

✧ Introduction ✧

Dividing Times

Staffan Bergwik and Anders Ekström

A distinctive and widely recognized feature of the modern history of knowledge in the last 250 years is the growing epistemological split between the study of nature and the study of human history. This divide emerged from the late eighteenth century and onwards, encompassing a variety of knowledge practices and emerging forms of historical thinking. It was further shaped by disciplinary formations and institutional arrangements in the nineteenth and early twentieth centuries, especially in what became known through this process as the humanities. Earlier schools of thought and knowledge systems that understood their scope more holistically—for instance, natural philosophy, *historia naturalis*, *historia litteraria*, and universal history—became marginalized and judged as obsolete or amateurish. Eventually, natural and cultural history were drawn apart, and ultimately transformed by being incorporated into or excluded from the modern organization of knowledge.

Central to the theme of this book is that this divide also conditioned different approaches to an increasing variety of time frames and historical durations. Not only human societies but also landscapes, species, and the layers of the earth were increasingly temporalized in the nineteenth century, but within different fields and practices, creating multiple timescales and divisions between the rhythms and paces of nature and culture.

In the twentieth century, major European historians elaborated this distinction, and between them they created an understanding of historical change that excluded the forces of nature from the proper domain of historical inquiry. For instance, this position was clearly expressed in a lecture on the nature of historical change, which was held in 1975 by one of the most prominent Scandinavian historians in the twentieth century, Erik Lönnroth. Addressing the Royal Swedish Academy of Sciences and speaking from more than forty years of experience of historical research, Lönnroth explained that there was a principal difference between human history and events in nature. Changes in climate, volcanic eruptions, earthquakes, and floods could no

doubt affect the course of humanity, he argued, but were not examples of *historical* change. Why? Because the notion of history and historical change that Lönnroth and the vast majority of his contemporary historians embraced was restricted to the study of changes and processes that they understood as caused by human activity.¹

Historians more sensitive to the multiple layers of historical time approached the dividing line between nature and culture differently. Fernand Braudel's epic account of the history of civilizations and their different paces emphasized the rhythms of seas and landscapes, but in a way that amplified the division between times in nature and times in culture. Braudel famously contrasted the rush of the history of events with conjunctural time, located in social patterns, long economic cycles, and the history of infrastructures. Besides these two temporalities, he argued, there was "a history slower still." The French historian described this third temporal layer as the almost immobile "history of man in his intimate relationship to the earth." Its rhythm was cyclical and repetitive. It was, Braudel suggested, a history "beyond time's reach and ravages."²

Since the late twentieth century however, things have changed. Through the introduction of anthropogenic climate change as a major theme in public discourse and global knowledge production, the modern distinction between the causes and temporalities of human and natural history has been thoroughly challenged. With growing insights into how human societies act as a major force in geological and atmospheric processes, the idea of human agency as external to floods and rising temperatures is no longer obvious. Neither can nature be conceived of as the slow and repetitive background to historical events. Anthropocene notions of human history in its "intimate relationship to the earth" are significantly different from Braudel's, turning the temporal structure of his conception of history on its head. While nature has become eventalized and described in metaphors of acceleration, feedback loops, and threshold times, human societies appear to be stuck in repetitive structures of the present. The latter is indicated by a lack of political decisions in the face of climate change, alongside the inability of changing entrenched cultural patterns and lifestyles. Most importantly, the shift in temporalities has redrawn and, in some respects, dissolved the boundaries between natural and historical times.

Temporalization

In the last two decades, this shift of temporal perspective has been reflected in an increased scholarly engagement with multiple historical time frames and temporalities. While some arguments start with the assumption of the collapse of modern timescales in the face of climate change, others point

to the importance of recognizing how the Anthropocene is rooted in the history of Western capitalism in the last 250 years.³ Especially relevant to this volume is the work by scholars who have attempted to outline, both historically and theoretically, how anthropogenic climate change creates a different understanding of the relation between a variety of time frames, for example by asking to what extent geological and historical timescales merge in the course of the Anthropocene, or how climate change temporalities are different from the time frames of geological epochs.⁴ While it seemed unnecessary and awkward to many historians in the twentieth century to approach the distinction between natural and historical times as unsettled and open to new interpretations, this is now a terrain of intense scholarly exploration. This turn has also fueled a renewed interest in theories of history that grapple with questions concerning the layering and coexistence of multiple paces of historical time. Several chapters in this book will return to the importance of the *Annales* historians in this respect, and the work not only of Braudel but also his predecessor Lucien Febvre, who, together with March Bloch, founded the *Annales* school in the late 1920s. Besides their advanced thinking on the composition of historical and natural times, these historians provide important examples for this book through their resistance to certain forms of disciplinary provincialism, a position that has become more crucial than ever in the twenty-first century.

