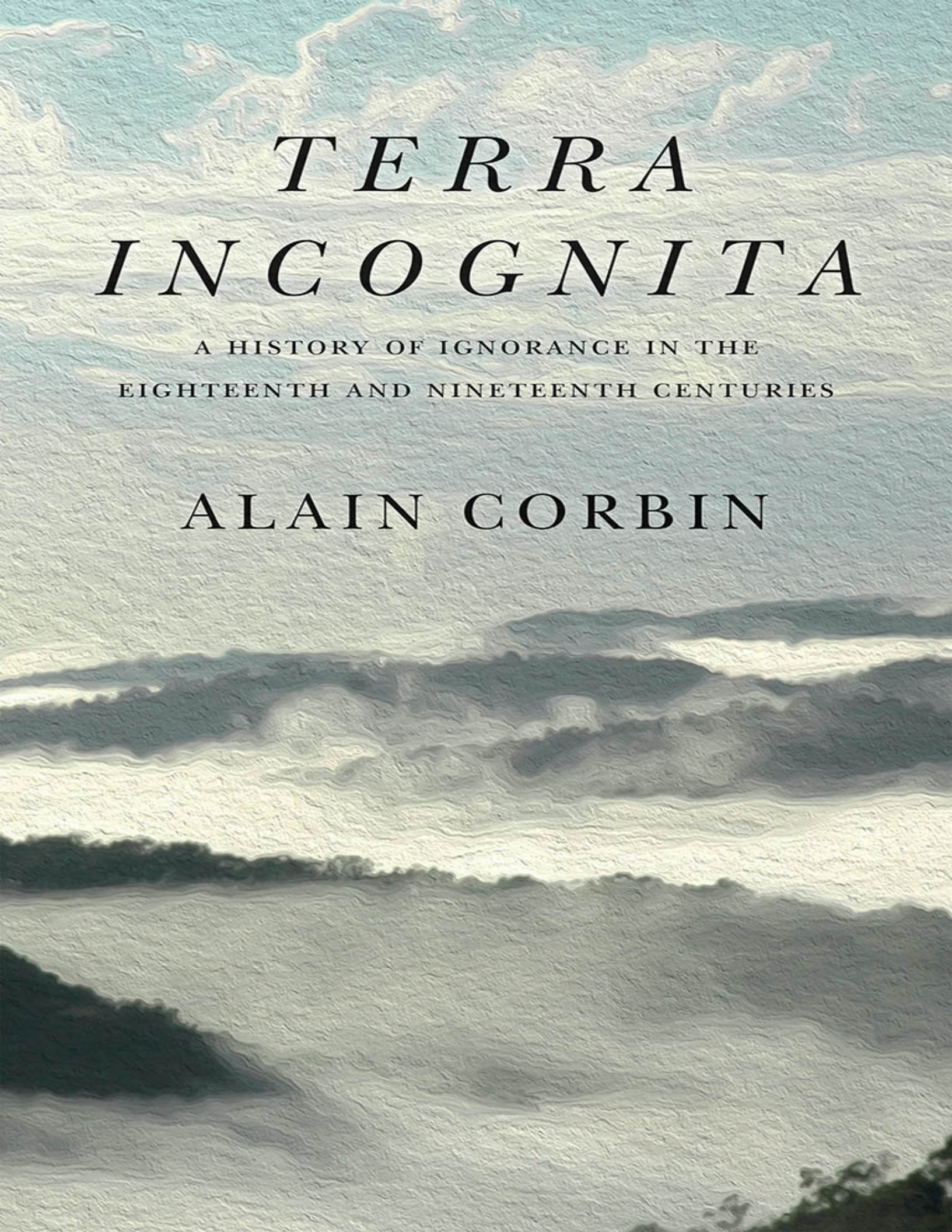

TERRA INCOGNITA

A HISTORY OF IGNORANCE IN THE EIGHTEENTH AND NINETEENTH CENTURIES

ALAIN CORBIN

CONTENTS

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Translated by Susan Pickford

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Ah, what hundreds of volumes we might fill with what we don’t know!

Jules Verne, *Autour de la Lune* [*Round the Moon*], 1869

A Comprehensive History Implies the Study of Ignorance

The first duty of all historians is to identify lacunae and to inventory and measure gaps in the knowledge of earlier generations and, by the same token, discrepancies in the social reach of what facts *were* known. We cannot fully understand our forebears without some idea of what they did not know, either because no one knew it, or because they in particular were not in a position to know it. This method can be applied to a wide range of fields: think, for instance, of anatomical knowledge, diseases and treatments. It would be an impossibly vast undertaking to write a fully comprehensive history of everything humans have not known and to approach the field in overall terms. To map out what our ancestors did not know, the historian must focus on a single field of endeavour and probe its blind spots and lacunae.

