# 1
# Introduction

Humans have altered their environment since prehistoric times. Today we have begun to transform our planet. Humankind has become a planetary force that influences global biogeochemical systems. Humans are no longer spectators who need to adapt to the natural environment; we have become a powerful agent of earth system evolution. The Amsterdam Declaration "Challenges of a Changing Earth," adopted in 2001 by a coalition of international research programs, concluded that human impacts on the earth's land surface, the oceans, the atmosphere, biological diversity, the water cycle, and biogeochemical cycles "are clearly identifiable beyond natural variability" and are "equal to some of the great forces of nature in their extent and impact" (Amsterdam Declaration 2001; see also Steffen, Sanderson, et al. 2004; UNEP 2012b). The later 2012 State of the Planet Declaration (2012, 2) confirmed, "[h]umanity's impact on the Earth system has become comparable to planetary-scale geological processes such as ice ages. … That the Earth has experienced large-scale, abrupt changes in the past indicates that it could experience similar changes in the future." This complex transformation of planetary systems by humankind is becoming one of the key political challenges of the twenty-first century. Political responses that fail to recognize this changed context are bound to fail. A new paradigm in both research and policymaking is needed.

In this book, I explore a new perspective on environmental politics: "earth system" governance. Environmental politics, from its very beginning, has focused on the surroundings of human settlements. Environmentalism is essentially centered on people. It is about the protection of what is around us, as humans, as is visible in the root of the word *environment* in English (based on old French "encircling, surrounding"), or the *Umwelt* ("surrounding world") in German and the *ambiente* in Romance languages. Target parameters of environmental policy were often defined in relation to impacts on humans, such as air or water quality standards. Today, however, this traditional concept of environmental policy is too limited. Humans are not only reshaping their local environment. They are changing the entire planet.

The most prominent example is global climate change. When Charles D. Keeling began to measure atmospheric carbon dioxide on Mauna Loa, Hawaii, in the 1950s, he found concentrations of around 310 parts per million. When he died in 2005, the value was around 380. In May 2013, it passed the symbolic value of 400 parts per million, which is about 40 percent higher than before the start of the industrial revolution (Peters et al. 2012). Ice core records show that over the last 420,000 years, the atmospheric carbon dioxide concentration remained roughly between 200 and 300 parts per million (Petit et al. 1999)—before humans began to burn about 40 percent of all known oil reserves, shooting up carbon dioxide concentrations in the atmosphere at unprecedented speed and to unprecedented levels. Also the concentration of methane—another powerful greenhouse gas—has more than doubled, from about 0.7 ppmv to 1.75 ppmv.

Today, global mean warming is already 0.85 degrees Celsius above preindustrial levels. The Intergovernmental Panel on Climate Change (IPCC) expects that without additional mitigation efforts beyond those in place, global temperatures will rise to 3.7 to 4.8 degrees Celsius above preindustrial levels within this century (IPCC 2013 and 2014b; see also World Bank 2012). The result could be the highest temperatures in the entire Quaternary Period of the last 2.6 million years. According to calculations by the World Bank, if current commitments are not implemented, a warming of 4 degrees Celsius could occur as early as the 2060s (World Bank 2012). With 50 additional parts per million of carbon dioxide in the atmosphere, coral reefs might stop growing and later start to dissolve. Sea levels are currently rising at 3.2 centimeters per decade (World Bank 2012), and are expected to rise within this century by up to 98 centimeters (IPCC 2013). More dramatic sea level rise is conceivable. In past periods of planetary history, comparably high atmospheric concentrations of carbon dioxide often occurred with sea levels that were several meters higher.

