

of requirements, since it is content to offer techniques of ecological resilience (techniques that are essentially nuclear and robotic) capable of prolonging liberal intoxication without suffering from the hangover of climate change.<sup>13</sup> More generally, the political controversy raised by the climate issue becomes evident once one focuses on nuclear energy: the false comparison between atomic and carbon-based power tends to suggest that we could, thanks to the former, preserve techno-policies (and lifestyles) typical of the age of affluence, while lowering our level of CO<sub>2</sub> emissions. Even supposing that this is possible, it means that the climate issue is merely a question of technological choice, or, as people sometimes say, of 'energy transition'. Now, if we admit, as we have just said, that the very content of the ideal of emancipation is called into question by the new ecological regime in which we find ourselves, then we must not seek new sources of affluence likely to revive extraction-autonomy, but rather ask what becomes of this ideal when it has to fit into a world that has been turned upside down.

Economic curbs and the critique of the limitless economy cannot be conceived without a reform of our political concepts. To put it more radically: any energy transition not based on a socialist movement reimagined outside the confiscations that have been prevalent in modernity is irrelevant, and would bring no real benefit. By defining, at the very beginning of this book, what I meant by the 'environmental history of ideas', I was already to some extent raising this issue. If political notions that are apparently indifferent to our modes of relation with the world turn out in fact to bear the mark of the institutional, technological, scientific mechanisms that organize these relations, this reciprocally means that the transformation of these mechanisms will leave its mark on future political awareness. Political thought therefore has no choice but to explore this field of possibilities, if only to prevent it being abandoned to new forms of domination based on the control and monopolization of means of subsistence that are increasingly difficult to access. By asserting from the start that the field of the political and the field of the ecological are, if not completely coextensive, at least impossible to separate, the methodological proposition of the environmental history of ideas therefore already contained a thesis: the transformation of our political ideas must be of a magnitude at least equal to that of the geo-ecological transformation that climate change constitutes.

Theoreticians of symmetry, who since the 1970s have developed subaltern and postcolonial historiography, the sociology of science, the anthropology of nature and the theory of unequal ecological exchange, were perhaps not fully aware that, by ending the reign of the modern twofold exception, they were not merely doing justice to the forgotten people and aspects of history or establishing an intellectual legitimacy

emancipated from the colonial and modernist schema. Indeed, the instruments necessary for devising an environmental and intergenerational justice adequate to the shock of climate change come to us from this movement, since it was the first to clearly envisage that the self-protection of future political collectives would not fall within the sociocentric dualist schema prevalent within the European experience of the world. What had long been understood as the universal basis for collective emancipation, namely the heritage of the Enlightenment, of industrial social critique, of historical rationality centred on the nation-state, now presents itself not in reverse form as a pure form of alienation, but as a singular schema, bound up with a historical moment, and as such hampered by the dead ends and blind spots of that moment. As soon as the forms of political reflexivity assume new guises on the basis of this symmetrization, the desire for emancipation can overcome the limits imposed by a modernizing narrative which, very literally, is the narrative of another world. If the labour question must today be redefined to give solidarity between humans and nonhumans the centrality it deserves in the present crisis, this can only be done at the cost of a transformation of our political compass. In other words, we cannot simply become ‘societies that protect nature’, since each of these terms – ‘society’, ‘protect’, ‘nature’ – carries with it a way of organizing beings that is out of kilter with the demands of the present; we have to follow the path of symmetrization to envisage our responsibility for our future in new terms.

\* \* \*

This means that we need first to grasp at the root questions about (1) the type of space that is circumscribed by our political, historical, material affiliations, (2) the meaning that we give to the technological and legal control that we exercise over the world, and (3) the type of authority that we give to scientific discourse, i.e., what guarantees the synthesis between the knowledge we have of ourselves and the knowledge we have of the world – a synthesis more necessary than ever in the age of climate change. These three points correspond to what was defined in the first chapter as the empirical space to be surveyed if we are to understand the ecological question: dwelling, subsisting, knowing.

If we take the first thread, that of dwelling, and pull it out of the spatial dimension of the ecological problem, what unfolds is the history of the relationships between sovereignty and property, i.e., the formation of a political thought of an exclusive domain (individual or collective), then the question of what has been called modern ubiquity, namely the tendency not to take the ecological territory that we consume as such, but also the problem, central to the nineteenth century, of a

mobile society whose symbol is the railway, and where attachments to the land are viewed as throwbacks to an alienating premodernity. In the context of climate change, where territorial discontinuity and the imposition of borders and national jurisdictions are evidence of a striking discrepancy with the emergence of new forms of political mobilization of territories, habitat thus defined becomes a fundamental issue. What we learn from the history of peasant social struggles (in the South as well as in the North) and from an awareness of the ecological interdependencies which underlie the globalized market order is that capitalism is not simply a mode of production, but also a mode of residence. In other words, it is a way of distributing social groups and functions, security and risk factors, across space, but also affluence and lack. This of course causes territorial inequalities, but with them a differentiation from what it means to live on a soil with its geographic, agricultural, historical and memorial characteristics. The territory of the urban middle classes is not that of the agents of global extractivism or of agro-ecological experiments, and these in turn are different, for example, from a town aiming for carbon neutrality or a community determined to create rights for a river.<sup>14</sup> The re-politicization of territories outside the polarity of the local and the global, set apart from the administrative and political regime of sovereignty, is therefore the first axis of theorization for a symmetrized political ecology: what is at stake with it is the fate of assemblies that are no longer understood as ‘a society in its environment’, but, precisely, as political territories.

In terms of subsistence, and obviously very related to the previous issue, it is essentially a matter of economic rationality and the sense of value. The historical background now reminds us of the constitutive tension of the market societies set up in the wake of the technological and energy revolutions of the nineteenth century. In this context, which is still partly our own, economic and political domination was exercised both through the privatization of the means of subsistence and effective control over the ever more massive flows of matter and energy on which the collective depends, and through complementary mechanisms that ensure the recoding in monetary terms of privatization, i.e., its invisibility as a metabolic phenomenon – thus preventing it from being explicitly subject to democratic exchange. What we learn from Saint-Simon, Veblen, bioeconomics and, more recently, Timothy Mitchell, each in their own way, is that the logic of the market (or the price system) always tends to obscure its connections to a singular technological and productive regime, and that one of the tasks of the social counter-movement consists in highlighting and attacking this very connection by weakening it and exploiting its weak points. The suboptimal nature of modern supply systems, the centrality of waste and wastage in the formation of prices and profits

– i.e., the extraordinary gap that has arisen between the regulation of the ‘economy’ and the regulation of ecology, or of the living planet that bears us – must provide the basis for a second axis of political theorization. Today, this already longstanding gap has become crucial, since the economic rationality that governs our understanding of the future, and of externalities, entails nothing less than climate inaction.<sup>15</sup> The integration of an ecological reflexivity into the critique of the market as a form of domination is therefore linked to the expulsion of our intellectual coordinates from the productionist schema, i.e., from the belief in a demiurgic mastery of ecological and evolutionary processes that ensure our integration with the Earth. Admitting that we do not produce our means of subsistence, and even less the general conditions of terrestrial coexistence, but accepting that we are part of a geo-ecological regulation made up of cycles that need to be maintained and preserved, is the first step in developing a political economy that finally responds to the good affordances of the earth.

Finally, in terms of knowledge, we must make ourselves the heirs of the symmetrization of scientific authority in order to lucidly conceive the right politics of knowledge for the ecological issue. For what is at stake is neither the subordination of modern voluntarist political consciousness to ‘natural’ norms, nor the empowerment of an enlightened scientific elite capable of imposing its decisions, but rather the reconnection of the process of democratization to the production of scientific statements – especially when they concern the state of the planet. The development of an environmental reflexivity has given rise to the most significant of recent epistemo-political struggles – and the interminable controversy about climate science is the most striking example: the collapse of the liberal pact has entailed the fanaticization of its most virulent defenders, ready to invent alternative truths to safeguard its meaning.<sup>16</sup> More generally, the competition of contradictory statements in an increasingly vast and open public sphere – and the emergence of what is now called ‘post-truth’ – has increased the need to tend to the chains of mediations that ensure the proper representation of facts in the political community. The apparent epistemic anomie in which we find ourselves today, far from being a consequence of the critique of the metaphysical authority of science, confirms its central postulate that our relation to the facts and to our capacity to establish them must be tended as carefully as our political values.<sup>17</sup> Indeed, climate change denial itself does not hesitate to exploit the political nature of science. Climate change therefore calls for a redefinition of the knowledge that structures the democratic space and a deepening of ecological literacy – now as essential to agreement between minds as is language, or reference to common history.



The symmetrization and overcoming of the modern twofold exception therefore lead to the identification of three major projects for a political ecology that can be formulated as an extension of the labour question of the nineteenth and twentieth centuries. The self-protection of collectives is first conceived in terms of space, as a critique of modern territoriality, i.e., of the logic of sovereignty and the vestiges of the split between modern people and nonmodern people; second, in terms of value, as a critique of economic rationality, a critique aimed at re-embedding the acquisitive and market processes not in society but in both local and planetary ecology; and third, in terms of knowledge, as an incorporation of ecological knowledge into social and political reflexivity.

\* \* \*

We often realize the value of what we owed to an ideological or cultural structure just as we are losing it, or can feel it slipping through our fingers. This is entirely true of modernity, understood as a structure that conceives autonomy as the removal of natural constraints – or rather as the transfer of these constraints to others than oneself, human or nonhuman. Indeed, the consolidation over the course of history of the equivalence between democratization and enrichment, or the acceleration of the productive machinery, is not viewed as a vulnerability by a significant proportion of the population until this equivalence becomes a mere memory – or in any case ceases to constitute a credible path for the future. The cornucopian schema inherited from the Enlightenment and classical political economy, which promises to open up our political horizons once the frugality of nature is forced to yield, is increasingly perceived as a myth of the past, as the object of a feeling of nostalgia. Yet the Thirty Glorious Years are not that far back in time, and with them the idea that social justice requires a redistribution of the fruits of growth that is now impossible. The type of individual produced during that period in industrial democracies by the last avatar of the liberal pact, namely the productivist welfare state, is now brutally plunged into a new world, with all the strange psychological and social consequences that this can have. One of the most striking examples of this discrepancy is the very frequent attachment to individual mobility, and its main technological realization, namely the automobile. The abundance of energy and the policies of urban sprawl associated with it have given shape to infrastructures and anthropological profiles, to forms of desire, whose inertia over time is at present coming into violent collision with the reality principle of the climate: the psychosocial attachments to automobile autonomy and to the sense of self that it cultivates are being called into question by the rise in energy costs, and urban

infrastructures, however recent, appear to be unsuited to the new ecological regime.<sup>18</sup>

This world, so close to us and yet already so old, is dissipating under the combined effect of attacks on the democratic compromise by austerity policies, the increase in inequalities, and the disappearance of material support for indefinite growth. However, this disappearance is producing all kinds of social reactions which, for some people, echo the problem of historical orientation often mentioned in this book. In other words: how can we envisage in progressive terms social transformations that are breaking away from the form that this progress took in the past? Indeed, if we only half deconstruct the equivalence of affluence and liberty, the idea that the democratization of society has been definitively halted in its tracks can easily impose itself. One need merely admit that, having broken the only material machinery that set this process in motion, this machinery itself simply has no future. This idea has already imposed itself, as we have seen, among the economic elites who have made the destruction of the human habitat the condition of the perpetuation of their power, but it is also found in certain trends in environmentalism which wager on the outright abolition of modern living conditions so as to propose a programme for a post-apocalyptic renaissance.<sup>19</sup> The polarization between the climate denial of the fossil elites and the millennialism of collapse rests on a false alternative: either one preserves the ‘progress’ of the past, based on abundance, and the Earth is abolished, or one puts an end to all political ambition by ensuring that after abundance comes only survival, adaptation or redemption.

The loss of what, just a generation ago, seemed as an irreversible pact between a way of living in the world and a way of looking towards the future has been so brutal – although the processes leading to this loss have long been familiar – that the transformation of our political compass, as it were, has hardly had time to take effect. Panic-stricken, some have started to assert that the project of autonomy as such has run out of breath and that ecology is inseparable from authoritarianism. But there is a world of difference between the claim that this project relied for two centuries on the removal of ‘natural constraints’, and the idea that all forms of political autonomy can be identified with this partnership. The space that appears between the two is absolutely decisive, because this is where the resumption of the democratic ambition can begin: collective control over our historic destiny is now conditioned by the integration of a certain number of ecological norms and thresholds, by the reality test imposed on us by the new climate regime. Maintaining the democratic ambition in the Anthropocene requires the reversal of the ecological partnership based on the production that supported it in the nineteenth and twentieth centuries, and a subversion

of the material support traditionally accepted by the expectations of justice. In other words, although a feeling of loss is taking an increasing grip on social groups affected by the collapse of the liberal pact, the self-protection of the new political collective can be viewed as more than just an accompaniment to the endgame: democratic reinvention is not a simple curbing of productive tendencies, not just a series of measures intended to avoid catastrophe, and it is generally not seen as something negative (as a series of things that we can no longer do, that are forbidden). The withdrawal of certain ways of doing and seeing, far from being an abstention, frees up space for action.

The autonomy of the twenty-first century contains, it is true, a component of restraint and self-restraint, notably against certain extractive and acquisitive forces which it is a question of controlling, but certainly not of renouncing. Our political unconscious, by associating action with an increase in the means of acting on oneself and on the world, and these means of acting with their technological implementation, blocks this idea. That is why we often retain just the negative dimension of the policies meant to produce a new form of autonomy – like *Bartleby*, ecology limits itself to asserting ‘I would prefer not to.’ The alternative proposed by the Enlightenment between primitive destitution and headlong technological advance (whether conceived as beneficial or as pathological), can therefore no longer serve as a meaningful historical structure. Not because it means having to stick to a compromise, to a middle path (the one we generally call ‘sustainable’), but more simply because the technological environment that needs to be built in response to current geo-ecological transformations is heterogeneous to the environment with which we are familiar. In the twenty-first century, the instituting desire that takes shape in law must be dissociated from the logic of technological innovation, because technological evolution can no longer act as a metaphor for social evolution as it has done since the eighteenth century. It is therefore impossible to conceive of this new form of autonomy (even if we do so sometimes) as a leap back over the modern parenthesis to a more distant past: the new democratic demand is not a neo-medieval or neo-primitive resurgence, it is not a return to the lost past of the commons, the tempering of desires, or the non-appropriation of the world, but the recovery of a classic ideal freed from its modernist gangue.

### **Towards a new critical subject**

In order for this decoupling of freedom from affluence to be seen positively, one of the main tasks consists in identifying the collective subject capable of rising up and going in search of its autonomy under

the new conditions defined by climate change. This phrase needs to be emphasized: *under the new conditions*, and not in any random set of circumstances, for it is now evident that the genesis of a political subject is correlative to a mode of relation to space, to resources, to knowledge (about oneself and the world).

The great transformation described by Karl Polanyi, with the additions made by Timothy Mitchell and several others on the form of social conflicts in the age of fossil fuels, has taught us this fundamental lesson. A political subject is discovered in the ordeal of a threat, of something that undermines the integrity and sustainability of a collective that, paradoxically, does not pre-exist for all eternity. Only the industrial world, constructed by the political and technological (i.e., ecological) forms proper to the nineteenth century, could bring about the socialist counter-movement, and with it the political subject called 'society'. This political actor is very complex, since it is both enshrined in other contemporary collectives such as the people, the nation, the class, or even humanity, and out of step with these latter groups insofar as it does not designate either a unique identity or a universal. We do not belong to the social as we belong to a people or a class, because it does not shape the same inclusions and the same exclusions. Social belonging is, to use Durkheim's terms, not mechanical, because it is not based on the resemblance of the terms it assembles but on their difference – and this is precisely what gives it its political character: neither identity nor abstract. It is caught up – like the notion of class – in conflicts, but irreducible to either of the parties to this conflict. And yet these dissimilarities which comprise the social sphere do indeed have an external limit. This is what we learn from the symmetrization of the great divisions, which underlines how much the nonmodern domain – which has not yet found its own sociality – and the nonhuman domain – which is there only as an assertion of the autonomous collective – have suffered from the social paradigm. After decolonization, after the transformation of our relationships to science and technology, the social domain seems to have exhausted its capacity to form a proper collection of political actors mobilized in the struggle.

On the new base map where the geo-ecological privilege of modern ubiquity no longer exists, where territories enter politics based on their experience of climate change and where the productionist mode of relationship has lost its hegemony, the process isolated by Polanyi's historical sociology can then be transposed, with deep analogies and urgent new questions. The sequence in which a metabolic shock is followed by the identification of a disorder, the development of critical thinking and the implementation of its means of action can be retained as a good guide to current political issues. But it no longer connects the industrial revolution (shock I) with the labour question

(unrest I), the socialism of growth (critique I) and workers' sabotage (means of action I). It gives way, term by term, to climate change (shock II), the question of the Earth (unrest II), anti-productionist socialism (critique II), and the mobilization of a new collective subject whose name and methods of action are being developed in ecological conflicts (means of action II). Once everything has changed, and the political sequence of self-protection has undergone a second great transformation structurally analogous to the first, albeit substantially reversed, there remains almost nothing of the sociopolitical landmarks bequeathed by the labour question, except the requirement for self-protection which is its true nature. This appears as an incorruptible principle which animates complex collectives – those who live with technological and institutional apparatuses that are too vast and too autonomous for them to govern themselves mechanically. And it is a persistent principle, even when the economic and ecological structures which had long, albeit imperfectly, provided security and protection to the greatest number now expose them to the most serious threats. Self-protection is in this sense more central than its usual historical subject (society), since it is this concept that makes it possible to closely link a politicized collective (that which protects itself), a power of aggression (what it protects itself from) and the mechanisms of self-defence (the knowledge and practices mobilized to protect itself).

The resistances to the advent of this political subject are unfortunately numerous and powerful – but fairly well known.<sup>20</sup> Several recent studies show that, at the time of the first major ecological alarms, and subsequently at the major scientific and diplomatic meetings convened to respond to the climate challenge from the late 1990s and the Kyoto Protocol onwards, the refocusing of the modern project on the protection of the Earth has been considered several times. The environment has thus become an object for global governance under the effect of the politicization of the ecological and climatological knowledge that has fed into the supranational bodies for regulation both economic (World Bank, IMF) and diplomatic (United Nations Framework Convention on Climate Change) when the paradigms of risk and limit predominated. But the political imaginary of these institutions has always left what we can call, following Amy Dahan and Stefan Aykut, a 'reality schism' between those for whom the reproduction of human society is at stake, and those for whom the issue is essentially the reproduction of capital (i.e., risk, in the economic sense of the term). According to the same authors, the incorporation of environmental issues into the international agenda has gradually taken the form of 'incantatory governance', i.e., a form of paradoxically depoliticizing support that, while affirming the imperative and urgent character of techno-political transformation, demonstrates

in its concrete inaction the failure of existing institutional forms to operate in accordance with this purpose – which thus becomes purely ideal. In a process eloquently described by Dominique Pestre, the attempt to subordinate globalized markets to environmental norms has undergone a shift, at the end of which market rationality has been paradoxically consolidated and relegitimized by the incorporation of watered-down and not very restrictive norms.

It is in a sense thanks to this cunning of history that what has prevailed is not the ecological critique of the economy and the politicization of territories, but the recoding in economic terms of ecological alarms, in a series of marginal modifications of market rules. The question could thus be considered as settled, while being projected onto the fringes of the process of recomposition and extension of the liberal logic which prevailed after the Keynesian parenthesis. It is still this logic that is at work, for example, in the Millennium Ecosystems Assessment<sup>21</sup> commissioned in 2000 by the UN and initially intended to provide the foundation for a global ecological transition. This document borrows its argumentative structure from bioeconomics via the concept of ‘ecosystem services’ – i.e., the set of underlying ecological functions essential for the economic and social reproduction of humanity. As we have seen, these concepts were developed to challenge the hegemony of the monetary expression of value in economic reasoning, and to replace it with a materialist conception, in which primacy is given to flows of energy, resource stocks and systemic eco-evolutionary functions. In this document, however, the original intention of bioeconomics has been subverted, to the extent that ecological services tend to be interpreted as natural capital to be maintained rather than as a qualitative set of evolutionary dynamics dictating classic economic metrics. Thus, these services, assimilated to capital, can be compensated for, exchanged and negotiated in the same way as goods (as is the case with the rights to pollute), while the fundamental message of the critics of growth consisted in bringing situated, irreversible, qualitative processes into the sphere of value. Thus, the instruments developed to create global environmental regulations once again reveal their inability to change paradigm, but above all demonstrate how the appropriation and deflection of ecological critiques slow down the emergence of a non-naturalistic political subject.

Thus, after several decades during which environmental governance has paradoxically functioned – within the framework of what can be called a neoliberal ecology – as an obstacle to the self-transformation of modernity, the assessment has to be very negative: the sense that the market paradigm is infinitely adaptable often ends up predominating, and with it the mechanisms already described by Polanyi three-quarters of a century ago are rendered fatefully inevitable. However,

these defeats result in a clarification of the issues, as will be even more clearly the case with the subsequent emergence of the authoritarian fossil liberalism discussed above: if an ecological and post-socialist counter-movement can see the light of day, it will be outside these institutional spheres, in a critical relationship to their current agendas – at least as something that overflows and shatters the pre-elaboration of what an ‘ecological question’ actually is. This counter-movement, in other words, results from a critique of the idealist environmentalism of the first generations focused on the defence of ‘wilderness’ and its alleged intrinsic value, but also and above all from turning away from the existing mechanisms that had set out to ensure ecological transformation.

These elements are essential to properly situate the type of politicization required for the development of a post-growth democracy. The betrayal of the ‘official’ environmental authorities in fact leads to a pushback: it provides evidence for the idea that this movement is again taking root in an ordinary class dynamic, where the antagonism between the interests of a majority but dominated collective and the interests of a minority ruling class ready for anything occupies the political centre stage. The problem, of course, is that the collective in which the new labour question, that is, self-protection in the context of climate change, is being developed, looks nothing, or almost nothing, like a class understood in its classic socioeconomic sense. People living near dangerous installations, victims of extractive devices, alternative land users, commoners, scientists and educators, and many others whose experiences are still diffracted by gender and race, compose, with the Earth, a collective hardly comparable to a dominated class, quite simply because they are united neither by the experience of exploitation nor by collective identification with a common condition or identity, or even simply by the fact of being victims. The spatial dimension of the stakes is the main differentiating factor compared to the classical framework of the labour question:<sup>22</sup> in a conjuncture where relationships with the Earth as a source of subsistence, as a habitat and as an object of knowledge become (again) an ideological marker and the object of cardinal struggles – since the whole problem is ultimately one of knowing on what land and what Earth we intend to live – the sociological profile of the emerging collective is necessarily unstable. And, above all, it does not easily acquire a self-consciousness similar to what we talk about when it comes to ‘class consciousness’ (and even less about ‘national consciousness’).

What remains of class conflict is the experience of an injustice to be corrected, which gives rise to certain forms of enquiry and knowledge; what remains of national identification is the local and territorial dimension; and what remains of the social movement is the ambition



to create an organic synthesis of different points of view. But none of these collective names from the past satisfactorily captures the process under way – all are reformulated from top to bottom. Many contemporary theorists of socialism have faced this problem by trying to rename the critical subject that matches the economic and political conjuncture of the end of the twentieth century, but none has, to date, proposed to define this critical subject by the links that it forges with the material and spatial conditions of the counter-movement.<sup>23</sup> It is this, moreover, that always gives conservative movements a head start, as they can be content to take from the pre-existing political lexicon the name of the collective to which they are addressed – people, nation, class (although the latter is not very fashionable) when they do not even more simply use the language of individualism. In other words: alongside the active resistances that oppose the emergence of a collective capable of responding to the good affordances of the Earth, there is the objective ambiguity of this entity in search of its internal integrity: neither class, nor people, nor nation, nor society, it differs from all these collective names by locating its centre of gravity at the crossroads of the human and the nonhuman.<sup>24</sup> Baptiste Morizot has shown that ecology is often reduced to the search for multispecies ‘alliances’ in which coexistence involves the exchange of different points of view on what it means to coexist.<sup>25</sup> But this paradigm of alliance also helps to conceive the composition of this political collective, whose sociological heterogeneity (and no longer just its specific heterogeneity) must be converted into a reason for questioning the nature of the convergence that drives it.

\* \* \*

It is probably not philosophy’s task to affirm by speculative means what will be the name and the exact form of this collective capable of establishing itself as the subject of the ecological counter-movement. In this respect, the gap between official social theory and the genesis of a working class in the nineteenth century,<sup>26</sup> formerly highlighted by E. P. Thompson, calls for caution: it may well be that once again the real trajectory of a collective political body and the conceptual expression of its mission diverge. And if we keep in mind the uncertain contours of activism with a protective aim, as well as the diversity of actors and attachments that they mobilize, the crystallization of these struggles in a common cause undoubtedly holds great surprises in store for us. However, one thing is perfectly clear: a historical and political task is, without the slightest doubt, emerging – the task of the reinvention of the democratic ambition independent of affluence. What unites, perhaps in spite of themselves, the various mobilizations that we listed at the beginning of this book is the development of a

partnership that renders obsolete the old cornucopian dream and, on the basis of spaces and flows of materials, shapes a new kind of partnership.

The self-protection of the Earth (and the land), which is the real movement hidden behind what is generally called political ecology, must gain self-confidence. It is not a peripheral, subordinate mobilization, which questions the future of modernity only at its margins. Rather, it is this self-protection that embodies the pursuit of a political ideal as old as the previous complex forms of coexistence, while the advocates of the liberal pact and the limitless economy cling to a necessarily transitory mechanism, one that has already lasted much longer than the planet allowed. Between this movement and the rest of the political options available, whether predominantly liberal, sovereignist, authoritarian or palaeosocialist, the relationship is reversed: it is this movement that now embodies the centre of gravity and drives the transformations in progress; it is this movement that projects to its periphery the various avatars of political naturalism, those vestiges of another time. The self-protection of the Earth, therefore, is not an ideological curiosity symptomatic of the erasure of politics, but the only arrangement of concrete struggles and aspirations that can meet the challenges of the present.

## *Conclusion: Reinventing Liberty*

A chasm has opened up between the ordinary horizon of political action and the magnitude of the changes that scientists are telling us about. The climate crisis and the host of problems that accompany it appear, in their gigantic menace, too massive and too intimidating to be the subject of an appropriate response, one adjusted to their material characteristics. And even if, thanks to history, we are now quite familiar with the bundle of causes that have led to the current geo-ecological derailment, to backtrack requires an effort that immediate interests, consolidated habits and the inertia of technological mechanisms make it difficult to imagine. This is the whole paradox expressed by the concept of the Anthropocene, which is in vogue today: humanity has acquired such power that it has become a geological actor, but at the same time it has created a monster, an object largely beyond the capacities of control on which it nonetheless prides itself. The politics of the Anthropocene thus merely exposes the striking gap between the level of the demand imposed on us by climate change and the scope of our regulatory systems.

But this chasm, if it exists, must not be reified: it is not due to the nature of action and political thought in the abstract, but to the way in which our instruments of governance are designed, and to the gap between them and the collective aspirations they claim to express. These instruments now operate, in the words of Jedediah Purdy, as ‘decision infrastructures’ which ‘keep us away from the most important problems’ and force us to live within ‘institutions and practices which, while having been refuted by the circumstances and denounced as inadequate, nevertheless persist’.<sup>1</sup> Dispossessed of means to act adapted to the situation that we are experiencing, stuck in a legal architecture that frames and limits the interventions hitherto implemented, we are always tempted to surrender and locate the ecological stake beyond the political, in a struggle for survival or salvation, or else at a lower level, in the accumulation of individual gestures.

Curiously, the environmental question had suffered for several decades from an inverse defect. The disquiet it fostered was in some ways small compared to the labour questions that dominated debates until the end of the twentieth century. The implementation of economic and social justice, decolonization, human rights and also, quite simply, the imperative of material development cast an intimidating shadow over the defence of natural environments, which could legitimately appear only as a secondary struggle. For a long time, ecology remained the poor relation of social critique, precisely because it was not clear how it could channel radical demands for justice. That period is fortunately behind us, and the idea that political ecology reconfigures and prolongs past struggles is no longer considered a crazy hypothesis. Classical environmentalism, which made nature its fetish and free enjoyment its ideal, has given way to a material reformulation of social conflicts, more in line with their history.

