INTRODUCTION TO BIG HISTORY

Introduction

This book is about big history: the approach to history that places human history within the context of cosmic history, from the beginning of the universe up until life on Earth today. In a radical departure from established academic ways of looking at human history, in big history the past of our species is viewed from within the whole of natural history ever since the big bang. In doing so, big history offers modern scientific answers to the question of how everything has become the way it is now. As a consequence, big history offers a fundamentally new understanding of the human past, which allows us to orient ourselves in time and space in a way no other form of academic history has done so far. Moreover, the big history approach helps us to create a novel theoretical framework, within which all scientific knowledge can be integrated in principle.

The term ‘big history’ was coined by historian David Christian (1946 CE–). In the 1980s CE, Christian developed a cross-disciplinary course at Macquarie University, in Sydney, Australia, in which academics ranging from astronomers to historians gave lectures about their portions of the all-embracing past. This course has become a model for other university courses, including two courses that I have been teaching since 1994 CE, first at the University of Amsterdam and later also at the Eindhoven University of Technology.

Although all the knowledge taught in big history courses is readily available in academia, only rarely is it presented in the form of one single historical account. This is mostly the result of the fact that over the past 200 years, universities have split up into increasing numbers of specializations and departments. Since the 1980s CE, however, academics ranging from historians to astrophysicists have been producing new grand unifying historical syntheses, set forth in books and articles.
In the pages that follow, I seek to explain big history. Within the emerging field of big history scholarship, this book presents a novel account of our all-embracing past. Building most notably on the work by US astrophysicist Eric Chaisson (1946 CE–), a historical theory of everything is proposed, in which human history is analyzed as part of this larger scheme. In Chapter 2 this theoretical approach will be introduced, while in the subsequent chapters it will be applied to big history. In this first chapter, a selected number of themes are discussed that are vital for a better understanding of big history.

Studying the Past

To understand the view of history proposed in this book, it is important to first address the question of how the past can be studied. Harvard historian Donald Ostrowski (1945 CE–) succinctly formulated his answer as follows: ‘We can’t study the past precisely because it’s over, gone.’ By saying so, Ostrowski pointed to the undeniable fact that all we know about history can only be found in the present, because if this knowledge were not available here and now, how could we possibly know about it? This is just as much the case for the history of the universe as for the history of us people. The idea that all historical knowledge resides in the present is not a new point of view among historians. Yet it is rarely stated very clearly. As I hope to show, in big history, this issue is perhaps even more urgent than in traditional historical accounts.

Because all evidence of the past can only be found in the present, creating a story about the past inevitably implies interpreting this evidence in terms of processes with a certain history of its own. We do so because we experience both the surrounding environment and our own persons to be such processes. As a result, all historical accounts are reconstructions of some sort, and thus likely to change over time. This also means that the study of history cannot offer absolute certainties, but only approximations of a reality that once was. In other words, true historical accounts do not exist. This may sound as if there is endless leeway in the ways the past is viewed. In my opinion, that is not the case. Just as in any other field of science, the major test for historical reconstructions is whether, and to what extent, they accommodate the existing data in a concise and precise manner. Yet there can be no way around the fact that all historical reconstructions consist of a selected number of existing data placed within a context devised by the historian.

The idea that all our knowledge of the past resides in the present also means that we do not know anything about things that may once have happened but did not leave any traces in the present. We do not know anything either about events that actually did leave traces in the present that have not yet been
uncovered or interpreted as such. All of this may well be the largest portion of what has happened in history, yet we will never know for sure. Surprisingly, perhaps, this rather problematic aspect of studying the past appears to have received very little attention among historians. Yet if the opposite situation existed, namely that we had at our disposal exhaustive information about everything that had ever happened, we would be totally drowned by the available data. Furthermore, as William McNeill has argued, the art of making a persuasive historical reconstruction consists to a considerable extent of what is left out. As a result, all historical reconstructions are rather patchy maps.

To make a reasonably persuasive historical reconstruction, we need to do at least two things, namely (1) find out what has happened to the data since they were generated, including their discovery by humans, and (2) find out what these data tell us about the past. Inevitably, academic studies of history always involve these two types of reconstruction, although this is not always shown explicitly. For big history, the best-selling overview *A Short History of Nearly Everything* by US author Bill Bryson (1951 CE–) may serve as a highly recommended illustration of mostly the first type of historical account, while David Christian's magnum opus *Maps of Time: An Introduction to Big History* focuses on telling the story of the entire past. In contrast to *Maps of Time*, Bryson's account does not include our human past, probably because a globalized tradition of human history research does not yet exist.

The study of history, including big history, consists of an ever-continuing discussion about how to view and understand past reality, and in doing so, provide the best possible images of what has happened in history. All these accounts are answers to questions about the past. Very often, however, these questions are not very clearly posed, while sometimes they are not even mentioned. In such situations the resulting answers may appear to come out of the blue. For instance, the biblical account of Beresheet/Genesis offers religiously inspired answers to the basic origin questions of its time and place about how the universe, Earth, life and humanity evolved. But the questions themselves are not mentioned in the account. By studying these stories in such ways, they throw a very interesting light on the major origins questions of the people who shared them as well as the answers they thought were convincing. Such worldwide studies would, in fact, put these religiously inspired accounts as well as the people who shared them into a fresh socio-scientific perspective.

The same is the case for modern scholarly accounts that offer academically based answers to questions about the past, but quite often without mentioning them explicitly either. Yet it is very important to keep in mind, and teach our students, that all our knowledge, including big history, has come as a result of inquisitive humans seeking answers to almost endless numbers of questions in a continuous dialogue within certain social situations. To be sure, most
academic research does not focus on fundamental questions, but instead aims to answer much smaller concerns. Yet the resulting views should, in principle, all fit into the larger story of our grand past. In consequence, all big history accounts are by necessity composites of a great many academic answers to a great many questions, large and small.

**Origin of Cosmic World Views**

In his autobiography *The Pursuit of Truth: A Historian's Memoir*, William McNeill argued that the origin of world views can be traced back to billions of years ago, when the first organisms began to form images of their surroundings using the first primitive sensors that were neurologically connected to the first primitive brains (2005, pp. 32–3). When, a few million years ago, these sensors and brains had become bigger, more complex and more refined, while better communicative capabilities had also developed, the circumstances were in place for the emergence of a species that not only could form such images in their brains but also discuss them with others, and thus improve them.

Most of these early human world views have been lost, because they were not recorded externally in the form of images or writings that we can understand. But it seems fair to suspect that there must have been a very long incipient period of shaping and discussing world views based on trial and error, combining sensory impressions with inspiration and fantasy. These images of the world must have been sufficiently reality-congruent to facilitate, and perhaps improve, the survival chances of these early humans. This depended on the size of these early societies, their social, cognitive, and technical stages of development, as well as the extent of the geographic range known to them.

Alexander von Humboldt argued along similar lines while describing the ‘history of the physical contemplation of the universe’ in the second volume of his *Cosmos* (1866), which is still one of the best, if not the best, overviews known to me of this theme. In this treatise von Humboldt described how peoples around the Mediterranean improved their world views as they traveled further, and developed more and better knowledge as a result. Over time and with ups and downs, the growth of human societies with improving skills and increasing contacts through travel, trade and conquest with the emerging Islamic world, India and China led to enlarging and improving cosmic world views. These ideas were further elaborated and improved in Western Europe starting between 1000 and
It is impossible to predict the relevance of academic answers to questions about reality. Much depends on the creativity, knowledge and ingenuity of the academics involved as well as on the freedom to express such new opinions within the societies they live in. Answers to what at first sight appear to be almost irrelevant questions may turn out to have fundamental implications. Two examples: the question posed in 1928 CE by Scottish scientist Sir Alexander Fleming (1881–1955 CE), while looking at a Petri dish that had become contaminated with a mold that was apparently killing the surrounding microorganisms and wondering what was going on, led to the discovery of penicillin as well as a great many fundamental insights into biological warfare in the world of small organisms. And, while wondering in 1913 CE what those fuzzy little objects were in the sky, US astronomer Vesto Melvin Slipher (1875–1969 CE) discovered to his surprise that their light was red shifted, which meant that they are all very rapidly moving away from us. Measuring their distances led to the discovery by another US astronomer, Edwin Powell Hubble (1889–1953 CE), in the 1920s CE that the whole universe is expanding. As a result, their combined
findings offered empirical evidence for an entirely new view of cosmic history, and thus provided a fundamentally new answer to the old question of how the universe had come into being.