In the last few thousand years, the human species has also colonized the rest of the biosphere. Humans consume or exploit about 42 percent of the terrestrial net primary production of the planet today (Vitousek et al. 1997). The global forest cover has shrunk by about 40 percent from the time when our ancestors turned from hunters and gatherers to settled farmers (Andreae, Talaue-McManus, and Matson 2004, 250). The biological diversity of our planet is dramatically declining, directly through human action and indirectly through global warming and other changes in the earth system. Over the past centuries, humans have increased the species extinction rate a thousand times. Between ten and thirty percent of mammal, bird, and amphibian species are threatened with extinction. In earth history, there have been five mass extinctions of species, the most recent 65 million years ago. The current mass extinction is the sixth, and the first induced by one species alone.

Human-made chemicals have flooded all parts of the globe. Persistent organic pollutants have spread throughout the ecosystems up to unsettled polar regions. Stratospheric ozone depletion through emission of chlorofluorocarbons since the 1920s has increased ultraviolet radiation. The high losses of stratospheric ozone discovered in the 1990s might have been the most dramatic interference of humans with the earth system so far. The time interval between discovery of the new chemicals and the discovery of their planetary impacts was about fifty years. In other words, it took us two generations before we figured out what we were doing.

The sheer number of humans has increased as well. A thousand years ago, there were probably about 300 million people on the planet, and 790 million at the beginning of the industrial revolution. In the last 200 years, this number has risen to over seven billion people. Intensive agriculture to feed the large number of people led to a fivefold increase of nitrogen fertilizer production in a thirty-year period from 1960 to 1990, and it continues to rise (Andreae, Talaue-McManus, and Matson 2004, 247). The amount of biologically available nitrogen from human activities has increased ninefold in the last hundred years. Eighty percent more nitrogen now reaches the oceans than in 1860. The flow of phosphorus to the seas is today three times higher than historical background rates. Marine resources are depleted. Humans now use one tenth of the renewable freshwater available in lakes, rivers, or glaciers worldwide.

That said, the environmental impact of the seven billion humans is hardly equal. The richest 20 percent claim 76.6 percent of the world's private consumption, and are most responsible for some core impacts on planetary systems. The poorest 20 percent account for just 1.5 percent of global consumption. Globally, one billion people still have insufficient access to water, and 2.6 billion lack basic sanitation (see chapter 6, on "Allocation"). Regardless of these huge social inequalities, the fact that the human species has increased its numbers twenty times in merely one thousand years is a major factor in the current earth system transformation.

## The Anthropocene

In short, the earth system has moved outside the range of natural variability that it has exhibited over the last half a million years. As stated in the Amsterdam Declaration of 2001, "[t]he nature of changes now occurring simultaneously in the Earth System, their magnitudes and rates of change are unprecedented" (Amsterdam Declaration 2001; see also UNEP 2012b).

To classify this new state of the earth system that societies and their governance systems have to respond to, some scientists argue that we have entered a new epoch in planetary history. The interglacial epoch of the last 12,000 years is described in geology as the Holocene, within the Quaternary Period denoting the last 2.6 million years. In the Quaternary, humans developed as a species. In the Holocene, human civilization emerged. Today, scientists claim that by reshaping the planet, humans have forced a new epoch in geological time, defined by our species: the "Anthropocene." This term was invented by the ecologist Eugene F. Stoermer in the 1980s, and later advanced in a joint publication with Nobel laureate Paul Crutzen (Crutzen and Stoermer 2000; Crutzen 2002). It is used to describe today's global environment as influenced, and dominated, by human action (overviews in Zalasiewicz et al. 2011; Steffen et al. 2011). In 2008, members of the Stratigraphy Commission of the Geological Society of London concurred that

> [w]e have entered a distinctive phase of Earth's evolution that satisfies geologists' criteria for its recognition as a distinctive stratigraphic unit, to which the name Anthropocene has already been informally given. … Sufficient evidence has emerged of stratigraphically significant change … for recognition of the Anthropocene—currently a vivid yet informal metaphor of global environmental change—as a new geological epoch to be considered for formalization by international discussion. (Zalasiewicz et al. 2008, 6 and 7)

Four years later, the State of the Planet Declaration, adopted at a major conference organized by the main global change research programs, argued that