This does not mean, however, that we finally have an intellectual and practical compass that can guide us through the ordeal of climate change. Modern political language is so deeply linked to now obsolete forms of land appropriation, resource management, and scientific authority that it must undergo a complete and demanding transformation. We have found elements of this in the movements of symmetrization, which have often been wrongly attacked as destroying modernity. The questioning of the epistemic and political order that separated the social from the natural, the West from the rest of the world, was in reality an attempt to safeguard political reflexivity against all fixation – i.e., against the illusion that what has been a driver of progress at some point in history will remain so forever. The regime of the twofold exception that has long ensured that the moderns can remain ecologically and politically dominant is, whether we like it or not, rendered ineffective by current events, and other ways of settling into the world must be built on its rubble. It is quite true that the imperatives of yesterday can be the threats of today, but we must proceed with great caution when deciding what we want to inherit, and from what historical burdens we want to be freed.

That is the reason why this book has taken the form of a conceptual and historical retrospect. The events of the present encourage us to reread the philosophical tradition and its main categories, placing the occupation and use of the land at the heart of the problem, as well as the relationships between scientific and political authorities. This is not because the ecological question has always been there, lurking in the shadow of philosophy, but because this occupation and these uses are ubiquitous elements of modern political imaginary, worse or better, and thus allow us to identify a common thread in the long term of social conflicts. The space in which we coexist, as well as its material

characteristics, are connected to a set of rules of access, exploitation and distribution, forms of knowledge and cooperation; this space gives rise to rivalries and alliances that constitute the fabric of our historical experience. The brief episode during which an abundance of raw materials and energy was able to generate collective emancipation, an episode now drawing to a close, has helped to conceal these components of political life from our gaze. We then believed that to think politically meant to think in terms of the abstract conditions of justice, dictated by intersubjective deliberation, while this very abstraction was actually an effect of the exact particular material conditions that made extraction-autonomy possible.

This is also the reason why these material components are so noisily reminding us of their existence. Many people these days are surprised that something as trivial as climate can have political significance – and some, faced with this disturbing reminder, prefer to deny it. Seeing the accumulation of heatwaves, extreme climatic events, the melting of glaciers and the collapse of insect populations as political phenomena of primary importance is clearly out of step with our implicit definition of what is political. We must therefore relearn the way we think about our arrangements with the Earth, without falling into the twofold trap of, on the one hand, idealizing a state prior to affluence – which had nothing ideal about it, and which is gone for good – and, on the other, promoting a political naturalism for which one would merely need to be attentive to the standards immanent in the living world. We cannot therefore revive an immemorial and happy sobriety, if only because of the importance of industrial struggles in our definition of the democratic and scientific space, and neither can we see the future as the extension of a familiar historical dynamic.

This is the tragedy of the present situation. The ecological and climatic crisis is burning almost all the bridges that usually connect us to the past – since the Earth we inhabit is no longer the same as before – but also to the future as we had imagined it up until now. We inherit a world that no available political category is designed to manage, and therefore we are faced with a seemingly impossible task. This historic loneliness, the fact that the past and the future seem definitively lost to us, and the discouragement that may ensue, can nevertheless be tempered if we manage to tell the story of our recent history and to organize the map of our attachments so that politics and the use of the Earth are no longer heterogeneous. Realigning the labour question on the ecological question, without of course denying the dropouts and changes of scale that keep them apart, makes it possible to restore some unity to this torn historical fabric, and provide some pointers to political action.

In a landmark article, the Indian historian Dipesh Chakrabarty said ten years ago: '[N]o debate on liberty since the time of the Enlightenment shows an awareness of the geological dimension of human action, which nevertheless took shape at the same time and by the same processes as the acquisition of liberty.' Philosophers of liberty, he adds, 'were primarily – and understandably – busy figuring out how to escape injustice, oppression, inequality, and even uniformity'.<sup>2</sup> The statement is quite true if one understands geological action in the maximalist sense given to it by Anthropocene theorists. But the ecological dimension of collective action, understood in a slightly broader sense, has indeed saturated these debates, at least in the background. The conquest of autonomy and the establishment of the legal, technological and economic mechanisms of affluence have largely been cast in the same moulds, deigned to tackle problems considered to be identical. This is what I called the 'liberal pact': the theoretical and practical formula that made intensive, then extensive, growth the vehicle of political emancipation by opening up the horizon of possibilities. This link between the shaping of the material world and the conquest of liberty was in many ways an indirect, unnoticed link – and this is what helps to explain Chakrabarty's assertion. The ecological foundation of political controversy was often implicit, as something that obsessed thought without being formulated.

But Chakrabarty, in this passage, pointed to the real problem: to what extent can the interminable process of the acquisition of liberty be captured by a material history, and how does this history challenge the meaning of this conquest? We can clearly see here the discrepancy with the classic thesis of historical materialism, formerly at the centre of the critical landscape. For historical materialism, praxis was intended to produce liberty at the same time as it produced the human world. Henceforth, the environmental history of political ideas must, by shedding light on the geo-ecological opportunities on which modern political reason has relied, protect and extend the sphere of liberty by guaranteeing the reproduction of the living world.

\* \* \*

This conceptual and political discrepancy is not self-evident, mainly because in the past, political ecology has essentially been formulated as a critique of progress. Or, more precisely, as a critique of the confiscation of the meaning of progress by autonomous and blind technological and economic mechanisms, whose alienating power needed to be denounced. From the Frankfurt School to Marcuse and André Gorz, this critique was part of an indictment of modern instrumental reason that had allegedly failed in its emancipatory mission. Or (and this pretty much comes down to the same thing),

this instrumental reason was charged with going beyond its original purposes to leave the field open to an infernal formalist utopianism. The fundamental hypothesis which drove this movement supposed that the abolition of the structures of alienation, whether they apply to human beings or to nature, would make it possible to reconquer an essential free humanity, capable of reconstituting what its relationship to the world should always have been. By eliminating the inauthentic desires created by technoscientific capitalism to justify itself, we were finally going to lift the heavy stone laid on human liberty by the abuses of reason.

Obviously, overcoming the two major forms of exploitation that defined the industrial age at one and the same time was a laudable goal. But the problem is that this wager does not stand up to analysis: all our concepts of autonomy are more or less entangled in the mechanisms of affluence. In other words, it is not enough to wipe out, by the magic of critique, the predatory powers linked to the indefinite expansion of capital so that a harmonious relationship to others and to the environment can be reborn. To say that liberty has a material history is also to assume that it is constantly defined, or at least nuanced, by ecological relationships that cannot be neutral. The liberty of the moderns is linked to the affordances of the land, to industrial conflicts, and to the possibilities opened up by 'development'; and this liberty is now dependent on the ordeal of climate change. The struggles and the categories that give it its content are in every respect sociohistorical realities, and unless we characterize with a minimum of precision the new assemblies that will enable us to rethink its definition, the task risks being left incomplete.

What blocks the emergence of a political thinking that can face up to the climate crisis is therefore not only capitalism and its excesses; it is also partly the very meaning of the emancipation of which we are the heirs, one that was built in the industrial and productionist matrix and resulted in the establishment of protective mechanisms still dependent on the reign of the growth. The obstacle lies within us, among us: in our laws and our institutions more than in an economic spectre hanging over us, one that we can comfortably denounce from the outside. The welfare state, in spite of its immense benefits, has helped, for example, to consolidate the economic performance objectives that condition its financing, and that in turn cause competition between social and ecological risks. The *gilets jaunes* (yellow vests) demonstrations in France are a perfect illustration of this: taxing fuel to dissuade people from using it conflicts with the sense of liberty of millions of people caught up in the mobility infrastructures inherited from the Thirty Glorious Years. So we need to perfect mechanisms that will allow us to lower our dependence on these energies without



violating the collective aspirations enshrined in them. This twofold constraint cannot be resolved either by denouncing the 'ideology of the car' or by compensating for its externalities, but by reinventing the protective institutions and urban infrastructures, and the mechanisms that finance them, as well as the social attachments which find their place in them.

That is one of the reasons why ecology and politics today are almost indistinguishable from one another, after having been diametrically opposed for so long. The majority of the most pressing demands for justice that are making themselves heard today, whether on a local or a global scale, are to do with issues related to energy, land use, the dynamics of living things, and material flows that structure the distribution of wealth. And as long as we maintain a critical knowledge of these networks of dependence on the fabric of which our lives encounter each other in vital ways, and provided that we follow this path and build it as a privileged site of political thought, it is possible that we will enable this new form of critical collective subject to emerge.

# Notes

## Introduction

- 1 See the National Oceanic and Atmospheric Administration website: [www.esrl.noaa.gov/gmd/ccgg/trends](http://www.esrl.noaa.gov/gmd/ccgg/trends).
- 2 Caspar A. Hallmann et al., 'More than 75 percent Decline over 27 Years in Total Flying Insect Biomass in Protected Areas', *PLoS ONE*, 12, 10 (2017).
- 3 See in particular the studies of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES): [www.ipbes.net](http://www.ipbes.net).
- 4 A ZAD (*zone à défendre* or 'zone to defend' – a name that involves the subversive hijacking of the earlier, more official acronym for a *zone d'aménagement différé*, or 'future development zone') is an area occupied by protestors who seek to prevent types of development to which they are hostile. The ZAD in Notre-Dame-des-Landes, near Nantes in France, was set up as a mass squat in the 2000s, meant to prevent the building of a new airport. (Translator's note.)
- 5 The Dakota Access Pipeline protests, starting in 2016, targeted plans to build an oil pipeline under the Standing Rock Reservation for Native Americans in North Dakota and South Dakota. (Translator's note.)
- 6 'Labour question' translates the French term '*question sociale*', which generally covers issues such as labour relations. (Translator's note.)
- 7 'Department of Energy Authorizes Additional LNG Exports from Freeport LNG': <https://www.energy.gov/articles/department-energy-authorizes-additional-lng-exports-freeport-lng>.
- 8 Max Roser, 'No Matter What Extreme Poverty Line You Choose, the Share of People Below that Poverty Line has Declined Globally': <https://ourworldindata.org/no-matter-what-global-poverty-line>; and more generally the data compiled at [www.ourworldindata.org](http://www.ourworldindata.org).
- 9 See Steven Pinker, *Enlightenment Now. The Case for Reason, Science, Humanism, and Progress* (London: Penguin, 2018) and Samuel Moyn's critique, 'Hype for the Best: Why does Steven Pinker Insist that Human Life is on the Up?': <https://newrepublic.com/article/147391/hype-best>.

- 10 Branko Milanović, *Global Inequality: A New Approach for the Age of Globalization* (Cambridge: MA: Harvard University Press, 2016).
- 11 See Matthew E. Kahn and Siqi Zheng, *Blue Skies Over Beijing. Economic Growth and the Environment in China* (Princeton, NJ: Princeton University Press, 2016).

## Chapter 1 The Critique of Ecological Reason

- 1 Fridolin Krausmann et al., ‘Global Human Appropriation of Net Primary Production Doubled in the 20th Century’, *PNAS*, 110, 25 (2013), pp. 10329–10342.
- 2 See the data provided at <http://data.footprintnetwork.org>.
- 3 A summary of the nine ‘planetary boundaries’ can be found at [www.stockholmresilience.org](http://www.stockholmresilience.org).
- 4 Several initiatives of this kind have been undertaken by groups of financial actors such as the ‘Green Bond Principles’ ([www.icmagroup.org](http://www.icmagroup.org)).
- 5 One example is Roger Scruton, *Green Philosophy. How to Think Seriously About the Planet* (London: Atlantic, 2011). For a critique, see Nils Gilman, ‘Beware the Rise of Far-Right Environmentalism’, *The World Post*, 17 October 2019: <https://www.berggruen.org/the-worldpost/articles/beware-the-rise-of-far-right-environmentalism>.
- 6 Tim Jackson, *Prosperity Without Growth*, 2nd edn (London: Routledge, 2017).
- 7 Gareth Stedman Jones, *An End to Poverty?* (London: Profile Books, 2004).
- 8 Marcel Gauchet analyses the political discourse of revolutionary autonomy in *La Révolution des droits de l’homme* (Paris: Gallimard, 1989).
- 9 See for example Silyane Larcher, *L’Autre Citoyen. L’idéal républicain et les Antilles après l’esclavage* (Paris: Armand Colin, 2014).
- 10 This was a programme shared by the Durkheimian school in France, and by Weber and German sociology, at the beginning of the twentieth century.
- 11 For studies that identify the history of the environmental problem with the model of a gradual emergence of ecological ideas, see Roderick Nash, *The Rights of Nature. A History of Environmental Ethics* (Madison: University of Wisconsin Press, 1989).
- 12 John Baird Callicott, *Earth’s Insights. A Multicultural Survey of Ecological Ethics from the Mediterranean Basin to Australian Outback* (Berkeley: University of California Press, 1994).
- 13 Bentham’s famous words about animals (‘The question is not, Can they reason? nor, Can they talk? but, Can they suffer?’) serve as a guideline for Peter Singer’s philosophy of animal liberation. See Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation*, first published in 1780, and Peter Singer, *Animal Liberation. A New Ethics for our Treatment of Animals* (New York: Avon Books, 1975).
- 14 See John R. McNeill, *Something New under the Sun. An environmental history of the twentieth century* (London: Penguin, 2001).
- 15 Though it is not presented as a work of environmental history, the now classic study by Kenneth Pomeranz, *The Great Divergence: China, Europe,*

- and the *Making of the Modern World Economy* (Princeton, NJ: Princeton University Press, 2009) has been a fundamental contribution to studies focusing on the ecological question.
- 16 Here, 'naturalism' does not refer to a philosophical doctrine that defends the legitimacy of an overall scientific approach to the world, as is the common usage. See Philippe Descola, *Beyond Nature and Culture*, trans. Janet Lloyd (Chicago, IL: University of Chicago Press, 2013). The way the social sciences have distanced themselves from the concept of nature stems partly from the works of Bruno Latour, for example, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 2012), and more broadly from the school of 'science studies' as reflected in the feminism of Marilyn Strathern, Donna Haraway, Isabelle Stengers and Vinciane Despret.
  - 17 See the way this term is used in Donna Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Chicago, IL: Prickly Paradigm Press, 2003).
  - 18 The French term here is *subsistence*; it could also be translated as 'livelihood'. The word 'subsisting' should here be understood as covering all the ways in which humans gain their livelihood. (Translator's note.)
  - 19 Karl Polanyi, *The Livelihood of Man*, edited by Harry W. Pearson (Cambridge, MA: The Academic Press, 1977).
  - 20 In the sense defined by James J. Gibson: 'The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill' – *The Ecological Approach to Visual Perception* (Boston, MA: Houghton Mifflin Harcourt, 1979), p. 127. The word 'affordance' is sometimes translated into French as 'invite' which gives a good sense of how Charbonnier uses it – as an 'invitation' to make use of, or to think of, a particular thing, i.e., what that thing *offers* us. (Translator's note.)
  - 21 This critique was formulated by Edmund Husserl in *The Crisis of European Sciences and Transcendental Phenomenology*, trans. David Carr (Evanston, IL: Northwestern University Press, 1970).
  - 22 See Helen Tilley, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870–1950* (Chicago, IL: University of Chicago Press, 2011); and Pierre Singaravélou, *Professer l'empire. Les 'sciences coloniales' en France sous la IIIe République* (Paris: Publications de la Sorbonne, 2011).
  - 23 Krausmann et al., 'Global Human Appropriation'.
  - 24 Paul J. Crutzen, 'Geology of Mankind', *Nature*, 415, 6867 (2002).
  - 25 Johan Rockström et al., 'A Safe Operating Space for Humanity', *Nature*, 461, 7263 (2009), p. 472–475.
  - 26 J. M. Keynes, 'Economic Possibilities for our Grandchildren (1930)', in *Essays in Persuasion* (New York: Harcourt Brace, 1932), pp. 358–373.
  - 27 Max Weber, *The Protestant Ethic and the Spirit of Capitalism and Other Writings*, ed. and trans. Peter Baehr and Gordon C. Wells (London: Penguin, 2002).
  - 28 Karl Polanyi, 'La mentalité de marché est obsolète', in *Essais* (Paris: Seuil, 2008).
  - 29 Cornelius Castoriadis, *Domaines de l'homme* (Paris: Seuil, 1986), p. 479.

- 30 Reinhardt Koselleck has put forward a genealogy of the relations between history and critique in *Critique and Crisis: Enlightenment and the Pathogenesis of Modern Society* (Cambridge, MA: MIT Press, 1988 [1959]).
- 31 See John Pocock, *The Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition* (Princeton, NJ: Princeton University Press, 1975).
- 32 Edward P. Thompson, *The Making of the English Working Class* (London: Victor Gollancz, 1963).
- 33 See for example Marcel Gauchet, especially *La Démocratie contre elle-même* (Paris: Gallimard, 2002).
- 34 On the emergence of the middle classes, see Pamela Pilbeam, *The Middle Classes in Europe, 1789–1914: France, Germany, Italy, and Russia* (Chicago, IL: Lyceum books, 1990). This phenomenon soon drew the interest of the sociologists: see Maurice Halbwachs, *La Classe ouvrière et les niveaux de vie. Recherches sur la hiérarchie des besoins dans les sociétés industrielles contemporaines* (Paris: Alcan, 1912).
- 35 See, respectively, Jackson, *Prosperity Without Growth*; Serge Latouche, *Le Pari de la décroissance* (Paris: Fayard, 2006); Kate Raworth, *Doughnut Economics* (London: Random House, 2017); Dominique Méda, *Au-delà du PIB. Pour une autre mesure de la richesse* (Paris: Flammarion, 2008), and Amartya Sen's work as a whole.
- 36 For an attempt of this kind, see however Lucas Chancel, *Insoutenables inégalités. Pour une justice sociale et environnementale* (Paris: Les petits matins, 2017).
- 37 See the *Stern Review on the Economics of Climate Change* (London: HM Treasury, 2010).

## **Chapter 2 Sovereignty and Property: Political Philosophy and the Land**

- 1 For a history of modern political geography, see Charles S. Maier, *Once within Borders: Territories of Power, Wealth, and Belonging since 1500* (Cambridge: Belknap, 2016); Lauren Benton, *A Search for Sovereignty: Law and Geography in European Empires, 1400–1900* (Cambridge: Cambridge University Press, 2010); and for its prehistory, see Stuart Elden, *The Birth of Territory* (Chicago, IL: University of Chicago Press, 2013).
- 2 I am partly taking this expression from Baptiste Morizot, but I am here using it in a somewhat different sense. (See also ch. 1, note 20. Translator's note.)
- 3 My reading will focus on the Atlantic, under the influence of Locke. But it needs to be remembered that the Mediterranean was and remained a crucial geographical centre in the constitution of the paradigm of sovereignty. See Guillaume Calafat, *Une Mer jalouse. Contribution à l'histoire de la souveraineté (Méditerranée, XVIIe siècle)* (Paris: Seuil, 2019).
- 4 Carl Schmitt, *The Nomos of the Earth in the International Law of the Jus*

- Publicum Europaeum*, trans. G. L. Ulmen (New York: Telos Publishing, 2006).
- 5 For a discussion of the implications of this doctrine in philosophy, see Céline Spector, ‘Le concept de mercantilisme’, *Revue de métaphysique et de morale*, 39, 3 (2003), pp. 289–309.
  - 6 Olivier Christin, *La Paix de religion. L’autonomisation de la raison politique au XVIe siècle* (Paris: Seuil, 1997).
  - 7 David Armitage, *Civil Wars. A History in Ideas* (New York: Alfred Knopf, 2017).
  - 8 Reinhart Koselleck, ‘Le futur passé des temps modernes’, in *Futur passé. Contribution à la sémantique des temps historiques* (Paris: Éditions de l’EHESS, 2016).
  - 9 Anthony Pagden, ‘Human Rights, Natural Rights, and Europe’s Imperial Legacy’, *Political Theory*, 31, 2 (2003), pp. 171–199.
  - 10 Andrew Fitzmaurice, *Sovereignty, Property and Empire, 1500–2000* (Cambridge: Cambridge University Press, 2014), and ‘The genealogy of *terra nullius*’, *Australian Historical Studies*, 129 (2007), pp. 1–15.
  - 11 Alexandre Koyré, *From the Closed World to the Infinite Universe* (Baltimore, MD: Johns Hopkins University Press, 1968).
  - 12 See Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England*, 2nd edn (Chicago, IL: Chicago University Press, 1995); and Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution* (New York: Harper & Row, 1983).
  - 13 Grotius, *The Freedom of the Seas*, trans. Ralph Van Deman Magoffin: [https://upload.wikimedia.org/wikipedia/commons/7/7b/Grotius\\_Hugo\\_The\\_Freedom\\_of\\_the\\_Sea\\_\(v1.0\).pdf](https://upload.wikimedia.org/wikipedia/commons/7/7b/Grotius_Hugo_The_Freedom_of_the_Sea_(v1.0).pdf).
  - 14 On Grotius’ thought in the context of trading empires, see Martine Julia Van Ittersum, *Profit and Principle. Hugo Grotius, Natural Rights Theories, and the Rise of Dutch Power in the East Indies, 1595–1615* (Boston, MA: Brill, 2006).
  - 15 Grotius, *The Freedom of the Seas*; see also Van Ittersum, *Profit and Principle*, pp. 21–22.
  - 16 Van Ittersum, *Profit and Principle*, p. 35.
  - 17 Grotius, *The Freedom of the Seas*; see also Van Ittersum, *Profit and Principle*, p. 37.
  - 18 Van Ittersum, *Profit and Principle*, p. 38.
  - 19 Paul Samuelson, ‘The Pure Theory of Public Expenditure’, *Review of Economics and Statistics*, 36, 4 (1954), pp. 387–389.
  - 20 Samuelson, ‘The Pure Theory of Public Expenditure’, p. 44.
  - 21 Hugo Grotius, *The Rights of War and Peace*: <https://oll.libertyfund.org/titles/grotius-the-rights-of-war-and-peace-1901-ed> (partial English translation).
  - 22 Grotius, *The Rights of War and Peace*.
  - 23 Grotius, *The Rights of War and Peace*.
  - 24 Grotius, *The Rights of War and Peace*.
  - 25 Hannes Gerhardt, Philip E. Steinberg, Jeremy Tasch, Sandra J. Fabiano and Rob Shields, ‘Contested Sovereignty in a Changing Arctic’, *Annals of the Association of American Geographers*, 100, 4 (2010), pp. 992–1002; see

- also Philip Steinberg, Jeremy Tasch and Hannes Gerhardt, *Contesting the Arctic. Politics and Imaginaries in the Circumpolar North* (London: I. B. Tauris, 2015).
- 26 See *Les Fondateurs du droit international. Leurs œuvres, leurs doctrines* (Paris: Giard et Brière, 1904).
- 27 Carl Schmitt, 'Appropriation/Distribution/Production: Toward a Proper Formulation of Basic Questions of any Social and Economic Order', *Telos* 95 (Spring 1993).
- 28 Thomas Hobbes, *Leviathan*, ed. Richard Tuck, revised student edition (Cambridge: Cambridge University Press, 1996), pp. 170–71.
- 29 David Armitage, 'John Locke, Carolina, and the *Two Treatises of Government*', *Political Theory*, 32, 5 (2004), p. 617.
- 30 Armitage, 'John Locke', pp. 607–608.
- 31 'Observations on Wine, Olives, Fruit and Silk', quoted in Armitage, 'John Locke', p. 611.
- 32 John Locke, *Second Treatise of Government*, ch. V, §26: <https://english.hku.hk/staff/kjohnson/PDF/LockeJohnSECONDTREATISE1690.pdf>.
- 33 Locke, *Second Treatise of Government*, §28.
- 34 Locke, *Second Treatise of Government*, §32.
- 35 Karl Polanyi, *The Great Transformation. The Political and Economic Origins of Our Time*, 2nd edn (Boston, MA: Beacon Press, 2001), Ch. 3, 'Habitation versus Improvement'; Paul Warde, 'The Idea of Improvement, c.1520–1700', in Richard Hoyle (ed.), *Custom, Improvement and the Landscape in Early Modern Britain* (Farnham-Burlington: Ashgate, 2011), pp. 127–148.
- 36 In *Nature's Government* (New Haven, CT: Yale University Press, 2000), Richard Drayton describes the context in which the ideal of *improvement* developed, especially the role of the Royal Society. He insists on the role of works such as *The English Improver Improved* by Walter Blith, published in 1652, which attempts to fulfil Bacon's promises consisting, as the work's frontispiece indicates, in liberating a 'providential abundance'.
- 37 Locke, *Second Treatise of Government*, §34.
- 38 For a reading of Locke in Marxist terms, see Neal Wood, *John Locke and Agrarian Capitalism* (Berkeley: University of California Press, 1984); and Ellen Meiksins Wood, 'The Agrarian Origins of Capitalism', *Monthly Review*, 50, 3 (1998).
- 39 '[F]or the provisions serving to the support of human life, produced by one acre of inclosed and cultivated land, are (to speak much within compass) ten times more than those which are yielded by an acre of land of an equal richness lying waste in common. And therefore he that incloses land, and has a greater plenty of the conveniencies of life from ten acres, than he could have from an hundred left to nature, may truly be said to give ninety acres to mankind' (Locke, *Second Treatise of Government*, §37).
- 40 Locke, *Second Treatise of Government*, §36.
- 41 Locke, *Second Treatise of Government*, §50.
- 42 Locke, *Second Treatise of Government*, §45.
- 43 In the sense of C. B. Macpherson in *The Political Theory of Possessive Individualism: From Hobbes to Locke* (Oxford: Clarendon Press, 1962).



### Chapter 3 Grain and the Market: The Order of Commerce and the Organic Economy in the Eighteenth Century

- 1 Donald Winch, *Economics and Policy: A Historical Study* (New York: Walker & Co, 1969); and *Poverty and Riches: An Intellectual History of Political Economy in Britain (1750–1834)* (Cambridge: Cambridge University Press, 1996).
- 2 Adam Smith, *The Theory of Moral Sentiments* (1759): [https://en.wikisource.org/wiki/The\\_Theory\\_of\\_Moral\\_Sentiments](https://en.wikisource.org/wiki/The_Theory_of_Moral_Sentiments); Albert O. Hirschman, *The Passions and the Interests: Political Arguments for Capitalism Before Its Triumph* (Princeton, NJ: Princeton University Press, 1997).
- 3 This is Karl Polanyi's interpretation of the economists' campaign to abrogate the poor laws in England, admittedly rather belatedly, at the beginning of the nineteenth century. See *The Great Transformation*, chs. 7–10.
- 4 I have taken this expression from E. A. Wrigley, *Poverty, Progress and Population* (Cambridge: Cambridge University Press, 2004).
- 5 Also, as Paul Warde notes, seeing economic thought in the context of the limitations of the organic system of production does not inevitably mean that limits become an obsession. See *The Invention of Sustainability* (Cambridge: Cambridge University Press, 2018), ch. 7.
- 6 It should be borne in mind that at this time Europe was emerging from a long period of economic and demographic stagnation. See Jan De Vries, *The Economy of Europe in an Age of Crisis, 1600–1750* (Cambridge: Cambridge University Press, 1976).
- 7 John C. Weaver, *The Great Land Rush and the Making of the Modern World (1650–1900)* (Montreal: McGill-Queen's University Press, 2003).
- 8 François Quesnay, 'Grains', in *L'Encyclopédie, ou Dictionnaire raisonné des Sciences, des arts et des Métiers*, repr. in *Physiocrates. Quesnay, Dupont de Nemours, Mercier de la Rivière, L'Abbé Baudeau, Le Trosne* (Paris: Guillaumin, 1846), p. 252. On this point, see Catherine Larrère, 'L'analyse physiocratique des rapports entre la ville et la campagne', *Études rurales*, 49, 1 (1973), pp. 42–68.
- 9 On the critique of the policing of wheat, see Jean-Daniel Boyer, 'Fermiers et grains, deux moments de confrontation de Quesnay à la science du commerce. Police contre polices au nom des libertés', *Cahiers d'économie politique*, 73 (2017), pp. 31–65.
- 10 See the discussions on this subject in the article 'Fermiers', and in the *Tableau économique* (Paris: GF-Flammarion), p. 95.
- 11 'True wealth is simply wealth in production. Wealth in money is just an effect of the former, and is sustained only by the former.' See Mercier de la Rivière, *L'Ordre naturel et essentiel des sociétés politiques* (Paris: Geuthner, 1910 [1767]), ch. 40.
- 12 See Mercier de la Rivière, *L'Ordre naturel*, p. 352.
- 13 Mirabeau, *Philosophie Rurale, ou économie générale et politique de l'agriculture, réduite à l'ordre immuable des lois physiques et morales qui assurent la prospérité des Empires* (Amsterdam: Les Libraires associés, 1763), p. 332.