To reinforce the importance of empirical evidence as answers to questions underlying all of big history, students are sometimes requested to do in-class experiments and observations related to the subject under discussion, preferably with unknown outcome. In addition, the importance of curiosity, inquisitiveness and following one’s intuition receives due emphasis, especially when something does not seem to be right, is ill-understood, strange or otherwise intriguing, because that is how major discoveries have been, and will be, made.

The resulting answers must, of course, conform to the established scientific method. All scholarly accounts of the past are constructed with the aid of empirical evidence ordered by logical reasoning, including some sort of theoretical framework, which may be either implicitly or explicitly formulated. Ideally, all the available data should fit this framework. In practice, however, that is rarely the case, which often gives rise to long discussions of how the past should be viewed. These general issues have been discussed by generations of historians and philosophers. It is not my intention to provide an overview of these issues here. Yet it may be helpful to consider that an important human characteristic that allows us to make reconstructions is our capacity for pattern recognition and map making, which helps us to simplify the great many sensory data and make sense of them by ordering them within certain patterns. Humans are endowed with this capacity to a much greater extent than any other animal.4 This capacity has allowed our species to become what it is today.

However uncertain historical reconstructions may be, the only firm statements we can actually make all deal with the past. Clearly, we do not have any data at our disposal giving an idea of what the future will bring. As a result, we can only construct more or less likely scenarios of the future, based on observational data in the present. One might argue that it is possible to make firm statements about the present, but unfortunately, the present is also a rather fleeting category. Although the present is ‘where the action is,’ as soon as we talk about it, it has become part of the past. This is also the case for scientific experiments. Even while performing scientific measurements, those aspects of the present we are seeking to get a grip on are gone forever. What we do retain, however, if we do our work well, are the observational data, which may be more or less durable, depending on how well we did our job in recording them. As a result, every study of the present inevitably becomes a reconstruction of the past. That is why the study of history should be regarded as both the queen and king of the sciences.

The present is actually an even more problematic category. I sometimes point out to my students that, while looking at one another during our meetings, we
are looking at images of one another’s pasts. There is no way around this conclusion. Everything we perceive about one another is based on sensory data: within a student–teacher setting, this is mostly sound and light, but also smells. These data take time to reach us. Sound in air at sea level under so-called standard conditions travels at about 1,225 km per hour (761 miles per hour), while light in a vacuum moves at about 1,079,252,848 km per hour (about 670,616,629 miles per hour). Although, within an academic class setting, the resulting time lags are very small and therefore in practice virtually negligible, they do exist. As a result, we are always looking at images of the past, while the only present we can be sure of is to be found within ourselves.

Yet even that statement is problematic. One may wonder, for instance, where within us the present would be located. Is it situated in our brains, where supposedly the awareness of us and of the surrounding world resides? Surely, any sensory data that we pick up with, for instance, our eyes or our fingers must have taken time to reach our brains. And then, one may wonder, where exactly in our brains? My conclusion is, therefore, that all the commonly used views of a shared and known present are human constructions.

While considering direct human interactions, this may sound like nitpicking. Yet in big history, these problems soon become overwhelming. For what can we say about the present of larger settings, such as our current position within the universe? Because the universe is so large, it takes a long time for all the light to reach us. In general, the farther light has traveled before it reaches us, the longer it has existed. Astronomers therefore often say that, by capturing light from the sky, we are probing back in time. This immediately means that, with the current state of knowledge, it is impossible to gain an overview of the universe in its present form, because most of the light that is being emitted now in the universe has not yet reached us.

The study of history inevitably implies using a time frame that allows us to order the events that we are studying according to when they happened. During the past centuries, historians have expended a great deal of effort in constructing such a reliable chronological time frame, which has become the backbone of history. This historical time frame is centered on Earth, while the recurring events of Earth’s orbit around the sun (years) and its rotation around its own axis (days and nights) provide stable markers that make it possible to subdivide the chronological time frame into days, weeks, months, years, decades, centuries and millennia. For studying the period of recent human history, about 10,000 years, these rotational movements have been sufficiently stable not to cause any serious problems. Yet as soon as we start examining the history of Earth, which covers a period of about 4.6 billion years, we find that the rotation of Earth around its own axis has slowed down progressively, while we cannot be sure that its orbit around the sun has not changed either. In other words,
while the years might have been different in the past, days and nights were also significantly shorter.

Because, in big history, we want to trace back events to the beginning of the universe, now thought to have happened about 13.8 billion years ago and thus long before Earth and the sun came into being, these issues become even more severe. Clearly, we cannot trace the remnants of early cosmic events in any other way than by observing them in the present from an Earthbound perspective. As a result, while making our reconstruction of big history, we inevitably use an Earthbound time frame that ends in the present. We simply do not have any other time frame at our disposal that can do the job. The time frame of our big history account is thus by necessity centered upon us. This does not mean, of course, that the evolution of the universe is Earth-centered. It only means that our account of it is centered on the present.

This point may need some further elaboration. With the exception of meteorites and other cosmic objects, all the data we receive from the rest of the universe consist of forms of electromagnetic radiation. Depending on the distance and our relative velocities, it takes a certain amount of time before this radiation reaches us. The radiation emitted by events that happened long ago and far away may reach us only now, while the radiation of other events that happened more recently and closer may reach us at the same time. We do not know anything, however, about still other events that may have happened recently but far away, because that radiation has not yet reached us. In a similar way, neither do we know anything about events that happened a long time ago close to Earth, because that radiation has already passed us and will never return.

As a result, our ability to reconstruct the past of the universe with the aid of observed electromagnetic radiation is limited. For the past 10,000 years of human history, for instance, we cannot even tell how our own Milky Way has developed, because we are still waiting for most of the radiation to arrive. For what happened in the universe during the period of globalization (about 500 years), we only have data about the universe at a distance of, at most, 500 light years, which is a very small portion of our galaxy. In other words, the closer we come to the present, the less we know about the universe at large. And, as soon as we reach the present, we have only data at our disposal that deal with us – all the other data are about the past that is gone forever. This is why big history accounts are by necessity Earth- and human-centered. In 1845 CE the great Prussian naturalist Alexander von Humboldt (1769–1859 CE) formulated this as follows:6

These events in the universe belong, however, with reference to their historical reality, to other periods of time than those in which the phenomena of light are first revealed to the inhabitants of the Earth: they reach us like the voices of the past.
One may argue that, because humans have been observing the sky for thousands of years, we possess data that actually make it possible to reconstruct longer stretches of cosmic history. The records of ancient star explosions, for instance, made by contemporary observers, coupled with modern observations, make it possible to reconstruct a sequence of events that happened after these cosmic fireworks went off. But that does not invalidate the general principle, namely that if we want to study empirical data from the universe that were generated close to the present, they must have been generated close to us. It may be fair to assume that the rest of the universe has developed in ways that are similar to our closer cosmic surroundings. If this were the case, our big history view would indeed be larger. Yet, with current detection techniques, such an assumption cannot be based on empirical data and could possibly be wrong as a result. If one wants to stick to a big history account that is based on empirical data, it is by necessity Earth-centered.

In sum, because the data that we use to reconstruct the past inevitably reside within the present, our analyses are always anthropocentric and geocentric to some extent. The art of making grand historical analyses of cosmic history consists, therefore, first of all in recognizing this, and then in dealing with the data accordingly. This is not easy. Yet it appears to be the only reasonable thing we can do.

The idea that our knowledge of the past resides within the present can be turned around by saying that, if we really want to know how everything we observe originated, we have to study big history. For instance, in Chapter 3 we will see that the building blocks that are shaping our personal complexity today, as well as all the complexity surrounding us, can all be traced back to the emergence and evolution of the universe. This very basic insight offers a compelling reason why big history should be important for all people who are interested in the origins of everything from a scientific point of view.