Another major influence when it comes to ideas about temporal strata, and more elaborated theories of historical time, is the work of the German historian Reinhart Koselleck.⁵ In his view, any historical inquiry “need[s] to work, at least implicitly, with a multilayered theory of time.” Koselleck famously used the term “temporalization” (*Verzeitlichung*) to describe the progressive nature of history that was applied to Western societies in the late eighteenth century. From that time on, he observes, the present became increasingly defined by its capacity to break with the past. This is the period that Koselleck refers to as *Neuzeit*, and which we might think of as the advent of modern historicity. It opens up what Koselleck and others describe as an ever-increasing gap between historical experience and the horizon of expectation in modern society.⁶ From the mid-nineteenth century and onwards, this notion of historicity was more commonly referred to in terms of modernity, and intimately connected to the unifying idea of progress and the envisioning of an open and malleable future.

In this book, temporalization is given a different meaning. Here, it refers to a different but equally pervasive shift in temporal and historical imagination. It started to emerge in the end of the twentieth century, precisely two-hundred years after the foundation of the notion of modern historicity and following the rise of global concern with anthropogenic climate change. Drawing on contexts as diverse as weather news and reports on changing landscapes,

everyday intergenerational concerns, new forms of global governance (the Intergovernmental Panel on Climate Change was established in 1988), and an abundance of Anthropocene reflections in art and museums, it is evident that the conflicting temporalities of climate change have become increasingly important to political and cultural imagination. In terms of historical experience, it creates a temporal thickening of the present, which is fueled by the urgent realization of the complex durations and timescales that global society both depend on and influence.⁷

For cultural and historical thinking, temporalization poses a challenge on par with the rise of globalization theories in the 1970s and 1980s. Most importantly, it is equally connected with major recalibrations of scale, and the need to develop alternative ways of imagining and visualizing abstract and multilayered relations between societies and epochs that are separated and yet connected over large distances in time and space. In this book, this sense of shifting scales, and the translations it involves, is analyzed through a variety of modelling, monitoring, and mediating practices that at the same time resonate with contemporary temporalization and display its multiple connections with the past.

Climate change temporalities are composed of a complex mix of time frames and historical rhythms. It fuels a sense of expanding and multiplying times, which is not defined by the long-term alone. It is rather the increasing entanglement of different scales and durations that distinguish contemporary temporalization from the modern regime of progress and its notion of a deepening gap between past and future. But as much as the climate crisis challenges the notion of the malleable future, it also has the effect of opening up different eras to each other, foregrounding the intertemporal dimension of human actions and choices, and bringing the past and future closer to the present. For historical thinking, this shift in temporal sensibilities evokes longstanding debates on, for example, chronology, matters of periodization, modern presentism, and the relation between natural and historical times.⁸ It also brings new emphasis on the temporal dimension in politics and how societies are acting on different timescales, making political conflicts and social movements gravitate toward issues of forecasting and intergenerational inequality.

Also, through this experience, and with growing insights into the scale of human impact on earth systems, new aspects of the past emerge through the lens of the contemporary situation. The expansion of geological and cosmological time frames in the period between 1750 and 1850, by which human history was turned into a distinctive epoch in a more far-reaching temporal scheme of an evolving earth, prefigure in important aspects the present engagement with the interaction between geological and historical processes.⁹

This is revealed by new Anthropocene readings of major contributions to natural history from the seventeenth to the early nineteenth century.

One case in point is the work of Georges-Louis Leclerc de Buffon, who famously extended the time span of the history of the earth in his multivolume *Histoire Naturelle* (1749–1804) by reinterpreting the six days of creation as six epochs of considerable duration that preceded human history. Buffon also engaged with the interaction of human and planetary history by conceiving of human activity as an irreversible but temporally limited force in the much longer history of the earth system. His analysis included vivid descriptions of the lasting traces of human history in seas and landscapes, and a prognostication of how the interaction between human societies and their environments caused a warmer climate, and saved the earth from its cooling past. Also, in a similar vein as seventeenth-century natural philosophers such as Nicolaus Steno and Robert Hooke, Buffon approached natural history in the language of an archivist. Bridging natural and historical time frames through metaphor facilitated the understanding of the earth both as a systemic and historical entity, and the idea that system aspects could also change with time and through human impact.¹⁰

Another example of the tendency of rereading the history of natural history from the perspective of Anthropocene concerns is Alexander von Humboldt's work in South America in the early 1800s, which is increasingly being rediscovered as part of the present-day discourse on global warming. Humboldt is discussed in greater detail in one of the chapters in this volume. Above all, he is now seen as an early founder of what would later become Earth System Science due to his ecological thinking.