This book focuses on our planet, exploring its mysteries past and present, and the intensity and eventual decline of the modes of terror and wonder it aroused. This means interpreting the history of science and discoveries by studying how the gaps in our ancestors' knowledge were filled, and consequently how the imaginaries and dreams they sparked faded away.

In studying discrepancies in the social reach of knowledge, it is important to draw a clear distinction between various types of scientific unknowns. Some things could only be dreamed of, not explored, such as the seabed and the polar ice caps. Others were observable but inexplicable, such as earthquakes, volcanoes and dry fogs. Yet others were resolved by forms of exploration that slowly restricted the

boundaries of ignorance, such as the rise of mountaineering and expeditions to the unmapped hearts of certain continents.

To make my point perfectly clear, let me turn to Jean Baechler. He has argued that in small prehistoric communities, everyone knew the same things. In the village where I grew up, set in the rolling Normandy countryside, most of the country folk who gathered in the local cafés after Sunday mass could easily join in conversation, since they all knew more or less the same things: livestock farming, traditional crafts, what they had learned at primary school and, in the case of the older men, their wartime experiences. Apart from the priest, the doctor, the primary school teacher, the vet and the notary, they all had the same gaps in their knowledge – and even then, an electrician and car mechanic had recently set up shop, further stratifying the local knowledge base to a small extent.

When we read Balzac, Goethe, Dickens and Stendhal, we have to make an effort to understand and imagine the way they thought about our planet, which they saw as a mysterious place, all the more frightening for being beyond comprehension. The depictions of the earth they would have been familiar with were fundamentally shaped by the vestiges of past cultural beliefs; those with little or no schooling must have found it truly terrifying. From the eighteenth century on, knowledge had become increasingly stratified between those described as ‘scholars’ – the term ‘scientist’ had not yet been coined – and the vast majority of the population in the West. In the same vein, the history of the stratification of the thirst for knowledge is a fascinating question: this is what philosophers, following Augustine, called *libido sciendi*. It is what makes Flaubert’s *Bouvard et Pécuchet* such a piquant read: the novel ironically foregrounds the depth of ignorance and intense

thirst for unattainable knowledge that must have tormented many a mid-nineteenth-century clerk.

Identifying gaps in the knowledge of our forebears means tracking the pace of discoveries and public access to knowledge – in other words, how scientific discoveries about the earth, geology, vulcanology, glaciology, meteorology and oceanography were transmitted down the social scale. It also means studying how the earth was illustrated, the depth of its history and geography, the gradual process of filling in the blanks, and attempts to discover the secrets of the polar regions. It is very difficult to close our own minds to the images of our planet that we carry within us. That is the aim, and the challenge, of this book.

The entire period under study was characterized by the triumph, or at least obstinate survival, of localism and restricted horizons, both literal and metaphorical, contradicting our modern perceptions of the vastness of space. This is particularly clear in the history of the perception of meteorological phenomena, recorded on a small local scale from the sixteenth century and gradually expanding to the discovery of the jet streams in the mid-twentieth century.

As I was writing this history of the developing stratification of ignorance, it came as some surprise to me to realize that such gaps were not always considered as shortcomings liable to mar human happiness. The advances of the Enlightenment and the progressive slaking of the thirst for knowledge, *libido sciendi*, had their fair share of detractors, just as the Enlightenment had its own dark side. Take, for instance, Jacques-Henri Bernardin de Saint-Pierre's shrewd essay in praise of ignorance in his 1784 *Études de la nature* [*Studies of Nature*]. He argued that ignorance stimulated the imagination and filled the world

with wonders: ‘Thanks to my ignorance, I can indulge the instinct of my soul.’ On his solitary rambles, he claimed to enjoy the countryside more when he had no knowledge of the chatelains who owed their reputations in large part to their châteaux: ‘The ignorance of the scenery is of greater advantage to me than an acquaintance with it. I have no occasion to know that a forest belongs to the abbey, or that duchy, in order to think it majestic. Its aged trees, its deep glades, its silent solitudes, are enough for me.’ Contrary to the beliefs of the apostles of the Enlightenment, ‘Night gives us a much higher idea of infinity than all the brilliancy of day.’[1]

Secondly, Bernardin de Saint-Pierre, inspired by the natural theology that is a constant feature of this book, wrote that ignorance encourages our trust in God: ‘Thanks to my ignorance, I can indulge the instinct of my soul’; ‘For one pleasure which science confers and destroys in conferring, ignorance bestows on us a thousand, which are much more agreeable.’ It also soothes our fears: ‘How many evils ignorance conceals from us.’ Paradoxically, it is ‘the inexhaustible source of our pleasures’.[2] The same inclination towards the obscure and unknown is shared by several Romantic literary travellers, guided more in their appreciation of the world by the authors of classical Antiquity than by what contemporary science might have been able to teach them.