Most human societies have understood this intuitively. As David Christian has often emphasized, every known society has told stories about how they themselves and everything around them came into being. From an academic point of view, such narratives are now considered origin myths. But this does not mean that these stories should be considered unimportant. To the contrary, they have often provided shared orientation, meaning, identities and goals, not least because their geographic settings represented maps of their societies’ natural and social environments. Up until today, most, if not all, humans have been exposed to such stories in one way or the other. We do not know, of course, whether all people have always fully believed them. Surely, it seems wise to suspect that skeptics would have existed in all human societies. Yet we may also suspect that in most, if not all, early human groups the majority shared most of these views, especially because, quite often, the number of available competing world views would have been limited, if they existed at all.
During the emergence of early state societies between 6,000 and 5,000 years ago, the new state elites began to promote their favored origin stories, while competing versions were often marginalized. For a long time, most, if not all, of these mythical big histories were local or regional in nature. This reflected both the size of the societies who told these stories and the extent of their contacts with others. For instance, the Inca view of the past did not include the Aztecs in Mexico, let alone Europeans (although some of their stories were later construed as referring to white people). The center of the world was their own region. Their capital city of Cuzco, for instance, was considered to be the navel of the world.

When societies became larger and more interconnected, some of these origin stories spread far and wide, while others fared less well. Examples of successful origin stories include Genesis in the Bible, similar stories in the Koran and also Hindu historical narratives.8

By the end of the Middle Ages in West European societies, the big origin questions were, for instance, addressed on the so-called mappae mundi, world maps, that were produced under Catholic clerical guidance and sometimes put on public display within churches. These maps were usually centered on Jerusalem and depicted the entire known world (Europe, Asia and Africa). These wall maps were more than only geographical depictions. The famous Hereford mappa mundi, for instance, produced around 1300 CE, also offers depictions of historical events in several places, most notably the biblical account of Genesis. As a result, the mappae mundi were, in fact, combinations of geography and history. This genre was continued in book form after movable-type printing had been invented in 1450 CE by Johannes Gutenberg (1395–1468 CE) in Mainz, (now) Germany. A well-known example of such a combination of history and geography is the Cosmographia book series first published in 1544 CE, authored by German cartographer Sebastian Münster (1488–1552 CE), which opened with the biblical account of creation. The title Cosmographia harked back to earlier cosmographies, in fact all the way back to Ptolemy’s highly influential scholarship, which had been rediscovered by West Europeans in the early fifteenth century. The same title was also used later by other authors.

During the European Middle Ages a few world histories were written, most notably perhaps the famous book Polychronicon authored between 1330 and 1360 CE by Ranulphus Higden (c. 1280–1364 CE). This account also opened with the biblical creation story and ended with the contemporary present. The idea of combining the Mosaic account of creation with world history may, in fact, go back all the way to the late Roman empire and was practiced from that time until the nineteenth century, as David Christian and others have argued. I call this type of history writing incipient big histories, because these narratives combined religiously inspired views of the deep past with empirically based stories about more recent periods.9
The globalization process starting in the sixteenth century CE has led both to the worldwide dissemination of the privileged origin stories, all of which had become supported by large and powerful state societies, and to the marginalization, if not total extinction, of most other such accounts. It is only very recently that societies emerged in which modern scientific ideas have permeated the public sphere, while the mythical origin stories have mostly been relegated to the private sphere. In the meantime, the study of history had been virtually monopolized by universities, where it was – and still is – defined as the history of literate people, resulting in the exclusion of all other accounts of the past. Why would modern academia define history in such a way?

**Big History and Other Histories**

How would big history relate to other forms of history? To be sure, telling stories about the past is something all of us do, or consume, in our daily lives. Such histories range from informal exchanges such as ‘guess what happened today …’ and ‘do you remember when …’ to information about the past provided by news media and the Internet.

Professional historians, however, set higher standards than most of us in reporting their stories about the past, based as they are on careful research and reflection. Their results are usually published in the form of articles in scholarly journals and as books. With the exception of some writings that are aimed at a broader audience, most of their work is for consumption by the professionals themselves.

Yet on the basis of their work a good many popularized histories have been written meant for classroom use or for a broader audience in the form of television series and popular books. Most people respond well to narratives that have an emotional appeal, so that they can empathize with people in other situations and/or other periods of time, especially if these events have a bearing on their own lives. That is a major reason why national, regional and local histories with a strong emotional flavor are very popular.

Analytical histories based on explicit theoretical models, by contrast, are usually far less appealing to most people. But they may be enlightening to some intellectually oriented folks, because in such stories it is much more evident what the stronger and weaker points are. In popular narratives it is usually far less clear what the evidence is on which they are based, or why some aspects were chosen to be part of the story while others were cast aside.

Big history may stimulate further reflection on other forms of history. To what extent would the story change, one may wonder, when some of
these larger aspects of time and space are taken into account? And would perhaps some theoretical approaches advocated in big history also help to better understand the smaller accounts of the past?

To be sure, telling stories about the history of all scales seems important. And the meticulous research performed by a great many historians studying human societies, life, the Earth and the cosmos has yielded the empirical evidence on which those accounts, and, in consequence, also big history, are based. All accounts of big history must be able to accommodate the evidence provided by historians who study at smaller scales. As soon as major discrepancies arise, these must be explored. This may lead to either a reinterpretation of the empirical data or a change in the historical account. That is how the academic enterprise works, and big history offers no exception to that rule.

A Very Short History of Academic History

The modern academic discipline of history emerged in the nineteenth century as part of the formation of nation states in Europe and the Americas. The first task of academic historians was to formulate a proud history of their own nation state (still known as ‘patriotic history’ in the Netherlands), which would provide a common identity to the inhabitants of these new social entities. In doing so, they followed in the footsteps of Roman historians of antiquity such as Titus Livy (c. 59 BCE–17 CE). The project of producing patriotic histories led to a great emphasis on the use of written documents. Over the course of time, historians also began to study other aspects of both their ‘own’ and other regions, while the study of national histories has become far more detached. Yet within academia, the study of human history as a whole has only rarely been practiced up to the present. This remarkable situation may be linked to the fact that to do so would produce global identities, which are not directly associated with any presently viable state society.

As a result of the emphasis on written sources, most historians begin their overviews of the past with the rise of literate societies. The attention is usually focused on those early states (often called ‘civilizations’) that are considered to be the precursors of their ‘own’ societies. The rest of human history is called ‘prehistory’ and is left to archaeologists. Whereas this academic division of labor appeared to have been caused mainly by the emphasis on written sources, there may also be another aspect to it. US historian Dan Smail (1961 CE–) emphasized in 2005 CE that the time span modern historians cover, about 6,000 years, is very similar to the total duration of history as told in the Old Testament. The reader may recall that, according to the famous calculations made by English bishop James Ussher (1581–1656 CE) in 1654 CE, the biblical world would have been
created in 4004 BCE. Would this similarity between the biblical time span and the period established historians usually cover be coincidental, Smail wondered, or could modern historians perhaps still be ‘in the grip of sacred history’?12

Up until the eighteenth and early nineteenth centuries, as we saw earlier, a good many popular human histories were written in Western Europe and North America that began with the biblical account. Subsequently, the recently acquired knowledge about the histories of people all around the world was integrated into this narrative. These accounts continued the tradition of the medieval incipient big histories. Some of these books became very popular and were printed in considerable numbers. This type of history remained popular until the middle of the nineteenth century.

Around 1840 CE, however, the emerging science of geology, which was stimulated by the industrial revolution, had made clear to academics in France, Britain and the USA that Earth must be much older than previously thought, even though nobody knew exactly how old it was, because reliable methods for dating rocks and fossils did not yet exist. This much larger time span inevitably meant that the Mosaic account could not possibly be correct. As US scholar Joseph E. Worcester (1784–1865 CE) formulated it in 1850 CE on p. 5 of the new edition of *Elements of History, Ancient and Modern*, a textbook that was ‘required in the examination of candidates for admission into the freshman class at Harvard College’:

The modern science of Geology, which has brought to light a vast number of important and interesting facts previously unknown, has produced a conviction among men of science that the origin of the earth is to be ascribed to a period far more remote than has been heretofore supposed, and the most learned Christian divines have adopted a mode of interpreting the Mosaic account of the creation which is in accordance with this opinion.

Regrettably, Worcester did not inform us what this new biblical interpretation looked like.

When modern nation states began to take shape – and with them the academic historical profession – these incipient big histories were ignored within academia. The emerging academic discipline of history decided to get rid of the biblical account and start their narrative with the period about which they had reasonably reliable documentary evidence, namely the early states in Mesopotamia and Egypt. These ancient societies were seen as the precursors of their own modern nation states. In doing so, the writing of national histories and the tracing of the preceding cultural trajectory (known as the Western Civilization Trajectory in the USA) took precedence over efforts to write a history of all people on Earth, including all of their origins.