It is our contention, then, that the ongoing process of temporalization means that the division between natural and historical times, which marked the nineteenth and twentieth centuries, and became closely attached to modern temporalities, is losing much of its explanatory power. The aim of this book however is not to proclaim an epistemic leap into a new temporal regime. Instead, the volume's chief contribution lies in revisiting the divide between times in history and times in nature since the eighteenth century and up to the present. Taken together, the individual chapters in the book trace three inter-related phenomena: first, we explore practices, tools, media, and metaphors for imagining and studying multiple timescales, paces, and rhythms across human and natural history. Second, we investigate how such practices, tools, media, and metaphors travelled between different fields of knowledge, public discourse, and historical inquiry and prognostication. Third, we reflect on the simultaneous division of knowledge into fields restricted to studying either times in nature or times in culture, and how these boundaries are redrawn in the context of climate change temporalities.

Our outlook and ambition to address these issues is profoundly shaped by present-day experiences of timescales in flux. From this vantage point, we suggest, the past opens up in new ways and displays instances where the boundaries of the modern organization of knowledge were less rigid than most recollections indicate. Indeed, we suggest the value of a simultaneous genealogy and reappraisal of the distinction between historical and natural times, as we turn to the past for ways of comprehending the conflicted temporalities that define the present.

Time-Binding Techniques

Telling time is an act embedded in vast infrastructures and cultural practices. There is a rich and theoretically diverse scholarship on the organization and perception of time in the past, covering the history of timekeeping, clocks and calendars, temporal regimes, and visual imaginaries of time as well as the politics of periodization and historical memory cultures.¹¹ This volume contributes to this literature in many ways. A recurrent topic is how temporal metaphors and visual media have developed between natural and human history. Several chapters collect and analyze a wide array of what we refer to as time-binding techniques. This concept is meant to bring together two media-theoretical influences. The first is Harold Innis's discussion about the temporal and spatial bias of different modes of communication.¹² The second is Bernard Siegert's analysis of an intriguing range of cultural material practices that he labels "cultural techniques."¹³ Giving Innis's distinction between time-binding and space-binding media a cultural twist, we especially focus on a set of technologies and emerging genres that enabled ways of connecting and visualizing different frames, layers, and durations of time.

A case in point is Emma Hagström Molin's chapter in which she investigates how the Habsburg region of Moravia received its first empirical and general history in the mid-nineteenth century. Hagström Molin underscores the importance of knowledge practices at the intersection of nature and culture. The temporalization of nature was vertical through the interest in the Moravian ground, while cultural events were understood horizontally as sources were arranged along a timeline constituting historical time. Nevertheless, the two versions of temporalization were connected, in particular through the interest in archaeological evidence and the usage of geological metaphors for history writing in the work of the Moravian historian Beda Dudík.

Staffan Bergwik's chapter also addresses how temporal media formats have tied natural and cultural history together. His chapter investigates the methods used by early twentieth-century geologists and dendrochronologists to carve out and visualize layers of time from trees and soil. Bergwik discusses

literary and visual formats—e.g., the year, the archive, and timelines—that geologists and dendrochronologists engaged with to mediate nature’s time and historical time as interconnected.

In his chapter, Adam Wickberg investigates the work of German polymath Alexander von Humboldt and his book *Views of Nature*, published in 1809. Wickberg discusses how Humboldt contributed to the establishment of a cultural technique to visually depict geological matters around 1800, in particular through a visual sign system labelled “pasigraphy” which originated in the Greek words *pasi* (everything) and *graphie* (writing). Humboldt argued that these signs would be universally recognized, thus creating a time-binding technique to show geological features visually rather than verbally. Time charts, according to Humboldt, could be included in atlases for easy comparison of different areas. Indeed, as Wickberg notes, the importance of conveying time in a comprehensible manner was important in a period, and to a scholar, that worked before the modern organization of knowledge into specialized disciplines. Time needed to be legible and intelligible across fields of knowledge.

A media-historical approach is also important for Marit Ruge Bjærke’s reading of red-list temporalities. By focusing on the discourse of biodiversity loss and species extinction, Bjærke discusses the characteristics of Red Lists as a time-binding visual genre. The lists appear in her analysis as statements about the interdependence and coexistence of evolutionary and political times, past and future, the long-term and the urgent present, end points and processes of acceleration. Among colors, red is closest to time. As Nina Wormbs shows, matters of color and shape are vital to models of the future. Wormbs studies the time-binding practices of climate modeling, and especially how complex timescales and measurements of changes in temperatures, CO₂-levels and sea-ice minima are translated into prognosis and possible futures. The abundance of record levels, end years, and deadlines in reports of climate change from IPCC and other authorities presuppose particular timelines and temporal targets and appear in Wormbs’s analysis as highly mediated phenomena.