- 14 For a clear explanation of the quantitative logic of the *Tableau*, see Jean-Yves Grenier, *Histoire de la pensée économique et politique de la France d'Ancien Régime* (Paris: Hachette, 2007), pp. 195–199.
- 15 This reading of the Physiocrat movement as having ‘one foot in the Enlightenment and the other in the state’ was put forward by Reinhart Koselleck in *Critique and Crisis: Enlightenment and the Pathogenesis of Modern Society* (Cambridge, MA: MIT Press, 1988 [1959]).
- 16 Karl Wittfogel, *Oriental Despotism: A Comparative Study of Total Power* (New Haven, CT: Yale University Press, 1957); James C. Scott, *Seeing Like a State. How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998).
- 17 David Hume, ‘Of Refinement in the Arts’, in *Essays Moral, Political, and Literary*, ed. Eugene F. Miller (Indianapolis, IN: Liberty Fund, Inc., 1987): [https://www.econlib.org/library/LFBooks/Hume/hmMPL.html?chapter\\_num=30#book-reader](https://www.econlib.org/library/LFBooks/Hume/hmMPL.html?chapter_num=30#book-reader).
- 18 Fredrik Albritton Jonsson, *Enlightenment's Frontier. The Scottish Highlands and the Origins of Environmentalism* (New Haven, CT: Yale University Press, 2013).
- 19 Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*: [https://www.ibiblio.org/ml/libri/s/SmithA\\_WealthNations\\_p.pdf](https://www.ibiblio.org/ml/libri/s/SmithA_WealthNations_p.pdf), p. 512.
- 20 Smith, *The Wealth of Nations*, Book III, ch. 1, ‘Of the Natural Progress of Opulence’.
- 21 Smith, *The Wealth of Nations*, pp. 287ff.
- 22 Smith, *The Wealth of Nations*, p. 287.
- 23 Smith, *The Wealth of Nations*, p. 533.
- 24 Smith, *The Wealth of Nations*, pp. 533–534. This last passage forms a transition to the last book, Book V, which focuses on the sovereign’s revenue, i.e., public finances.
- 25 Wrigley, *Poverty, Progress and Population*, ch. 3: ‘Two kinds of capitalism, two kinds of growth’, pp. 68–86. This is also why Smith and his contemporaries viewed close neighbours such as Scotland, as strategic land resources to be exploited. See also Jonsson, *Enlightenment's Frontier*.
- 26 Here is one of the most direct expressions of this: ‘It deserves to be remarked, perhaps, that it is in the progressive state, while the society is advancing to the further acquisition, rather than when it has acquired its full complement of riches, that the condition of the labouring poor, of the great body of the people, seems to be the happiest and the most comfortable. It is hard in the stationary, and miserable in the declining state. The progressive state is in reality the cheerful and the hearty state to all the different orders of the society. The stationary is dull; the declining, melancholy’: Smith, *The Wealth of Nations*, pp. 67–68. In this sense, Smith was one of the first to propose what was later called the ‘Whig’ interpretation of history. On this term, see Herbert Butterfield, *The Whig Interpretation of History* (London: Bell, 1931).
- 27 On the relation between the question of growth and Smith’s implicit anthropology, see Christian Marouby, *L'Économie de la nature. Adam Smith et l'anthropologie de la croissance* (Paris: Seuil, 2004).

- 28 The following discussion draws largely on Antonin Pottier, ‘L’Économie dans l’impasse climatique. Développement matériel, théorie immatérielle et utopie auto-stabilisatrice’, PhD dissertation, EHESS, 2014.
- 29 Quoted in Pierre-Joseph Proudhon, *The System of Economic Contradictions: or, The Philosophy of Poverty*, trans. Benjamin R. Tucker: <https://socialsciences.mcmaster.ca/~econ/ugcm/3ll3/proudhon/misery.htm>.
- 30 Jan De Vries, *The Industrious Revolution: Consumer Behaviour and the Household Economy, 1650 to the Present* (Cambridge: Cambridge University Press, 2008), p. 6.
- 31 De Vries, *The Industrious Revolution*, p. 10.
- 32 For a discussion of the debate between De Vries and Pomeranz, see Christopher Bayly, *The Birth of the Modern World 1780–1914: Global Connections and Comparisons* (Oxford: Blackwell, 2004).
- 33 On the debates about the political geography of the eighteenth century, see Isaac Nakhimovsky, *The Closed Commercial State. Perpetual Peace and Commercial Society from Rousseau to Fichte* (Princeton, NJ: Princeton University Press, 2011). On Fichte’s political thought in general, see David James, *Fichte’s Social and Political Philosophy: Property and Virtue* (Cambridge: Cambridge University Press, 2011).
- 34 On cameralism, see Keith Tribe, *Governing Economy: The Reformation of German Economic Discourse (1750–1840)* (Cambridge: Cambridge University Press, 1988); and Guillaume Garner, *État, économie et territoire en Allemagne. L’espace dans le caméralisme et l’économie politique (1740–1820)* (Paris: Editions de l’EHESS, 2005).
- 35 Johann Gottlieb Fichte, *The Closed Commercial State*, trans. Anthony Curtis Adler (New York: SUNY Press, 2012), p. 94.
- 36 See Fichte, *The Closed Commercial State*, p. 6. Fichte’s theory of property is developed in his *Foundations of Natural Right*, translated by Michael Baur (Cambridge: Cambridge University Press, 2000).
- 37 Fichte, *The Closed Commercial State*, p. 108.
- 38 Fichte sees international trade as a kind of war (*The Closed Commercial State*, p. 145).
- 39 For an example of this ubiquity, see the two articles by Jason Moore, “‘Amsterdam Is Standing on Norway’”. Part I: The Alchemy of Capital, Empire and Nature in the Diaspora of Silver, 1545–1648’, *Journal of Agrarian Change*, 10, 1 (2010), and “‘Amsterdam is Standing on Norway’”. Part II: The Global North Atlantic in the Ecological Revolution of the Long Seventeenth Century’, *Journal of Agrarian Change*, 10, 2 (2010).
- 40 Fichte, *The Closed Commercial State*, p. 85.
- 41 Fichte, *The Closed Commercial State*, p. 169.
- 42 Fichte, *The Closed Commercial State*, p. 171.

#### Chapter 4 The New Ecological Regime

- 1 Jennifer Pitts, *A Turn to Empire. The Rise of Imperial Liberalism in Britain and France* (Princeton, NJ: Princeton University Press, 2005); Uday Singh Mehta, *Liberalism and Empire. A Study in 19th-Century British Liberal*

- Thought* (Chicago, IL: University of Chicago Press, 1999); Anthony Pagden, 'Fellow Citizens and Imperial Subjects: Conquest and Sovereignty in Europe's Overseas Empires', *History and Theory*, 44, 4 (2005), pp. 28–46.
- 2 Jennifer Pitts, 'Empire and Legal Universalisms in the Eighteenth Century', *American Historical Review*, 117, 1 (2012), pp. 92–121.
  - 3 Jean-Claude Debeir, Jean-Paul Deléage and Daniel Hémerly, *Une Histoire de l'énergie* (Paris: Flammarion, 2013), ch. 5; E. A. Wrigley, *Energy and the English Industrial Revolution* (Cambridge: Cambridge University Press, 2010); Rolf Peter Sieferle, *The Subterranean Forest: Energy Systems and the Industrial Revolution* (Cambridge: White Horse, 2001); Edward Barbier, *Scarcity and Frontiers. How Economies Have Developed Through Natural Resource Exploitation* (University of Wyoming Press, 2010), chs. 5, 6 and 7.
  - 4 See Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace & Company, 1934); also the work of Václav Smil, in particular *Energy in World History* (Boulder, CO: Westview Press, 1994).
  - 5 The term was coined by Arnold Toynbee: *Lectures on the Industrial Revolution of the 18th Century in England* (London: Longmans, 1884). For an overview of these debates, see Julien Vincent, 'Cycle ou catastrophe? L'invention de la "révolution industrielle" en Grande-Bretagne, 1884–1914', in Jean-Philippe Genet and François-Joseph Ruggiu (eds), *Les Idées passent-elles la Manche? Savoir, représentations, pratiques (France-Angleterre, Xe–XXe siècles)* (Paris: Presses de la Sorbonne, 2007), pp. 235–258.
  - 6 Andreas Malm, *Fossil Capital* (London: Verso, 2016); and Michael Mann, 'Review Article: The Great Divergence', *Millennium: Journal of International Studies*, 46, 2 (2018), pp. 241–248.
  - 7 Donald Kelley and Bonnie Smith, 'What Was Property? Legal Dimensions of the Labour Question in France (1789–1848)', *Proceedings of the American Philosophical Association*, 128, 3 (1984), pp. 200–230.
  - 8 Stephen Jay Gould and Elisabeth S. Vrba, 'Exaptation. A Missing Term in the Science of Form', *Paleobiology*, 8, 1 (1982), pp. 4–15.
  - 9 Stephen Jay Gould and Richard Charles Lewontin. 'The Spandrels of San Marco and the Panglossian Paradigm. A Critique of the Adaptationist Programme', *Proceedings of the Royal Society of London. Series B, Biological Sciences*, 205, 1161 (1979), pp. 581–598.
  - 10 Marcel Gauchet, *La Révolution des droits de l'homme* (Paris: Gallimard, 1989).
  - 11 François Guizot, *Essai sur l'histoire et sur l'état actuel de l'instruction publique en France* (Paris: Maradan, 1816), pp. 37–38.
  - 12 On the relationships between natural law, the idea of a golden age under the aegis of reason, and the Terror, see Dan Edelstein, *The Terror of Natural Right. Republicanism, the Cult of Nature, and the French Revolution* (Chicago, IL: University of Chicago Press, 2009).
  - 13 On this problem, see Frédéric Brahami, *La Raison du Peuple, Un héritage de la Révolution française (1789–1848)*, especially the theme of the 'offence to time', ch. 2.

- 14 Pierre Rosanvallon, *Le Moment Guizot* (Paris: Gallimard, 1985), p. 25.
- 15 John Stuart Mill, *On Liberty*: <https://socialsciences.mcmaster.ca/econ/ugcm/3ll3/mill/liberty.pdf>, p. 8.
- 16 Drayton, *Nature's Government*; and Pitts, *A Turn to Empire*.
- 17 Thomas Leroux and François Jarrige, *La Contamination du monde* (Paris: Seuil, 2017), p. 90, and more generally the whole of ch. 3.
- 18 Jean-Baptiste Fressoz, *L'Apocalypse joyeuse. Une histoire du risque technologique* (Paris: Seuil, 2012).
- 19 For a study of the conditions in which this work was written, see the excellent article by Antoine Missemmer, 'William Stanley Jevons' *The Coal Question* (1865), Beyond the Rebound Effect', *Ecological Economics*, 82 (2012), pp. 97–103.
- 20 William Stanley Jevons, *The Coal Question* (London: Macmillan, 1865), pp. vii–viii.
- 21 Jevons, *The Coal Question*, pp. 459–460 (Jevons's emphasis).
- 22 See Harold Hotelling, 'The Economics of Exhaustible Resources', *Journal of Political Economy*, 39, 2 (1931), pp. 137–175, and King Hubbert's studies of 'peak oil'. In the article quoted above, Antoine Missemmer sets Jevons in the context of a history that starts with Malthus and Ricardo, who discuss the exhaustion of the Earth's organic resources, and includes the contemporary problems of ecological economics: Missemmer, 'William Stanley Jevons' *The Coal Question*', pp. 100–102.
- 23 Jevons, *The Coal Question*, p. 17.
- 24 If it goes without saying that coal conditions the use of the steam engine, which converts heat into movement, simple thermal force is also necessary for a great number of chemical procedures, such as the extraction of sodium carbonate for the manufacture of soap, or of glass. Jevons also mentions the importance of abundant energy for the use of newly invented refrigerators – he foresees that the latter have a great future: Jevons, *The Coal Question*, p. 99.
- 25 Jevons, *The Coal Question*, ch. 6.
- 26 Jevons, *The Coal Question*, p. 104. On the next page we read: 'Civilization, says Baron Liebig, is the economy of power, and our power is coal. It is the very economy of the use of coal that makes our industry what it is; and the more we render it efficient and economical, the more will our industry thrive, and our works of civilization grow.'
- 27 In a very interesting passage, Jevons anticipates the argument in Andreas Malm's *Fossil Capital*; according to Jevons, coal allows us to reverse the logic of the previous hydraulic system that consisted in bringing labour to energy, and energy to labour: *The Coal Question*, p. 129.
- 28 Jevons, *The Coal Question*, p. 140.
- 29 Jevons, *The Coal Question*, p. 204. On migrations from the British Isles, see James Belich, *Replenishing the Earth: The Settler Revolution and the Rise of the Anglo-World, 1783–1939* (Oxford: Oxford University Press, 2009).
- 30 Jevons, *The Coal Question*, pp. 250–251.
- 31 Fredrik Albritton Jonsson, 'The Origins of Cornucopianism: A Preliminary Genealogy', *Critical Historical Studies*, 1, 1 (2014), pp. 151–168.
- 32 Jonsson, 'The Origins of Cornucopianism', pp. 306–307.

- 33 Alfred Crosby, *The Columbian Exchange. Biological and Cultural Consequences of 1492* (Wesport, CT: Greenwood Publishing Group, 1972).
- 34 William Cronon, *Changes in the Land: Indians, Colonists and the Ecology of New England* (New York: Hill & Wang, 1983).
- 35 See Eric Williams, *Capitalism and Slavery* (Chapel Hill: University of North Carolina Press, 1944); and C. L. R. James, *The Black Jacobins: Toussaint L'Ouverture and the San Domingo Revolution* (London: Penguin, 2001).
- 36 Sidney Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Penguin Books, 1986).
- 37 See Drayton, *Nature's Government*. For examples from the nineteenth and twentieth centuries, see Helen Tilley, *Africa as a Living Laboratory. Empire, Development, and the Problem of Scientific Knowledge, 1870–1950* (Chicago, IL: University of Chicago Press, 2011); Pierre Singaravélou, *Professer l'empire* (Paris: Publications de la Sorbonne, 2011); Alice Conklin, *A Mission to Civilize. The Republican Idea of Empire in France and West Africa, 1895–1930* (Stanford, CA: Stanford University Press, 1997).
- 38 Richard Grove, *Green Imperialism: Colonial Expansion, Tropical Island Eden and the Origins of Environmentalism, 1600–1860* (Cambridge: Cambridge University Press, 1996).
- 39 Modern history's focus on the West has itself given rise to some important studies. See J. M. Blaut, *The Colonizer's Model of the World: Geographical Diffusionism and Eurocentric History* (London: Guilford Press, 1993); Jack Goody, *The Theft of History* (Cambridge: Cambridge University Press, 2006).
- 40 Silyane Larcher, *L'Autre Citoyen. L'idéal républicain et les Antilles après l'esclavage* (Paris: Armand Colin, 2014).
- 41 See Hannah Arendt, *The Origins of Totalitarianism* (New York: Harcourt Brace & Company, 1973).
- 42 'Democracy is favorable to the increase of the internal resources of the State; it tends to diffuse a moderate independence; it promotes the growth of public spirit, and fortifies the respect which is entertained for law in all classes of society': Alexis de Tocqueville, *Democracy in America*, trans. Henry Reeve (Book 1, ch. 13): <https://www.gutenberg.org/files/815/815-h/815-h.htm>.
- 43 Tocqueville, *Democracy in America*, Book 1, ch. 17.
- 44 We should however note that Tocqueville devotes the first chapter of his study to the 'Exterior Form of North America'. Like Jefferson a few decades earlier, he produces a description and inventory of the continent's geophysical characteristics, especially its rivers. See Thomas Jefferson, *Notes on the State of Virginia*: [https://en.wikisource.org/wiki/Notes\\_on\\_the\\_State\\_of\\_Virginia\\_\(1802\)](https://en.wikisource.org/wiki/Notes_on_the_State_of_Virginia_(1802)).
- 45 Tocqueville describes the American territory as 'prepared to be the abode of a great nation, yet unborn': *Democracy in America*, Book 1, ch. 1.
- 46 Tocqueville, *Democracy in America*, Book 1, ch. 17.
- 47 Tocqueville, *Democracy in America*, Book 1, ch. 17.
- 48 Jedediah Purdy, 'American Natures: The Shape of Conflict in Environmental Law', *Harvard Environmental Law Review*, 36 (2012), p. 173.
- 49 'It is the proper end of government to reduce this wretched waste to the



- smallest possible amount, by taking such measures as shall cause the energies now spent by mankind in injuring one another, or in protecting themselves against injury, to be turned to the legitimate employment of the human faculties, that of compelling the powers of nature to be more and more subservient to physical and moral good': J. S. Mill, *Principles of Political Economy*, Book V, ch. XI, §16: [https://oll.libertyfund.org/title/mill-principles-of-political-economy-ashley-ed#lf0199\\_label\\_1225](https://oll.libertyfund.org/title/mill-principles-of-political-economy-ashley-ed#lf0199_label_1225).
- 50 Frédéric Brahami, *La Raison du peuple* (Paris: Les Belles Lettres, 2016).

## Chapter 5 Industrial Democracy: From Proudhon to Durkheim

- 1 Pierre-Joseph Proudhon, *The System of Economic Contradictions, or, The Philosophy of Poverty*, vol. 1: <https://theanarchistlibrary.org/library/pierre-joseph-proudhon-system-of-economical-contradictions-or-the-philosophy-of-poverty>.
- 2 See Émile Durkheim, *Le Socialisme* (Paris: PUF, 1992).
- 3 Marx wrote this in a letter to Schweitzer, 24 January 1865: *Misère de la philosophie* (Paris: Éditions Sociales, 1977), pp. 183, 188.
- 4 On this expression, and more generally on the controversies over property in the early nineteenth century, see Donald Kelley and Bonnie Smith, 'What Was Property? Legal Dimensions of the Labour question in France (1789–1848)', *Proceedings of the American Philosophical Association*, 128, 3 (1984), pp. 200–230.
- 5 *Code Civil*, art. 544.
- 6 Bernardi, quoted in Kelley and Smith, 'What Was Property?', p. 201.
- 7 William Belime, *Traité du droit de possession* (Paris: Joubert, 1842), p. 3.
- 8 Adolphe Thiers, *De la propriété* (Paris: Paulin, Lheureux et Cie, 1848).
- 9 Jean-Baptiste Say, *Traité d'économie politique*, 6th edn (Paris: Zeller, 1841), p. 133.
- 10 Kelley and Smith, 'What Was Property?', p. 211.
- 11 Proudhon, *What Is Property?* trans. Benjamin R. Tucker (Princeton, NJ: Benjamin R. Tucker, 1876).
- 12 Proudhon, *What Is Property?*, p. 76.
- 13 Proudhon, *What Is Property?*, p. 92.
- 14 Proudhon, *What Is Property?*, p. 75.
- 15 Louis Blanc, *Organisation du travail*, 5th edn (Paris: Société de l'industrie fraternelle, 1847 [1839]), p. 37.
- 16 Joseph Schumpeter, *Capitalism, Socialism and Democracy* (London: Routledge, 2003 [1943]), p. 83.
- 17 Proudhon, *The System of Economic Contradictions*.
- 18 Blanc, *Organisation du travail*, p. 4.
- 19 Proudhon, *The System of Economic Contradictions*.
- 20 In a short text published in the revolutionary period of 1848, the association between property and labour was explicitly formulated: *Le Droit au travail et le droit de propriété* (Paris: Vassbenter, 1848). (The title means 'The right to work and the right to property'. Translator's Note.)
- 21 Proudhon, *The System of Economic Contradictions*.



- 22 Proudhon, *The System of Economic Contradictions*.
- 23 In fact, Proudhon always quotes the same passage, which he helped to make famous, in the *The System of Economic Contradictions*: ‘A man who is born into a world already occupied, his family unable to support him, and society not requiring his labor – such a man, I say, has not the least right to claim any nourishment whatever: he is really one too many on the earth. At the great banquet of Nature there is no plate laid for him. Nature commands him to take himself away, and she will not be slow to put her order into execution.’
- 24 Proudhon, ‘Les Malthusiens’, text published in the journal *Le Peuple*, 10 August 1848.
- 25 Proudhon, *The System of Economic Contradictions*.
- 26 Proudhon, *The System of Economic Contradictions*.
- 27 Proudhon, *The System of Economic Contradictions*.
- 28 Proudhon’s argument prefigures one of the main ideas of contemporary economic anthropology: see Marshall Sahlins, *Stone Age Economics* (New York: De Gruyter, 1972).
- 29 Pierre-Joseph Proudhon, *De la Concurrence entre le chemin de fer et les voies navigables* (Paris: Guillaumin, 1845), p. 43.
- 30 The expression comes from James C. Scott, *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia* (New Haven, CT: Yale University Press, 2009).
- 31 Charles Dunoyer, *De la Liberté du travail* (Paris: Guillaumin, 1845), quoted in Proudhon, *The System of Economic Contradictions*. Charles Dunoyer was a liberal lawyer and economist frequently mentioned by Proudhon, who considered him to be one of the most significant figures in political economy.
- 32 Proudhon, *The System of Economic Contradictions*.
- 33 See William H. Sewell, *Work and Revolution in France: The Language of Labour from the Old Regime to 1848* (Cambridge: Cambridge University Press, 1980).
- 34 Sewell, *Work and Revolution in France*.
- 35 The main work on this subject is Paolo Grossi, *An Alternative to Private Property: Collective Property in the Juridical Consciousness of the Nineteenth Century* (Chicago, IL: University of Chicago Press, 1981).
- 36 See the examples in Serge Audier, *La Société écologique et ses ennemis* (Paris: La Découverte, 2017); and François Jarrige, *Technocritiques. Du refus des machines à la contestation des technosciences* (Paris: La Découverte, 2014).
- 37 Beatrice and Sidney Webb, *Industrial Democracy* (London: Longmans, Green & Co., 1897).
- 38 On this connection, see Bruno Karsenti and Cyril Lemieux, *Sociologie et socialisme* (Paris: Éditions de l’EHESS, 2017).
- 39 On the historical significance of the idea of a ‘middle class’, see Christophe Charle, ‘Les “classes moyennes” en France: discours pluriel et histoire singulière, 1870–2000’, *Revue d’histoire moderne et contemporaine*, 50, 4 (2003), pp. 108–134.
- 40 For a presentation of Durkheim that rejects commonplace ideas about

- the latter's holism, see Bruno Karsenti, *La Société en personnes. Études durkheimiennes* (Paris: Economica, 2006); and Francesco Callegaro, *La Science politique des modernes. Durkheim, la sociologie et le projet d'autonomie* (Paris: Economica, 2015).isme
- 41 Émile Durkheim, *Suicide: A Study in Sociology*, trans. John A. Spaulding and George Simpson (Glencoe, IL: The Free Press, 1951), p. 314.
- 42 Émile Durkheim, *The Division of Labour in Society*, trans. George Simpson (Glencoe, IL: The Free Press, 1933), p. 50 (translation slightly modified).
- 43 Durkheim, *The Division of Labour in Society*, p. 234.
- 44 Durkheim, *The Division of Labour in Society*, p. 265.
- 45 Durkheim, *The Division of Labour in Society*, pp. 234–235.
- 46 On this intellectual tradition, see Isabelle Dupéron, *G. T. Fechner. Le parallélisme psychophysologique* (Paris: PUF, 2000).
- 47 Durkheim, *Suicide*, p. 285.
- 48 Durkheim, *Suicide*, p. 113.
- 49 Durkheim, *Suicide*, p. 286.
- 50 It is in the main industrial centres that crimes and suicides are most frequent: Durkheim, *Suicide*, p. 358.
- 51 Durkheim, *Suicide*, p. 254.
- 52 Mélanie Plouviez, 'Le projet durkheimien de réforme corporative: droit professionnel et protection des travailleurs', *Les Études sociales*, 157–158 (2013), pp. 57–103.
- 53 Plouviez, 'Le projet durkheimien', p. 101.
- 54 For the most tragic example of such resurgences, see Johann Chapoutot, *La Révolution culturelle nazie* (Paris: Gallimard, 2017).

## Chapter 6 The Technocratic Hypothesis: Saint-Simon and Veblen

- 1 John R. Commons, *Legal Foundations of Capitalism* (New York: Macmillan, 1924), pp. 3–4.
- 2 Henri de Saint-Simon, *Œuvres complètes* (Paris: PUF, 2012), vol. II, p. 1638. References hereafter are to this edition.
- 3 On the possibility of Saint-Simon's influence on Veblen, see William E. Akin, *Technocracy and the American Dream: The Technocrat Movement, 1900–1941* (Berkeley: University of California Press), p. 122, which refers to the influential engineer Harold Loeb's interest in Saint-Simon in his *Life in a Technocracy*.
- 4 Olivier Pétré-Grenouilleau, *Saint-Simon. L'utopie ou la raison en actes* (Paris: Payot, 200) provides important biographical data on this period.
- 5 Saint-Simon, *Œuvres complètes*, p. 107.
- 6 Saint-Simon, *Œuvres complètes*, p. 1081.
- 7 Saint-Simon, *Œuvres complètes*, pp. 2119–2124.
- 8 'All the desires of industry are limited to wishing that people do not interfere with its affairs, and that they will protect it without governing it': Saint-Simon, *Œuvres complètes*, p. 1450. 'Industry needs to be governed as little as possible and, to this end, there is only one means – that it contrive

- to be governed as cheaply as possible’: Saint-Simon, *Œuvres complètes*, p. 1470.
- 9 In the elections of May 1815, twenty-three representatives of banking and industry were elected to the National Assembly, marking a new stage in French political history.
  - 10 See, for example, Saint-Simon, *Œuvres complètes*, p. 1444: ‘All of society rests on industry. Industry is the sole guarantor of its existence, the single source of all wealth and all prosperity. Thus, the state of things that is most favourable to industry is the only one that is favourable to society.’ It was at this time, too, that Saint-Simon adopted as his motto ‘All through industry, all for it’.
  - 11 See Célestin Bouglé and Élie Halévy (eds), *Doctrine de Saint-Simon, Exposition, Première année, 1829* (Paris: Rivière, 1924), p. 94. On this question, see Vincent Bourdeau, ‘Les mutations de l’expression “exploitation de l’homme par l’homme” chez les saint-simoniens (1829–1851)’, *Cahiers d’économie politique*, 75 (2018), pp. 13–41.
  - 12 Bouglé and Halévy, *Doctrine de Saint-Simon*, p. 17.
  - 13 Saint-Simon, *Œuvres complètes*, p. 2172.
  - 14 Saint-Simon, *Œuvres complètes*, pp. 2187–2188.
  - 15 Jean-Baptiste Fressoz, *L’Apocalypse joyeuse. Une histoire du risque technologique* (Paris: Seuil, 2012); and, from a similar angle, François Jarrige and Thomas Le Roux, *La Contamination du monde* (Paris: Seuil, 2017).
  - 16 The link between the critique of modernity and the preservation of nature, including in its aesthetic dimension, was made mainly in England, by John Ruskin and Thomas Carlyle, with political consequences that extended from romantic socialism in the former to conservatism in the latter.
  - 17 Bruno Latour, *Politics of Nature: How to Bring the Sciences into Democracy*, trans. Catherine Porter (Boston, MA: Harvard University Press, 2004).
  - 18 In this sense, we can see a significant Saint-Simonian heritage in some radical initiatives for energy transition, such as that proposed in the NégaWatt manifesto. Written by a collective of engineers, this text envisages reintegrating into energy planning the set of environmental and economic criteria that will enable the creation of energy infrastructures for a sustainable social optimum. See Association NégaWatt, *Manifeste NégaWatt. En route pour la transition énergétique* (Arles: Actes Sud, 2012).
  - 19 On this period, see Richard Hofstadter’s classic *The Age of Reform* (New York: Vintage Books, 1955).
  - 20 See in particular Thorstein Veblen, *The Theory of the Leisure Class: An Economic Study of Institutions* (New York: Penguin, 1994).
  - 21 Cyril Hédoïn, *L’Institutionnalisme historique et la relation entre théorie et histoire en économie* (Paris: Garnier, 2014), p. 352.
  - 22 On this period, see Jeff Crane, *The Environment in American History. Nature and the Formation of the United States* (London: Routledge, 2015), ch. 8.
  - 23 Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920* (Pittsburgh, PA: University of Pittsburgh Press, 1959).