However, by discarding the traditional answers to the big origin questions that were no longer deemed credible, historians also cast aside the big origin
questions themselves. This may have happened almost entirely unnoticed. They were replaced by answers to origin questions that were first of all related to the emergence of the historian’s ‘own’ nation state and its presumed cultural roots.

Furthermore, by concentrating on human action until today most historians have paid relatively little attention to the natural environment, which instead became the object of study for the emerging sciences of geology and geography. The trend of focusing on human action could also be witnessed in the emerging social sciences: psychology, sociology and cultural anthropology. As a result, the study of human affairs became increasingly divorced from the biosphere, let alone the universe.

Certainly some historians, most notably French historian Fernand Braudel (1902–85 CE) and his followers, have paid systematic attention to the natural environment as an integral part of the history they studied. But most historians have not followed their example and have instead preferred to write narratives focused on human action. Further, the sub-discipline of environmental history that emerged in the late 1970s and early 1980s CE, which was part and parcel of the rise of environmental concerns during that period, has not yet been fully integrated into mainstream historical accounts.

The lack of such an integrated attention to the relationship between humans and their natural environment may mirror the difference in focus between what Christians call the Old and New Testaments. While in the first and longest part of the Bible there is a considerable attention to human relationships with the surrounding nature, the story of Jesus of Nazareth, by contrast, almost exclusively focuses on human affairs. The underlying reason for this may be found in the fact that the authors of the New Testament as well as most nineteenth- and twentieth-century academic historians lived in urban environments. As a consequence they did not directly experience a great many human interactions with the rest of nature, which they neglected in their writings as a result. If correct, the still popular Western Civilization Trajectory may to a considerable extent represent a secularized version of history focusing on the life of Jesus, his precursors and everything else that followed in the Christianized part of the world, while other societies only enter the story when they were seen as interacting with the Christian cultural sphere.

As a result of the continuing importance of national histories, no secular histories of humankind as a whole have become established within academia, even though Leopold von Ranke (1795–1886 CE), a major culture hero of academic historians, was very much in favor of writing human history, which he called both Weltgeschichte (world history) and Universalgeschichte (universal history).13 Enlightenment historians, such as David Hume, Edward Gibbon, William Robertson and François-Marie Arouet de Voltaire, who became culture heroes for academic historians, distanced themselves from religious approaches
and, perhaps as a result, largely abandoned the search for origins. While sometimes attacking the popular human histories, these authors produced histories of ‘their’ nations or of similar other nations as well as of ‘their’ cultures by tracing them back to antiquity.

During the first half of the twentieth century, only a few dedicated and courageous academic historians, most notably Arnold Joseph Toynbee (1889–1975 CE), kept the study of human history alive. Outside of academia, however, human histories remained popular, such as the books written by H. G. Wells (1866–1946 CE). More likely than not, this interest was stimulated by the ongoing process of globalization. Even though, for instance, British historian Geoffrey Barraclough (1908–84 CE) argued strongly in favor of new forms of ‘universal, or general, history’ as long ago as 1955 CE, until today most academic historians have not yet embraced any such accounts of the human adventure on Earth.14

In the middle of the twentieth century, however, some change began to take place. Following Toynbee’s example, a few farsighted scholars took the lead, most notably US historians William H. McNeill and Leften S. Stavrianos (1913–2004 CE), while English historian John Roberts (1928–2003 CE) wrote History of the World. All these authors realized that for a good understanding of recent history it was important to trace the past all the way back to the origin of Earth, if not farther, and as a result paid increasing attention to the natural environment in which humans lived. More recently, historian Bob Moore (1941 CE–) at the University of Newcastle, one of Roberts’ students, has been an English pioneer in human history. In the 1980s, the idea of human history (usually called ‘world history’ in the United States) began to globalize.

A good example of this type of scholarship in the twenty-first century is The Human Web by father and son William H. and John R. McNeill (1954 CE–), which was published in 2003 CE. In this book new ideas were offered, including solutions for imperfections in The Rise of the West (1963 CE) that had been pointed out by William McNeill in the introductory essay to the 1992 CE edition. These changes included, most notably, systematic attention to global human connections as well as to our dependence on the biosphere. This improved vision came as a result of the ongoing globalization process and growing environmental concerns.

Not only have most academic historians paid relatively little attention to human history as a whole, but by defining history as the history of literate people they have also ignored the past of almost everything else we can observe around us. As a result, the history of life has become the domain of biologists; geologists are taking care of the history of our planet; while astronomers and cosmologists have been reconstructing the history of the universe. During the past 50 years or so, only very few academics have tried to forge all these stories into one single coherent historical account explaining how we, as well as everything around us, have come to be the way we are now.
De historiae utilitate and Mercator sapiens

‘About the usefulness of history’ was the title of a lecture delivered in Latin by Gerardus Vossius, inaugurating the new Atheneum Illustre school in Amsterdam in January 1632 CE. In founding this school, the city of Amsterdam actually sought to found a university in disguise, since the central government would not allow them to found a real university because the nearby city of Leyden already had one. In consequence, they gave their school a different name, while two internationally renowned academics, Gerardus Vossius (1577–1649 CE) and Caspar Barlaeus (1584–1648 CE), were requested to lend their fame to the new institution.

A few days later Barlaeus argued in his presentation that a good merchant needed to be wise and well instructed. In all likelihood both scholars pushed their points of view a little further than the city fathers intended. Yet while the first lecture has been almost entirely forgotten, the presentation about the wise merchant has resonated throughout the centuries in the city of Amsterdam, although it has often been misquoted or misinterpreted. In fact, the University of Amsterdam which evolved out of the Atheneum Illustre still uses the term for the organization selling its merchandise.

Here is a lesson that historians may want to keep in mind. Caspar Barlaeus was smart enough to flatter his sponsors, the wealthy city aldermen, most of whom were enterprising merchants, and was successful as a result, even though his message was not completely accepted or perhaps even understood. Gerardus Vossius, by contrast, was much more straightforward, flattering no one in particular. Quite possibly, in consequence his message about the usefulness of history has almost completely been ignored. So the lesson may be that wrapping the argument the right way may have mattered more than the argument itself.

To be successful, all people, including merchants who operate in complex social networks, need good knowledge of their world. But that may not always be the knowledge university professors teach or deem useful. As a result, throughout the centuries there has been a in-built tension between those who provide money for education and those who teach this knowledge.

Because the Atheneum Illustre did not yet have its own building, the gentlemen just mentioned held their presentations in a chapel called the Agnietenkapel. In the nearby courtyard of the venerable old university complex called Oudemanhuispoort, statues of both professors can be
found today, overgrown with lichen, and virtually ignored by almost all students who pass them every day. Inside that very same building, we started our first big history course in December of 1994 CE. While organizing the course, I often looked at those statues and wondered whether there was a connection.

At the time, Amsterdam was in its golden age, mostly under self-rule, while it was pursuing trade all around the world. As part of these developments Amsterdam burghers excelled not only in geography, map making, navigation, astronomy, botany and other forms of practical knowledge, but also in the study of history, philosophy and theology, including ethics. In all of these fields there must have been a good many tensions and discussions, but probably more in the second category, because practical knowledge could be tested by empirical evidence, while philosophy and ethics in particular are often a little different.

It is therefore not surprising that the famous philosophical debates in Amsterdam, such as those initiated by Descartes, Spinoza, Locke and others, took place outside of the Atheneum Illustre, which was more conservative in nature, while focusing on more direct needs. Yet even in such a situation there may have been some room for new, large world views from time to time, because these visions may have helped merchants to become a little wiser, and thus a little more successful. This global mercantile legacy may have provided room for big history in Amsterdam in 1994 CE.

One wonders whether this situation is part of a larger pattern. Most notably trade communities, and especially the financiers who find themselves at the heart of their trade hubs, may feel a need for global views. It is therefore not surprising that for instance Phoenicians, Jews, Chinese and other Asians, as well as many other similar communities, have traditionally placed great emphasis on getting to know the world and understanding it, including its history, through study and discussion. This has shaped the cultural outlook of such communities to an unfathomable extent.