Researching ignorance inevitably throws up a number of difficulties. The first is our modern depictions of a planet that we consider our home. The degree of responsibility we feel towards it was barely beginning to emerge in the nineteenth century. The increasing number of threats to the planet in the Anthropocene era are now understood to be a human, rather than divine, apocalypse. This process, which distances us from the understandings of the eighteenth and nineteenth centuries, has progressed at a much faster pace

since the mid-twentieth century. It is likely that in times past, no single individual could ever accumulate so much knowledge in the span of their lifetime. I personally feel this very strongly, though I am no scientific expert, and I call on my contemporaries as witnesses.

On Monday, 1 July 1946, I was a boarder at a Catholic middle school in the small Normandy town of Flers-de-l'Orne. The headmaster, a priest, seemed very elderly to me. He had a degree in philosophy, and had in fact, I later found out, studied under Émile Durkheim in the early years of the century. That day, he came into our classroom and told us that classes were to be suspended that afternoon: we were to go to chapel to pray for the earth (*sic*), because the Americans were going to drop an atomic bomb more powerful than the ones that had destroyed Hiroshima and Nagasaki. People everywhere were asking whether this horrifying experiment would not annihilate or lay waste to the earth. We lined up, walked to the chapel and began to pray. No disaster ensued.

The reason why I am sharing this anecdote is because it is significant. The headmaster had, quite unwittingly, swept us into the Anthropocene era by teaching us that man was a terrible threat to what we call our planet.

In my mind, however, it was not as simple as that. We were not allowed to talk at the school refectory. While we ate, one of the older pupils would read aloud from a book, and I would always listen attentively. I remember being particularly struck by three readings in the course of the years 1946 to 1948. The first was René Caillié's narrative of his travels from 1824 to 1828 to Timbuktu, in the dark heart of Africa, full of slaves but not cannibals. The second, which obsessed me for a while, was about the notebooks found on Captain Scott's body after he tragically perished on his way back from his failed attempt to be the first man

to reach the South Pole. Two years later, the older boys read aloud Jules Verne's *Île mystérieuse* [*Mysterious Island*] – and by then I was one of the older boys myself. In short, while the headmaster was ushering us into the Anthropocene era, the books read to us to furnish our imaginations dated from a time when the earth was much more mysterious and frightening, and very different from the earth we were learning about in the immediate aftermath of the Second World War. In my case, the chasm widened yet further as I eagerly devoured many more of Jules Verne's novels.

I sometimes wonder about how I pictured the earth myself before 1957, before the beginning of aerospace history, which has filled our television screens with images of our entire planet seen from on high and from every angle. I find it amazing today that it was not until I was gone thirty that I heard talk of plate tectonics, explaining how earthquakes happened.

Core samples extracted from the polar ice caps are now shedding astonishing new light on our knowledge of the earth's past, while nanotechnologies are teaching us much about the temporal depth of the humans that inhabit it. In a word, the way we picture the earth, or rather the planet, is undergoing a radical upheaval, in a way that goes much further than the constant refrain of climate change and the short-term threats of the Anthropocene era.

These inklings hint at the usefulness of a history of ignorance and an inventory of gaps in the knowledge of each period of history, to give a clearer picture of the humans who lived through them.

NOTES

1. Jacques-Henri Bernardin de Saint-Pierre, *The Works of Saint-Pierre: Comprising His Studies of Nature, Paul and Virginia and Indian Cottage: With a Memoir of the Author and Explanatory Notes*, vol. 2, tr. E. Clarke. London: Henry Bohn, 1846, pp. 408–9.

2. Ibid., p. 406.

Part I
GAPS IN ENLIGHTENMENT KNOWLEDGE OF THE EARTH

1
The Great Lisbon Earthquake of 1755

Pinpointing and understanding the significance of the Great Lisbon Earthquake means looking back at a broad outline of how such major natural disasters impacted the way our ancestors thought, from the medieval period on. On 25 November 1348, Petrarch described watching a destructive tidal wave sweep across the Bay of Naples:[1]

> I had scarcely fallen asleep when not only the windows but the walls themselves, though built on solid stone, were shaken from their very foundations and the night light, which I am accustomed to keep lit while I sleep, went out. We threw off our blankets, and […] the fear of imminent death overcame us. […] The religious of the dwelling in which we were living […] frightened by the unexpected danger, and bearing their crosses and their relics of saints, and invoking the mercy of God in a loud voice, all marched […] into the bedroom I occupied. […] What a downpour! What winds! What lightning! What deep thunder! What frightening tremors! What roaring of the sea! What shrieking of the populace![2]