- 24 There is a good summary of Muir's positions in Gifford Pinchot, 'The Foundations of Prosperity', *The North American Review*, 188, 636 (1908), pp. 740–752.
- 25 In 1909, the National Conservation Commission was tasked by President Roosevelt with drawing up as complete an inventory as possible of available natural resources.
- 26 See 'A Memorandum on a Schedule of Prices for the Staple Foodstuffs', in *Essays in our Changing Order, Collected Works*, vol. X, pp. 347–354.
- 27 Frederick Taylor, *The Principles of Scientific Management* (New York: Harper and Brothers, 1911).
- 28 On this period, see William Akin, *Technocracy and the American Dream: The Technocrat Movement, 1900–1941* (Berkeley: University of California Press, 1977); and David Adair, 'The Technocrats, 1919–1967: A Case Study of Conflict and Change in a Social Movement', PhD dissertation, Vancouver, Simon Fraser University, 1970.
- 29 One of the main studies in this context is Stuart Chase, *The Economy of Abundance* (New York: Macmillan, 1934).
- 30 It should also be noted that the technocratic movement owes a large part of its audience to the success of a science fiction novel that depicts the radiant future of an efficient and totalitarian industrial society: Edward Bellamy, *Looking Backward, 2000–1887* (Boston, MA: Ticknor and Co., 1888).
- 31 At about the same period, Wilhelm Ostwald developed a theory of the social order that subordinated all political reason to the quest for an energy optimum, in *Energetische Grundlagen der Kulturwissenschaft* (Leipzig, 1909).
- 32 These two texts together comprise volume VII of the *Collected Works*.
- 33 Veblen, *The Engineers*, in *Collected Works*, vol. VII, p. 4.
- 34 Veblen, *The Engineers*, in *Collected Works*, vol. VII, pp. 20–21.
- 35 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 44. According to Veblen, property has been denatured by the course of historical events, and no longer assumes the responsibilities it once did. It used to be true that property conferred a personal responsibility for things upon the individual, but when property is applied to industry and the large-scale organizations required by industrialization, it loses most of its once essential functions.
- 36 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 21.
- 37 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 44. The modern point of view in legal matters seems to lag behind the progress being made in science and technology.
- 38 Veblen, *The Engineers*, in *Collected Works*, vol. VII, pp. 29ff.
- 39 Veblen, *The Engineers*, in *Collected Works*, vol. VII, p. 41.
- 40 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 60.
- 41 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, pp. 68–70.
- 42 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 70.
- 43 This development is studied in Commons, *Legal foundations of Capitalism*. Veblen enters this debate when he discusses the legal status of business, defined by the notion of 'going concern': a business's *raison d'être* lies in

- its right to remain solvent, i.e., the continuity of the flow of capital that passes through it and the health of its balance sheets. Properly industrial factors (management of human beings and resources) are thus eliminated from this definition. See Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 38.
- 44 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 89.
- 45 Veblen, *The Vested Interests*, in *Collected Works*, vol. VII, p. 93. See also the theme of ‘tangible performance’, in Veblen, *The Engineers*, in *Collected Works*, vol. VII, p. 75.
- 46 On Veblen’s influence on this discipline, see Ernst Berndt, *From Technocracy to Net Energy Analysis. Engineers, Economists, and Recurring Energy Theories of Value* (Cambridge, MA: MIT, Studies in Energy and the American Economy, Discussion Paper no. 11, 1982).
- 47 Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process* (Cambridge, MA: Harvard University Press, 1971).
- 48 Robert Costanza, *Frontiers in Ecological Economics* (Cheltenham: Elgar, 1997).
- 49 *Millennium Ecosystem Assessment: Ecosystems and Human Well-Being* (Washington, DC: Island Press, 2005).
- 50 See, in France, Antonin Pottier, *Comment les économistes réchauffent le climat* (Paris: Seuil, 2016); and Lucas Chancel, *Insoutenables inégalités. Pour une justice sociale et environnementale* (Paris: Les petits matins, 2017).

## Chapter 7 Nature in a Market Society

- 1 Karl Marx and Friedrich Engels, *Manifesto of the Communist Party*: <https://www.marxists.org/archive/marx/works/download/pdf/Manifesto.pdf>.
- 2 Karl Marx, ‘On the Question of Free Trade’: <https://www.marxists.org/archive/marx/works/1888/free-trade/index.htm>.
- 3 ‘L’impossible anthropologie communiste de Karl Marx’, in Vincent Bourdeau and Arnaud Macé (eds.), *La Nature du socialisme. Pensée sociale et conceptions de la nature au XIXe siècle* (Besançon: Presses Universitaires de Franche-Comté, 2018), p. 345.
- 4 Marx and Engels, *Manifesto of the Communist Party*.
- 5 Cornelius Castoriadis raises this question directly in *The Imaginary Institution of Society*, trans. Kathleen Blamey (Cambridge, MA: MIT Press, 1987).
- 6 Karl Marx, *The Poverty of Philosophy*: <https://www.marxists.org/archive/marx/works/download/pdf/Poverty-Philosophy.pdf>.
- 7 Karl Marx, *Theses on Feuerbach*: <https://www.marxists.org/archive/marx/works/1845/theses/theses.htm>.
- 8 On this link between his reform, Marx’s positions, and German legal thought, especially Savigny’s *Traité de droit romain*, see the illuminating discussion in Mikhaïl Xifaras, ‘Marx, justice et jurisprudence, une lecture du “vol de bois”’, *Revue française d’histoire des idées politiques* (2002), pp. 63–112.

- 9 For a fuller study of a similar case, albeit a much older one (going back to 1723), see Edward P. Thompson, *Whigs and Hunters. The Origins of the Black Act* (London: Allen Lane, 1975).
- 10 Karl Marx, *Debates on the Law on Thefts of Wood in Proceedings of the Sixth Rhine Province Assembly. Third Article*: <https://marxists.catbull.com/archive/marx/works/1842/10/25.htm#n1>.
- 11 Marx, *Debates on the Law on Thefts of Wood*.
- 12 It is clear that the theme of the commons, one that critical thought is currently taking a new look at – see, for example, Pierre Dardot and Christian Laval, *Commun. Essai sur la révolution au XXIe siècle* (Paris: La Découverte, 2014) – continues where Marx left off in 1842.
- 13 Chloé Gaboriaux, ‘Nature versus Citoyenneté dans le discours républicain’, in Bourdeau and Macé, *La Nature du socialisme*, p. 191.
- 14 Karl Marx, *The Eighteenth Brumaire of Louis Bonaparte*, ch. 7: <https://www.marxists.org/archive/marx/works/1852/18th-brumaire/ch07.htm>.
- 15 Letter of 8 March 1881 to Vera Zassoulitch, republished by Maurice Godelier in *Sur les Sociétés précapitalistes* (Paris: Éditions Sociales, 1978), pp. 340–342.
- 16 Karl Marx, *Capital. A Critique of Political Economy, Volume I. Book One: The Process of Production of Capital*: <https://www.marxists.org/archive/marx/works/download/pdf/Capital-Volume-I.pdf>.
- 17 Marx, *Capital*, vol. I.
- 18 Marx, *Capital*, vol. I.
- 19 Marx, *Capital*, vol. I, p. 363.
- 20 Charles Babbage, *On the Economy of Machinery and Manufactures*, 4th edn (London: Charles Knight, 1935); Andrew Ure, *Philosophie des manufactures ou économie industrielle de la fabrication du coton et de la laine, du lin et de la soie* (Paris: L. Mathias, 1836).
- 21 On the contributions of Babbage and Ure to Marx’s thought, see Keith Tribe, ‘De l’atelier au procès de travail. Marx, les machines et la technologie’, in François Jarrige (ed.), *Dompter Prométhée. Technologies et socialismes à l’âge romantique (1820–1870)* (Besançon: Presses Universitaires de Franche-Comté, 2016).
- 22 See John B. Foster, *Marx’s Ecology: Materialism and Nature* (New York: Monthly Review Press, 2000).
- 23 See, for example, the letter of 13 February 1866 to Engels in which Marx gets carried away and writes that Liebig and Schönbein (a Swiss scientist and the founder of geochemistry) ‘are more important than all the economists put together’ (Marx and Engels, *Lettres sur les sciences de la nature* (Paris: Éditions Sociales, p. 44)).
- 24 Karl Marx, *Capital*, vol. I.
- 25 Karl Marx, *Capital*, vol. I, p. 330.
- 26 Karl Marx, *Grundrisse, Foundations of the Critique of Political Economy*: <https://www.marxists.org/archive/marx/works/download/pdf/grundrisse.pdf>.
- 27 Marx, *Grundrisse*, passim.
- 28 Marx, *Grundrisse*, p. 399.
- 29 This expression appears in Marx, *Grundrisse*.



- 30 Marx, *Grundrisse*.
- 31 Marx, *Grundrisse*, p. 334.
- 32 All these quotations are taken from Marx, *Grundrisse*, pp. 335–336.
- 33 Karl Polanyi, *The Great Transformation. The Political and Economic Origins of Our Time*, 2nd edn (Boston, MA: Beacon Press, 2001), p. 340.
- 34 Polanyi, *The Great Transformation*, p. 70.
- 35 Polanyi, *The Great Transformation*, p. 318.
- 36 Polanyi, *The Great Transformation*, p. 71.
- 37 Polanyi, *The Great Transformation*, p. 84.
- 38 Before Polanyi, in 1940, the sociologist Karl Mannheim attempted to answer this argument in *Man and Society in an Age of Reconstruction, Collected Works*, vol. 2 (London: Routledge, 1997).
- 39 See for example *The Good Society* (Boston, MA: Little, Brown & Co., 1937). Hayek acknowledges this debt in *The Road to Serfdom* (London: Routledge, 1944), though this does not prevent a certain number of political misunderstandings between them, since Lippmann defends a typically American progressivist liberalism, which in particular comes with measures to supervise private property, measures that Hayek always rejected.
- 40 Hayek, *The Road to Serfdom*. In this context, Hayek explicitly contrasts Tocqueville with Saint-Simon, confirming retrospectively that the debate on the materiality of autonomy does indeed draw essentially on the thought of these writers.
- 41 See Polanyi, *The Great Transformation*, chs. 7 and 8.
- 42 Polanyi, *The Great Transformation*, p. 137.
- 43 See Polanyi, *The Great Transformation*, pp. 172ff.
- 44 On these questions, see the works by Fredrik Albritton Jonsson and Paul Warde.
- 45 See Polanyi, *The Great Transformation*, ch. 3, ‘Habitation contre amélioration’, and especially the extract of a document presented to the House of Lords in 1607: ‘L’homme pauvre sera satisfait dans son but: l’habitation; et le gentilhomme ne sera pas entravé dans son désir: l’Amélioration: See Polanyi, *The Great Transformation*, p. 77. This is clearly reminiscent of the notion of improvement in the thought of Locke (ch. 2).
- 46 See Polanyi, in *Essais*, pp. 505–520.
- 47 André Orléan, *L’Empire de la valeur* (Paris: Seuil, 2011), p. 133.
- 48 On this point, see Marshall Sahlins, *Stone Age Economics* (New York: De Gruyter, 1972).
- 49 See Andreas Malm, *Fossil Capital* (London: Verso, 2016).
- 50 The main theorist of colonization, Wakefield, is a faithful follower of the Ricardo-Malthus school. See Edward Gibbon Wakefield, *A View of the Art of Colonization* (Cambridge: Cambridge University Press, 2014 [1849]).
- 51 Polanyi, ‘La machine et la découverte de la société’, in *Essais*, p. 547.
- 52 Polanyi, ‘La machine et la découverte de la société’, in *Essais*, p. 547.
- 53 Polanyi, *The Great Transformation*, p. 261.
- 54 Polanyi, *The Great Transformation*, p. 253.
- 55 Polanyi, *The Great Transformation*, p. 233.



- 56 Edward P. Thompson, ‘The Moral Economy of the English Crowd in the Eighteenth Century’, *Past & Present*, 50 (1971), pp. 76–136.
- 57 Polanyi, *The Great Transformation*, p. 259. Of course, the way Polanyi generalizes from the case of England to the whole of Europe needs to be somewhat qualified. The political history of European rural areas between the sixteenth and nineteenth centuries does not uniformly follow the model proposed here, and the specificity of the case of France, for example, would require further examination. See M. Agulhon, *La République au village* (Paris: Plon, 1970), where the case of a rural area adopting republican democracy is discussed.
- 58 Georges Canguilhem, ‘Les paysans et le fascisme’, dans *Œuvres complètes*, vol. 1, *Écrits philosophiques et politiques, 1926–1939* (Paris: Vrin, 2011), p. 558.
- 59 Polanyi, *The Great Transformation*, p. 266.
- 60 This expulsion of the land outside of any theorization of progressive thinking corresponds to what Bruno Latour has recently diagnosed in *Où atterrir?* (Paris: La Découverte, 2017).
- 61 Aldo Leopold, *Almanach d’un Comté des sables* (Paris: GF-Flammarion, 2000).

## Chapter 8 The Great Acceleration and the Eclipse of Nature

- 1 I am using this term in the same sense as Wolfgang Streeck in his *Du temps acheté. La crise sans cesse ajournée du capitalisme démocratique* (Paris: Gallimard, 2014).
- 2 William Beveridge, ‘Social insurance and allied services’, HM Stationery Office (1943), §444.
- 3 On the involvement of intellectuals in American welfare, see Nils Gilman, *Mandarins of the Future: Modernization Theory in Cold War America* (Baltimore, MA: Johns Hopkins University Press, 2007); on the war on poverty, see Romain Huret, *La Fin de la pauvreté? Les experts sociaux en guerre contre la pauvreté aux États-Unis (1945–1974)* (Paris: Éditions de l’EHESS, 2008).
- 4 For a counter-history written from this point of view, see Céline Pessis, Sezin Topçu and Christophe Bonneuil (eds), *Une Autre Histoire des Trente Glorieuses. Modernisation, contestations et pollutions dans la France d’après-guerre* (Paris: La Découverte, 2013).
- 5 One example is Rachel Carson, *Silent Spring* (Boston, MA: Houghton Mifflin, 1962).
- 6 Jean Fourastié, *Machinisme et Bien-être* (Paris: Minuit, 1951), p. 9.
- 7 For a historical reflection on the conquest of domestic isolation, see Chris Otter, ‘Encapsulation: Inner Worlds and their Discontents’, *Journal of Literature and Science*, 10, 2 (2017), pp. 55–66.
- 8 Will Steffen, Wendy Broadgate, Lisa Michel Deutsch, Owen Gaffney and Cornelia Ludwig, ‘The Trajectory of the Anthropocene: The Great Acceleration’, *The Anthropocene Review*, 2, 1 (2015), pp. 81–98; John R. McNeill, *The Great Acceleration. An Environmental History of the*

- Anthropocene since 1945* (Cambridge, MA: Harvard University Press, 2014).
- 9 Herbert Marcuse, *One-Dimensional Man. Studies in the Ideology of Advanced Industrial Society* (Boston, MA: Beacon Press, 1964).
  - 10 On the welfare state, see Marcuse, *One-Dimensional Man*.
  - 11 Theodor Adorno and Max Horkheimer, *La Dialectique de la raison* (Paris: Gallimard, 1974 (1944)).
  - 12 See Marcuse, *One-Dimensional Man*. This problem is eloquently discussed in a lecture given in July 1967 in London, where he refers to the problem of gaining freedom from a society that is neither poor nor falling apart, not in lost cases terroristic, but that ascribes great significance to the satisfaction of people's cultural and material needs – a society that, to put it in a slogan, provides a large proportion of its population with benefits. See also 'Liberation from the Affluent Society', in Marcuse, *Collected Works*, vol. 3, 'The New Left and the 1960s' (London: Routledge, 2005).
  - 13 The legal metaphor is found in Marcuse, *One-Dimensional Man*.
  - 14 Marcuse, *One-Dimensional Man*.
  - 15 Marcuse, *One-Dimensional Man*.
  - 16 See Herbert Marcuse, *Eros and Civilization: A Philosophical Inquiry into Freud* (Boston, MA: Beacon Press, 1955).
  - 17 Marcuse, *One-Dimensional Man*, ch. 6. Note that this blend of Marxism, psychoanalysis and phenomenology would later form the basis of the work of André Gorz, which in many aspects follows in Marcuse's path.
  - 18 Marcuse, *One-Dimensional Man*; Marcuse also emphasizes the need for imagination.
  - 19 Marcuse, *One-Dimensional Man*.
  - 20 The book's first page sets the tone, with its denunciation of the war in Vietnam. See Marcuse, *One-Dimensional Man*.
  - 21 Marcuse, 'Liberation from the Affluent Society'.
  - 22 It is interesting that, for Marcuse, the reduction of the future population is a precondition of this liberation (Marcuse, *One-Dimensional Man*).
  - 23 Marcuse, *One-Dimensional Man*.
  - 24 On the ambiguities of these movements, see Thomas Frank, *The Conquest of Cool. Business culture, counterculture, and the rise of hip consumerism* (Chicago, IL: University of Chicago Press, 1997).
  - 25 Aaron Bastani, *Fully Automated Luxury Communism. A Manifesto* (London: Verso, 2018).
  - 26 See for example Richard Lane's evidence about the role played by the Paley Commission in the wake of the war in the construction of the imperative of growth, in 'The American Anthropocene. Economic Scarcity and Growth during the Great Acceleration', *Geoforum*, 99 (2019), pp. 11–21.
  - 27 Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil*, 2nd rev. edn (London: Verso, 2013).
  - 28 Mitchell, *Carbon Democracy*.
  - 29 Mitchell, *Carbon Democracy*.
  - 30 This critique is analysed by Claus Offe in 'New Social Movements: Challenging the Boundaries of Institutional Politics', *Social Research*, 52, 4 (1985), pp. 817–868.

- 31 On these arrangements, see Andrew Barry, ‘Technological Zones’, *European Journal of Social Theory*, 9, 2 (2006), pp. 239–253; see also the concept of ‘technoscape’ developed by Arjun Appadurai, *Modernity at Large. Cultural Dimensions of Globalization* (Minneapolis, MN: University of Minnesota Press, 1996).
- 32 Mitchell, *Carbon Democracy*. On the social construction of growth on the basis of economic indicators, see Matthias Schmelzer, ‘The Growth Paradigm: History, Hegemony, and the Contested Making of Economic Growthmanship’, *Ecological Economics*, 118 (2015), pp. 262–271; *The Hegemony of Growth. The OECD and the Making of the Economic Growth Paradigm* (Cambridge: Cambridge University Press, 2016).
- 33 Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge, MA: MIT Press, 2009); and ‘Invisible Production and the Production of Invisibility’, in Daniel Lee Kleinman (ed.), *Routledge Handbook of Science, Technology and Society* (London: Routledge, 2014).
- 34 Yannick Barthe, *Le Pouvoir d’indécision. La mise en politique des déchets nucléaires* (Paris: Economica, 2006).
- 35 One might add that the atomic industry also proceeds by spatial externalisation: uranium mines are mainly located in former colonized regions, which entails an indirect but quite real monitoring of economic and health matters. On these matters, see Gabrielle Hecht, *Being Nuclear: Africans and the Global Uranium Trade* (Cambridge, MA: MIT Press, 2012).

## Chapter 9 Risks and Limits: The End of Certainties

- 1 Donella H. Meadows, Dennis Meadows, Jørgen Randers, William Behrens III, *The Limits to Growth* (New York: Universe Books, 1972).
- 2 Ulrich Beck, *Risk Society: Towards a New Modernity* (London: Sage, 1992).
- 3 Paul Ehrlich, *The Population Bomb* (New York: Ballantine Books, 1968); Barry Commoner, *The Closing Circle* (New York: Random House, 1971); Ernst Friedrich Schumacher, *Small is Beautiful* (London: Blond & Briggs, 1973).
- 4 Joan Martinez-Alier, *Ecological Economics: Energy, Environment and Society* (London: Blackwell, 1987).
- 5 These models are described by Jay Forrester in *World Dynamics* (Cambridge: Wright-Allen Press, 1971).
- 6 Meadows et al., *The Limits to Growth*, pp. 102–103.
- 7 Naomi Oreskes and John Krige (eds), *Science and Technology in the Global Cold War* (Cambridge: MIT Press, 2014).
- 8 See chapter 3 (above).
- 9 For a succinct explanation of the connections between degrowth and bioeconomics, see Giorgios Kallis, Christopher Kerschner and Joan Martinez-Alier, ‘The Economics of Degrowth’, *Ecological Economics*, 84 (2012), pp. 172–180. See also the work of Antoine Missemer, especially *Nicholas Georgescu-Roegen. Pour une révolution bioéconomique* (Lyon: ENS

- Éditions), and ‘Nicholas Georgescu-Roegen and Degrowth’, *European Journal of the History of Economic Thought*, 24, 3 (2017), pp. 493–506.
- 10 I am here drawing on this book and ‘Energy and Economic Myths’, *Southern Economic Journal*, 41, 3 (1975), pp. 347–381.
  - 11 See Philip Mirowski, *More Heat Than Light: Economics as Social Physics, Physics as Nature’s Economics* (Cambridge: Cambridge University Press, 1989).
  - 12 ‘Energy and Economic Myths’, p. 356.
  - 13 Nicholas Georgescu-Roegen, *The Entropy Law and the Economic Process* (Cambridge, MA: Harvard University Press, 1971), p. 19.
  - 14 On the form taken by economic debates after 1972, see in particular Francis Sandbach, ‘The Rise and Fall of the *Limits to Growth* Debate’, *Social Studies of Science*, 8 (1978), pp. 495–520.
  - 15 Howard Odum, *Environment, Power and Society* (New York: Columbia University Press, 1971), p. 90.
  - 16 Odum, *Environment, Power and Society*, p. 199.
  - 17 Odum, *Environment, Power and Society*, ch. 9 and p. 303.
  - 18 Odum, *Environment, Power and Society*, ch. 10.
  - 19 For example, Odum suggests ‘redefining the principles of medical ethics that interfere with genetic selection’; see *Environment, Power and Society*, p. 391.
  - 20 Bruno Latour’s work is a wide-ranging reflection on the consequences of the formation and disintegration of the authority of the sciences. See in particular his *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 2012), and *Politics of Nature. How to Bring the Sciences into Democracy*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 2004).
  - 21 Langdon Winner, *The Whale and the Reactor: A Search for Limits in an Age of High Technology* (Chicago, IL: University of Chicago Press, 1986).
  - 22 Robert Castel, *La Montée des incertitudes* (Paris: Seuil, 2009).
  - 23 Castel, *La Montée des incertitudes*, p. 18.
  - 24 See Paul Pierson, *Dismantling the Welfare State? Reagan, Thatcher, and the Politics of Retrenchment* (Cambridge: Cambridge University Press, 1994); and Paul Hacker, *The Great Risk Shift: The Assault on American Jobs, Families, Health Care, and Retirement* (Oxford: Oxford University Press, 2006).
  - 25 Anthony Giddens, ‘Risk and Responsibility’, *The Modern Law Review*, 69, 1 (1999), pp. 1–11. See also Ulrich Beck, Anthony Giddens and Scott Lasch, *Reflexive Modernization. Politics, Tradition and Aesthetics in Modern Social Order* (Cambridge: Polity, 1994).
  - 26 See Giddens, ‘Risk and Responsibility’, p. 5, where he states that risk society, viewed positively, is the society in which there are ever more choices. Indeed, risk society is industrial society when it has transcended its limitations, which assume the form of manufactured risk.
  - 27 Giddens, ‘Risk and Responsibility’, p. 7.
  - 28 See Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Cambridge, MA: Harvard University Press, 1987).
  - 29 See Dominique Pestre, ‘L’analyse de controverses dans l’étude des sciences

- depuis trente ans. Entre outil méthodologique, garantie de neutralité axiologique et politique’, *Mil neuf cent*, 25 (2007), pp. 29–43.
- 30 Stefan Aykut and Amy Dahan, *Gouverner le climat? Vingt ans de négociations internationales* (Paris: Presses de Sciences Po, 2015).
- 31 See, respectively, Timothy M. Lenton, ‘Early Warning of Climate Tipping Points’, *Nature Climate Change*, 1, 4 (2011), pp. 201–209; Johan Rockström et al., ‘A Safe Operating Space for Humanity’, *Nature*, 461 (2009), pp. 472–475; and Will Steffen et al., ‘Trajectories of the Earth System in the Anthropocene’, *PNAS*, 115, 33 (2018), pp. 8252–8259.
- 32 See Roy Scranton, *Learning to Die in the Anthropocene* (San Francisco, CA: City Lights Books, 2015); and Pablo Servigne et Raphaël Stevens, *How Everything Can Collapse: A Manual for Our Times*, trans. Andrew Brown (Cambridge: Polity, 2020).
- 33 A critical analysis of these phenomena can be found in Razmig Keucheyan, *La Nature est un champ de bataille* (Paris: La Découverte, 2014), and Sara Aguiton, ‘Fortune de l’infortune. Financiarisation des catastrophes naturelles par l’assurance’, *Zilsel*, 4 (2018), pp. 21–57.
- 34 Romain Felli, *La Grande Adaptation* (Paris: Seuil, 2016).

## Chapter 10 The End of the Modern Exception and Political Ecology

- 1 It is impossible to do justice to the diversity and breadth of this literature. A panoramic view would include Aimé Césaire, *Discourse on Colonialism*, trans. Joan Pinkham: [http://abahlali.org/files/\\_Discourse\\_on\\_Colonialism.pdf](http://abahlali.org/files/_Discourse_on_Colonialism.pdf); Frantz Fanon, *Black Skin, White Masks*, trans. Charles Lam Markmann (New York: Grove Press, 1967); Edward Said, *Orientalism* (New York: Pantheon Books, 1978); Gayatri Spivak, ‘Can the Subaltern Speak?’ in Cary Nelson and Lawrence Grossberg (eds), *Marxism and the Interpretation of Culture* (Basingstoke: Macmillan, 1988), pp. 271–313; Dipesh Chakrabarty, *Provincializing Europe: Postcolonial Thought and Historical Difference*, rev. edn (Princeton, NJ: Princeton University Press, 2009).
- 2 In other words, I will omit a study of the symmetrization of sex and gender relations, as this would involve issues that go beyond the framework of this book. The feminist critique of political economy, however, has already led to certain convergences with ecology. See Silvia Federici, *Caliban et la Sorcière. Femmes, corps et accumulation primitive* (Genève: Entremonde, 2017 [2004]); Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (New York: Harper Collins, 1990); Maria Mies and Vandana Shiva, *Ecofeminism* (London: Zed Books, 1993); and Ariel Salleh, *Ecofeminism as Politics: Nature, Marx, and the Postmodern* (London: Zed Books, 1997).
- 3 Timothy Mitchell, ‘The Stage of Modernity’, in Timothy Mitchell (ed.), *Questions of Modernity* (Minneapolis: University of Minnesota Press, 2000), p. 3.
- 4 Tania Murray Li, ‘Qu’est-ce que la terre? Assemblage d’une ressource et investissement mondial’, *Tracés*, 33 (2017), pp. 19–48.