As much as the visualization of abstract temporalities is necessary for enabling societies to feel and act upon climate change, it also points to the interplay between science, public authority, and media in turning climate times into a perceptible moment in human history. Eric Paglia and Erik Isberg investigate the 2°C target in climate policy and the inherent multitude of timescales to reach ideas about global warming in the past and the now. The temperature targets of global climate politics rest on a single, linear temporal scale, yet such a scale is the product of a multitude of measurements. The temporal aspect of the “political temperature target” of 2°C is often taken for granted, and Paglia and Isberg wish to historicize its highly diverse set of timescales. They make a particular point of recording temperatures, and

“the record” becomes both a genre for temperatures and for temporalities. Moreover, the record has turned the global average temperature into a governable phenomenon. As Paglia and Isberg draw our attention to the ambiguity of the notion of the record and its history as a temporal genre, their analysis also unveils the historicity of political temperature targets.

Another recurring theme throughout the book concerns how timescales have been arranged, separated, and at times conflated since the eighteenth century, and how the need for major recalibrations or the synchronization of time intensify at certain historical junctures.¹⁴ As Helge Jordheim has indicated elsewhere, “practices of synchronization” depend upon material and conceptual tools to coordinate what in the modern era has been multiple, coexisting timescales.¹⁵ In this vein, several chapters analyze what we might think of as the historical production of common times and its infrastructural extensions. One example is Gustaf Holmberg’s study of the production and distribution of synchronized time in Sweden in the second half of the nineteenth century. Holmberg points to the key role of astronomical knowledge in the standardization of clock time in the modern period. It resulted in a far-reaching system for homogenizing and representing time across society and constituted a major shift in communicative infrastructures in Europe, connected to the invention of railway time and the introduction of electrical media such as the telegraph.

The theme of synchronizing practices also comes to the fore in Hagström Molin’s and Bergwik’s chapters. According to Hagström Molin, Beda Dudík approached history as an open category, combining knowledge of mines, landscapes, and archaeological sites in his overall efforts to synchronize the deep time of nature with the religious time of Christianity and the national time of the Moravian region. Bergwik points to how natural and cultural timescales were synchronized through metaphors and visual formats like the calendar and the timeline to bring together the cyclical time of nature with the linear time of culture. In their contribution, Paglia and Isberg show how the 2°C temperature target is the effect of synchronization of many different temperature records, which in turn hide the many timescales that go into it. This is also demonstrated by the range of empirical examples that they engage with: a host of reports, meetings, and discussions that are spread out over time and place have been ordered and synchronized into the legible and political temperature of the 2°C target. Interestingly, Paglia and Isberg also indicate how the political temperature target builds on an amalgamation of records, yet is “compressed” into a single, linear time of Western modernity.

Lise Camilla Ruud discusses synchronization through the idea of “temporal alignment” between the deep time of nature and the deep time of culture in her analysis of naming practices in Norwegian petroleum fields. The chapter focuses on how the rhythms and durations of earthly, industrial, and cultural

temporalities are arranged to make each other meaningful and comprehensible in narratives on the Norwegian oil industry. Ruud focuses on technoscientific practices which align the deep and slow time of nature, which has produced the oil in the seafloor, with the rapid industrial time of producing fuel. Secondly, she ties these temporalities to the cultural history of Norway through an examination of how names from the age of Vikings and Norse mythology play a crucial role. A key argument in Ruud's chapter is that while history has often been understood as linear and chronological, the alignment of oil time and the time of Vikings pave the way for a temporal concentration, through which particular parts of the past are brought together and played out against each other. Importantly, Ruud shows how temporal work is necessary for the oil fields to become part of the national self-perception of present-day Norway. Offshore petroleum fields, seldom experienced by people on dry land need to be culturally comprehensible, even relatable or familiar. Accordingly, names from Norse mythology and the age of Vikings are used to tap into, and further create, a collective past and experience of being Norwegian.

This in turn points to how the links between versions of common time and the framework of national history run deep. From the early nineteenth century onwards, archives, museums, statistics, and other visual and literary genres were mobilized in collecting the past of nations to imagine their collective futures. This wave of nationalizing history did not necessarily discriminate between natural landscapes and human societies. In fact, and more broadly construed, this indicates the extent to which the politics of time is a recurring theme in the history of modern temporalities, as well as in this book. The chapters of Wormbs and Isberg and Paglia also exemplify how struggles over the future mobilize the past. Chapters dealing with matters of energy extraction, landscape formation, species extinction, and natural resources inevitably turn to the scales and temporalities of political action and intervention itself.