While such social situations may provide fertile ground for big history, they may not by necessity engender big history. This very much depends on to what extent the ruling elites think whether this would be a good idea. If not, the trade and financial communities will keep these ideas to themselves and use them to make a profit. But if the ruling elites are wise and stimulate big history, the whole world may profit. Because only by understanding history do we know who we are, how everything has become the way it is now and, in consequence, how to make the best possible plans for the future.
A Short History of Big History

Because an established academic discipline of big history does not yet exist, no one appears to have written a history of big history and, as a result, start a big history tradition. All the established academic disciplines, by contrast, have created their own histories and traditions. Not unlike the proud patriotic histories of nation states, the histories of academic disciplines typically revolve around their culture heroes, while they rarely mention the social and ecological circumstances within which these people operated. Their lesser heroes are usually only mentioned in specific textbooks, while the villains, or the less welcome aspects of the heroes, are usually kept out of the story as much as possible. This almost inevitably conveys the idea of ‘progress’ in science.

Keeping these caveats in mind, we will now take a look at the vestiges of what could become a history of big history. As yet I may not have a good overview that highlights all the major players, good or bad. My research has led to some unexpected findings, and it may well turn out to be that there were actually far more early scholars who produced big histories than those mentioned here. Like all other academic accounts, my history of big history is a snapshot in time and thus likely to change somewhere in the future.

The first big history pioneer – and thus our first culture hero – may well have been Friedrich Wilhelm Heinrich Alexander von Humboldt (1769–1859 CE), a most intelligent and sensitive man of Prussian descent. During his lifetime, Alexander von Humboldt became about as famous as Albert Einstein is today. Most of his work was read all over the North Atlantic academic world and has deeply influenced modern science and culture up to the present. Usually known as the father of geography (where he was adopted as one of its culture heroes), von Humboldt was interested in everything, ranging from peoples and their cultures to the cosmos as a whole. In doing so he did not heed the boundaries between the sciences as they exist today, because in his time they had not yet been erected. Von Humboldt's work was very much part of the rise of empirical science in the eighteenth and nineteenth centuries that had led to the questioning of the biblical account. For the empirical scholar this was not a problem. He saw religion as a higher level of speculation for which no observational evidence existed.15

Late in life von Humboldt wrote a multi-volume series called Kosmos, in which he intended to summarize all the existing knowledge about nature, including humans, in an integrated fashion. He called his approach ‘a cosmical history of the universe.’16 The first volume was published in 1845 CE in German. Like his earlier books, his Kosmos tomes were widely read and translated into many languages. Regrettably von Humboldt passed away
before finishing his project. In the first volume, he summarized his program as follows:17

Beginning with the depths of the space and the regions of remotest nebulae, we will gradually descend through the starry zone to which our solar system belongs, to our own terrestrial spheroid, circled by air and ocean, there to direct our attention to its form, temperature, and magnetic tension, and to consider the fullness of organic life unfolding itself upon its surface beneath the vivifying influence of light. … By uniting, under one point of view, both the phenomena of our own globe and those presented in the regions of space, we embrace the limits of the science of the Cosmos, and convert the physical history of the globe into the physical history of the universe, the one term being modeled upon that of the other.

In 1825/6 CE von Humboldt had already outlined his cosmic approach in the Parisian salon of the Marquis de Montauban. After returning to Berlin in 1827 CE the Baron elaborated these ideas in 61 lectures at the University of Berlin as well as during 16 well-attended and even better-publicized presentations at the Berliner Singakademie.18 In these lectures and books von Humboldt made the ambitious attempt to systematically link everything with everything, from the most remote corners of the universe to human beings, providing a history where possible. I consider him therefore the first big historian. Because in his time the ages of rocks and fossils could not yet be determined, while the universe as a whole was considered stable and timeless, von Humboldt refused to place his analysis systematically within a historical perspective, even though he thought that the cosmos must have existed for millions of years.

Because von Humboldt saw everything as linked with everything else, his take on human history started with analyzing its natural environment. In this respect many of his views are still very modern. Yet von Humboldt very much depended, of course, on the level of scientific knowledge that had been attained during the first half of the nineteenth century, when many of our current great scientific paradigms had not yet been formulated. In his time, for instance, the theory of natural evolution formulated by Charles Darwin (1809–82 CE) and Alfred Russel Wallace (1823–1913 CE) did not yet exist in the public sphere (von Humboldt died six months before Darwin’s On the Origin of Species was published). And the Prussian scholar was not familiar, either, with our current theories of particle physics, big bang cosmology and plate tectonics. As a result, the Baron could not describe nature and human affairs in terms of these theories. His descriptions are, therefore, attempts to provide systematic overviews of all these different aspects while indicating all the links that he saw. In doing so, he was very much aware of the possibility that important scientific insights were still lacking and might be discovered in the future.
Alexander von Humboldt, as shown in Figure 1.1, did not operate within a university setting. He was able to do a considerable part of his research and writing thanks to an inheritance, which made him financially independent. Such independence is characteristic of many original thinkers, including Robert Chambers, Charles Darwin, Albert Einstein and James Lovelock.\footnote{Even though von Humboldt was never attached to a university, he was part and parcel of the emerging North Atlantic scientific tradition, to which he contributed a great deal.}

Before von Humboldt was ready to write *Kosmos*, he had pursued what can be considered an exciting career by almost any standard. Trained as a mining inspector, von Humboldt traveled through the Americas for five years at the end of the eighteenth century, together with his French companion Aimé Jacques Alexandre Bonpland (1773–1858 CE), experiencing the most amazing adventures while making an almost unbelievable range of scientific measurements. At 29 years of age onboard a sailing ship waiting to leave Spain for the New World, von Humboldt formulated his main goal in a letter dated 5 June 1799, as follows:\footnote{I shall try to find out how the forces of nature interact upon one another and how the geographic environment influences plant and animal life. In other words: I must find out about the unity of nature.}

\begin{align*}
\text{I shall try to find out how the forces of nature interact upon one another and how the geographic environment influences plant and animal life. In other words: I must find out about the unity of nature.}
\end{align*}
Although this sounds familiar to scientists today, to search for an explanation of the workings of nature without invoking any supernatural influence was still a revolutionary idea 200 years ago.

At the time, the only Europeans allowed to travel in the Spanish Americas were Spanish nationals. Even such people were subject to a great many restrictions. This was part of Spanish governmental efforts to keep control over their American colonies, which had become economically self-supporting. As a result, for most Europeans and North Americans, the Spanish-American colonies were almost a terra incognita. However, because a considerable part of the Spanish royal income was derived from mining activities in the Americas, and because the royal finances were in dire straits, any research that would help to discover more such wealth was welcome. This explains why Alexander von Humboldt received special royal permission to do his research, which he used for his own benefit. It also helps to explain why his voyage was followed with such great interest in Western Europe and on the eastern seaboard of the recently formed United States. The contemporary globalization process allowed von Humboldt to travel the way he did and also become famous for it, at least within learned European and American circles. And it was also very helpful that, unlike today, quite a few leading politicians were good scientists.

In order to place his all-embracing cosmic approach into a historical perspective von Humboldt wrote a History of the Physical Contemplation of the Universe in the second volume of Kosmos. This brilliant overview of scholars who started thinking about the universe as a whole opened with the earliest written records and continued all the way down to his own time. Even today, this is one of the best accounts, if not the best, of how over time people living in different world areas have enlarged their views of the history of everything toward a scientific mode of observation and interpretation as a result of ecological and cultural interactions.

Furthermore, the Prussian scholar took great care to specify his contemporary academic sources. These included outstanding scholars such as the French naturalist Georges-Louis Leclerc, Comte de Buffon (1707–88 CE), who wrote the earliest science-based history of our planet (1780 CE). His holistic approach inspired von Humboldt, even though he challenged Buffon’s opinion that species in the New World were inferior. Von Humboldt also admired, among others, the French mathematician and cosmologist Pierre Simon de Laplace (1749–1827 CE) and the British naturalist Charles Lyell (1797–1875 CE), one of the founders of modern geology. All of this allows us to understand the intellectual regime within which von Humboldt was operating. By the late eighteenth and early nineteenth century these enlightened universal scholars, mostly naturalists, were already convinced that the cosmos and Earth had existed far longer than the biblical account allowed, and that one could understand nature and humankind better by using science rather than by following religious traditions.
Most notably, French (German-born) scholar Paul-Henri Thiry, Baron d'Holbach (1723–89 CE), had been a leading force in promoting such ideas. After inheriting a fortune, he had become financially independent. A leading atheist thinker and a most active participant in the French Enlightenment, d'Holbach wrote and translated countless articles on a great variety of subjects for Diderot and d'Alembert's famous *Encyclopédie*. In his widely read and famous book *Système de la nature ou des loix du monde physique et du monde moral* published in 1770 CE in Amsterdam under the pseudonym of Jean-Baptiste de Mirabaud, d'Holbach placed humans squarely within the rest of nature, including the universe, which he saw as solely ruled by matter, motion and energy (a rather modern point of view). The thrust of his argument was to deny any religious explanations of nature or divinely decreed moral rules for humans. Instead, d'Holbach argued that humans should be free to pursue happiness, which, if done properly, would automatically lead to harmonious societies. More likely than not, this revolutionary approach to human morality inspired Thomas Jefferson to include the famous phrase ‘the pursuit of happiness’ in the US Declaration of Independence of 1776 CE. Because d'Holbach did not attempt to sketch a history of everything, he should not be considered an early big historian. Yet his approach of viewing humans as part of nature ruled by natural laws very much contributed to paving the way for big history.