- 5 See Andre Gunder Frank, *ReORIENT: Global Economy in the Asian Age* (Berkeley: University of California Press, 1998); Jack Goody, *The Theft of History* (Cambridge: Cambridge University Press, 2012); Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton, NJ: Princeton University Press, 2001).
- 6 For one example, see Gildas Salmon, ‘Les paradoxes de la supervision. Le “règne du droit” à l’épreuve de la situation coloniale dans l’Inde britannique, 1772–1782’, *Politix*, 123 (2019), pp. 35–62.
- 7 George W. Stocking Jr., *Victorian Anthropology* (New York: Free Press, 1987).
- 8 Johannes Fabian, *Time and the Other: How Anthropology Makes its Object* (New York: Columbia University Press, 2014).
- 9 This equivocation was clearly described and assumed by Bronisław Malinowski, ‘The Rationalization of Anthropology and Administration’, *Africa*, 3, 4 (1930), pp. 405–430.
- 10 I discuss this in my earlier work, *La Fin d’un grand partage* (Paris: Éditions du CNRS, 2015).
- 11 See Claude Lévi-Strauss, *The Savage Mind* (Chicago, IL: University of Chicago Press, 1966); and *Race et histoire* (Paris: UNESCO, 1952).
- 12 Silyane Larcher, *L’Autre Citoyen. L’idéal républicain et les Antilles après l’esclavage* (Paris: Armand Colin, 2014).
- 13 Bruno Latour, *Où atterrir? Comment s’orienter en politique* (Paris: La Découverte, 2017).
- 14 David Bloor, *Knowledge and Social Imagery* (Chicago, IL: University of Chicago Press, 1991 [1976]); Bruno Latour and Steve Woolgar, *Laboratory Life: The Construction of Scientific Facts* (Princeton, NJ: Princeton University Press, 1986). See also Harry M. Collins, *Changing Order: Replication and Induction in Scientific Practice* (London: Sage, 1985); Martin J. S. Rudwick, *The Great Devonian Controversy* (Chicago, IL: University of Chicago Press, 1985);
- 15 See Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Cambridge, MA: Harvard University Press, 1987).
- 16 The expression is used in this sense by Achille Mbembe in *Critique of Black Reason*, trans. Laurent Dubois (Durham, NC: Duke University Press, 2017).
- 17 Bruno Latour, ‘Technology is Society made Durable’, *Sociological Review*, 38, 1 (1990), pp. 103–131.
- 18 This movement, sometimes identified as an ‘ontological turn’, can be understood as a way of revitalizing the discipline’s theoretical ambitions after the postmodernist critique of ethnological authority. See Gildas Salmon, ‘On Ontological Delegation. The Birth of Neoclassical Anthropology’, in Pierre Charbonnier, Gildas Salmon, and Peter Skafish (eds.), *Comparative Metaphysics. Ontology after Anthropology* (London: Rowman and Littlefield, 2017), pp. 41–60.
- 19 See Tim Ingold, *The Perception of the Environment. Essays in Livelihood, Dwelling and Skill* (London: Routledge, 2000); Philippe Descola, *La Nature domestique. Symbolisme et praxis dans l’écologie des Achuar* (Paris:



- Éditions de la MSH, 1986); Eduardo Viveiros de Castro, *From the Enemy's Point of View. Humanity and Divinity in an Amazonian Society* (Chicago, IL: University of Chicago Press, 1986); and Nurit Bird David, "'Animism" Revisited. Personhood, Environment and Relational Epistemology', *Current Anthropology*, 40 suppl. (1999), pp. 67–91.
- 20 Pierre Clastres, *La Société contre l'État* (Paris: Minuit, 1974).
- 21 Eduardo Viveiros de Castro, *Métaphysiques cannibales* (Paris: PUF, 2009), p. 4.
- 22 The political stakes of Amazonian animism have been explored on the basis of indigenous reports in Davi Kopenawa and Bruce Albert, *La Chute du ciel. Parole d'un chaman yanomami* (Paris: Plon, 2010).
- 23 See David Abram, *Comment la terre s'est tue. Pour une écologie des sens* (Paris: La Découverte, 2013); and Jane Bennett, *Vibrant Matter. A Political Ecology of Things* (Durham, NC: Duke University Press, 2010).
- 24 See Philippe Descola, *Beyond Nature and Culture*, trans. Janet Lloyd (Chicago, IL: University of Chicago Press, 2013), ch. 13.
- 25 Descola, *Beyond Nature and Culture*.
- 26 André-Georges Haudricourt, 'Domestication des animaux, culture des plantes et traitement d'autrui', *L'Homme*, 2, 1 (1962), pp. 40–50.
- 27 Giorgios Kallis and Erik Swyngedouw, 'Do Bees Produce Value? A Conversation Between an Ecological Economist and a Marxist Geographer', *Capitalism, Nature, Socialism*, 29, 3 (2018), pp. 36–50.
- 28 In particular in a presentation at the conference on 'The Right Use of the Earth' in June 2018: 'Prédation et production. Quel bon usage de la terre?'
- 29 V. Gordon Childe, *Man Makes Himself* (London: Watts, 1936).
- 30 Baptiste Morizot, 'Nouvelles alliances avec la terre. Une cohabitation diplomatique avec le vivant', *Tracés*, 33 (2017), pp. 73–96.
- 31 See the three volumes of *The Modern World System*, published between 1974 and 1989.
- 32 Samir Amin, *Le Développement inégal. Essai sur les formations sociales du capitalisme périphérique* (Paris: Minuit, 1973).
- 33 *The Columbian Exchange. Biological and Cultural Consequences of 1492* (Westport, CN: Greenwood Publishing Group, 1972).
- 34 Joan Martinez-Alier, *The Environmentalism of the Poor. A Study of Ecological Conflicts and Valuation* (Cheltenham: Elgar, 2002).
- 35 Robert Costanza (ed.), *Ecological Economics. The Science and Management of Sustainability* (New York: Columbia University Press, 1991).
- 36 Roldan Muradian, Martin O'Connor and Joan Martinez-Alier, 'Embodied Pollution in Trade. Estimating the "Environmental Load Displacement" of Industrialised Countries', *Ecological Economics*, 41, 1 (2002), pp. 51–67.
- 37 On the convergence between environmental history and the theory of unequal ecological exchange, see Stephen Bunker, *Underdeveloping the Amazon: Extraction, Unequal Exchange and the Failure of the Modern State* (Chicago, IL: University of Chicago Press, 1990); and Alf Hornborg, in particular, *The Power of the Machine: Global Inequalities of Economy, Technology, and Environment* (Lanham, MA: AltaMira Press, 2001); and Alf Hornborg, John McNeill and Joan Martinez-Alier, *Rethinking*



- Environmental History. World-system History and Global Environmental Change* (Lanham, MA: AltaMira Press, 2007).
- 38 Jason Moore and Raj Patel, *A History of the World in Seven Cheap Things* (London: Verso, 2017).
- 39 Murray Li, ‘Qu’est-ce que la terre?’
- 40 For an overview of studies on these issues, see Saturnino M. Borrás Jr., Ruth Hall, Ian Scoones, Ben White and Wendy Wolford, ‘Towards a Better Understanding of Global Land Grabbing: An Editorial Introduction’, *Journal of Peasant Studies*, 38, 2 (2011), pp. 209–216.
- 41 I am here drawing on Ranajit Guha, ‘Quelques questions concernant l’historiographie de l’Inde coloniale’, *Tracés*, 30 (2016): <http://journals.openedition.org/traces/6478>. This text originally appeared in the first volume of *Subaltern Studies* in 1982.
- 42 *Elementary Aspects of Peasant Insurgency in Colonial India* (Delhi: Oxford University Press, 1983).
- 43 *Provincializing Europe*, p. 13.
- 44 See *Elementary Aspects*, especially pp. 329–332. These analyses have led to the development of a literature that occupies the ground between the history of subaltern populations and environmental history. See Madhav Gadgil and Ramachandra Guha, *This Fissured Land: An Ecological History of India* (Oxford: Oxford University Press, 1992).
- 45 See *The Environmentalism of the Poor*.
- 46 For one example, see Marisol de la Cadena, ‘Indigenous Cosmopolitics in the Andes: Conceptual Reflections Beyond “Politics”’, *Cultural Anthropology*, 25, 2 (2012), pp. 334–370; and *Earth Beings. Ecologies of Practice across Andean Worlds* (Durham, NC: Duke University Press, 2015).
- 47 The mass relocalization of productive activities in China is probably the most striking example of this dynamic. See Andreas Malm, ‘China as Chimney of the World: The Fossil Capital Hypothesis’, *Organization & Environment*, 25, 2 (2012), pp. 146–177, which contains an extensive bibliography on the subject.

## Chapter 11 Self-Protection of the Earth

- 1 On the idea of nature coded as a constraint, see Baptiste Morizot, ‘Ce que le vivant fait au politique’, in Emanuele Coccia and Frédérique Aït-Touati (eds.), *Le Cri de Gaïa* (Paris: La Découverte, 2021).
- 2 Sara Vanuxem, *La Propriété de la terre* (Marseille: Wildproject, 2018).
- 3 See Pierre Dardot and Christian Laval, *Commun. Essai sur la révolution au XXIe siècle* (Paris: La Découverte, 2014).
- 4 Giorgos Kallis, *Degrowth* (Newcastle: Agenda Publishing, 2017).
- 5 Johan Rockström et al., ‘A Safe Operating Space for Humanity’, *Nature*, 461, 7263 (2009), pp. 472–475.
- 6 Naomi Klein, *This Changes Everything: Capitalism vs. the Climate* (London: Penguin, 2014); Bruno Latour, *Où atterrir? Comment s’orienter en politique* (Paris: La Découverte, 2017).

- 7 In this respect, climate denial in Trump's administration has functioned as the centre of gravity of an international policy that was summarized by one of his senior officials after a visit to the Middle East and Europe in May 2017 as encapsulating the idea that the world is not a 'global community' but an arena of competition involving nations, NGOs and businesses in which the United States presents an unequalled military, political, economic and cultural force. See [www.wsj.com/articles/america-first-doesnt-mean-america-alone-1496187426](http://www.wsj.com/articles/america-first-doesnt-mean-america-alone-1496187426).
- 8 Dieter Plehwe, 'Think Tank Networks and the Knowledge-Interest Nexus: The Case of Climate Change', *Critical Policy Studies*, 8, 1 (2014), pp. 101–115. For a perfectly explicit example of an anti-ecological liberal doctrine, see the work of the economist Deepak Lal, who introduced the idea of 'eco-imperialism'; see in particular 'Eco-Fundamentalism', *International Affairs*, vol. 71, 1995.
- 9 See respectively Wolfgang Streeck in *Du temps acheté. La crise sans cesse ajournée du capitalisme démocratique* (Paris: Gallimard, 2014); Thomas Piketty, *Capital in the Twenty-First Century*, trans. Arthur Goldhammer (Cambridge, MA: Harvard University Press, 2014); Adam Tooze, *Crashed: How a Decade of Financial Crises Changed the World* (London: Penguin, 2018).
- 10 See Paul Krugman, 'On the Political Economy of Permanent Stagnation', *New York Times*, 5 July 2013.
- 11 The expression 'new enclosures' is used to refer both to the seizure of land and to the political economy of intellectual property, especially in the digital domain. See Ben White, Saturnino M. Borrás Jr., Ruth Hall, Ian Scoones, and Wendy Wolford, 'The New Enclosures. Critical Perspectives on Corporate Land Deals', *Journal of Peasant Studies*, 39, 3–4 (2012), p. 619–647; and Christopher May, *The Global Political Economy of Property Rights. The New Enclosures* (London: Routledge, 2009).
- 12 Maurice Barrès (1862–1923) was a conservative French writer who advocated a nationalist mystique of France's organic unity. (Translator's note.)
- 13 The text is available online: [www.ecomodernism.org/francais](http://www.ecomodernism.org/francais).
- 14 See Erin L. O'Donnell and Julia Talbot-Jones, 'Creating Legal Rights for Rivers. Lessons from Australia, New Zealand and India', *Ecology and Society*, 23, 1 (2018); Ferhat Taylan, 'Droits des peuples autochtones et communs environnementaux: le cas du fleuve Whanganui en Nouvelle-Zélande', *Annales des Mines*, 92, 4 (2018), pp. 21–25.
- 15 See the column by Antonin Pottier, 'Climat: William Nordhaus est-il bien sérieux?': [www.alternatives-economiques.fr/climat-william-nordhaus-bien-serieux/00086544](http://www.alternatives-economiques.fr/climat-william-nordhaus-bien-serieux/00086544).
- 16 See Naomi Oreskes and Erik W. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (London: Bloomsbury, 2012); and Edwin Zaccai, François Gemenne and Jean-Michel Decroly (eds), *Controverses climatiques, sciences et politique* (Paris: Presses de Sciences Po, 2012).
- 17 See the portrait and the interview with Ava Kofman published in the *New York Times*, 25 October 2018, 'Bruno Latour, the Post-Truth Philosopher,

- Mounts a Defense of Science’: [www.nytimes.com/2018/10/25/magazine/bruno-latour-post-truth-philosopher-science.html](http://www.nytimes.com/2018/10/25/magazine/bruno-latour-post-truth-philosopher-science.html).
- 18 The work of Ivan Illich is entirely focused on these issues. See in particular *Energy and Equity* (New York: Harper & Row, 1974).
  - 19 See Pablo Servigne, Raphaël Stevens and Gauthier Chapelle, *Another End of the World Is Possible*, trans. Geoffrey Samuel (Cambridge: Polity Press, forthcoming).
  - 20 These resistance movements are documented by studies that underline the institutional blocks to the advent of a complete politicization of the question of ecology and climate change. See Stefan Aykut and Amy Dahan, *Gouverner le climat? Vingt ans de négociations internationales* (Paris: Presses de Sciences Po, 2015); and Dominique Pestre, ‘La mise en économie de l’environnement comme règle. Entre théologie économique, pragmatisme et hégémonie politique’, *Écologie et Politique*, 52 (2016), pp. 19–44.
  - 21 The document is available online: [www.millenniumassessment.org/fr](http://www.millenniumassessment.org/fr).
  - 22 This leads Bruno Latour to propose a map of geosocial struggles (*Où atterrir*, p. 83), but without explicitly setting this new concept in the context of a critique of the collective names that stem from our history.
  - 23 I mainly have in mind Ernesto Laclau and Chantal Mouffe, *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics*, 2nd edn (London: Verso, 1985); Michael Hardt and Antonio Negri, *Multitude. War and Democracy in the Age of Empire* (London: Penguin, 2004); and, more recently, Nancy Fraser and Rahel Jaeggi, *Capitalism. A Conversation in Critical Theory* (Cambridge: Polity, 2018).
  - 24 In this respect, the slogan ‘Nous sommes la nature qui se défend’ [‘We are nature defending itself’], often brandished by activists settled on the ZAD of Notre-Dame-des-Landes, sounds (apart from the fact that it still uses the idea of nature) like a possible formulation for this critical collective.
  - 25 Baptiste Morizot, ‘Nouvelles alliances avec la terre. Une cohabitation diplomatique avec le vivant’, *Tracés*, 33 (2017), pp. 73–96.
  - 26 Edward P. Thompson, *The Making of the English Working Class* (London: Victor Gollancz, 1963).

### **Conclusion: Reinventing Liberty**

- 1 Jedediah Purdy, *This Land Is Our Land* (Princeton, NJ: Princeton University Press, 2019), p. 87.
- 2 Dipesh Chakrabarty, ‘The Climate of History: Four Theses’, *Critical Inquiry*, 35, 2 (2009), p. 208.

# Bibliography

- Abram, David, *Comment la terre s'est tue. Pour une écologie des sens* (Paris: La Découverte, 2013).
- Adair, David, 'The Technocrats, 1919–1967: A Case Study of Conflict and Change in a Social Movement', PhD dissertation, Vancouver, Simon Fraser University, 1970.
- Adorno, Theodor and Max Horkheimer, *La Dialectique de la raison* (Paris: Gallimard, 1974 [1944]).
- Afeissa, Hicham-Stéphane (ed.), *Éthique de l'environnement. Nature, valeur, respect* (Paris: Vrin, 2007).
- Aguiton, Sara, 'Fortune de l'infortune. Financiarisation des catastrophes naturelles par l'assurance', *Zilsel*, 4 (2018), pp. 21–57.
- Agulhon, Maurice, *La République au village* (Paris: Plon, 1970).
- Akin, William E., *Technocracy and the American Dream: The Technocrat Movement, 1900–1941* (Berkeley: University of California Press, 1977).
- Albritton, Vicky and Fredrik Albritton Jonsson, *Green Victorians. The Simple Life in John Ruskin's Lake District* (Chicago, IL: University of Chicago Press, 2016).
- Albritton Jonsson, Fredrik, *Enlightenment's Frontier: The Scottish Highlands and the Origins of Environmentalism* (New Haven, CT: Yale University Press, 2013).
- Albritton Jonsson, Fredrik, 'The Origins of Cornucopianism: A Preliminary Genealogy', *Critical Historical Studies*, 1, 1 (2014), pp. 151–168.
- Albritton Jonsson, Fredrik, 'Abundance and Scarcity in Geological Time, 1784–1844', in Sophie Smith and Katrina Forrester (eds.), *Nature, Action, and the Future. Political Thought and the Environment* (Cambridge: Cambridge University Press, 2018).
- Amin, Samir, *Le Développement inégal. Essai sur les formations sociales du capitalisme périphérique* (Paris: Minuit, 1973).
- Appadurai, Arjun, *Modernity at Large: Cultural Dimensions of Globalization* (Minneapolis: University of Minnesota Press, 1996).
- Arendt, Hannah, *The Origins of Totalitarianism* (New York: Harcourt Brace & Company, 1973).
- Armitage, David, *Civil Wars: A History in Ideas* (New York: Alfred Knopf, 2017).

- Armitage, David, 'John Locke, Carolina, and the *Two Treatises of Government*', *Political Theory*, 32, 5 (2004).
- Association NègaWatt, *Manifeste NègaWatt. En route pour la transition énergétique* (Arles: Actes Sud, 2012).
- Audier, Serge, *La Société écologique et ses ennemis* (Paris: La Découverte, 2017).
- Aykut, Stefan and Amy Dahan, *Gouverner le climat? Vingt ans de négociations internationales* (Paris: Presses de Sciences Po, 2015).
- Babbage, Charles, *On the Economy of Machinery and Manufactures*, 4th edn (London: Charles Knight, 1835).
- Barbier, Edward, *Scarcity and Frontiers: How Economies Have Developed Through Natural Resource Exploitation* (Laramie: University of Wyoming Press, 2010).
- Barles, Sabine, *La Ville délétère. Médecins et ingénieurs dans l'espace urbain* (Seyssel: Champ Vallon, 1999).
- Barry, Andrew, 'Technological Zones', *European Journal of Social Theory*, 9, 2 (2006), pp. 239–253.
- Barthe, Yannick, *Le Pouvoir d'indécision. La mise en politique des déchets nucléaires* (Paris: Economica, 2006).
- Bastani, Aaron, *Fully Automated Luxury Communism: A Manifesto* (London: Verso, 2018).
- Bayly, Christopher, *The Birth of the Modern World 1780–1914: Global Connections and Comparisons* (Oxford: Blackwell, 2004).
- Beck, Ulrich, *Risk Society: Towards a New Modernity* (London: Sage, 1992).
- Beck, Ulrich, Anthony Giddens and Scott Lasch, *Reflexive Modernization: Politics, Tradition and Aesthetics in Modern Social Order* (Cambridge: Polity, 1994).
- Belich, James, *Replenishing the Earth: The Settler Revolution and the Rise of the Anglo-World, 1783–1939* (Oxford: Oxford University Press, 2009).
- Belime, William, *Traité du droit de possession* (Paris: Joubert, 1842).
- Bellamy, Edward, *Looking Backward, 2000–1887* (Boston, MA: Ticknor and Co., 1888).
- Bennett, Jane, *Vibrant Matter: A Political Ecology of Things* (Durham, NC: Duke University Press, 2010).
- Bentham, Jeremy, *An Introduction to the Principles of Morals and Legislation* (London: T. Payne and Sons, 1780).
- Benton, Lauren, *A Search for Sovereignty: Law and Geography in European Empires, 1400–1900* (Cambridge: Cambridge University Press, 2010).
- Berndt, Ernst, *From Technocracy to Net Energy Analysis: Engineers, Economists, and Recurring Energy Theories of Value*, Studies in Energy and the American Economy, Discussion paper 11 (Cambridge, MA: MIT, 1982).
- Beveridge, William, 'Social Insurance and Allied Services', HM Stationery Office (1943).
- Bird-David, Nurit, "'Animism" Revisited: Personhood, Environment and Relational Epistemology', *Current Anthropology*, 40 suppl. (1999), pp. 67–91.
- Blanc, Louis, *Organisation du travail*, 5th edn (Paris: Société de l'industrie fraternelle, 1847 [1839]).

- Blancaert, Claude, *La Nature de la société. Organicisme et sciences sociales au XIXe siècle* (Paris: L'Harmattan, 2004).
- Blaut, James Morris, *The Colonizer's Model of the World: Geographical Diffusionism and Eurocentric History* (London: Guilford Press, 1993).
- Bloor, David, *Knowledge and Social Imagery* (Chicago, IL: University of Chicago Press, 1991 [1976]).
- Boltanski, Luc, Élisabeth Claverie, Nicolas Offenstadt and Stéphane Van Damme (eds), *Affaires, scandales et grandes causes. De Socrate à Pinochet* (Paris: Seuil, 2007).
- Borras, Saturnino M. Jr., Ruth Hall, Ian Scoones, Ben White and Wendy Wolford, 'Towards a Better Understanding of Global Land Grabbing: An Editorial Introduction', *Journal of Peasant Studies*, 38, 2 (2011), pp. 209–216.
- Bouglé, Célestin and Élie Halévy, eds, *Doctrine de Saint-Simon. Exposition, première année, 1829* (Paris: Rivière, 1924).
- Bourdeau, Vincent, 'Les mutations de l'expression "exploitation de l'homme par l'homme" chez les saint-simoniens (1829–1851)', *Cahiers d'économie politique*, 75 (2018), pp. 13–41.
- Boyer, Jean-Daniel, 'Fermiers et Grains, deux moments de confrontation de Quesnay à la science du commerce. Police contre polices au nom des libertés', *Cahiers d'économie politique*, 73 (2017), pp. 31–65.
- Brahami, Frédéric, *La Raison du peuple* (Paris: Les Belles Lettres, 2016).
- Bunker, Stephen, *Underdeveloping the Amazon: Extraction, Unequal Exchange and the Failure of the Modern State* (Chicago, IL: University of Chicago Press, 1990).
- Butterfield, Herbert, *The Whig Interpretation of History* (London: Bell, 1931).
- Cadena, Marisol de la, 'Indigenous Cosmopolitics in the Andes: Conceptual Reflections Beyond "Politics"', *Cultural Anthropology*, 25, 2 (2012), pp. 334–370.
- Cadena, Marisol de la, *Earth Beings. Ecologies of Practice across Andean Worlds* (Durham, NC: Duke University Press, 2015).
- Calafat, Guillaume, *Une Mer jalouse. Contribution à l'histoire de la souveraineté (Méditerranée, XVIIe siècle)* (Paris: Seuil, 2019).
- Callegaro, Francesco, *La Science politique des modernes. Durkheim, la sociologie et le projet d'autonomie* (Paris: Economica, 2015).
- Callicott, John Baird, *Earth's Insights: A Multicultural Survey of Ecological Ethics from the Mediterranean Basin to Australian Outback* (Berkeley: University of California Press, 1994).
- Callon, Michel, Pierre Lascombes and Yannick Barthe, *Agir dans un monde incertain* (Paris: Seuil, 2001).
- Canguilhem, Georges, 'Les paysans et le fascisme', in *Œuvres complètes*, vol. 1, *Écrits philosophiques et politiques, 1926–1939* (Paris: Vrin, 2011).
- Carson, Rachel, *Silent Spring* (Boston, MA: Houghton Mifflin Harcourt, 1962).
- Castel, Robert, *Les Métamorphoses de la question sociale* (Paris: Gallimard, 1995).
- Castel, Robert, *La Montée des incertitudes* (Paris: Seuil, 2009).
- Castoriadis, Cornelius, *Domaines de l'homme* (Paris: Seuil, 1986).



- Castoriadis, Cornelius, *The Imaginary Institution of Society*, trans. Kathleen Blamey (Cambridge, MA: MIT Press, 1987).
- Catton, William, *Overshoot: The Ecological Basis of Revolutionary Change* (Urbana: University of Illinois Press, 1980).
- Césaire, Aimé, *Discourse on Colonialism*, trans. Joan Pinkham: [http://abahlali.org/files/\\_Discourse\\_on\\_Colonialism.pdf](http://abahlali.org/files/_Discourse_on_Colonialism.pdf).
- Chakrabarty, Dipesh, *Provincializing Europe: Postcolonial Thought and Historical Difference*, rev. edn (Princeton, NJ: Princeton University Press, 2009).
- Chakrabarty, Dipesh, 'The Climate of History: Four Theses', *Critical Inquiry*, 35, 2 (2009).
- Chakrabarty, Dipesh, 'Réécrire l'histoire depuis l'anthropocène', interview with Paul Guillaibert and Stéphane Haber, *Actuel Marx*, 61, 1 (2017), pp. 95–105.
- Chancel, Lucas, *Insoutenables inégalités. Pour une justice sociale et environnementale* (Paris: Les petits matins, 2017).
- Chapoutot, Johann, *La Révolution culturelle nazie* (Paris: Gallimard, 2017).
- Chaptal, Jean-Antoine, *De l'Industrie Française* (Paris: chez Antoine-Augustin Renouard, 1819).
- Charbonnier, Pierre, *La Fin d'un grand partage* (Paris: CNRS Éditions, 2015).
- Charle, Christophe, 'Les "classes moyennes" en France. Discours pluriel et histoire singulière, 1870–2000', *Revue d'histoire moderne et contemporaine*, 50, 4 (2003), pp. 108–134.
- Chase, Stuart, *The Economy of Abundance* (New York: Macmillan, 1934).
- Chevalier, Miche, *Politique industrielle et système de la méditerranée. Religion Saint-simonienne* (Paris: Bureau du Globe, 1832).
- Childe, Gordon, *Man Makes Himself* (London: Watts, 1936).
- Christin, Olivier, *La Paix de religion. L'autonomisation de la raison politique au XVIIe siècle* (Paris: Seuil, 1997).
- Claeys, Gregory, *Machinery, Money and the Millennium: From Moral Economy to Socialism, 1815–1860* (Cambridge: Polity, 1987).
- Clastres, Pierre, *La Société contre l'état* (Paris: Minuit, 1974).
- Collins, Harry M., *Changing Order: Replication and Induction in Scientific Practice* (London: Sage, 1985).
- Commoner, Barry, *The Closing Circle* (New York: Random House, 1971).
- Commons, John R., *Legal Foundations of Capitalism* (New York: Macmillan, 1924).
- Condorcet, *Esquisse d'un tableau historique des progrès humains* (Paris: Masson et fils, 1822).
- Conklin, Alice, *A Mission to Civilize: The Republican Idea of Empire in France and West Africa, 1895–1930* (Stanford, CA: Stanford University Press, 1997).
- Costanza, Robert, *Ecological Economics: The Science and Management of Sustainability* (New York: Columbia University Press, 1991).
- Costanza, Robert, *Frontiers in Ecological Economics* (Cheltenham: Elgar, 1997).
- Crane, Jeff, *The Environment in American History: Nature and the Formation of the United States* (London: Routledge, 2015).



- Cronon, William, *Changes in the Land: Indians, Colonists and the Ecology of New England* (New York: Hill & Wang, 1983).
- Crosby, Alfred, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, CT: Greenwood Publishing Group, 1972).
- Crutzen, Paul J., 'Geology of Mankind', *Nature*, 415, 6867 (2002).
- Dale, Gareth, *Karl Polanyi: A Life on the Left* (New York: Columbia University Press, 2016).
- Daly, Herman, *Steady-State Economics* (Washington, DC: Island Press, 1977).
- Dardot, Pierre and Christian Laval, *La Nouvelle Raison du monde* (Paris: La Découverte, 2009).
- Dardot, Pierre and Christian Laval, *Marx, prénom: Karl* (Paris: Gallimard, 2012).
- Dardot, Pierre and Christian Laval, *Commun. Essai sur la révolution au XXI<sup>e</sup> siècle* (Paris: La Découverte, 2014).
- Debeir, Jean-Claude, Jean-Paul Deléage and Daniel Hémerly, *Une Histoire de l'énergie* (Paris: Flammarion, 2013).
- Descola, Philippe, *La Nature domestique. Symbolisme et praxis dans l'écologie des Achuar* (Paris: Éditions de la MSH, 1986).
- Descola, Philippe, *Beyond Nature and Culture*, trans. Janet Lloyd (Chicago, IL: University of Chicago Press, 2013).
- De Vries, Jan, *The Economy of Europe in an Age of Crisis, 1600–1750* (Cambridge: Cambridge University Press, 1976).
- De Vries, Jan, *The Industrious Revolution: Consumer Behaviour and the Household Economy, 1650 to the Present* (Cambridge: Cambridge University Press, 2008).
- Diamond, Jared, *Guns, Germs, and Steel. The Fates of Human Societies* (New York: Norton, 1997).
- Dorfman, Joseph, *Thorstein Veblen and His America* (New York: Viking, 1934).
- Drayton, Richard, *Nature's Government* (New Haven, CT: Yale University Press, 2000).
- Dunoyer, Charles, *De la Liberté du travail* (Paris: Guillaumin, 1845).
- Dupéron, Isabelle, *G. T. Fechner. Le parallélisme psychophysique* (Paris: PUF, 2000).
- Durkheim, Émile, *Suicide: A Study in Sociology*, trans. John A. Spaulding and George Simpson (Glencoe, IL: The Free Press, 1951).
- Durkheim, Émile, *The Elementary Forms of Religious Life*, trans. Carol Cosman (Oxford: Oxford University Press, 2008).
- Durkheim, Émile, *The Division of Labor in Society*, trans. George Simpson (Glencoe, IL: Free Press, 1933).
- Durkheim, Émile, *Le Socialisme* (Paris: PUF, 1992 [1928]).
- Edelstein, Dan, *The Terror of Natural Right: Republicanism, the Cult of Nature, and the French Revolution* (Chicago, IL: University of Chicago Press, 2009).
- Ehrlich, Paul, *The Population Bomb* (New York: Ballantine Books, 1968).
- Elden, Stuart, *The Birth of Territory* (Chicago, IL: University of Chicago Press, 2013).
- Ewald, François, *L'État providence* (Paris: Grasset, 1986).