In her contribution, Julia Nordblad explores the history of how times of nature connect to political and economic time frames through a study of political debates relating to a new French forest legislation of 1827. The intergenerational care of the long-term, what Nordblad calls the "temporal otherness of trees," was contrasted to the temporalities of the market, the liberal economy and private ownership. The question of how forests were to be handled—who decided whether to clear them or not—was profoundly a clash of timescales. Moreover, Nordblad incorporates an analysis of how the issue of conflicting timescales played out as a question of human emotions and passions. To some of the French debaters, material interest in the forests was a wild state of mind leaving men short sighted, and the slow temporality of trees stood in opposition to the short timescale of human interests. To others, the interest in the forest was a cool mode of action paving the way for planning.

The general outlook among French parliamentarians, however, was that a failure to control passions led to shortsightedness and to individuals working against the interests of the collective. Nordblad's case also throws light on the issue of the relation between particular and common interests, between the state as an institution governing time and the freedom of individuals. She argues that the case of forest temporality adds another dimension to this well-rehearsed question in the history of political ideas.

Dividing Temporal Knowledge

As has been stated, the aim in the following is not only to investigate temporal media that imagine and explain multiple paces and rhythms across human and natural history, we also explore how such representational practices travelled between fields of knowledge, indeed how they have served to create a gradual division of knowledge about historical time into fields pertaining to nature and culture respectively. In short, we seek to illuminate aspects of the epistemological divides that eventually shaped the modern knowledge system. Some of the contributions thus draw on the early history of the formation of the natural and human sciences in the eighteenth and nineteenth centuries to discuss the shifting time regimes of the modern organization of knowledge. This includes perspectives on the history of individual disciplines such as geology, astronomy, biology, meteorology, and history, and their various ways of organizing time in layers, scales, and periods.

Approached from this broad perspective, the history of temporal knowledge organization is ambiguous. On the one hand, the following chapters display an increasing division of time knowledge into modern academic disciplines during the nineteenth and twentieth century. In his chapter, Helge Jordheim goes back to the downfall of *historia naturalis* in the eighteenth century as a paradigm for investigating both the natural and the cultural world. A crucial argument in Jordheim's contribution is that parallel to the discovery of geological deep time by the emerging discipline of geology between 1750 and 1850, another science about time was branched out in the modern order of knowledge. This was the discipline of history, which developed around a notion of historical time that separated human events from natural history. In Jordheim's argument, deep time thus slipped out of human view and geo-history became a science without an anthropology. Staffan Bergwik makes a similar argument as he explores how geologists tried to coordinate genres of "earth history" and "world history," precisely at a time of increasing specialization and a growing divide between the disciplinary formations of history and geology in the early twentieth century. Against that backdrop, the vision of history as restricted to human activity—and the strict demarcation of what

such activities might comprise, which was elaborated by Erik Lönnroth in 1975—can be understood as part of epistemic and professional norms among historians going back to the mid-nineteenth century.

On the other hand, several of the chapters in this volume investigate instances where models, metaphors, and knowledge practices enabled an exchange between natural and human history. Combined together, these studies thus reveal intriguing continuities across centuries and between different forms of time-binding knowledge. As mentioned, earth scholars in the seventeenth century such as Robert Hooke approached fossils and soil in terms of archives and dust.¹⁶ The exchange not only of metaphors but knowledge practices between the study of nature and culture in the context of natural history prefigured the time-binding work involved in planetary, national, and ecological thinking in the eighteenth and nineteenth centuries. Another example is the idea of stratigraphy. As discussed by Helge Jordheim, stratigraphy is a pattern of thought to handle and describe multiple times, going back to seventeenth-century Danish anatomist and geologist Nicolaus Steno. Moreover, stratigraphy is an example of a language of “layers” and “layering” to address the entanglement or conflict between multiple timescales. In going back to Steno, Jordheim displays a longer trajectory of historiographical movements where geological and phenomenological temporalities were organized.

Another example from that longer trajectory is Alexander von Humboldt, whose work spanned multiple timescales and topics of cultural and natural history. In his chapter on Humboldt, Adam Wickberg discusses the entwined human and geological temporality of the Americas, which emerged from Humboldt’s work. Of particular importance is the concept geo-anthropology. The German scholar envisioned a holistic understanding of life through his geological work; and in his publications, geology, environment, and the human sciences are interconnected. Indeed, Wickberg suggests that Humboldt’s work encapsulated deep time, natural history, and human history, as well as environmental and social sciences to understand the history of the Americas.