> consensus is growing that we have driven the planet into a new epoch, the Anthropocene, in which many Earth-system processes and the living fabric of ecosystems are now dominated by human activities. (State of the Planet Declaration 2012, 2)

This ongoing human perturbation of the Earth system is a major planetary experiment; in fact, it is the largest experiment humans have conducted. As with all experiments, the exact outcomes and changes in system parameters are not known ahead of time. Maybe there is no reason for immediate concern. Earth system transformation is a long-term process and may not be experienced in a dramatic way by our present generation, except for some ongoing effects such as the melting of the snowfields on Kilimanjaro or the shrinking of the ice cover on the Arctic Ocean, which has been reduced by 30 percent in thirty years (Gillis 2011).

But the impacts of the current planetary transformation could also occur earlier and be more dramatic. According to the main global change research programs, earth system dynamics are "characterized by critical thresholds and abrupt changes." Human activities could "inadvertently trigger such changes with severe consequences for Earth's environment and inhabitants." Over the last half million years, the earth system has operated in different states, with abrupt transitions sometimes occurring between them. Human activities now "have the potential to switch the Earth System to alternative modes of operation that may prove irreversible and less hospitable to humans and other life" (Amsterdam Declaration 2001).

According to some scientists, major disruptions in the earth system could occur even within this century (Steffen, Sanderson, et al. 2004). The last two million years have been characterized by a highly interrelated climate system that evidenced substantial variability and sensitivity to forcing. Ocean circulation, for instance, has experienced substantial changes in the past. We cannot rule out future circulation changes, with possibly very adverse effects on our vulnerable social systems (Rahmstorf and Sirocko 2004, 168–169). Within the last 400,000 years, the most recent 12,000 years are the longest, and rather unusual, period of relatively stable climate and sea levels. So-called Dansgaard/Oeschger events that occurred at times in the last 100,000 years, for example, involved temperature changes of up to 10 degrees Celsius within decades. What is today the harsh desert of the Sahara was a green savanna only 6,000 years ago. The dramatic desertification of this savanna is likely to have occurred rather abruptly, due to small, subtle changes in the Earth's orbit, which pushed the earth system over a threshold that triggered a series of biophysical feedback reactions. At that time, the cause was solar radiation (Steffen, Sanderson, et al. 2004). Yet human influences on biogeochemical cycles could cause similar transitions. As argued by Steffen, Andreae, and other leading scientists (2004, 319), "such evidence of instabilities …

gives a warning that human activities could trigger similar or even as-yet unimagined instabilities in the Earth system."

This insight has led to intense research in recent years on the "tipping points," or "tipping elements," in the earth system. Tipping elements are defined as subsystems of the earth system that can be switched under certain circumstances into a qualitatively different state by small perturbations (Lenton et al. 2008, 1786). In other words, climate change and other planetary transformations are not linear but might occur abruptly, determined by thresholds and tipping points in the system (Scheffer et al. 2009). Some of the most widely discussed tipping elements are the potential collapse of the Atlantic thermohaline circulation (which might cool off Europe); the dieback of the Amazon rainforest or of the boreal forest; the meltdown of the Greenland ice sheet; and alterations in the Indian summer monsoon, the Sahara/Sahel and West African monsoon, or the El Niño-Southern Oscillation. For some tipping elements, threshold values could be reached within this century (Lenton et al. 2008). For both summer and winter Arctic sea ice, the area covered by ice is declining already. The ice has become significantly thinner. The melting of the Greenland ice sheet alone—which is expected to occur rather slowly over centuries and millennia (Robinson, Calov, and Ganopolski 2012)—might raise sea levels by 2–7 meters (Lenton et al. 2008, 1788; IPCC 2014a).