- Ewald, François and Denis Kessler, 'Les noces du risque et de la politique', *Le Débat*, 109 (2000).
- Fabian, Johannes, *Time and the Other: How Anthropology Makes Its Object* (New York: Columbia University Press, 2014).
- Fanon, Franz, *Black Skin, White Masks*, trans. Charles Lam Markmann (New York: Grove Press, 1967);
- Fauré, Christine (dir.), *Des manuscrits de Sieyès* (Paris: Honoré Champion, 1999).
- Federici, Silvia, *Caliban et la Sorcière. Femmes, corps et accumulation primitive* (Geneva: Entremonde, 2017 [2004]).
- Felli, Romain, *La Grande Adaptation* (Paris: Seuil, 2016).
- Ferry, Luc, *The New Ecological Order*, trans. Carol Volk (Chicago, IL: University of Chicago Press, 1995).
- Fichte, Johann Gottlieb, *The Closed Commercial State*, trans. Anthony Curtis Adler (New York: SUNY Press, 2012).
- Fichte, Johann Gottlieb, *Foundations of Natural Right*, trans. Michael Baur (Cambridge: Cambridge University Press, 2000).
- Fichte, Johann Gottlieb, *The Science of Rights*, trans. A. E. Kroeger (Philadelphia, PA: J. B. Lippincott & Co., 1869).
- Fitzmaurice, Andrew, *Sovereignty, Property and Empire, 1500–2000* (Cambridge: Cambridge University Press, 2014).
- Fitzmaurice, Andrew, 'The genealogy of *terra nullius*', *Australian Historical Studies*, 129 (2007).
- Les Fondateurs du droit international. Leurs œuvres, leurs doctrines* (Paris: Giard et Brière, 1904).
- Forrester, Jay, *World Dynamics* (Cambridge: Wright-Allen Press, 1971).
- Forrester, Katrina and Sophie Smith (eds.), *Nature, Action and the Future* (Cambridge: Cambridge University Press, 2018).
- Foster, John B., *Marx's Ecology: Materialism and Nature* (New York: Monthly Review Press, 2000).
- Foster, John B., 'Marx's Theory of Metabolic Rift. Classical Foundations for Environmental Sociology', *American Journal of Sociology*, 105, 2 (1999).
- Foucault, Michel, *Security, Territory, Population: Lectures at the Collège de France, 1977–78*, trans. Graham Burchell (London: Palgrave Macmillan, 2007).
- Foucault, Michel, *The Birth of Biopolitics: Lectures at the Collège de France, 1978–79*, trans. Graham Burchell (London: Palgrave Macmillan, 2010).
- Fourastié, Jean, *Machinisme et bien-être* (Paris: Minuit, 1951).
- Frank, Thomas, *The Conquest of Cool: Business Culture, Counterculture, and the Rise of Hip Consumerism* (Chicago, IL: University of Chicago Press, 1997).
- Fraser, Nancy and Rahel Jaeggi, *Capitalism: A Conversation in Critical Theory* (Cambridge: Polity, 2018).
- Fresso, Jean-Baptiste, *L'Apocalypse joyeuse. Une histoire du risque technologique* (Paris: Seuil, 2012).
- Gaboriaux, Chloé, 'Nature versus citoyenneté dans le discours républicain', in Vincent Bourdeau and Arnaud Macé (eds), *La Nature du socialisme*.

- Pensée sociale et conceptions de la nature au XIXe siècle* (Besançon: Presses Universitaires de Franche-Comté, 2017).
- Gadgil, Madhav and Ramachandra Guha, *This Fissured Land: An Ecological History of India* (Oxford: Oxford University Press, 1992).
- Garner, Guillaume, *État, économie et territoire en Allemagne. L'Espace dans le caméralisme et l'économie politique (1740–1820)* (Paris: Éditions de l'EHESS, 2005).
- Gauchet, Marcel, *La Révolution des droits de l'homme* (Paris: Gallimard, 1989).
- Gauchet, Marcel, 'Sous l'amour de la nature, la haine des hommes', *Le Débat*, 60 (1990), pp. 247–250.
- Gauchet, Marcel, *La Démocratie contre elle-même* (Paris: Gallimard, 2002).
- Gauchet, Marcel, *L'Avènement de la démocratie, IV. Le nouveau monde* (Paris: Gallimard, 2017).
- Gerhardt, Hannes, Philip E. Steinberg, Jeremy Tasch, Sandra J. Fabiano and Rob Shields, 'Contested Sovereignty in a Changing Arctic', *Annals of the Association of American Geographers*, 100, 4 (2010), pp. 992–1002.
- Georgescu-Roegen, Nicholas, *The Entropy Law and the Economic Process* (Cambridge, MA: Harvard University Press, 1971).
- Georgescu-Roegen, Nicholas, 'Energy and Economic Myths', *Southern Economic Journal*, 41, 3 (1975), pp. 347–381.
- Giddens, Anthony, 'Risk and Responsibility', *The Modern Law Review*, 69, 1 (1999), pp. 1–11.
- Gilman, Nils, *Mandarins of the Future: Modernization Theory in Cold War America* (Baltimore, MD: Johns Hopkins University Press, 2007).
- Glacken, Clarence, *Traces on the Rhodian Shore* (Berkeley: University of California Press, 1976).
- Godelier, Maurice, *Sur les Sociétés précapitalistes* (Paris: Éditions Sociales, 1978).
- Goody, Jack, *The Theft of History* (Cambridge: Cambridge University Press, 2006).
- Gould, Steven Jay and Richard Charles Lewontin, 'The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme', *Proceedings of the Royal Society of London. Series B, Biological Sciences*, 205, 1161 (1979), pp. 581–598.
- Gould, Stephen Jay and Elisabeth S. Vrba, 'Exaptation. A Missing Term in the Science of Form', *Paleobiology*, 8, 1 (1982), pp. 4–15.
- Grenier, Jean-Yves, *Histoire de la pensée économique et politique de la France d'Ancien Régime* (Paris: Hachette, 2007).
- Gribaudo, Maurizio, *Paris, ville ouvrière. Une histoire occultée, 1789–1848* (Paris: La Découverte, 2014).
- Grossi, Paolo, *An Alternative to Private Property: Collective Property in the Juridical Consciousness of the Nineteenth Century* (Chicago, IL: University of Chicago Press, 1981).
- Grotius, Hugo, *The Freedom of the Seas*, trans. Ralph Van Deman Magoffin: [https://upload.wikimedia.org/wikipedia/commons/7/7b/Grotius\\_Hugo\\_The\\_Freedom\\_of\\_the\\_Sea\\_\(v1.0\).pdf](https://upload.wikimedia.org/wikipedia/commons/7/7b/Grotius_Hugo_The_Freedom_of_the_Sea_(v1.0).pdf).
- Grotius, Hugo, *The Rights of War and Peace*: <https://oll.libertyfund.org/titles/grotius-the-rights-of-war-and-peace-1901-ed> (partial English translation).

- Grove, Richard, *Green Imperialism: Colonial Expansion, Tropical Island Eden and the Origins of Environmentalism, 1600–1860* (Cambridge: Cambridge University Press, 1996).
- Guha, Ramachandra, *Environmentalism: A Global History* (New York: Longman, 2000).
- Guha, Ramachandra and Joan Martinez-Alier, *Varieties of Environmentalism: Essays North and South* (London: Earthscan, 1997).
- Guha, Ranajit, *Elementary Aspects of Peasant Insurgency in Colonial India* (Delhi: Oxford University Press, 1983).
- Guha, Ranajit, 'Quelques questions concernant l'historiographie de l'Inde coloniale', *Tracés. Revue de Sciences humaines*, 30 (2016 [1982]).
- Guizot, François, *Essai sur l'histoire et sur l'état actuel de l'instruction publique en France* (Paris: Maradan, 1816).
- Gunder Frank, Andre, *ReORIENT: Global Economy in the Asian Age* (Berkeley: University of California Press, 1998).
- Hacker, Paul, *The Great Risk Shift: The Assault on American Jobs, Families, Health Care, and Retirement* (Oxford: Oxford University Press, 2006).
- Halbwachs, Maurice, *La Classe ouvrière et les niveaux de vie. Recherches sur la hiérarchie des besoins dans les sociétés industrielles contemporaines* (Paris: Alcan, 1912).
- Hallmann, Casper A., Martin Sorg, Eelke Jongejans, Henk Siepel, Nick Hofland, Heinz Schwan et al., 'More than 75 percent Decline over 27 Years in Total Flying Insect Biomass in Protected Areas', *PLoS ONE*, 12, 10 (2017).
- Haraway, Donna, *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Chicago, IL: Prickly Paradigm Press, 2003).
- Hardt, Michael and Antonio Negri, *Multitude. War and Democracy in the Age of Empire* (London: Penguin, 2004).
- Haudricourt, André-Georges, 'Domestication des animaux, culture des plantes et traitement d'autrui', *L'Homme*, 2, 1 (1962), pp. 40–50.
- Hayek, Friedrich von, *The Road to Serfdom* (London: Routledge, 1944).
- Hays, Samuel P., *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920* (Pittsburgh, PA: University of Pittsburgh Press, 1959).
- Hecht, Gabrielle, *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge, MA: MIT Press, 2009).
- Hecht, Gabrielle, 'Invisible Production and the Production of Invisibility', in Daniel Lee Kleinman (ed.), *Routledge Handbook of Science, Technology and Society* (London: Routledge, 2014).
- Hecht, Gabrielle, *Being Nuclear: Africans and the Global Uranium Trade* (Cambridge, MA: MIT Press, 2012).
- Hédoin, Cyril, *L'Institutionnalisme historique et la relation entre théorie et histoire en économie* (Paris: Garnier, 2014).
- Hirschmann, Albert, *The Passions and the Interests: Political Arguments for Capitalism Before Its Triumph* (Princeton, NJ: Princeton University Press, 2013).
- Hobbes, Thomas, *Leviathan*, ed. Richard Tuck, revised student edition (Cambridge: Cambridge University Press, 1996).

- Hofstadter, Richard, *The Age of Reform* (New York: Vintage Books, 1955).
- Hornborg, Alf, *The Power of the Machine: Global Inequalities of Economy, Technology, and Environment* (Lanham, MA: Altamira Press, 2001).
- Hornborg, Alf and Andreas Malm, 'The Geology of Mankind? A Critique of the Anthropocene Narrative', *The Anthropocene Review*, 1, 1 (2014), pp. 62–69.
- Hornborg, Alf, John McNeill and Joan Martinez-Alier, *Rethinking Environmental History. World-system History and Global Environmental Change* (Lanham, MA: Altamira Press, 2007).
- Hotelling, Harold, 'The Economics of Exhaustible Resources', *Journal of Political Economy*, 39, 2 (1931), pp. 137–175.
- Hulak, Florence, 'Sociologie et théorie socialiste de l'histoire. La trame saint-simonienne chez Durkheim et Marx', *Incidence*, 11 (2015), pp. 83–107.
- Hulak, Florence, 'Le social et l'historique. Robert Castel face à Michel Foucault', *Archives de Philosophie*, 81, 2 (2018), pp. 387–404.
- Hume, David, *Essays Moral, Political, and Literary*, ed. Eugene F. Miller (Indianapolis, IN: Liberty Fund, Inc., 1987)
- Huret, Romain, *La Fin de la pauvreté? Les experts sociaux en guerre contre la pauvreté aux États-Unis (1945–1974)* (Paris: Éditions de l'EHESS, 2008).
- Husserl, Edmund, *The Crisis of European Sciences and Transcendental Philosophy*, trans. D. Carr (Evanston, IL: Northwestern University Press, 1989).
- Illich, Ivan, *Energy and Equity* (New York: Harper & Row, 1974).
- Ingold, Tim, *The Appropriation of Nature. Essays on Human Ecology and Social Relations* (Manchester: Manchester University Press, 1986).
- Ingold, Tim, *The Perception of the Environment: Essays in Livelihood, Dwelling and Skill* (London: Routledge, 2000).
- Jackson, Jim, *Prosperity Without Growth*, 2nd edn (London: Routledge, 2017).
- James, C. L. R., *The Black Jacobins: Toussaint L'Ouverture and the San Domingo Revolution* (London: Penguin, 2001).
- James, David, *Fichte's Social and Political Philosophy: Property and Virtue*, Cambridge (Cambridge: Cambridge University Press, 2011).
- Jarrige, François, *Technocritiques. Du refus des machines à la contestation des technosciences* (Paris: La Découverte, 2014).
- Jarrige, François and Thomas Le Roux, *La Contamination du monde* (Paris: Seuil, 2017).
- Jefferson, Thomas, *Notes on the State of Virginia*: [https://en.wikisource.org/wiki/Notes\\_on\\_the\\_State\\_of\\_Virginia\\_\(1802\)](https://en.wikisource.org/wiki/Notes_on_the_State_of_Virginia_(1802)).
- Jevons, William Stanley, *The Coal Question* (London: Macmillan, 1865).
- Kahn, Matthew E. and Siqi Zheng, *Blue Skies Over Beijing: Economic Growth and the Environment in China* (Princeton, NJ: Princeton University Press, 2016).
- Kallis, Giorgios, Christopher Kerschner and Joan Martinez-Alier, 'The Economics of Degrowth', *Ecological Economics*, 84 (2012), pp. 172–180.
- Kallis, Giorgios and Erik Swyngedouw, 'Do Bees Produce Value? A Conversation Between an Ecological Economist and a Marxist Geographer', *Capitalism, Nature, Socialism*, 29, 3 (2018), pp. 36–50.
- Kallis, Giorgios, *Degrowth* (Newcastle: Agenda Publishing, 2017).

- Karsenti, Bruno, *La Société en personnes. Études durkheimiennes* (Paris: Economica, 2006).
- Karsenti, Bruno and Cyril Lemieux, *Sociologie et socialisme* (Paris: Éditions de l'EHESS, 2017).
- Kelley, Donald and Bonnie Smith, 'What Was Property? Legal Dimensions of the Social Question in France (1789–1848)', *Proceedings of the American Philosophical Association*, 128, 3 (1984), pp. 200–230.
- Keucheyan, Razmig, *La Nature est un champ de bataille* (Paris: La Découverte, 2014).
- Keynes, John Maynard, 'Economic Possibilities for our Grandchildren (1930)', in *Essays in Persuasion* (New York: Harcourt Brace (1932), pp. 358–373.
- Klein, Naomi, *This Changes Everything: Capitalism vs. the Climate* (London: Penguin, 2014).
- Kofman, Ava, 'Bruno Latour, the Post-Truth Philosopher, Mounts a Defense of Science', *New York Times*, 25 October 2018: [www.nytimes.com/2018/10/25/magazine/bruno-latour-post-truth-philosopher-science.html](http://www.nytimes.com/2018/10/25/magazine/bruno-latour-post-truth-philosopher-science.html).
- Kopenawa, Davi and Bruce Albert, *La Chute du ciel. Parole d'un chaman Yanomami* (Paris: Plon, 2010).
- Koselleck, Reinhart, *Critique and Crisis: Enlightenment and the Pathogenesis of Modern Society* (Cambridge, MA: MIT Press, 1988 [1959]).
- Koselleck, Reinhart, *Futur passé. Contribution à la sémantique des temps historiques* (Paris: Éditions de l'EHESS, 2016).
- Koyré, Alexandre, *From the Closed World to the Infinite Universe* (Baltimore, MD: Johns Hopkins University Press, 1968).
- Krausmann, Fridolin et al., 'Global Human Appropriation of Net Primary Production Doubled in the 20th Century', *Proceedings of the National Academy of Sciences*, 110, 25 (2013), pp. 10324–10329.
- Krugman, Paul, 'On the Political Economy of Permanent Stagnation', *New York Times*, 5 July 2013: <https://krugman.blogs.nytimes.com/2013/07/05/on-the-political-economy-of-permanent-stagnation/>.
- Laboulaye, Edouard, *Histoire du droit de propriété foncière* (Paris: Durand et Rammelmann, 1839).
- Laclau, Ernesto and Chantal Mouffe, *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics*, 2nd edn (London: Verso, 1985).
- Lal, Deepak, 'Eco-Fundamentalism', *International Affairs*, 71 (1995).
- Lane, Richard, 'The American Anthropocene: Economic Scarcity and Growth during the Great Acceleration', *Geoforum*, 99 (2019).
- Larcher, Silyane, *L'Autre Citoyen. L'idéal républicain et les Antilles après l'esclavage* (Paris: Armand Colin, 2014).
- Larrère, Catherine, 'L'analyse physiocratique des rapports entre la ville et la campagne', *Études rurales*, 49, 1 (1973), pp. 42–68.
- Larrère, Catherine, *L'Invention de l'économie au XVIIIe siècle. Du droit naturel à la physiocratie* (Paris: PUF, 1992).
- Latouche, Serge, *Le Pari de la décroissance* (Paris: Fayard, 2006).
- Latour, Bruno, *Science in Action: How to Follow Scientists and Engineers Through Society* (Cambridge, MA: Harvard University Press, 1987).
- Latour, Bruno, 'Technology is Society Made Durable', *Sociological Review*, 38, 1 (1990), pp. 103–131.



- Latour, Bruno, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 1993).
- Latour, Bruno, *Politics of Nature: How to Bring the Sciences into Democracy*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 2004).
- Latour, Bruno, *Facing Gaia: Eight Lectures on the New Climatic Regime*, trans. Catherine Porter (Cambridge: Polity, 2017).
- Latour, Bruno, *Où atterrir? Comment s'orienter en politique* (Paris: La Découverte, 2017).
- Latour, Bruno and Steve Woolgar, *Laboratory Life: The Construction of Scientific Facts* (Princeton, NJ: Princeton University Press, 1986).
- Lenton, Timothy M., 'Early Warning of Climate Tipping Points', *Nature Climate Change*, 1, 4 (2011), pp. 201–209.
- Leopold, Aldo, *Almanach d'un Comté des sables* (Paris: GF-Flammarion, 2000).
- Lévi-Strauss, Claude, *Race et histoire* (Paris: UNESCO, 1952).
- Lévi-Strauss, Claude, *The Savage Mind* (Chicago, IL: University of Chicago Press, 1966).
- Lippmann, Walter, *The Good Society* (Boston, MA: Little, Brown & Co., 1937).
- Locke, John, *Second Treatise of Government*: <https://english.hku.hk/staff/kjohnson/PDF/LockeJohnSECONDTREATISE1690.pdf>.
- Luxemburg, Rosa, *The Accumulation of Capital*: <https://www.marxists.org/archive/luxemburg/1913/accumulation-capital/index.htm>.
- Macé, Arnaud, 'La naissance de la nature en Grèce ancienne', in Stéphane Haber and Arnaud Macé (eds.), *Anciens et modernes par-delà nature et société* (Besançon: Presses Universitaires de Franche-Comté, 2012).
- Macherey, Pierre, *Marx 1845. Les 'thèses' sur Feuerbach (traduction et commentaire)* (Paris: Éditions Amsterdam, 2008).
- MacPherson, C. B., *The Political Theory of Possessive Individualism: From Hobbes to Locke* (Oxford: Clarendon Press, 1962).
- Maier, Charles S., *Once within Borders: Territories of Power, Wealth, and Belonging since 1500* (Cambridge, MA: Belknap, 2016).
- Malinowski, Bronislaw, 'The Rationalization of Anthropology and Administration', *Africa*, 3, 4 (1930), pp. 405–430.
- Malm, Andreas, 'China as Chimney of the World: The Fossil Capital Hypothesis', *Organization & Environment*, 25, 2 (2012), pp. 146–177.
- Malm, Andreas, *Fossil Capital* (London: Verso, 2016).
- Mann, Michael, 'Review Article: The Great Divergence', *Millennium: Journal of International Studies*, 46, 2 (2018), pp. 241–248.
- Mannheim, Karl, *Man and Society in an Age of Reconstruction: Collected Works*, vol. 2 (London: Routledge, 1997).
- Marcuse, Herbert, *Eros and Civilization: A Philosophical Inquiry into Freud* (Boston, MA: Beacon Press, 1955).
- Marcuse, Herbert, *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society* (Boston, MA: Beacon Press, 1964).
- Marcuse, Herbert, 'Liberation from the Affluent Society', in *Collected Works*, vol. 3, *The New Left and the 1960s* (London: Routledge, 2005).
- Marouby, Christian, *L'Économie de la nature. Adam Smith et l'anthropologie de la croissance* (Paris: Seuil, 2004).



- Martinez-Alier, Joan, *Ecological Economics: Energy, Environment and Society* (London: Blackwell, 1987).
- Martinez-Alier, Joan, *The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation* (Cheltenham: Elgar, 2002).
- Marx, Karl, *Debates on the Law on Thefts of Wood in Proceedings of the Sixth Rhine Province Assembly. Third Article*: <https://marxists.catbull.com/archive/marx/works/1842/10/25.htm#n1>.
- Marx, Karl, *The Poverty of Philosophy*: <https://www.marxists.org/archive/marx/works/download/pdf/Poverty-Philosophy.pdf>.
- Marx, Karl, 'On the Question of Free Trade': <https://www.marxists.org/archive/marx/works/1888/free-trade/index.htm>.
- Marx, Karl, *Anti-Dühring* (Paris: Éditions sociales, 1968).
- Marx, Karl, *Thèses sur Feuerbach*, in Pierre Macherey, *Marx 1845: Les 'thèses' sur Feuerbach (traduction et commentaire)* (Paris: Éditions Amsterdam, 2008).
- Marx, Karl, *The Eighteenth Brumaire of Louis Bonaparte*: <https://www.marxists.org/archive/marx/works/1852/18th-brumaire/ch07.htm>.
- Marx, Karl, *Grundrisse: Foundations of the Critique of Political Economy*: <https://www.marxists.org/archive/marx/works/download/pdf/grundrisse.pdf>.
- Marx, Karl, *Capital. A Critique of Political Economy, Volume I. Book One: The Process of Production of Capital*: <https://www.marxists.org/archive/marx/works/download/pdf/Capital-Volume-I.pdf>.
- Marx, Karl, *Lettres sur les sciences de la nature* (Paris: Éditions Sociales, 1973).
- Marx, Karl and Friedrich Engels, *Manifeste du parti communiste* (Paris: Ère nouvelle, 1895): <http://gallica.bnf.fr/ark:/12148/bpt6k3163449>.
- May, Christopher, *The Global Political Economy of Property Rights: The New Enclosures* (London: Routledge, 2009).
- Mbembe, Achille, *Critique of Black Reason*, trans. Laurent Dubois (Durham, NC: Duke University Press, 2017).
- McMaster, H. R. and Gary D. Cohn, 'America First Doesn't Mean America Alone', *Wall Street Journal*, 30 May 2017: [www.wsj.com/articles/america-first-doesnt-mean-america-alone-1496187426](http://www.wsj.com/articles/america-first-doesnt-mean-america-alone-1496187426).
- McNeill, John R., *Something New under the Sun. An Environmental History of the Twentieth Century* (London: Penguin, 2001).
- McNeill, John R., *The Great Acceleration. An Environmental History of the Anthropocene since 1945* (Cambridge, MA: Harvard University Press, 2014).
- Meadows, Donella H., Dennis Meadows, Jørgen Randers and William Behrens, III, *The Limits to Growth* (New York: Universe Books, 1972).
- Méda, Dominique, *Au-delà du PIB. Pour une autre mesure de la richesse* (Paris: Flammarion, 2008).
- Mehta, Uday Singh, *Liberalism and Empire: A Study in 19th-Century British Liberal Thought* (Chicago, IL: University of Chicago Press, 1999).
- Merchant, Carolyn, *The Death of Nature: Women, Ecology and the Scientific Revolution* (New York: Harper & Row, 1983).
- Merchant, Carolyn, *Ecological Revolutions: Nature, Gender, and Science in New England* (Chapel Hill: University of North Carolina Press, 1989).

- Mercier de la Rivière, *L'Ordre naturel et essentiel des sociétés politiques* (Paris: Geuthner, 1910 [1767]).
- Mies, Maria and Vandana Shiva, *Ecofeminism* (London: Zed Books, 1993).
- Milanović, Branko, *Global Inequality: A New Approach for the Age of Globalization* (Cambridge: MA: Harvard University Press, 2016).
- Mill, John Stuart, *On Liberty*: <https://socialsciences.mcmaster.ca/econ/ugcm/3ll3/mill/liberty.pdf>.
- Mill, John Stuart, *Principles of Political Economy*: [https://oll.libertyfund.org/title/mill-principles-of-political-economy-ashley-ed#lf0199\\_label\\_1225](https://oll.libertyfund.org/title/mill-principles-of-political-economy-ashley-ed#lf0199_label_1225).
- Mill, John Stuart, *Socialism*: <https://www.gutenberg.org/files/38138/38138-h/38138-h.htm>.
- Millennium Ecosystem Assessment: Ecosystems and Human Well-Being* (Washington, DC: Island Press, 2005).
- Mintz, Sidney, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Penguin Books, 1986).
- Mirabeau, *Philosophie rurale, ou économie générale et politique de l'agriculture, réduite à l'ordre immuable des lois physiques et morales qui assurent la prospérité des Empires* (Amsterdam: Les Libraires associés, 1763).
- Mirowski, Philip, *More Heat Than Light: Economics as Social Physics, Physics as Nature's Economics* (Cambridge: Cambridge University Press, 1989).
- Missemer, Antoine, 'William Stanley Jevons' *The Coal Question* (1865), Beyond the Rebound Effect', *Ecological Economics*, 82 (2012), pp. 97–103.
- Missemer, Antoine, *Nicholas Georgescu-Roegen, pour une révolution bioéconomique* (Lyon: ENS Éditions, 2013).
- Missemer, Antoine, 'Nicholas Georgescu-Roegen and Degrowth', *European Journal of the History of Economic Thought*, 24 (2017), pp. 493–506.
- Mitchell, Timothy, 'The Stage of Modernity', in Timothy Mitchell (ed.), *Questions of Modernity* (Minneapolis: University of Minnesota Press, 2000).
- Mitchell, Timothy, *Carbon Democracy: Political Power in the Age of Oil*, 2nd rev. edn (London: Verso, 2013).
- Mokyr, Joel, *The Enlightened Economy: Britain and the Industrial Revolution 1700–1850* (London: Penguin Books, 2011).
- Moore, Jason, "'Amsterdam Is Standing on Norway". Part I: The Alchemy of Capital, Empire and Nature in the Diaspora of Silver, 1545–1648', *Journal of Agrarian Change*, 10, 1 (2010).
- Moore, Jason, "'Amsterdam Is Standing on Norway". Part II: The Global North Atlantic in the Ecological Revolution of the Long Seventeenth Century', *Journal of Agrarian Change*, 10, 2 (2010).
- Moore, Jason, *Capitalism in the Web of Life* (London: Verso, 2015).
- Moore, Jason and Raj Patel, *A History of the World in Seven Cheap Things* (London: Verso, 2017).
- Morizot, Baptiste, *Les Diplomates. Cohabiter avec les loups sur une nouvelle carte du vivant* (Marseille: Wildproject, 2016).
- Morizot, Baptiste, 'Nouvelles alliances avec la terre. Une cohabitation diplomatique avec le vivant', *Tracés*, 33 (2017), pp. 73–96.
- Morizot, Baptiste, 'Prédation et production. Quel bon usage de la terre?', paper given at the conference 'The Right Use of the Earth', June 2018, Paris.