This exchange of ways of imagining traces and layers of time across natural and cultural history continued in the nineteenth and twentieth centuries, both in the context of various forms of general and universalist history writing, as well as emerging disciplines like archaeology. Moreover, latter-day historical scholars have revived ideas about time as layered and repeated stratigraphy as a mode of thinking. For instance, this is illuminated by Jordheim’s discussion about the work of Braudel, Koselleck, and Kzysztzof Pomian, indicating how they use geological metaphors in their theories and conceptualizations of historical time. Yet another example of an early twentieth-century historian who developed a refined understanding of how landscapes and natural surroundings were affected by human societies was the founder of the *Annales* school, Lucien Febvre. He contributed to a style of historical research that

was shaped by the broader traditions of cultural and natural history, and that were seeking conceptual innovation by thinking across the emerging disciplines of the human and natural sciences. Developing a less naturalized version of historiography than Braudel, Febvre tried to trace human agency in the formation of landscapes and the history of the earth. As Sverker Sörlin indicates in his chapter, key to this human-made version of the natural world was the modern concept of the environment. Sörlin's chapter addresses the rise of the environmental discourse by tracing the emergence in the twentieth century of what he calls *environmental times* in a wide range of disciplinary contexts, and how they required synchronization with cultural, social, and political temporalities. The chapter thus makes a crucial contribution to the history of Anthropocene thinking more generally, pointing to the continuous engagement with the interaction between humans and their surroundings in the modern history of knowledge.

Sörlin also proposes a general history that synthesizes the period from the eighteenth century and up to the present in three major waves of temporal synchronization. The first is located to the expanding time frames and globalizing histories of the world in the eighteenth and early nineteenth century, overlapping with the era that Koselleck referred to as the *Sattelzeit*, and in which the idea of progress became the universalizing force of Western historicism. A second wave of synchronization emerges from the infrastructures and technologies of global and commercial timekeeping that developed from the mid-nineteenth century onwards, and that became increasingly linked to and supported by the rise of international organizations, nation states and their institutions, and modern scientific disciplines, as exemplified by the role of astronomers in the standardization of time around 1900. The ongoing integration of geophysical, biological, social, and historical timescales in the context of the Anthropocene can be seen as the epitome of a third wave of major synchronizations, a process that encompassed the formation of environmental times that Sörlin collects in his chapter, and that lead up to present concerns with climate change temporalities.

Taken together, the chapters provide much support for such a periodization, but they also convey a strong sense of coexistent and overlapping temporal regimes. What is clear is that we are currently experiencing a shift in temporal imagination that goes beyond academic knowledge production. In the closing chapter of this book, Anders Ekström takes his point of departure in the abundance of contemporary images and news reports of weather extremes and climate-connected emergencies. Enmeshed in digital infrastructures and mediating technologies, Ekström suggests, contemporary culture has switched into a monitoring mode, increasingly turning to the sky, sea, and ice for knowledge about past and forthcoming events. This elemental

turn points to a longer history of cultural responses to nature emergencies and the role of major geological events as sources for imagining temporal complexity. Today, the category of “extreme weather,” which was introduced in public discourses on global warming in the 1990s, work as a time-binding medium for visualizing climate change temporalities. Online news coverage of floods, hurricanes, and heat waves simultaneously refer to the accumulation of disasters, accelerating deep time and a warmer future. Likewise, images of vanishing glaciers and rising waters turn the past into a living archive, expanding into and acting on the present in multiple and unforeseeable ways. Ekström argues that this creates a sense of the present as moving into the geological live. This new version of the present merges geological and historical time frames, but also challenges modern understandings of the very nature of “media” and “events.” Like many of the chapters in this book, Ekström’s discussion points back to the decades around 1800 as an era of major shifts in temporal imaginations, comparing contemporary temporalization to the continuous history of dividing and integrating historical and natural times and temporalities in modern society.

Finally, a word on the arrangement of the book. We have chosen to organize the chapters in four thematic blocs. The first, *Eras of Synchronization*, engages in particular with historical junctures, moments, and waves of intensified temporal division, standardization and rescaling. The second, *Biocultural Times*, turns away from a certain tendency of historicizing Anthropocene ideas from the relation between geological and historical time frames, and focuses instead on temporal conflicts and alignments in the intersection between biological and cultural forms of knowledge and meaning production. The third section, *Time-Binding Knowledges and Visual Genres*, is especially concerned with knowledge making in scientific settings where the invention of particular tools and methodologies for studying, scaling, and representing time also involved the undoing of disciplinary boundaries. Finally, the chapters in the fourth section, *Recording and Envisioning Climate Times*, share a focus on the media history of present modes of prognosticating, modelling and monitoring temporalities of climate change. This is followed by a brief conclusion in which we collect some of the book’s findings.