By that time, a few enlightened European philosophers had also made considerable contributions to the understanding of nature and human societies without invoking supernatural influences. In his major book *Le Monde, ou, Traité de la lumière*, published posthumously in 1664 CE, French philosopher René Descartes (1596–1650 CE) analyzed the workings of the heavens in terms of natural processes without any divine intervention. Elaborating these ideas in 1755 CE, German philosopher Immanuel Kant (1724–1804 CE) anonymously published his ideas of the cosmos, including a theory of how the solar system emerged that is still accepted today, as well as the idea that nebulae were actually island universes far beyond our Milky Way. Like Descartes, Kant thought that all these things would have come into being as a result of natural forces. In Kant's view, however, divine action was still detectable in the ways in which the natural laws shape reality. This was apparently an attempt to hedge himself against accusations of atheism. In 1784 CE, Kant promoted the idea of universal history – we would call it human history today – solely based on natural explanations, although with a teleological slant. According to the great philosopher, there was a purpose in nature for human history, namely ‘the achievement of a universal civic society which administers law among men to produce perfect world citizens.’ Although Kant never wrote a comprehensive analysis from one single perspective, he should be considered another important forerunner of big history. Similarly, Georg Wilhelm Friedrich Hegel’s *Enzyklopädie der
philosophischen Wissenschaften im Grundrisse, first published in 1817 CE, may also be considered a precursor of big history. In this monumental work, Hegel (1770–1831 CE) strove to find a common philosophical basis for all of nature including humanity.24

The second big history pioneer known to me was Scottish publisher and author Robert Chambers (1802–71 CE). Like Alexander von Humboldt, Chambers was familiar with most contemporary science, including, of course, the Scottish Enlightenment. He lived in an increasingly entrepreneurial society that was rapidly industrializing. As a result of the introduction of steam presses, the publishing business was becoming more profitable, which is how Chambers made his money. His book Vestiges of the Natural History of Creation was anonymously published in London by John Churchill in 1844 CE. In contrast to von Humboldt’s treatment of the history of the universe in Kosmos, which is mostly descriptive, Chambers’ Vestiges offered a dynamic history of everything, beginning with the origin of the universe in the form of a fire mist, and ending with the history of humanity. This dynamic approach to all of history was perhaps Chambers’ major contribution. His book consists of a great number of challenging hypotheses, some of which still look surprisingly modern. These include the ideas that the emergence of matter would have taken place in a fire mist and that civilizations emerged as a result of specific ecological and social constraints. But Chambers, of course, was a man of his time and had other ideas, such as a racial theory about the evolution of humans, which would have started at the lowest stage with black savages while Caucasian whites were to be found at the pinnacle of history.25

According to British historian James Secord (1953 CE–), who wrote an illuminating study on Vestiges and its effects on contemporary society, Chambers was motivated to write this book, among other things, to promote a middle course between political radicalism inspired by the French Revolution and evangelical Christianity.26 It is not clear to what extent Chambers might have been influenced by von Humboldt’s work. In England, both Chambers’ Vestiges and von Humboldt’s Kosmos appeared in print more or less at the same time, while von Humboldt had already been lecturing about these things for about 20 years. Whatever the case, Vestiges caused a huge stir in Victorian Britain and sold well accordingly. Following the works of Lyell and von Humboldt, Vestiges suggested a time span for the history of Earth and of life that was far longer than the biblical account allowed. Vestiges contributed, therefore, a great deal to preparing the ground for Charles Darwin’s and Alfred Russel Wallace’s later work on the evolution of life.27 Only in 1884 CE was the identity of the author posthumously revealed.

During the second part of the nineteenth century, to my knowledge, no new big histories were published. The academic world was busy splitting up into
clearly demarcated disciplines, while historians were oblivious to any attempts to place humans within a wider terrestrial or cosmic context, focused as they were on constructing patriotic histories and civilizational trajectories. As a result, there was no room for big history within academia. Yet there remained potential room for large-scale accounts within the walls of science. Nineteenth-century naturalists increasingly adopted historical approaches, while at the same time the biblical account was losing credibility within academia as a literal historical source. One may wonder, therefore, why no scholars appear to have been interested in producing big histories during this period. It may be that the strong feelings of nationalism resulting from the development of nation states discouraged any such attempts. But, possibly, a few big histories were actually published during this period and only need to be rediscovered.

Whatever the case may turn out to be, in the twentieth century big history re-emerged. The first pioneer was English author H. G. Wells, with his book *The Outline of History* (1920 CE). Wells was motivated to write his all-embracing history as a result of the effects of the First World War, by many considered horrifying. Wells hoped that by doing so, he would help to foster a global identity, which would contribute to preventing further major wars. Because most scholars still considered the universe to be stable and infinite, Wells concentrated his efforts on the history of Earth, life and mankind (as he called it).

In the meantime, however, scientific discoveries continued to enlarge our views of space and time. In astronomy, remarkable discoveries were made with the aid of bigger and better telescopes that could catch more light, financed by US industrial entrepreneurs. The invention of photography also greatly facilitated the capture of more light by exposing photographic plates for long periods of time. Photography also made it possible to preserve much better images than the earlier hand drawings that had been made by weak candlelight.

As a result, the prevalent view among astronomers around 1900 CE of humans living in the center of the Milky Way, which most astronomers considered to be the entire universe, was replaced by a much bigger universe that had started with an extremely hot and dense big bang 13.8 billion years ago and has expanded ever since, producing many billions of galaxies, one of which is ours. Suddenly, the whole universe had a history with a chronology that could actually be represented on a time line. And now we know that we do not inhabit the Milky Way’s center, either, but live instead in one of its huge suburban arms.

Furthermore, during the 1950s CE as a consequence of intensive research into the nature of radioactive chemical elements geologists learned to determine the absolute ages of rocks and fossils with the aid of radiometric dating. They discovered, for instance, that Earth and the solar system were about 4.57 billion years old. Today, it has even become possible to determine the entire history of one single rock with ever more refined methods, a history which
can be as long as many millions of years. These new dating methods allowed scientists to reconstruct a chronology of the history of everything. David Christian calls the emergence of these new insights the second chronometric revolution (the first chronometric revolution consisted of the nineteenth-century scientific developments mentioned earlier that had led to abandoning the Mosaic account).29

A few perceptive US astronomers and physicists, most notably Harlow Shapley (1885–1972 CE), director of the Harvard Observatory, and Robert Jastrow (1925–2008 CE), lead scientist of the emerging NASA space program, independently began to reconsider the positions of humans within this novel grand perspective. They wrote books and gave television interviews explaining their exciting new vision. Being natural scientists, however, their rendition of human history within the bigger story was by necessity limited. In France, Guy Dingemans, docteur at the University of Lausanne, pioneered along similar lines in 1958 CE by publishing his book The Tragedy of the Universe: Formation and Transformation of the Continents, the Universe, Life, Species, Races, Mankind. But in contrast to Shapley’s and Jastrow’s writings, which influenced a whole generation of younger scholars, I have not been able to trace any impact of Dingemans’ equally daring views.30

It took until the 1970s CE before the first big history was produced with emphasis on human history. I do not know why it took so long. Possibly earlier twentieth-century big history texts do exist and only need to be found.31 By the 1970s CE, the effects of the Apollo moon flights together with the ongoing globalization and industrialization again stimulated the idea of looking at things as a whole. The first modern big history account known to me is a large volume titled The Columbia History of the World (1972). This book was the result of a team effort by scholars from Columbia University and runs to more than 1,000 pages, 45 of which were devoted to the period ranging from the emergence of the universe to the rise of agriculture.