- Morizot, Baptiste, 'Ce que le vivant fait au politique', *Le cri de Gaïa* (Paris: La Découverte, 2021).
- Moyn, Samuel, 'Hype for the Best. Why does Steven Pinker Insist that Human Life is on the Up?', *The New Republic*, 19 March 2018: <https://newrepublic.com/article/147391/hype-best>.
- Mucchielli, Laurent, *Histoire de la criminologie française* (Paris: L'Harmattan, 1994).
- Mumford, Lewis, *Technics and Civilization* (New York: Harcourt, Brace & Company, 1934).
- Muradian, Roldan, Martin O'Connor and Joan Martinez-Alier, 'Embodied Pollution in Trade. Estimating the "Environmental Load Displacement" of Industrialised Countries', *Ecological Economics*, 41, 1 (2002), pp. 51–67.
- Murray Li, Tania, 'Qu'est-ce que la terre? Assemblage d'une ressource et investissement mondial', *Tracés*, 33, (2017), pp. 19–48.
- Nakhimovsky, Isaac, *The Closed Commercial State. Perpetual Peace and Commercial Society from Rousseau to Fichte* (Princeton, NJ: Princeton University Press, 2011).
- Nash, Roderick, *The Rights of Nature. A History of Environmental Ethics* (Madison: University of Wisconsin Press, 1989).
- O'Donnell, Erin L. and Julia Talbot-Jones, 'Creating Legal Rights for Rivers: lessons from Australia, New Zealand and India', *Ecology and Society*, 23, 1 (2018).
- Odum, Howard T., *Environment, Power and Society for the Twentieth Century* (New York: Columbia University Press, 1971).
- Offe, Claus, *The Contradictions of the Welfare State* (London: Hutchinson, 1984).
- Offe, Claus, 'New Social Movements: Challenging the Boundaries of Institutional Politics', *Social Research*, 52, 4 (1985), pp. 817–868.
- Oreskes, Naomi and Erik W. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (London: Bloomsbury, 2012).
- Oreskes, Naomi and John Krige (eds), *Science and Technology in the Global Cold War* (Cambridge, MA: MIT Press, 2014).
- Orléan, André, *L'Empire de la valeur* (Paris: Seuil, 2011).
- Ostwald, Wilhelm, *Energetische Grundlagen der Kulturwissenschaft* (Leipzig, 1909).
- Otter, Chris, 'Encapsulation: Inner Worlds and their Discontents', *Journal of Literature and Science*, 10, 2 (2017), pp. 55–66.
- Pagden, Anthony, 'Human Rights, Natural Rights, and Europe's Imperial Legacy', *Political Theory*, 31, 2 (2003), pp. 171–199.
- Pagden, Anthony, 'Fellow Citizens and Imperial Subjects: Conquest and Sovereignty in Europe's Overseas Empires', *History and Theory*, 44, 4 (2005), pp. 28–46.
- Pessis, Céline, Sezin Topçu and Christophe Bonneuil (eds.), *Une Autre Histoire des trente glorieuses. Modernisation, contestations et pollutions dans la France d'après-guerre* (Paris: La Découverte, 2013).
- Pestre, Dominique, 'L'analyse de controverses dans l'étude des sciences depuis

- trente ans. Entre outil méthodologique, garantie de neutralité axiologique et politique', *Mil neuf cent*, 25 (2007), pp. 29–43.
- Pestre, Dominique, 'La mise en économie de l'environnement comme règle. Entre théologie économique, pragmatisme et hégémonie politique', *Écologie et Politique*, 52 (2016), pp. 19–44.
- Pétri-Grenouilleau, Olivier, *Saint-Simon. L'utopie ou la raison en actes* (Paris: Payot, 2001).
- Physiocrates. Quesnay, Dupont de Nemours, Mercier de la Rivière, L'Abbé Baudeau, Le Trosne* (Paris: Guillaumin, 1846).
- Pierson, Paul, *Dismantling the Welfare State? Reagan, Thatcher, and the Politics of Retrenchment* (Cambridge: Cambridge University Press, 1994).
- Piketty, Thomas, *Capital in the Twenty-First Century*, trans. Arthur Goldhammer (Cambridge, MA: Harvard University Press, 2014).
- Pilbeam, Pamela, *The Middle Classes in Europe, 1789–1914: France, Germany, Italy, and Russia* (Chicago, IL: Lyceum Books, 1990).
- Pinchot, Gifford, 'The Foundations of Prosperity', *The North American Review*, 188, 636 (1908), pp. 740–752.
- Pinker, Steven, *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress* (London: Penguin Books, 2018).
- Pitts, Jennifer, *A Turn to Empire: The Rise of Imperial Liberalism in Britain and France* (Princeton, NJ: Princeton University Press, 2005).
- Pitts, Jennifer, 'Empire and Legal Universalisms in the Eighteenth Century', *American Historical Review*, 117, 1 (2012), pp. 92–121.
- Plehwe, Dieter, 'Think Tank Networks and the Knowledge–Interest Nexus: The Case of Climate Change', *Critical Policy Studies*, 8, 1 (2014), pp. 101–115.
- Plouviez, Mélanie, 'Le projet durkheimien de réforme corporative: droit professionnel et protection des travailleurs', *Les Études sociales*, 157–158 (2013), pp. 57–103.
- Pocock, John, *The Machiavellian Moment: Florentine Political Thought and the Atlantic Republican Tradition* (Princeton, NJ: Princeton University Press, 1975).
- Polanyi, Karl, *The Livelihood of Man*, ed. Harry W. Pearson (Cambridge, MA: The Academic Press, 1977).
- Polanyi, Karl, 'La mentalité de marché est obsolète', in *Essais* (Paris: Seuil, 2008).
- Polanyi, Karl, *The Great Transformation. The Political and Economic Origins of Our Time*, 2nd edn (Boston, MA: Beacon Press, 2001).
- Pomeranz, Kenneth, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton, NJ: Princeton University Press, 2009)
- Pottier, Antonin, 'L'économie dans l'impasse climatique. Développement matériel, théorie immatérielle et utopie auto-stabilisatrice', PhD dissertation, EHESS, 2014.
- Pottier, Antonin, *Comment les économistes réchauffent le climat* (Paris: Seuil, 2016).
- Pottier, Antonin, 'Climat: William Nordhaus est-il bien sérieux?', *Alternatives Économiques*, 9 October 2018: [www.alternatives-economiques.fr/climat-william-nordhaus-bien-serieux/00086544](http://www.alternatives-economiques.fr/climat-william-nordhaus-bien-serieux/00086544).

- Proudhon, Pierre-Joseph, *De la Concurrence entre le chemin de fer et les voies navigables* (Paris: Guillaumin, 1845).
- Proudhon, Pierre-Joseph, *Le Droit au travail et le droit de propriété* (Paris: Vassbender, 1848).
- Proudhon, Pierre-Joseph, 'Les Malthusiens', *Le Peuple*, 10 August 1848.
- Proudhon, Pierre-Joseph, *De la Capacité politique des classes ouvrières* (Paris: Dentu, 1865).
- Proudhon, Pierre-Joseph, *What Is Property?*, trans. Benjamin R. Tucker (Princeton, NJ: Benjamin R. Tucker, 1876).
- Proudhon, Pierre-Joseph, *The System of Economic Contradictions, or, The Philosophy of Poverty*, vol. 1: <https://theanarchistlibrary.org/library/pierre-joseph-proudhon-system-of-economical-contradictions-or-the-philosophy-of-poverty>.
- Purdy, Jedediah, 'American Natures: The Shape of Conflict in Environmental Law', *Harvard Environmental Law Review*, 36 (2012).
- Purdy, Jedediah, *This Land Is Our Land* (Princeton, NJ: Princeton University Press, 2019).
- Quesnay, François, *Physiocratie* (Paris: Garnier-Flammarion, 2008).
- Raworth, Kate, *Doughnut Economics* (London: Random House, 2017).
- Rockström, Johan et al., 'A Safe Operating Space for Humanity', *Nature*, 461, 7263 (2009), pp. 472–475.
- Rosanvallon, Pierre, *Le Moment Guizot* (Paris: Gallimard, 1985).
- Rudwick, Martin J. S., *The Great Devonian Controversy* (Chicago, IL: University of Chicago Press, 1985).
- Sahlins, Marshall, *Stone Age Economics* (New York: De Gruyter, 1972).
- Said, Edward, *Orientalism* (New York: Pantheon Books, 1978).
- Saint-Simon, Henri de, *Œuvres complètes* (Paris: PUF, 2012).
- Salleh, Ariel, *Ecofeminism as Politics: Nature, Marx, and the Postmodern* (London: Zed Books, 1997).
- Salmon, Gildas, 'Foucault et la généalogie de la sociologie', *Archives de Philosophie*, 79, 1 (2016), pp. 79–102.
- Salmon, Gildas, 'On Ontological Delegation. The Birth of Neoclassical Anthropology', in Pierre Charbonnier, Gildas Salmon and Peter Skafish (eds), *Comparative Metaphysics. Ontology after Anthropology* (London: Rowman & Littlefield, 2017), pp. 41–60.
- Salmon, Gildas, 'Les paradoxes de la supervision. Le "règne du droit" à l'épreuve de la situation coloniale dans l'Inde britannique, 1772–1782', *Politix*, 123 (2019), pp. 35–62.
- Samuelson, Paul, 'The Pure Theory of Public Expenditure', *Review of Economics and Statistics*, 36, 4 (1954), pp. 387–389.
- Samuelson, Paul, 'The Canonical Classical Model of Classical Political Economy', *Journal of Economic Literature*, 16 (1978).
- Sandbach, Francis, 'The Rise and Fall of the Limits to Growth Debate', *Social Studies of Science*, 8, 1978), pp. 495–520.
- Say, Jean-Baptiste, *Traité d'économie politique*, 6th edn (Paris: Zeller, 1841).
- Schmelzer, Matthias, 'The Growth Paradigm: History, Hegemony, and the Contested Making of Economic Growthmanship', *Ecological Economics*, 118 (2015), pp. 262–271.

- Schmelzer, Matthias, *The Hegemony of Growth. The OECD and the Making of the Economic Growth Paradigm* (Cambridge: Cambridge University Press, 2016).
- Schmitt, Carl, 'Appropriation/Distribution/Production: Toward a Proper Formulation of Basic Questions of any Social and Economic Order', *Telos*, 95 (Spring 1993).
- Schmitt, Carl, *The Nomos of the Earth in the International Law of the Jus Publicum Europaeum*, trans. G. L. Ulmen (New York: Telos Publishing, 2006).
- Schumacher, Ernst Friedrich, *Small is Beautiful* (New York: Blond & Briggs, 1973).
- Scott, James C., *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998).
- Scott, James C., *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia* (New Haven, CT: Yale University Press, 2009).
- Scranton, Roy, *Learning to Die in the Anthropocene* (San Francisco, CA: City Lights Books, 2015).
- Scruton, Roger, *Green Philosophy. How to Think Seriously About the Planet* (London: Atlantic, 2011).
- Schumpeter, Joseph, *Capitalism, Socialism and Democracy* (London: Routledge, 2003 [1943]).
- Servigne, Pablo and Raphaël Stevens, *How Everything Can Collapse: A Manual for Our Times*, trans. Andrew Brown (Cambridge: Polity, 2020).
- Servigne, Pablo, Raphaël Steven and Gauthier Chapelle, *Another End of the World Is Possible*, trans. Geoffrey Samuel (Cambridge: Polity, 2018).
- Sewell, William, *Work and Revolution in France: The Language of Labour from the Old Regime to 1848* (Cambridge: Cambridge University Press, 1980).
- Shapin, Steven, *A Social History of Truth: Civility and Science in Seventeenth-Century England*, 2nd edn (Chicago, IL: University of Chicago Press, 1995).
- Shapin, Steven and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, NJ: Princeton University Press, 2017).
- Sieferle, Rolf, *The Subterranean Forest: Energy Systems and the Industrial Revolution* (Cambridge, MA: White Horse Press, 2001).
- Singaravélou, Pierre, *Professer l'empire. Les 'sciences coloniales' en France sous la IIIe République* (Paris: Publications de la Sorbonne, 2011).
- Singer, Peter, *Animal Liberation. A New Ethics for our Treatment of Animals* (New York: Avon Books, 1975).
- Smil, Vaclav, *Energy in World History* (Boulder, CO: Westview Press, 1994).
- Smith, Adam, *An Inquiry into the Nature and Causes of the Wealth of Nations*: [https://www.ibiblio.org/ml/libri/s/SmithA\\_WealthNations\\_p.pdf](https://www.ibiblio.org/ml/libri/s/SmithA_WealthNations_p.pdf).
- Smith, Adam, *The Theory of Moral Sentiments* (1759): [https://en.wikisource.org/wiki/The\\_Theory\\_of\\_Moral\\_Sentiments](https://en.wikisource.org/wiki/The_Theory_of_Moral_Sentiments).
- Spector, Céline, 'Le concept de mercantilisme', *Revue de métaphysique et de morale*, 39, 3 (2003), pp. 289–309.
- Spivak, Gayatri, 'Can the Subaltern Speak?' in Cary Nelson and Lawrence



- Grossberg (eds), *Marxism and the Interpretation of Culture* (Basingstoke: Macmillan, 1988), pp. 271–313.
- Stedman Jones, Gareth, *An End to Poverty?* (London: Profile Books, 2004).
- Stedman Jones, Gareth, 'National Bankruptcy and Social Revolution: European Observers on Britain, 1813–1844', in Donald Winch and Patrick K. O'Brien (eds), *The Political Economy of British Historical Experience 1688–1914* (Oxford: Oxford University Press, 2002), pp. 61–92.
- Stedman Jones, Gareth, 'Saint-Simon and the Liberal Origins of the Socialist Critique of Political Economy', in Sylvie Aprile and Fabrice Bensimon (eds), *La France et l'Angleterre au XIXe siècle* (Paris: Créaphis, 2006).
- Stedman Jones, Gareth, 'L'impossible anthropologie communiste de Karl Marx', in Vincent Bourdeau and Arnaud Macé (eds), *La Nature du socialisme. Pensée sociale et conceptions de la nature au XIXe siècle* (Besançon: Presses Universitaires de Franche-Comté, 2018).
- Steffen, Will, Wendy Broadgate, Lisa Michel Deutsch, Owen Gaffney and Cornelia Ludwig, 'The Trajectory of the Anthropocene: The Great Acceleration', *The Anthropocene Review*, 2, 1 (2015), pp. 81–98.
- Steffen, Will, et al., 'Trajectories of the Earth System in the Anthropocene', *PNAS*, 115, 33 (2018), pp. 8252–8259.
- Steinberg, Philip, Jeremy Tasch and Hannes Gerhardt, *Contesting the Arctic: Politics and Imaginaries in the Circumpolar North* (London: I. B. Tauris, 2015).
- Stengers, Isabelle, *L'Invention des sciences modernes* (Paris: La Découverte, 1993).
- Stern Review on the Economics of Climate Change* (London: HM Treasury, 2010).
- Stocking, Jr., George W., *Victorian Anthropology* (New York: Free Press, 1987).
- Streeck, Wolfgang, *Du temps acheté. La crise sans cesse ajournée du capitalisme démocratique* (Paris: Gallimard, 2014).
- Taylan, Ferhat, *Mésopolitiques. Connaître, théoriser et gouverner les milieux de vie, 1750–1900* (Paris: Éditions de la Sorbonne, 2018).
- Taylan, Ferhat, 'Droits des peuples autochtones et communs environnementaux. Le cas du fleuve Whanganui en Nouvelle-Zélande', *Annales des Mines*, 92, 4 (2018), pp. 21–25.
- Taylor, Frederick, *The Principles of Scientific Management* (New York: Harper and Brothers, 1911).
- Thiers, Adolphe, *De la propriété* (Paris: Paulin, Lheureux et Cie, 1848).
- Thompson, Edward P., *The Making of the English Working Class* (London: Victor Gollancz, 1963).
- Thompson, Edward P., 'The Moral Economy of the English Crowd in the Eighteenth Century', *Past and Present*, 50 (1971), pp. 76–136.
- Thompson, Edward P., *Whigs and Hunters. The Origins of the Black Act* (London: Allen Lane, 1975).
- Tilley, Helen, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870–1950* (Chicago, IL: University of Chicago Press, 2011).
- Tocqueville, Alexis de, *Democracy in America*, trans. Henry Reeve: <https://www.gutenberg.org/files/815/815-h/815-h.htm>.



- Tort, Patrick, *Spencer et l'évolutionnisme philosophique* (Paris: PUF, 1996).
- Tort, Patrick, *Darwin et le darwinisme* (Paris: PUF, 1997).
- Tooze, Adam, *Crashed: How a Decade of Financial Crises Changed the World* (London: Penguin, 2018).
- Toynbee, Arnold, *Lectures on the Industrial Revolution of the 18th Century in England* (London: Longmans, 1884).
- Tribe, Keith, *Governing Economy: The Reformation of German Economic Discourse (1750–1840)* (Cambridge: Cambridge University Press, 1988).
- Tribe, Keith, 'De l'atelier au procès de travail. Marx, les machines et la technologie', in François Jarrige (ed.), *Dompter Prométhée. Technologies et socialismes à l'âge romantique (1820–1870)* (Besançon: Presses Universitaires de Franche-Comté, 2016).
- Turner, Fredrik Jackson, 'The Significance of the Frontier in American history', Annual Report of the American Historical Association (1894), pp. 119–227.
- Tylor, Edward B., *Primitive Culture* (London: John Murray, 1871).
- Ure, Andrew, *Philosophie des manufactures ou économie industrielle de la fabrication du coton et de la laine, du lin et de la soie* (Paris: L. Mathias, 1836).
- Van Ittersum, Martine Julia, *Profit and Principle. Hugo Grotius, Natural Rights Theories, and the Rise of Dutch Power in the East Indies, 1595–1615* (Boston, MA: Brill, 2006).
- Vanuxem, Sara, *La Propriété de la terre* (Marseille: Wildproject, 2018).
- Veblen, Thorstein, *The Collected Works of Thorstein Veblen* (London: Routledge and Thoemmes, 1994).
- Veblen, Thorstein, *The Theory of the Leisure Class: An Economic Study of Institutions* (New York: Penguin Books, 1994).
- Vincent, Julien, 'Cycle ou catastrophe? L'invention de la "révolution industrielle" en Grande-Bretagne, 1884–1914', in Jean-Philippe Genet and François-Joseph Ruggiu (eds), *Les Idées passent-elles la Manche? Savoirs, représentations, pratiques (France-Angleterre, Xe–XXe siècles)* (Paris: Presses de la Sorbonne, 2007), pp. 235–258.
- Vincent, Julien, 'Une contre-révolution du consommateur? Le comte Rumford à Boston, Munich, Londres et Paris (1774–1814)', *Histoire, économie et société*, 32, 3 (2013), pp. 13–32.
- Viveiros de Castro, Eduardo, *From the Enemy's Point of View: Humanity and Divinity in an Amazonian Society* (Chicago, IL: University of Chicago Press, 1986).
- Viveiros de Castro, Eduardo, *Métaphysiques Cannibales* (Paris: PUF, 2009).
- Wallerstein, Immanuel, *The Modern World System* (Berkeley: University of California Press, 1974–89).
- Warde, Paul, 'The Idea of Improvement, c.1520–1700', in Richard Hoyle (ed.), *Custom, Improvement and the Landscape in Early Modern Britain* (Farnham-Burlington: Ashgate, 2011), pp. 127–148.
- Warde, Paul, *The Invention of Sustainability* (Cambridge: Cambridge University Press, 2018).
- Wakefield, Edward Gibbon, *A View of the Art of Colonization* (Cambridge: Cambridge University Press, 2014 [1849]).
- Weaver, John C., *The Great Land Rush and the Making of the Modern World (1650–1900)* (Montreal: McGill-Queen's University Press, 2003).

- Webb, Beatrice and Sidney Webb, *Industrial Democracy* (London: Longmans, Green & Co., 1897).
- Weber, Eugen, *La Fin des terroirs* (Paris: Fayard, 1983).
- Weber, Max, *The Protestant Ethic and the Spirit of Capitalism and Other Writings*, ed. and trans. Peter Baehr and Gordon C. Wells (London: Penguin, 2002).
- White, Leslie, 'Energy and the Evolution of Culture', *American Anthropologist*, 45, 3 (1943).
- White, Jr., Lynn, 'The Historical Roots of our Ecological Crisis', *Nature*, 155, 3767 (1967).
- White, Ben, Saturnino M. Borrás, Jr., Ruth Hall, Ian Scoones and Wendy Woolford, 'The New Enclosures: Critical Perspectives on Corporate Land Deals', *Journal of Peasant Studies*, 39, 3–4 (2012), p. 619–647.
- Williams, Eric, *Capitalism and Slavery* (Chapel Hill: University of North Carolina Press, 1944).
- Winch, Donald, *Economics and Policy: A Historical Study* (New York: Walker & Co., 1969).
- Winch, Donald, *Riches and Poverty: An Intellectual History of Political Economy in Britain, 1750–1834* (Cambridge: Cambridge University Press, 1996).
- Winner, Langdon, *The Whale and the Reactor: A Search for Limits in an Age of High Technology* (Chicago, IL: University of Chicago Press, 1986).
- Wittfogel, Konrad, *Oriental Despotism: A Comparative Study of Total Power* (New Haven, CT: Yale University Press, 1957).
- Wolloch, Nathaniel, *Nature in the History of Economic Thought. How Natural Resources Became an Economic Concept* (London: Routledge, 2017).
- Wood, Ellen Meiksins, 'The Agrarian Origins of Capitalism', *Monthly Review*, 50, 3 (1998).
- Wood, Neal, *John Locke and Agrarian Capitalism* (Berkeley: University of California Press, 1984).
- Wrigley, E. A., *Poverty, Progress and Population* (Cambridge: Cambridge University Press, 2004).
- Wrigley, E. A., *Energy and the English Industrial Revolution* (Cambridge: Cambridge University Press, 2010).
- Xifaras, Mikhaïl, 'Marx, justice et jurisprudence, une lecture du "vol de bois"', *Revue Française d'Histoire des Idées Politiques* (2002), pp. 63–112.
- Zaccai, Edwin, François Gemenne and Jean-Michel Decroly (eds), *Controverses climatiques, sciences et politique* (Paris: Presses de Sciences Po, 2012).

# Index

- acceleration  
  and the eclipse of nature 172–86  
  emancipation and 175–9  
adaptation 140, 197, 207  
Adorno, Theodor 175  
affordances, political 30–5, 113–14,  
  169–70, 237, 267n20  
agrarian  
  kingdom 54–5, 60–1  
  protectionism 167  
agro-industrial transition 18  
agronomy, technology and 148–51  
alarms, and controversies 187–90  
Amazon basin 220–1, 222, 231  
America *see* United States  
*ancien régime* 77, 96, 105, 122, 143  
animism 220–2  
Anthropocene 11, 23–4, 155, 174–5,  
  205–6, 251–2, 259  
anthropology  
  historical 50–1, 153  
  of nature 219–24  
anti-ecological liberal doctrine 293n8  
anti-productionist socialism 254  
arbitrary coercion 127  
arbitration, industrial 96–7  
Arctic region 42, 220  
aristocracy 26, 44, 46, 55, 57, 90,  
  166, 179  
Armitage, David 43, 44  
arts, the 58–9, 125  
Asia 36, 38, 58, 65  
atomic power 180, 185, 186, 194,  
  246, 287n35  
authoritarianism 127, 243, 251, 256  
authority, and composition 215–19  
automobiles 250–1, 264  
autonomy  
  and affluence 21–9, 87–8  
  climate change and 237–8  
  environmental history of 112  
  of the individual 111  
  margins of 27  
  Marx as a thinker of 142–5  
  paradoxes of 75–80  
  political-historical 127  
  project of 10–11, 13, 240, 243  
  risk, and the reinvention of 198–204  
  social 111–12  
  without affluence 244–52  
Aykut, Stefan 254–5  
Babbage, Charles 149–50  
baby boomers 173  
Baconian method 80, 270n36  
Barrès, Maurice 244, 293n12  
Barthe, Yannick, *Agir dans un monde incertain* 203  
Beck, Ulrich, *Risk Society* 188–9  
Belime, William 96  
Bentham, Jeremy 15–16, 108, 266n13  
Beveridge Report (1942) 173  
biodiversity, collapse of 9  
bioeconomics 193–7, 204, 207,  
  225–6, 255  
biomass 9, 23  
Blanc, Louis 105  
  *L'Organisation du travail* 98–100

- Blanqui, Adolphe 64  
 Blith, Walter, *The English Improver Improved* 270n36  
 Bloor, David 216  
 Bolsonaro, Jair 1  
 Bonapartism 147  
 borders 37–8, 68, 143  
 Bouglé, Célestin, 126  
 bourgeoisie 26, 55, 97, 142–3, 152, 230  
 Bretton-Woods agreements 181  
 Brexiteers 1  
 British Empire 47, 69, 215, 231  
 business cycle 100, 102–3, 109, 132, 134, 137, 143  
  
 Callicott, John Baird 15  
 Callon, Michel, *Agir dans un monde incertain* 203  
 cameralism, German 66–7  
 Canguilhem, Georges 167  
 capitalism 135–8  
     collapse of 143  
     democratic 28, 172–3, 285n1  
     difference of 152  
     eighteenth-century 56  
     global 153–6, 225  
     Marx on 25, 150  
     totalitarianism and 175–6  
 capitalist mode of production 149, 151, 153, 241–2  
 carbon sociology 106–113  
 Caribbean 86  
 Carlyle, Thomas 51, 280n16  
 Carolina, America 43–4  
 Cartesian idea 34–5  
 cartography, new conceptual 234–6  
 Castel, Robert 200  
 castes 114, 231  
 Castoriadis, Cornelius 25  
 catastrophe (risk) 128–30, 187–208  
 Chakrabarty, Dipesh 231, 262  
 Chaptal, Jean-Antoine 121, 124  
 chemistry 20  
 Chernobyl accident 187, 188, 199  
 China 60, 65, 292n47  
 Christianity 32–5  
 chronopolitics 189–90, 199  
  
 citizenship, modern 147  
 civil engineers 124  
 classes 56, 131  
     middle 27–8, 107, 173, 174, 248  
     patrician 100–1  
     peasant 44, 54, 60, 97, 166, 167, 179, 231  
     sterile 56, 57  
     working 101, 107, 113, 134, 143, 166, 168–9, 174  
 Clastres, Pierre 220  
 climate change 205–7, 237–42, 245–9, 253–4  
     autonomy and 10  
     awareness of 1–2  
     dealing with 263  
     denial 242, 249, 251, 293n7  
     extreme events 261  
 closed commercial state 66–71  
 Club of Rome report (*The Limits to Growth*) 187–8, 190–2, 194, 195  
 CO<sub>2</sub> emissions 1, 205, 241, 246  
 coal 162–3, 275nn22–7  
     availability of 74  
     energy 65  
     industry 73  
     Jevons on 80–5, 182  
     oil and 181  
     political affordances of 113–14  
     quantification of resources 81–2  
 Colbert, Jean-Baptiste 52–3  
 Cold War 180  
 collapse and resilience, impasse between 204–7  
 collectivism 119–21  
     labour and 17–18, 109, 124  
     nature and 22, 148–51, 156–60, 164  
     property and 105  
     society and 25–6  
 colonialism  
     colonial extractions 85–9  
     colonial reflexivity 89  
     empires 213  
     Europe and 12, 13, 27, 28, 52, 215  
     Fichte on 69