Finally, our knowledge of the earth system is still very limited. It is likely to be full of further "surprises," that is, (possibly abrupt) changes based on system parameters that we do not yet fully understand. The history of earth system research points to the need for humility concerning the accurateness of the science. At the first major global environmental governance conference—the 1972 Stockholm Conference on the Human Environment—none of the major earth system challenges that we discuss today were on the agenda. Hardly anybody talked then about ozone depletion, climate change, desertification, and the mass extinction of species. This was only forty years ago! In the case of stratospheric ozone depletion, we have already had a "near miss," that is, a sudden transition in a tipping element of the earth system that was only recognized at a late stage in the process. To quote Nobel laureate Paul Crutzen, one of the lead scientists to discover stratospheric ozone depletion, "Do not assume that scientists always exaggerate; the ozone loss over Antarctica was much worse than originally thought" (Crutzen and Ramanathan 2004, 280).

### Societal Impacts

In our current interdependent, partially highly developed and industrialized times, any major event related to earth system transformation will have significant impacts on human societies. Environmental changes have been related to the collapse of civilizations from time immemorial (Diamond 2005). The falls of the Indus valley civilization, the Mayas, the Khmer Empire, and many other cultures have been linked to changes in environmental parameters. The little ice age in Europe between the thirteenth and eighteenth century also caused much human suffering. Of course, modern societies have more means to adapt to changing natural systems than did the Mayas or the Greenland Vikings. Yet our societies are also highly vulnerable in quite different ways. About half of us live today in cities, many of which are megacomplexes of tens of millions of inhabitants. Many rely on international trade in food, or on long-distance transportation of water. Modern civilization, especially in the rich industrialized countries, might seem unaffected by the forces of nature that so plagued our ancestors. Yet this might well be a fatal fallacy.

Outside the rich refugia of Europe, North America, or East Asia, vulnerabilities to earth system disruptions are even higher. About 842 million people are today undernourished. This "bottom billion" of humanity is extremely vulnerable to any changes in their natural environment. Drought, floods, sea level rise, tropical storms, as well as economic decline and increased food competition due to global environmental change are severe threats to this segment of humanity (Jerneck and Olsson 2010; World Bank 2012). Current climate change is already showing more negative impacts on crop yields than positive (IPCC 2014a). Up to 1.5 billion people could suffer from water stress by 2085 even if we assume a temperature rise of only 1–2 degrees and low population growth (Warren et al. 2006, 20). Diseases might spread, such as malaria. All impacts are interlinked, and earth system changes will further increase interdependencies. Increased water stress, as one example, could reduce international food supply due to land degradation. Food and water shortages could trigger millions of people to migrate, or lead to conflicts over natural resources (German Advisory Council on Global Change 2007; Gleditsch, Nordås, and Salehyan 2007). The US-based CNA Corporation concluded in 2007 that climate change will "seriously exacerbate already marginal living standards in many Asian, African and Middle Eastern countries, causing widespread political instability and the likelihood of failed states" (CNA Corporation 2007). According to the UK government's Development, Concepts and Doctrine Centre (2010, 26), climate change could lead to "significant increases in environmentally-induced migration," in which much of the migration will be "uncontrolled and generate significant social and economic impacts wherever it occurs. States and cities that are unable to cope are likely to seek international humanitarian assistance of unprecedented scale and duration."

## Toward Earth System Governance

In short, it is time to act. The scientific findings about the earth system and its current transformation become more confident every day. As Nobel laureate Paul Crutzen and Veerabhadran Ramanathan warn, "[w]ithout major catastrophes …, humankind will remain a major geological force for many millennia, maybe millions of years, to come. To develop a worldwide accepted strategy leading to sustainability of ecosystems against human-induced stresses will be one of the great tasks of human societies" (Crutzen and Ramanathan 2004, 286). In 2001, the four main global change research programs urged that an

> ethical framework for global stewardship and strategies for Earth System management are urgently needed. The accelerating human transformation of the Earth's environment is not sustainable. Therefore, the business-as-usual way of dealing with the Earth System is not an option. It has to be replaced—as soon as possible—by deliberate strategies of good management that sustain the Earth's environment while meeting social and economic development objectives. (Amsterdam Declaration 2001)

Ten years later, a comprehensive Foresight Process organized by the United Nations Environment Programme (UNEP) identified "Aligning Governance to the Challenges of Global Sustainability" as the most urgent emerging issue related to the global environment (UNEP 2012a).