It may have been coincidence – although I think not – but very soon after the Apollo flights had taken place most of the current major scientific paradigms (in Thomas Kuhn’s sense) of the history of the universe, the solar system and Earth became accepted within mainstream science.32 This coincided with the introduction of novel techniques to determine the ages of rocks with the aid of radioactive decay. Furthermore, new ways were discovered or refined to determine the age of other objects and events, such as the counting of tree rings, genetic dating and the detection of electromagnetic radiation that had originated in the early universe. As a result, scientists were able to construct much more precise accounts of the history of life, Earth, the solar system and even the universe.

Building on both the new scientific discoveries and the insights provided by Shapley and Jastrow, during the late 1970s and 1980s CE a few innovative and
insightful natural scientists, such as Canadian-French astrophysicist Hubert Reeves (1932 CE–), US astronomers George Field (1929 CE–) and Eric Chaisson at Harvard University, US scientist Carl Sagan (1934–96 CE) –a former student of William McNeill’s – with his immensely popular Cosmos television series, US geologist Preston Cloud (1912–91 CE) at the University of Minnesota and German-born US astrophysicist G. Siegfried Kutter (1935 CE–) at Evergreen State College in Washington State, used this new knowledge to achieve fresh grand syntheses. This included university courses and books dealing with a scientifically based history of everything, with an emphasis on their own specializations. Being natural scientists, they paid only limited attention to human history.

Furthermore, already in 1986 CE Hubert Reeves outlined many salient aspects of the rise of complexity in cosmic history in his book L’heure de s’enivrer: L’univers a-t-il un sens? published in 1991 CE as The Hour of Our Delight: Cosmic Evolution, Order, and Complexity. This brilliant book has so far received comparatively little attention, most likely because the thrust of Reeves’ argument was directed at how to avoid nuclear destruction, which had become less of a menace at the time of publication right after the end of the Cold War.

Austrian philosopher Erich Jantsch (1929–80 CE) may have been the first to develop a systematic model for big history in The Self-Organizing Universe (1980), in which he summarized many important principles. Soon after its publication, however, Jantsch passed away, which may partially explain why his book did not become better known among academics. Remarkably, in Russia Jantsch’s work served as a source of inspiration for a number of scholars, including psychologist Akop Nazaretyan (1948 CE–), to formulate their own approaches to universal history. Unfortunately, these scholars have published most of their work in Russian, which has not facilitated the globalization of their insights, which is currently the fate of academic insights published in languages other than English. In other countries such as France, England, Colombia and Peru, widely interested and intellectually gifted scholars also began to write big histories. Today, it may well be that such people can be found in almost every country on Earth. And although William McNeill has never taught or investigated big history himself, he has argued in favor of this approach, as well as actively supported it, from at least as early as 1991 CE.

Subsequently, these large-scale history accounts began to fuse into a new genre, increasingly known as ‘big history’ among historians in Australia, the United States and Western Europe, as ‘cosmic evolution’ among astronomers and astrophysicists and as ‘universal history’ in Russia.

By the end of the 1980s CE, among academic historians there were at least two pioneers who began to teach the big story: David Christian at Macquarie University, in Sydney, Australia, and US historian John Mears (1938 CE–), another former student of William McNeill’s, at Southern Methodist University
in Dallas, Texas. In 1986 CE Mears outlined the idea of a multi-disciplinary, team-taught big history course in a little-known but visionary article. Yet he did not encounter sufficient support to actually organize such a course. While Mears subsequently took up the gigantic task of designing a big history course that he taught all by himself, around the same time David Christian independently invented the same course model in Australia. In the Macquarie University big history course that started in 1989 CE, astronomers taught about the history of the universe; geologists explained Earth history; biologists lectured on life and evolution; while archaeologists and historians took care of human history. This course model not only produced an amazing synergy among the teachers, but also served as an example for similar courses in Australia, the United States and the Netherlands.35

By fusing human history with the new scientific account of the emergence of everything into big history, the medieval genre of incipient big histories was unwittingly reshaped into a new form, now based on rigorous science instead of on religious inspiration. Suddenly all the old origin questions were back on the agenda of history, even though the answers had changed. By restoring this ancient tradition in a new way, big history offers a fresh, scientifically based account of all of history, including a time line to which all knowledge can be attached in an orderly fashion. What is more, attention to the natural environment has almost effortlessly returned, because by starting at the beginning of time and space it would be impossible to ignore this most important aspect of human history.

This new, holistic approach to history has generated great interest and enthusiasm among a great many students and teachers, while its diffusion around the world has been greatly facilitated by the emergence of the Internet and email. In terms of publications, the Russian ‘Uchitel’ publishing house based in Volgograd directed by Leonid Grinin has done pioneering work in publishing big history materials in their English-language journal Social Evolution & History as well as the Almanac Evolution series.

In 2008 CE, big history caught the attention of Microsoft cofounder Bill Gates (1955 CE–), who listened to an audio version of David Christian’s big history approach while working out on his home trainer. Gates became so enthusiastic – he called it ‘the greatest course of all time’ – that he felt everybody on the planet should have access to it. As a consequence Gates personally funded the development of a website that offers for free all the materials needed to teach big history at secondary schools. After several years of development by David Christian and a team of dedicated coworkers, this website, www.bighistoryproject.com, is now open to all people who have an interest in big history.

On 20 August 2010 CE, as part of this development, seven big history scholars, US geologist Walter Alvarez (1940 CE–), Australian historian Craig Benjamin
Introduction to Big History

(1954 CE–), US big historians Cynthia Brown (1938 CE–), David Christian and Barry Rodrigue (1949 CE–), US political scientist Lowell Gustafson (1954 CE–) and myself, founded the International Big History Association (IBHA) during a meeting at the Geological Observatory in Coldigioco, Italy, where we had met for a week to take a geology course organized by Walter Alvarez and his Italian colleague Alessandro Montanari. In 2011 CE, IBHA was chartered as a nonprofit organization based at Grand Valley State University, Michigan, USA. It held its inaugural conference there in 2012 CE, which was attended by about 200 scholars. Its second conference (of a similar size) took place in August 2014 CE at Dominican University of California. By that time IBHA had 357 members, while there were about 50 big history university courses worldwide. In addition to Bill Gates, big history has attracted the attention of influential people and organizations including among others highly ranked Chinese politicians, the World Economic Forum, former US vice president Al Gore, US comic Stephen Colbert (1964 CE–) and the History Channel 2, which produced a big history series that has been broadcast not only in the USA but also elsewhere around the globe.

At Dominican University of California at San Rafael, as of 2010 CE all first-year students start with a big history program initiated by US philosopher Philip Novak (1950 CE–), Cynthia Brown, who wrote the engaging book *Big History: From the Big Bang to the Present* (2007 CE), and US scholar and administrator Mojgan Behmand (1966 CE–). The introductory big history course is followed by other courses in which teachers are requested to present their subjects from a big history perspective. In doing so, Dominican University of California may be the first academic institution worldwide to require all incoming students to become familiar with this new grand perspective. Furthermore, IBHA is currently defining a research agenda for big history, a first outline of which was published in 2011 CE.35

All of this is part of a worldwide effort of stimulating big history within academia. In doing so, it is the first form of history that is truly globalizing, thus following the trajectory of the natural sciences. These developments can also been seen as a return to more inclusive nineteenth-century global attitudes, when Joseph Worcester’s textbook *Elements of History, Ancient and Modern* was required in the examination of candidates for admission into the freshman class at Harvard College, and Alexander von Humboldt’s *Kosmos* was translated into a great many languages.

**Little Big Histories**

Little big histories are essays about subjects or answers to questions about history that are placed within the context of big history. This novel historical genre was invented in the Netherlands in 2007 CE by Dutch
big historian Esther Quaedackers (1980 CE–) and her husband Marcel Koonen (1978 CE–) as a way of stimulating students to think big and out-of-the-box, while seeking to grasp the importance of big history in everyday life.

In writing their little big histories, students are requested to pick a subject that they value and trace its entire history, from the big bang until today. They are also requested to make comparisons between different processes, such as, for instance, the emergence of the universe and the emergence of their subject. Such unusual comparisons may help to clarify the particular aspects of both processes. Students may also look for metaphorical comparisons, such as how humans have projected their views onto their image of the universe, for instance the names and shapes of the constellations, the names of the planets, etc. In fact, they may use any link they like as long as it helps to throw new light on their topic from a big history point of view.