- North America and 43–4  
 subjects and 72  
 Columbian exchange 225  
 commerce  
   and industry 119  
   and organic economy 50–71  
 Commoner, Barry 190  
 Commons, John R. 119  
 communism 142–4  
 communities 30, 51  
 competition 62, 104–5, 131  
 composition, authority and 215–19  
 Comte, Auguste 77  
 Condorcet, Nicolas de 12, 122  
 conflicts of ecological distribution  
   232–4  
 conservationism 57–8, 132, 140  
 conservatism 165, 166, 169–70, 244,  
   257  
 Constituent Assembly (1791) 77  
 consumer goods 65, 101–2, 125,  
   178  
 consumption  
   commodity 109  
   conspicuous 55, 131  
   cycle of production and 140, 193  
   market 111  
   mass 180  
   practices of 28  
   private 126  
   sphere of  
 contracts 67–8  
 controversies, alarms and 187–90  
 corporations 68, 114, 115  
 corporative idiom 104–5  
 cotton 87  
 counter-movements 109, 115, 156,  
   163–4, 175, 178, 239, 242  
 Counter-Reformation 32  
 craft sectors 52, 104–5, 125  
 creative destruction 99  
 crime rates 110  
 critical subject, towards a new  
   252–7  
 critical thinking 129, 180, 186, 215,  
   228, 239  
 Cronon, William 86  
 Crosby, Alfred 225  
 currency 181  
 customs tariffs 135  
 Dahan, Amy 254–5  
 Daly, Herman, *Steady-State  
   Economics* 190  
 Darwinism 207–8  
 De Vries, Jan 53, 64–5  
 decarbonization 10  
 decision infrastructures 259  
 Declaration of Human Rights,  
   Universal (UDHR) 19  
 Declaration of the Rights of Man  
   and the Citizen 76  
 decolonization 210, 221, 229, 237  
 deferred satisfaction, principle of  
   200  
 degrowth 190, 287n9  
 democracy 90–2  
   in America 276n42, 276n44; *see*  
   also Tocqueville, Alexis de  
   industrial 94–117, 139, 204  
   technological 204  
 democratic capitalism 28, 172–3,  
   285n1  
 democratic collapse, state 8  
 Descola, Philippe 13, 219, 220  
   *Beyond Nature and Culture* 221–2  
 development, critique of 190–6  
 differential rent 62, 158  
 disasters, environmental 8  
 disembedding, of the economy 160–3  
 disorder identification 253–4  
 domestication 39–41  
 dominium 31, 39  
 Drayton, Richard, *Nature's  
   Government* 270n36  
 dualism 211, 221  
 Dunoyer, Charles 103, 278n31  
 Durkheim, Émile  
   ‘carbon sociology’ 106–113  
   *The Division of Labour in Society*  
   108, 114  
   individualist anomie 171  
   overconsumption 140  
   scientific sociology 20, 95, 214  
   on social belonging 253  
   *Suicide* 107–8, 279n50

- Dutch East India Company 36  
dwelling 18–19, 247–8
- Earth, the 254  
Earth sciences 174  
eco-modernist programme 245–6  
ecology  
  conflicts 232–4, 254  
  constraints 11  
  integral 10  
  and the labour question 11–14  
  neoliberal 243, 255  
  political 170, 209–36  
  reason critique 7–29  
  reflexivity 58, 179, 249  
  unequal exchange 224–9, 232, 246,  
  291n37  
  warnings 7  
economy, commerce and organic 50–71  
ecosystem services 255  
efficiency, cult of 130–4, 139–40  
Egypt 60  
Ehrlich, Paul 190  
elitism  
  aristocratic 26  
  economic 124, 125, 135, 242  
  idle 123, 131  
  Indian 215  
  industrial 125, 132  
  intellectual 31–2, 53, 123  
  social 58  
  technocratic 121  
emancipation and acceleration 175–9  
‘emergy’, concept of 196  
empire, and possession 35–42  
empirical sciences 21  
enclosure, land 45, 160–3  
enclosures, new 293n11  
energy 65, 84, 131  
Engels, Friedrich, *The Manifesto of  
  the Communist Party* 142–3, 150  
engineers 121, 124, 126, 133, 149  
  and property 134–9  
England  
  coal 81–4  
  welfare plan 173  
Enlightenment, Age of  
  autonomy and 26  
  cameralism and 67  
  Colbert and 53  
  Hume and 58–9  
  impact of 12, 13  
  legacy of 210, 252  
  thinkers during 21, 34, 135  
  universalism and 72  
entrepreneurs 133, 134, 136, 137  
entropy, principle of 23, 193, 195  
environmentalism 251, 256, 260  
epistemo-political critique 52, 215,  
  217, 239, 244, 249  
equality, labour question and 11, 12  
ethnography 214, 219, 220  
Europe  
  colonialism and 12, 13, 27, 28, 52  
  imports to 86–7  
  political history 285n57  
  space and 68–71  
exaptation, of liberalism 75, 136, 164  
exception  
  end of modern 209–36  
  twofold 211–15  
exosomatic energies 23, 65, 76  
expenditure, excessive 131  
experimental sciences 21  
exploitation 125–7, 148, 152, 197,  
  225, 263, 272n25  
expropriation 96  
extensive growth 64, 83, 150  
extraction-autonomy 89–92, 93, 103,  
  108, 179, 199  
family, and nation 10  
farming 46, 53, 54, 56  
fascism 134, 158, 163, 167–8, 173  
fatalism 144  
feminist critique (political economy)  
  289n2  
fertilizers 150–1  
feudalism 26, 34, 143, 144  
Feuerbach, Ludwig 144  
Fichte, Johann G. 83, 93, 184, 228  
  *The Closed Commercial State*  
  66–71  
food supply 56  
forestry 74, 83, 132, 145–7  
Forrester, Jay 190–1

- fossil fuels 8, 18, 23, 73, 76, 181, 184, 196
- Fourastié, Jean, *Machinisme et bien-être* 173–4
- France
- agriculture 44
  - Civil Code 95–6
  - Constituent Assembly 77
  - elections 280n9
  - Encyclopaedists 53
  - lack of coal 84
  - nuclear projects 184–5
  - post-revolution 79–80
  - railways 98–9
  - rivalry with England 52–61
  - technological modernization 96–7
  - see also* *ancient regime*; French Revolution; *gilets jaunes* demonstrations
- fraternal idiom 103–5
- free income 138
- freedom from want 172–5
- French Antilles 215
- French Revolution 11, 13, 67, 70, 78, 94–5
- Fressoz, Jean-Baptiste 128
- Freudo-Marxist critique 176, 179
- ‘fully automated luxury communism’ 178
- Galileo-Cartesian ideal 35
- Gauchet, Marcel 76
- GDP (gross national product) 174, 182, 184, 194
- geo-power 32
- geoclimatic indicators 174
- Georgescu-Roegen, Nicholas, *The Entropy Law and the Economic Process* 141, 190, 193, 194, 195
- Germany 66–71
- Gibson, James J. 267n20
- Giddens, Anthony, ‘Risk and Responsibility’ 201–2, 204, 288n26
- gilets jaunes* demonstrations 2, 263
- global risk 206, 207
- GNP (gross national product) 184
- ‘going concern’ (business) 281n43
- gold standard 181
- Gorz, André 177
- government, principles of 26–7
- grain, and the market 50–71
- Gramsci, Antonio 230
- gravitational system 210–11, 245
- Great Depression 133, 138, 140
- green finance 9
- greenhouse gases 205, 237, 241
- Grotius, Hugo
- empire and possession 35–42
  - De Jure Praedae* 36–8
  - Mare Liberum* 36
  - The Rights of War and Peace* 32, 36, 38–40
- growth
- economic 8, 23, 64, 91, 171, 190, 192, 242
  - socialism of 254
- Guha, Ranajit 230–2
- Elementary Aspects* 292n41, 292n44
- Guizot, François 75–80, 85, 93
- Essai sur l’histoire et sur l’état actuel de l’instruction publique en France* 76–7
- Halévy, Élie, 126
- Hansen, James 205
- happiness 23, 108, 109–10, 129, 132, 174
- Haudricourt, André-Georges 222
- Hayek, Friedrich, *The Road to Serfdom* 159–60, 284nn39–40
- Heemskerk, Jacob Van 36
- Heidegger, Martin 176–7
- heteronomy 21, 72, 85, 89, 180, 198, 210, 222
- history of ideas, environmental 14–16, 20
- Hobbes, Thomas, *Leviathan* 43
- Horkheimer, Max 175
- Hottinguer, Jean-Henri 124
- human rights 19, 26, 76
- Hume, David, ‘Of Refinement in the Arts’ 58–9
- Husserl, Edmund 176–7
- hydroelectric power 83, 196–7



- imperialism 31, 70  
 imports 84, 87  
 incantatory governance 254–5  
 India 60, 214–15, 230–1  
 Indians, American 44, 46, 91  
 indigenous communities 34, 86  
 individual property 49, 105  
 individualism 27, 104–5, 111  
 industrial  
   arbitration 96–7  
   democracy 94–117, 139, 204  
   elitism 125, 132  
   liberty 94, 95  
   Polanyi on 159, 164  
   pollution 8  
   reformers 190–1  
   revolution 65, 73, 74–5, 119–20,  
     135, 253  
   technoscience 20–1, 74, 79, 120  
   underefficiency 135  
 industrialists 124  
 inequalities 8, 44, 127  
 Ingold, Tim 219  
 injustice, experience of 8  
 innovators 124, 136  
 integral ecology 10  
 integration-autonomy 111, 112,  
   116–17, 129, 243  
 intensive growth 63–5, 108–9, 150  
 international law 36–9  
 international policy 293n7  
 investment, financial 86, 96–7, 124,  
   135–6, 137  
 investment, technological 52  
 invisible energies 179–86  
 IPBES (Intergovernmental Science-  
   Policy Platform on Biodiversity  
   and Ecosystem Services) 6  
 IPCC (Intergovernmental Panel on  
   Climate Change) 6, 205, 237  
 Italy 105  
   Italian republics 126–7  
  
 James, C. L. R. 86  
 Japan 65  
 Jefferson, Thomas, *Notes on the  
   State of Virginia* 276n44  
 Jevons paradox 82  
  
 Jevons, Stanley 76, 89, 93, 131–2,  
   156, 182  
   *The Coal Question* 80–5,  
     275nn22–7  
 July Monarchy 78, 124  
 Justi, Johann von 66–7  
 justice, changing expectations of  
   237–44  
  
 Kant, Immanuel 33–4  
 Kelley, Donald 97  
 Kennedy, John F. 173  
 Keynes, John Maynard 24, 177,  
   181–2  
 Klein, Naomi 242, 244  
 knowledge 19–21, 223–4, 249  
 Kyoto Protocol 205, 254  
  
 labour  
   collectivism and 17–18, 124  
   cost of 52–3  
   organization of 98–100  
   productivity 174  
   and property 95–100, 277n20  
   subsisting and 17–18  
   time-saving 133  
   unskilled 227  
 labour, division of  
   Durkheim on 106, 108–10, 112,  
     114  
   labour question 253–4, 265n6  
   ecology and the 11–14  
   equality and the 11, 12  
   Indian 231  
 Laffitte, Jacques 124  
 laissez-faire 53, 137, 167, 243  
 land  
   abandonment of 167–8  
   enclosure 45, 160–3  
   fertility 9, 150, 270n39  
   good use of 50–2, 227  
   grab/rush 70, 227  
   management 105, 230  
   political affordances of the 30–5,  
     169–70, 267n20  
 landowners 44, 53, 56–7, 143  
 Lane, Richard 286n26  
 Larcher, Silyane 215

- Lascoumes, Pierre, *Agir dans un monde incertain* 203
- Latin America 226
- Latour, Bruno 13, 215, 216, 218, 242
- Où atterrir?* 244, 285n60, 294n22
- Politics of Nature* 203
- We Have Never Been Modern* 217, 288n20
- law, natural 42, 97–8
- Leopold, Aldo 170
- Lévi-Strauss, Claude 214
- liberal cosmopolitanism 218–19
- liberal pact 172, 180, 187, 204, 262
- Proudhon as critic of 100–3
- Smith and 59–63
- liberalism 58–9, 72–5, 163–5, 169–71
- anti-ecological doctrine 293n8
- classic 63–6
- consolidated 89
- critical 89
- doctrine of 91
- emancipation and 159–60
- ethical and legal systems 135
- exaptation of 75, 136, 164
- and heteronomy 180
- liberty
- definition of 103, 177
- fabric of 7–11
- industrial 94, 95
- reinventing 259–64
- of the seas 36–9
- Liebig, Justus von 150, 283n23
- limitlessness
- economy 182, 186, 242, 246
- growth 190, 194, 195, 196
- power of the people 76
- will and 78
- limits, risks and 187–208
- Limits to Growth, The* (Club of Rome report) 187–8, 190–2, 194, 195
- Lippmann, Walter 159, 284n39
- living conditions 12, 18, 164
- living standards 65, 107, 174
- Locke, John 43–7, 237, 268n3, 270n39
- Fundamental Constitutions of Carolina* 44
- Second Treatise of Government* 43, 44
- Lutheran Reformation 32
- Malthus, Thomas 23, 51, 62, 63, 100, 161, 192
- Malthusian trap 63, 73, 83, 84, 100
- Malthusianism 192, 197
- managers, role of 133, 137
- Mandeville, Bernard, *Fable of the Bees* 51
- manufacturing 52, 54–6, 57, 59
- maps 58
- Marcuse, Herbert, *One-Dimensional Man* 175–9, 286n12
- maritime space 36–9, 82
- market
- arrangements 118–21
- global 233
- grain and the 50–71
- nature in a market society 142–71, 183
- Martinez-Alier, Joan 226, 227, 232
- The Environmentalism of the Poor* 225
- Marx, Karl 168–9
- Capital* 25, 148, 150
- conquering the globe 153–6
- The Eighteenth Brumaire of Louis Bonaparte* 147
- letter to Engels 283n23
- Grundrisse* 153–6
- The Manifesto of the Communist Party* 142–3, 146
- peasant classes 231
- The Poverty of Philosophy* 144
- on Proudhon 95
- putting the forest to good use 145–7
- and Quesnay 55
- ‘On the Question of Free Trade’ 143
- on rural life 166
- technology and agronomy 148–52
- as a thinker of autonomy 142–5

- material  
 abundance 176  
 flows 118–21  
 infrastructures 126  
 management 136  
 poverty 140  
 power 113–14  
 reconstruction 172  
 reflexivity 18, 27–8, 137, 138  
 structures 12
- materialism 142–3, 152, 262
- materials, raw 53, 182, 194, 226–7
- Mauss, Marcel 214
- Meadows, Donella 190, 192
- mercantilism 32
- Mercier de la Rivière, *L'Ordre naturel et essentiel des sociétés politiques* 54
- metabolic  
 cycle 134, 150–1  
 rift 151, 155  
 shock 253–4
- metaphysics 55–7
- middle class *see* classes
- migration 84
- Milanović, Branko 6
- Mill, James 149, 161
- Mill, John Stuart, 78–9, 276n49  
*Principles of Political Economy*  
 92, 108
- Millennium Ecosystems Assessment 255
- Mintz, Sidney 86
- Mirabeau, *Philosophie rurale* 53–4
- Missemer, Antoine 275n22
- Mitchell, Timothy, 107, 184, 211–12, 248, 253  
*Carbon Democracy* 181–2
- mobility 103, 130, 173, 210, 250, 263
- modernity  
 critique of 209–15, 280n16  
 early 40–1  
 history of 22–3  
 twice-born 73–4
- Moore, Jason 227
- moral economy 166
- Morizot, Baptiste 223, 224, 257
- mortality 100–1
- Muir, John 132, 281n24
- Murray Li, Tania 227, 233
- nationalism 10, 115
- natural  
 borders 31, 70  
 laws 161
- naturalism  
 concept of 267n16  
 political 190–6  
 production and 219–24, 227–8
- nature  
 alienation from 142, 148, 153  
 anthropology of 219–24  
 collectivism and 22, 148–51, 156–60, 164  
 concept of 16–17  
 great acceleration and the eclipse of 172–86  
 indifference to 290n18  
 in a market society 142–71, 183  
 Marx on 145–7  
 protecting 156–60, 247, 280n16  
 social relations and 12, 169–70  
 socialization of 130, 152, 155
- NégaWatt manifesto 280n18
- neoliberal ecology 243, 255
- Netherlands 52
- network infrastructures 126
- New World 34
- nonmoderns 47, 211–16, 219, 221, 253
- normativity of the moderns, technological 125–7
- North–South relationships 197, 226, 233–4
- Northwest Passage 42
- nuclear power 180, 185, 186, 194, 246, 287n35
- Odum, Howard 226  
*Environment, Power and Society*  
 190, 196–7, 288n19
- oil 179, 181–3, 184, 186, 196, 265n5
- organic economy, commerce and 50–71
- organization of labour 98–100
- Orléan, André 162
- Ostwald, Wilhelm 197, 281n31

- overconsumption 140  
 overproduction 137, 143
- Paine, Thomas 12, 26  
     *Agrarian Justice* 52
- Paris Agreement (2015) 1–2
- Patel, Raj 227
- patrician class *see* classes
- peasant class *see* classes
- peasant practices 145–7
- Peccei, Aurelio 190
- people of producers 118, 185, 209, 224
- permanent stagnation 243
- Perregaux, François 124
- perspectivism 221
- Pestre, Dominique 255
- petroknowledge 182
- Physiocracy 52–8, 272n15
- physiology 55, 122
- Pinchot, Gifford 132
- Pinker, Steven 5
- Polanyi, Karl 185, 218, 230, 231–2  
     disembedding 160–3  
     *The Great Transformation* 104,  
     156–9, 239–40, 253, 271n3,  
     284n45, 285n57  
     protecting society and nature 156–60  
     socialism, liberalism, conservatism  
     163–9, 170  
     ‘Our Obsolete Market Mentality’  
     25, 162  
     on subsistence 17
- polar regions 42
- political  
     authority 20, 32, 77, 199, 244  
     changing landscape of 1  
     contemporary events 8  
     naturalism 190–6  
     philosophy 33–4  
     rationality 25, 32–5  
     reconstruction 172  
     reflexivity 18, 34, 72, 213, 237,  
     247, 266n10  
     transformation 10  
     will 78, 80
- pollution 8, 151, 191–2, 192
- Pomeranz, Kenneth, *The Great  
     Divergence* 65, 74, 89
- poor laws 161, 271n3
- Popper, Karl, *The Open Society and  
     Its Enemies* 159
- population growth 25, 83–4, 187, 192
- Portugal 36, 37, 38
- positive direct action 222
- possession 35–42, 68, 87, 96, 123,  
     145, 176
- postwar modernization 135, 173,  
     175–6, 183–4
- poverty 12, 101–2, 110–11, 144, 161
- price systems 9, 101–2, 226, 248
- production, naturalism and 219–24,  
     227–8
- productive schema 128–30
- professional solidarity 104–5
- progress, critique of 262–3
- progressiveness trap 173
- progressivism 21, 50, 57–9, 72, 101,  
     104–5, 129, 154
- proletariat 101, 113, 168–9
- property  
     age of 95–6  
     civility and 135  
     collective 105  
     concept of 31, 46, 48–9, 72, 238  
     and the engineer 134–9  
     individual 49, 105  
     and labour 95–100, 277n20  
     Locke’s definition 46  
     origin of 39–40  
     plot ownership 147  
     private 97  
     relationships 67–8  
     sovereignty and 30–49
- prosperity without growth 10
- prosperous descent 197
- protectionism 143, 156–60, 167, 228
- protest movements 2, 263
- Protestantism 32, 115
- Proudhon, Pierre-Joseph 94–100,  
     144, 171, 231  
     as critic of the liberal pact 100–3  
     *Philosophy of Poverty* 101  
     *System of Economic  
     Contradictions* 100, 278n23  
     *What is Property?* 100
- providential republicanism 92

- provincializing critique 229–34  
 psychoanalysis 176  
 public utility 80, 96–7  
 Purdy, Jedediah 259
- Quesnay, François 53–5, 57  
   *Philosophie rurale* 54  
   *Physiocratie* 53  
   *Tableau économique* 54, 55–6
- radicalism 76  
 railways 82, 96–7, 98–9, 102  
 rational state 67–8, 71  
 rationality  
   economic 119, 120, 135, 192  
   political 25, 32–5  
 rationalization, of tasks 133, 151, 152  
 Rawls, John 175  
 reality schism 254  
 rebound effect theory 82  
 reflexivity  
   colonial 89  
   ecology 58, 179, 249  
   material 18, 27–8, 137, 138  
   modern 189, 201–2  
   political 18, 34, 72, 213, 237, 247, 266n10  
   social 89, 92, 154, 230, 232  
 regulatory bodies 254  
 religion  
   Christianity 32–5  
   Protestantism 32, 115  
   war and 32–3, 41  
   will of God 36  
 religious authority 32  
 Renaissance, the 73  
 rent laws 161–2  
 republicanism 12  
 reservationist school 132  
 resilience, impasse between collapse and 204–7  
 resistance movements 294n20  
 revolutionary  
   ideal 77–80, 86, 122  
   practice 144, 146  
 revolution  
   industrial 65, 73, 74–5, 119–20, 135, 253  
   and industry 94–5  
   *see also* French Revolution  
 Rhine Diet 145, 152  
 Ricardo, David 51, 62, 63, 149, 158, 161, 192  
 rights  
   human 19, 26, 76  
   individual 135, 136  
   social 202  
 risk (catastrophe)  
   and limits 187–208  
   productive schema 128–30  
   and the reinvention of autonomy 198–204  
 Roosevelt, Theodore 132, 173, 281n25  
 Rousseau, Jean-Jacques 33–4  
 Ruskin, John 280n16  
 Russia 167
- sabotage, types of 134–5, 254  
 Saint-Simon, Henri de 118–21, 144, 197  
   on industry 280n10  
   *L'Industrie* 124  
   influence on Veblen 279n3  
   *Mémoire sur la science de l'homme* 122  
   a new social art 121–4  
   *Œuvres complètes* 279n8  
   the productive schema 128–30  
   technological normativity of the moderns 125–7  
*Santa Catarina* (ship) 36  
 Say, Jean-Baptiste 96  
 Schmitt, Carl 32, 70  
 Schönbein, Christian Friedrich 283n23  
 Schumacher, Ernst Friedrich 190  
 Schumpeter, Joseph 99  
 sciences, modern 34–5  
 scientific  
   authority 20, 150, 199–204, 213–14, 216–18, 231, 244, 249  
   racism 89  
 Scott, James C. 58  
 seas, liberty of the 36–9  
 second-degree technology 149

- Second World War 159, 167, 172, 173  
 security 18–19, 202  
 self-determination 13  
 self-help 136  
 self-protection, of the Earth 237–58  
 separatist strategy 15  
 Sewell, William 104–5  
 Shaftesbury, Earl of 43  
 shareholders 121, 138  
 Sieyès, Emmanuel-Joseph 122  
 slavery 13, 27, 44, 53, 86, 91  
   machinery and 100–3  
 Smith, Adam 59–66  
   on pins 150  
   *The Wealth of Nations* 59–61, 64,  
     68, 92, 272n24, 272n26  
   Wrigley and 136, 272n25  
 Smith, Bonnie 97  
 Smithian growth 63–5  
 social  
   art 121–4  
   autonomy 111–12  
   belonging 253  
   elitism 58  
   inequalities 8, 44  
   organization 10, 43, 121, 133, 145,  
     165, 193  
   protection 172–3, 188, 200–1, 234  
   reflexivity 89, 92, 154, 230, 232  
   responsibility 128–30, 202  
   rights 202  
   sciences 13, 164, 210–11  
   solidarity 104  
   values 40  
 social relationships 8, 97, 179, 218  
   and nature 12, 169–70  
 socialism 163–71  
   anti-productionist 254  
   characteristics 159  
   definitions 94, 118, 157  
   legacy of 240  
   of proof 204  
 socialization 139, 197  
   of nature 130, 152, 155  
 society  
   and collectivism 25–6  
   nature in a market 142–71, 183  
   protecting 156–60, 247  
   risk 188–9, 200, 201, 288n26  
   transparency and modern 26  
   as a ‘work of art’ 178  
 sociology  
   carbon 106–113  
   of science 20, 216–17, 219  
   soil fertility 1, 9, 150–1, 270n39  
   solidarity, forms of 104–5  
   South Asia 226, 233  
   sovereignty, and property 30–49  
   Soviet Union 134  
   Spanish Empire 36, 37  
   Spencer, Herbert 108  
   stagnation, economic 62  
   state, closed commercial 66–71  
   steam engine 82  
   Stedman Jones, Gareth 12, 143  
   sterile class 56, 57  
   stock market crises 138  
   subaltern studies 211, 230–1  
   subsistence 17–18, 248–9, 267n18  
   substantialism 55–6  
   sugar 86, 87  
   suicide 110–11  
   supply chains 9, 132, 183, 229  
   supply-driven growth 65–6  
   surplus value 149, 151–2  
   survival 24, 164, 207, 208, 241  
   sustainability 9  
   symmetrizations 210–16, 218, 229,  
     234–5, 244, 246–7, 249  
 taxation 68, 162, 230  
 Taylor, Frederick 121, 132–3  
 technicians 136, 149  
 technocratic  
   elitism 121  
   hypothesis 118–41, 171  
   movements 133, 281n30  
 technological  
   democracy 204  
   normativity of the moderns 125–7  
   world 8–9  
 technology  
   and agronomy 148–51  
   French modernization of 96–7  
   investment 52  
   second-degree 149

- technoscience, industrial 20–1, 74,  
 79, 120  
 technoscientific objectification of the  
 world 241–2  
 temperature, rise in 8  
 territoriality 18, 41, 45, 231  
 territories 38–9, 253  
 thermodynamics and systems theory  
 141, 190, 193–4, 195, 196  
 Thiers, Adolphe 96  
 Thirty Glorious Years, France  
 (1945–75) 28, 172–4, 180, 183,  
 186, 250  
 Thirty Years' War 32  
 Thompson, E. P. 166, 230, 257  
 Tocqueville, Alexis de, *Democracy in  
 America* 90–2, 160  
 totalitarianism 159–60, 172, 175–6,  
 186  
 totemism, definition of 214  
 Townsend, Joseph 161  
 trade  
   and energy 84  
   laws 36–42  
   virtues 118–19  
 transport infrastructures 18, 61, 82,  
 96–7, 102, 124, 126, 250–1  
 triumphalism 13  
 Trump, Donald 1, 293n7  
 twofold  
   exception 211–15, 234, 244  
   movement 167  
  
 ubiquity of the moderns 69, 71, 83,  
 184  
 UDHR *see* Declaration of Human  
 Rights, Universal  
 underefficiency, industrial 135  
 unions, trade 134  
 United Provinces 36  
 United States 43–7, 90–2, 130–4  
   currency 181  
   democracy and 276n42, 276n44  
   Department of Energy 3  
   four liberties 173  
   New England 86  
   *see also* Great Depression;  
   Jefferson, Thomas;  
   Tocqueville, Alexis de; Veblen,  
   Thorstein  
   universalism 72, 244  
   Ure, Andrew 149–50  
   utilitarianism 108, 110, 132, 179  
  
 value, exchange 101–2  
 Veblen, Thorstein 139–41  
   cult of efficiency 130–4  
   the engineer and property 134–9  
   *The Engineers and the Price  
   System* 131, 134, 197  
   ‘going concern’ 281n43  
   people of producers 118  
   *The Theory of the Leisure Class*  
   130–1  
   *The Vested Interests* 131, 134, 135,  
   281n35  
   vested interests 137  
 Viveiros de Castro, Eduardo 219,  
 231  
   *Métaphysiques cannibales* 221  
 Voltaire 86  
  
 Wakefield, Edward Gibbon, *A View  
 of the Art of Colonization*  
 284n50  
 Wallerstein, Immanuel 225  
 want, freedom from 172–5  
 war 32–3, 39, 41, 180  
 Warde, Paul 271n5  
 warnings, ecological and climate 7  
 water quality 1, 196  
 wealth  
   biocapacity and 9  
   Mercier de la Rivière on 271n11  
   redistribution of 182  
   suicide and 110  
   Western 160  
 Webb, Beatrice and Sidney 106  
 Weber–Fechner law 109  
 Weber, Max 24  
 welfare state 28, 173, 201  
 Westphalia, treaties of 32–3  
 wheat, policing of 271n9  
 ‘Whig’ interpretation of history  
 272n26  
 wilderness 132



- Williams, Eric 86  
women, subservience of 27  
Woolgar, Steve 216  
working class *see* classes  
World Model (*Limits to Growth*) 191  
Wrigley, Anthony 62, 136, 192
- Poverty, Progress and Population*  
272n25  
Wundt, Wilhelm 109  
ZAD (zone to defend) 2, 265n4,  
294n24

## **POLITY END USER LICENSE AGREEMENT**

Go to [www.politybooks.com/eula](http://www.politybooks.com/eula) to access Polity's ebook EULA.