Acknowledgments

The editors wish to acknowledge Riksbankens Jubileumsfond, Stockholm University, and Uppsala University for financial support for organizing and conducting research and editorial work for this volume. Funds for open access have been provided by Riksbankens Jubileumsfond, grant number

P17-0596:3-OA. We also wish to extend our thanks to the two anonymous referees, and Amanda Horn at Berghahn Books for her skillful and friendly support in guiding us through the publication process.

Staffan Bergwik is Professor of the History of Science and Ideas at the Department of Culture and Aesthetics at Stockholm University. His research focuses on the cultural history of the modern sciences, including topics like science and verticality, science and temporality, history of emotions, history of knowledge, and science and the media. Recent publications include “Elevation and Emotion: Sven Hedin’s Mountain Expedition to Transhimalaya 1906–1908,” *Centaurus* (2020); “Standing on Whose Shoulders? A Critical Comment on the History of Knowledge,” *Forms of Knowledge: Developing the History of Knowledge* (Nordic Academic Press, 2020); and *Domesticity in the Making of Modern Science* (Palgrave MacMillan, 2015).

Anders Ekström is Professor of the History of Science and Ideas at Uppsala University, and currently Professor II of History of Knowledge at Oslo University. He has published broadly on modern cultural and media history and theory for three decades. His most recent work includes a series of essays on time and temporality in the history of natural disasters, which appeared in journals such as *Theory*, *Culture & Society*, and *Media, Culture & Society*. His ongoing research is focused on two main areas: cultural processes of temporalization in the context of climate change, and the modern history of publicness.

NOTES

1. Erik Lönnroth, *Tidens flykt: Stora historiska förändringar och människor som har levat i dem* (Stockholm: Atlantis, 1998), 21–22.
2. Fernand Braudel, *On History*, trans. Sarah Matthews (Chicago: Chicago University Press, 1980), 12.
3. For example, this point is convincingly made in Christophe Bonneuil and Jean-Baptiste Fressoz, *The Shock of the Anthropocene: The Earth, History and Us* (London: Verso, 2017).
4. See, for example, Dipesh Chakrabarty, “Anthropocene Time,” *History and Theory* 57, no. 1 (2018): 5–32; Julia Nordblad, “On the Difference Between Anthropocene and Climate Change Temporalities,” *Critical Inquiry* 42, no. 7 (2021): 328–48.
5. Reinhart Koselleck, “Sediments of Time,” in *Sediments of Time: On Possible Histories*, trans. and ed. Sean Franzel and Stefan Ludwig Hoffmann (Stanford: Stanford University Press, 2018), 7.
6. Reinhart Koselleck, *Futures Past: On the Semantics of Historical Time*, trans. Keith Tribe (New York: Columbia University Press, 2004), 224.

7. On the “temporal thickening” of the present through climate change temporalities, see Anders Ekström, “Remediation, Time and Disaster.” *Theory, Culture & Society* 33, no. 5 (2016): 119.
8. See especially François Hartog, *Regimes of Historicity: Presentism and Experiences of Time*, trans. Saskia Brown (New York: Columbia University Press, 2015); Dipesh Chakrabarty, “The Climate of History: Four Theses,” *Critical Inquiry* 35, no. 2 (2009): 197–222; Hans Ulrich Gumbrecht, *Our Broad Present: Time and Contemporary Culture* (New York: Columbia University Press, 2014); Helge Jordheim, “Introduction: Multiple Times and the Work of Synchronization.” *History and Theory* 53, no. 4 (2014): 498–518; Stefan Tanaka, “History without Chronology,” *Public Culture* 28, no. 1 (2015): 161–86.
9. This period in the history of the emerging earth sciences is dealt with in Martin Rudwick’s classical study *Bursting the Limits of Time: The Reconstruction of Geohistory in the Age of Revolution* (Chicago: Chicago University Press, 2005), and more recently by the same author in *Earth’s Deep History: How It Was Discovered and Why It Matters* (Chicago: University of Chicago Press, 2014).
10. For an Anthropocene reading of Buffon’s work, see Jan Zalasiewicz, Sverker Sörlin, Libby Robin, and Jacques Grinevald, “Introduction: Buffon and the History of the Earth,” in *The Epochs of Nature (1778)* by Georges-Louis Leclerc, le comte de Buffon, trans. and ed. Jan Zalasiewicz, Anne-Sophie Milon, and Mateusz Zalasiewicz (Chicago: University of Chicago Press, 2018), xiii–xxxiv. On Buffon’s archival approach to natural history, see Rudwick, *Earth’s Deep History*, 62–65.
11. See, for example, Paul Glennie and Nigel Thrift, *Shaping the Day: A History of Time-keeping in England and Wales 1300–1800* (Oxford: Oxford University Press, 2009); Daniel Rosenberg and Anthony Grafton, *Cartographies of Time: A History of the Timeline* (New York: Princeton Architectural Press, 2010); Lynn Hunt, *Measuring Time, Making History* (Budapest: Central European University Press, 2008); Pierre Nora, “Between Memory and History: *Les Lieux de Mémoire*,” *Representations* 26 (1989): 7–24.
12. Harold A. Innis, *Empire and Communications* (Toronto: Dundurn Press, 2007).
13. Bernhard Siegert, *Cultural Techniques: Grids, Filters, Doors, and Other Articulations of the Real* (New York: Fordham University Press, 2015).
14. Deborah R. Coen, “Big is a Thing of the Past: Climate Change and Methodology in the History of Ideas,” *Journal of the History of Ideas*, 77, no. 2 (2016), 312.
15. Jordheim, “Introduction.”
16. Rudwick, *Earth’s Deep History*, 47–49.