Little big histories have been very successful in motivating our students, and have been adopted worldwide, for instance, in the big history project sponsored by Bill Gates; by the US History Channel; and in various other big history courses around the world. Esther Quaedackers herself is writing an illuminating history of the Tiananmen gate in Beijing viewed from this perspective.

A few other scholars have independently written such long-term histories, such as Global Brain: The Evolution of Mass Mind from the Big Bang to the 21st Century (2000) by US author Howard Bloom (1943 CE–), the illuminating article on the big history of grasses (2009) by New Zealand-born US big historian Jonathan Markley (1970 CE–), The Planet in a Pebble (2010) by British geologist Jan Zalasiewicz (1954 CE–) and The Universe Within: The Deep History of the Human Body (2013) by US paleontologist Neil Shubin (1960 CE–). None of these authors, however, has presented his work as examples of a particular historical genre that could be used to stimulate students to gain a deeper understanding of big history. We found these examples only after little big histories had been invented. The episodes broadcast as Big History by the US History Channel 2 in the fall of 2013 CE, by contrast, were presented as little big histories.

**A Historical Theory of Everything?**

My efforts at organizing big history courses led to the historical theory of everything that will be presented in the next chapter. This theory does not include a claim to be able to explain every detail of everything that has ever happened in
history. Yet by thinking big, it is possible to discern general patterns that would remain obscured if one were to examine only smaller portions of our past. It may be that, at this point, the reader would not be interested in delving into a theoretical discussion without seeing some of the meat of history on its theoretical bones. If this were the case, it might be better to skip Chapter 2 and continue with Chapter 3. As soon as the need emerges for theoretical clarification, the reader could then return to Chapter 2.

Whatever the reader may decide to do, it may be worthwhile to point out that my theoretical approach could already be discerned in the way I earlier explained the rise of big history in the early nineteenth century. It would, for instance, not have been possible to predict or explain everything that Alexander von Humboldt did. Yet we can have some hope of being able to explain the rise and demise of the social and ecological circumstances, with all their opportunities and limitations, within which individuals such as von Humboldt got the chance to do what they did. This involves, of course, a considerable amount of hindsight.

Like most, if not all large-scale historical accounts, big history tends to focus on the emergence of developments that cause major changes, most notably new forms of complexity. Less systematic attention is devoted to the decline of complexity. In a more balanced account, both aspects would need to be addressed more systematically. But in doing so, the story would require many more pages than are available for this current text. The reader is therefore requested to keep this bias toward emergence in mind and, if not mentioned in the text, to keep an eye open for all those aspects of reality that became less important over time or even completely disappeared.

Natural scientists may argue that, in contrast to the study of human societies, they can predict with great precision the future of a great many phenomena, such as the Earth’s orbit around the sun (which is not entirely regular). My response would be that this is only the case because these are rather simple regimes, in which patterns occur rather regularly. One wonders whether natural scientists would also be able to predict with similar precision a possible supernova event that might end the existence of our solar system over billions of years, or any possible future impacts on Earth by meteorites whose trajectories cannot be measured yet. It seems to me that in such cases natural scientists would rely on exactly the same approach as the one advocated here.

Hindsight is both a strength and a weakness. It is helpful, because it allows us to achieve an overview of processes of longer or shorter duration. Yet hindsight may also lead us into the trap of a circular argument by assuming that things happened in a certain way because the circumstances were right, while we define which circumstances were the right ones, because at such moments those particular things happened. In the following chapters, I will seek to avoid this trap while making use of the advantages hindsight has to offer. Whatever the
case may be, the vantage point of hindsight is simply inevitable in any type of historical reconstruction. And let us not forget that hindsight is also part and parcel of our elusive present, and therefore likely to change over time.

Notes

2. Donald Ostrowski’s posting on the H-World Discussion Group on 15 April 2005 ce, as part of the discussion on ‘Why is studying history important?’ See www.h-net.org/-world/. See also Ostrowski (1989 & 2003). In a letter to the science magazine New Scientist, 16 June 2007, Thomas Shipp put forward almost exactly the same argument.
3. For scholarly references to the idea that all of our knowledge of the past resides in the present, see Walsh (1951), p. 18; Bloch (1984), pp. 23ff. and pp. 48ff.; Collingwood (1993), pp. 251–2 and p. 364 (Bob Moore kindly supplied these references). See also Barraclough (1955), p. 23 and Wesseling (1995), p. 20. For Ostrowski’s elaborations, see Hurwitz & Ostrowski (1983) and Ostrowski (1989). For discussions of major problems in reconstructing history, see Barraclough (1955); Bloch (1984); Carr (1968); Kitson Clark (1967); Collingwood (1993); Huizinga (1995); McNeill (1986b); Slicher van Bath (1978); Tosh (1992); Walsh (1951); and Wesseling (1995).
4. This is not at all an original point of view. Many scholars, including William McNeill (1986a&b) and David Christian (2004), have argued along these lines.
5. This is, unfortunately, not an accurate statement. No one can probe back in time, because the past is gone forever. Astronomers also sometimes use other confusing phrases, such as ‘this galaxy is at a distance of 1.5 billion light years away from us.’ The only thing we can be fairly sure of is that it is not there today and certainly not in the way we observe it.
7. From a very detached point of view, one may argue that, in principle, there is no reason why scientific principles ought to be applied to analyzing data in the present to reconstruct an account of events that may once have happened. One may, for example, decide to accept literally what sacred texts have to say regarding the past. This may not be scientific in the current meaning of the term, but I cannot see any reason why this would be an issue as long as one does not care about science.
8. In Hinduism, there are, in fact, no origins but only endless recycling, which may resemble some current large cosmological models.
11. Cultural anthropologists in particular are often uncomfortable with the emphasis on literacy defining what constitutes history. This is perhaps best expressed in the influential book by US cultural anthropologist Eric Wolf (1923–99 ce): Europe and the People without History (1982).
12. See Smail (2005 & 2007). Bishop Ussher published his calculation of the moment of creation in *The Annals of the World*, which is, in fact, a human history from the beginning of time to 70 CE.


14. Barraclough (1955), pp. 17ff. For instance, in 2008 British economic historian Patrick O’Brien described the situation in the 1970s as follows: ‘Just four decades ago departments of history in Britain really did consist mainly of scholars who worked on their own countries, complemented by a somewhat isolated minority for undergraduate teaching and postgraduate supervision on an alien world – which in those days included the mainland of Europe as well as the kingdom’s decolonized empire’ (2008), p. 1.


18. For the Berliner Singakademie lectures, see von Humboldt (1993).

19. Chambers, Einstein and Lovelock had not been so lucky as to live off an inheritance but they made their money in other ways while doing their scientific work.

20. Von Humboldt (1995), p. ix. His views had also been shaped by the French Revolution, including its intellectual and emotional aspects.

21. At the time, there was no separation between biologists and geologists. While, for instance, Darwin and Lyell called themselves naturalists, today we would call them both geologists and biologists. For Darwin and Lyell, however, these two aspects of nature were very much intertwined. Interestingly, Lyell later became a major culture hero for geologists, while his biological interests were downplayed. The opposite happened to Darwin. In other words, the formation of academic disciplines led to greatly limited images of these scholars. Today, we would call them interdisciplinary thinkers. Such a term would not have made any sense to them, because these disciplines had not yet been demarcated as clearly as they are today.


23. See Descartes (1977) and Kant (1755 & 1963). I have used these documents as they are published on various websites in both their original languages and English.

24. For Hegel’s *Enzyklopädie der philosophischen Wissenschaften*, see www.zeno.org.


27. Charles Darwin was well aware of the works by von Humboldt, Lyell, Chambers and others, most of which he greatly admired.

29. For the chronometric revolution, see Christian (2009a&b).
31. There were also attempts to produce all-embracing overviews, such as Dutch schoolteacher Kees Boeke’s pioneering picture book *Cosmic View: The Universe in 40 Jumps* (1957). It became the basis of the far better-known book (1994) and movie by Philip and Phylis Morrison, *Powers of Ten: About the Relative Size of Things in the Universe*, produced during the late 1960s and 1970s CE. Although these productions – there are many variations on this theme now – should not be considered big histories (because they do not deal with history), their authors probably had a very similar goal in mind.
34. See McNeill (1992, 1998 & 2001). In 1996 CE, when McNeill was awarded the Erasmus Prize in Amsterdam, he most generously donated half of the prize money to our big history project.

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**Recommended Reading**