There is no dearth of political responses from decision makers at all levels. In 1988, the United Nations General Assembly declared the changing climate a "common concern of humankind" and called upon all countries to limit emissions. The 1992 United Nations Conference on Environment and Development was at that time the largest diplomatic gathering in human history, later surpassed only by similar megaevents in Johannesburg in 2002 and in Rio de Janeiro in 2012. More than one thousand international agreements on environmental protection are now in force (Mitchell 2013).

Yet there remains a serious mismatch between the research and recommendations of earth system analysts and the actions of political decision makers, who still operate within the parameters of a nation-state system inherited from the twentieth century. Policymakers in the twentieth century gained much experience in managing confined ecosystems, such as river basins, forests, or lakes. In the twenty-first century, they are faced with one of the largest governance challenges humankind has ever had to deal with: protecting the entire earth system, including most of its subsystems, and building stable institutions that guarantee a safe transition process and a coevolution of natural and social systems at planetary scale.

I call this the challenge of earth system governance. I define earth system governance here (following Biermann, Betsill, et al. 2009) as the sum of the formal and informal rule systems and actor networks at all levels of human society that are set up to steer societies toward preventing, mitigating, and adapting to environmental change and earth system transformation. The normative context of earth system governance is sustainable development, that is, a development that meets the needs of present generations without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987).

## About This Book

This book attempts to contribute to a better understanding of earth system governance as an empirical reality and a political necessity. The book advances both an analytical and a normative perspective on earth system governance.

The *analytical theory* of earth system governance studies this emerging phenomenon as it is expressed in hundreds of international regimes, international bureaucracies, national agencies, local and transnational activists groups, expert networks, and so forth. The analytical perspective is, in short, about how the current governance system functions. I assess five elements of earth system governance, following a conceptual framework that I first advanced in 2005 (Biermann 2005a and 2007) and that has been further developed in the science plan of a global research program (Biermann, Betsill, et al. 2009; see also www.earthsystemgovernance.org). These five dimensions of effective governance—which are interrelated yet can be studied individually as well—are:

- the analytical problem of *agency* in earth system governance, including agency that reaches beyond traditional state actors;

• the overall *architecture* of earth system governance, from local to global levels;

• the *accountability* and *legitimacy* of earth system governance;

• the problem of (fair) *allocation* in earth system governance; and

• the overall *adaptiveness* of governance mechanisms and of the overall governance system.

Each analytical problem is investigated in detail in chapters 3–7.

The effectiveness of governance is not conceptualized in this framework as a separate analytical problem. Instead, it is seen as an underlying dependent variable in studying all five governance dimensions. In other words, I assume that the analysis of all five governance dimensions, in their totality and complexity, will lead toward a better understanding and explanation of the prevailing lack of effectiveness in the current overall system of earth system governance. Governance effectiveness is understood, in this book, as changes in social behavior due to the influence of the governance process in question, as well as related positive changes in environmental parameters (on concepts of governance effectiveness and performance see Mitchell 2007, 2008, and 2009; Stokke 2012). Studying the actual effectiveness of current earth system governance lays the basis, I argue, for the development of a normative theory.

This *normative theory of earth system governance* is the critique of the existing systems of governance in light of the exigencies of earth system transformation in the Anthropocene. The normative theory understands earth system governance as a political project that engages more and more actors who seek to strengthen the current architecture of institutions and networks at local and global levels. Here lies the second contribution of this book: In chapters 3–7, I not only analyze current governance and assess its potential, but also propose potential reforms. I develop policy proposals to make current earth system governance better equipped to deal with the challenges that lie ahead.