BIBLIOGRAPHY

- Bonneuil, Christophe, and Jean-Baptiste Fressoz. *The Shock of the Anthropocene: The Earth, History and Us*. London: Verso, 2017.
- Braudel, Fernand. *On History*. Translated by Sarah Matthews. Chicago: Chicago University Press, 1980.

- Chakrabarty, Dipesh. "Anthropocene Time." *History and Theory* 57, no. 1 (2018): 5–32.
- . "The Climate of History: Four Theses." *Critical Inquiry* 35, no. 2 (2009): 197–222.
- Coen, Deborah R. "Big is a Thing of the Past: Climate Change and Methodology in the History of Ideas." *Journal of the History of Ideas* 77, no. 2 (2016): 305–22.
- Ekström, Anders. "Remediation, Time and Disaster." *Theory, Culture & Society* 33, no. 5 (2016): 117–38.
- Glennie, Paul, and Nigel Thrift. *Shaping the Day: A History of Timekeeping in England and Wales 1300–1800*. Oxford: Oxford University Press, 2009.
- Gumbrecht, Hans Ulrich. *Our Broad Present: Time and Contemporary Culture*. New York: Columbia University Press, 2014.
- Hartog, François. *Regimes of Historicity: Presentism and Experiences of Time*. Translated by Saskia Brown. New York: Columbia University Press, 2015.
- Hunt, Lynn. *Measuring Time, Making History*. Budapest: Central European University Press, 2008.
- Innis, Harold A. *Empire and Communications*. Toronto: Dundurn Press, 2007.
- Jordheim, Helge. "Introduction: Multiple Times and the Work of Synchronization." *History and Theory* 53, no. 4 (2014): 498–518.
- Koselleck, Reinhart. *Futures Past: On the Semantics of Historical Time*. Translated by Keith Tribe. New York: Columbia University Press, 2004.
- . *Sediments of Time: On Possible Histories*. Translated and edited by Sean Franzel and Stefan Ludwig Hoffmann. Stanford: Stanford University Press, 2018.
- Lönnroth, Erik. *Tidens flykt: Stora historiska förändringar och människor som har levat i dem*. Stockholm: Atlantis, 1998.
- Nora, Pierre. "Between Memory and History: *Les Lieux de Mémoire*." *Representations* 26 (1989): 7–24.
- Nordblad, Julia. "On the Difference Between Anthropocene and Climate Change Temporalities." *Critical Inquiry* 42, no. 7 (2021): 328–48.
- Rosenberg, Daniel, and Anthony Grafton. *Cartographies of Time: A History of the Timeline*. New York: Princeton Architectural Press, 2010.
- Rudwick, Martin. *Bursting the Limits of Time: The Reconstruction of Geohistory in the Age of Revolution*. Chicago: Chicago University Press, 2005.
- . *Earth's Deep History: How It Was Discovered and Why It Matters*. Chicago: University of Chicago Press, 2014.
- Siegert, Bernhard. *Cultural Techniques: Grids, Filters, Doors, and Other Articulations of the Real*. New York: Fordham University Press, 2015.
- Tanaka, Stefan. "History without Chronology." *Public Culture* 28, no. 1 (2015): 161–86.
- Zalasiewicz, Jan, Sverker Sörlin, Libby Robin, and Jacques Grinevald. "Introduction: Buffon and the History of the Earth." In *The Epochs of Nature (1778)* by Georges-Louis Leclerc, le Comte de Buffon. Translated and edited by Jan Zalasiewicz, Anne-Sophie Milon, and Mateusz Zalasiewicz, xiii–xxxiv. Chicago: University of Chicago Press, 2018.