Some of these policy proposals might not seem realistic in the short term. But realism in the short term is not my aim. Instead, I offer proposals that could provide a long-term vision and long-term development trajectory for earth system governance. Major changes are required if humankind is to cope with earth system transformation and keep key parameters of our system within ranges that are sustainable. As pointed out by leading earth system scientists, what are needed now are strategies for earth system governance that can generate a new level of effectiveness, legitimacy, and overall performance. World politics in the Anthropocene cannot be business as usual.

As such, this book is directly related to the larger effort of the global research network Earth System Governance Project. This research alliance has put forward a science plan that has a structure similar to this book, notably in the identification of five analytical themes of agency, architecture, accountability and legitimacy, allocation, and adaptiveness (Biermann, Betsill, et al. 2009). Nonetheless, there are also substantial differences. While the science and implementation plan of the Earth System Governance research alliance proposes a scientific agenda that involves hundreds of scientists from all over the globe, this book is a much more modest undertaking as it presents my own vision and analysis of the current processes of earth system governance, with a particular focus on reform options that could contribute to an integrated system of earth system governance over the next decade or two. While most colleagues in the Earth System Governance research alliance would agree with my overall research motivation to identify more effective forms of earth system governance, many will disagree with one or more of the particular analytical propositions and policy reform proposals that I advance. Such differences in point of view of close colleagues, to the extent that they are published, I have cited in the analytical and policy reform sections of chapters 3–7. This book is hence by no means a comprehensive assessment of the state of the art from the perspective of the entire community of earth system governance researchers. It is rather an individual contribution to the overarching program of the Earth System Governance research alliance.

In addition, within the larger context of earth system governance theory I concentrate in this book on international, or transnational, politics. Earth system governance is not, as I point out in detail in chapter 2, restricted to global institutions. Earth system governance is a process that must involve, and be based on, local actors and national policies. Earth system governance needs to draw on the engagement of cities, the energy of civil society organizations, the support of local authorities, the social responsibility of corporations, and the support of citizens. Strengthened policies are needed at the local and national levels to energize societies and strengthen the worldwide transition to sustainability. Global multilateral institutions, intergovernmental cooperation, and the UN system are thus only one part, and one dimension, of earth system governance. Yet strong and legitimate international cooperation and institutions remain in my view a critical component of earth system governance, without which failure is guaranteed. I have focused in this book thus on the global level of earth system governance. Most of my reform proposals target multilateral institutions and the United Nations system as well.

This does not imply that I believe that the *current* United Nations system will be a solution to all problems of earth system governance. Most likely it will not. Instead, my policy discussions rather aim at a *new* United Nations: a new United Nations that is substantially different from the current system that follows in many ways the trodden paths of the twentieth century. Effective earth system governance and planetary stewardship require *new types of multilateralism* and *new forms of global governance* that are better aligned with the exigencies of the Anthropocene. I have laid out elements of such new types of multilateralism in more detail in the policy reform sections of chapters 3–7.

The remainder of this book is organized in seven chapters.

Chapter 2 presents my conceptualization of earth system governance. I elaborate upon this concept based on existing literature in earth system science and global governance studies, and distinguish earth system governance from traditional environmental policy studies. I identify key elements of the earth system governance problem structure that make it particularly challenging and complicated, and lay out the normative frame for earth system governance.

Chapters 3–7 present my analysis of each of the five dimensions of earth system governance. Each chapter has a similar structure: First, I introduce and conceptualize the analytical problem at hand. Next I provide an assessment of the current state of governance, drawing on existing research and focusing on aspects of international governance that I see as particularly relevant and important. Drawing on this assessment, each chapter will then develop a set of policy reforms.

In line with this general structure, chapter 3 addresses the *agents* of earth system governance. I distinguish here between agents and actors, and argue that agents are actors who have authority to set standards and rules that govern human interactions. I discuss four types of agents of earth system governance: first, the state; second, nonstate agents, with special focus on the increasing number of transnational public policy networks that bring actors together from different parts of society; third, transnational networks of scientists; and fourth, international bureaucracies.

Chapter 4 discusses the overall *architecture* of earth system governance. I conceptualize architecture as the overarching system of intergovernmental and nonstate institutions operating in a governance domain. It is, in other words, the institutional framework within which agents operate. I look at the increasing institutional fragmentation within earth system governance, and between earth system and economic governance, and outline a number of reform options to increase the overall consistency and coherence of earth system governance.

Chapter 5 develops further an important dimension that is touched upon briefly in chapters 3 and 4: the *accountability* and *legitimacy* of earth system governance. I argue in this chapter that questions of accountability and legitimacy are becoming ever more important. All key elements of the problem structure of earth system governance, as outlined in chapter 2, pose particular and often novel challenges for the accountability and legitimacy of governance. I discuss these challenges in some detail, and outline political reform options to cope with them.

Chapter 6 addresses another key element of effective and legitimate earth system governance: the question of *allocation*, or differently put, of justice, fairness, and equity. This chapter places earth system governance within the context of a highly divided world, with huge differences in resources and vulnerabilities, where one-tenth of humankind consumes sixty percent of global wealth. I distinguish here between three ways of distributing costs and benefits of earth system governance. These are, first, direct allocation through multilateral agreement, such as through international funds; second, allocation through markets established under international agreements, such as emissions trading; and third, allocation through environmentally motivated restrictions of global trade and investment.

Chapter 7 addresses the *adaptiveness* of governance arrangements. This chapter reflects the increasing thinking among scientists that current efforts in earth system governance are too little, too late. While much timely and relevant research has discussed adaptation at local and national levels, my analysis addresses the requirements of *global* adaptation governance. I discuss core dilemmas such as adaptability versus stability, effectiveness versus legitimacy, and effectiveness versus fairness in global governance arrangements. As one example of global adaptation governance, I analyze governance of climate-related migration and propose a system of global governance that could cope with substantially increased numbers of migrants due to earth system disruptions, notably sea level rise and more frequent or more severe droughts and extreme weather events.

Chapter 8 presents my conclusions. I summarize the political proposals that I develop in chapters 3–7, and reflect on the realistic utopianism that runs as a leitmotif throughout this book.

| **Über das Frühjahr** | **Concerning Spring** |
|---|---|
| Lange bevor | Long before |
| Wir uns stürzten auf Erdöl, Eisen und Ammoniak | We swooped on oil, iron and ammonia |
| Gab es in jedem Jahr | There was each year |
| Die Zeit der unaufhaltsam und heftig grünenden Bäume. | A time of irresistible violent leafing of trees. |
| Wir alle erinnern uns | We all remember |
| Verlängerter Tage | Lengthened days |
| Helleren Himmels | Brighter sky |
| Änderung der Luft | Change of the air |
| Des gewiß kommenden Frühjahrs. | The certainly arriving Spring. |
| Noch lesen wir in Büchern | We still read in books |
| Von dieser gefeierten Jahreszeit | About this celebrated season |
| Und doch sind schon lange | Yet for a long time now |
| Nicht mehr gesichtet worden über unseren Städten | Nobody has seen above our cities |
| Die berühmten Schwärme der Vögel. | The famous flocks of birds. |
| Am ehesten noch sitzend in Eisenbahnen | Spring is noticed, if at all |
| Fällt dem Volk das Frühjahr auf. | By people sitting in railway trains. |
| Die Ebenen zeigen es | The plains show it |
| In alter Deutlichkeit. | In its old clarity. |
| In großer Höhe freilich | High above, it is true |
| Scheinen Stürme zu gehen: | There seem to be storms: |
| Sie berühren nur mehr | All they touch now is |
| Unsere Antennen. | Our aerials. |

Bertolt Brecht, 1928