A century later, Bindo, the Sienese ambassador to Naples, described an earthquake that struck the city on 4 December 1456: ‘The great cries, the laments, the great wailing and shouting of men, women and children who ran naked out of their homes in the dead of night, clasping their infants to their necks …’. Such terrifying displays of the earth’s powers were experienced in a climate of fear,

explored some decades ago by Jean Delumeau.[3] Contemporaries read them as interventions by the hand of God, or secondarily as the work of demons. In the cultural background were episodes of Biblical violence, from the Flood (a point we will return to at length) to the destruction of Sodom and Gomorrah and, most importantly, the Apocalypse. Faced with disaster – the term 'catastrophe' was not yet in use – contemporaries influenced by sermons and other religious practices read such events as scourges intended to punish sinners. On a population level, psychological reactions were driven by the urge to save the souls not only of individuals, but of society as a whole. In a world where entering Paradise was the ultimate purpose of life, divine wrath seemed quite logical.

As Thomas Labbé points out, in this perspective, natural chaos was by no means blamed on God; a feeling that the punishment was fair and just and the need for preservation were enough to avoid such a reaction. At that point in time, events were interpreted above all on a local scale, in urban and rural areas alike. Anywhere further afield was barely taken into account, if at all. The materiality of the disaster did not become central to people's concerns until the fifteenth or even early sixteenth century, when disaster culture began to emerge.[4]

Yet there was a gradual change in perspective between the late medieval period in the fifteenth century and 1755, when this book opens. Multiple earthquakes were recorded in this period, with at least twenty-seven causing major damage between 1600 and 1800. Interpretations began to shift early in the period. Disasters were still considered to be God's work, but they were seen less as manifestations of divine wrath – and therefore as punishment – than as signs of His mercy, saving men's souls from damnation. Many prodigious events were interpreted in a similar light.[5]

A further process that helped soften the harshness of divine punishment was that second causes gradually came to be taken into account. This was the belief that God rarely intervened directly in nature, instead letting it work on its own. The seventeenth century saw the development of a reading of divine intervention crucial to understanding the period under study, which I highlighted in a previous work: the physico-theology of Oxford's Protestant scholars, underpinned by the regular Anglican practice of reading the Psalms daily. This school, known on the continent as 'natural theology', studied at length by Henri Brémond,[6] considered the earth as a marvel corresponding to God's plan. It was to be exalted for its beauty, overlooking the brutality it sometimes displayed. This sense of wonderment gave rise to the Providentialism celebrated by the Abbé Pluche and Bernardin de Saint-Pierre.

Prior to the Great Lisbon Earthquake, a series of questions came to change sixteenth- and seventeenth-century images of the Flood, though it remained an accepted historical fact for everyone with the exception of Leonardo da Vinci. Questions gradually arose about how it happened and whether all the consequences associated with it were even possible. Was it one single flood, or were there several? It must be acknowledged that such questions were asked only by an elite few. This was society's solid bedrock of beliefs and questions on 1 November 1755, when Lisbon was struck by a catastrophe (the word was first used in French in its modern sense in Montesquieu's *Lettres persanes* [*Persian Letters*] in 1721).[7] My aim is not to write a history of the earthquake, but it is important to outline it in some detail to shed light on the history of the stratification of ignorance, thrown into sharp focus by the event.[8]

Anne-Marie Mercier-Faivre has argued that from 1755, or roughly mid-century, on, disasters were no longer mere

signs, but events in their own right: ‘It progressively became a concept that made for a brand-new way of thinking about the world and about mankind.’[9] Stripped of their religious frame of reference, disasters were now open to analysis. Thinking about and trying to understand catastrophes was no longer the sole preserve of the church. That said, a degree of caution was still required. The idea of divine punishment, the fear of everlasting damnation, and the primary goal of salvation had by no means faded from people’s minds. Disasters may now have been considered suitable material for analysis, but they were still a reminder of the transience of life, the gift of a merciful God.

On All Saints’ Day, 1 November 1755, Lisbon was shaken by four major tremors in nine minutes, starting at twenty to ten in the morning. Clouds of sulphurous vapour darkened the sky. A few moments later, a tidal wave – what we would now call a tsunami – five to six metres in height ploughed across the city, causing devastation in its wake. An aftershock struck at around eleven. Fire ravaged the city for five to six days. Looters caused further panic. The worst-affected areas were the low-lying neighbourhoods in the city centre. It is currently estimated that some ten thousand people died. Few of them were from the city’s leading families, who were on their country estates. The king and the royal family were in residence at the Belém Palace.

Though in relative decline at the time, Lisbon was still at this point Europe’s third most important port, after Amsterdam and London. Vast quantities of merchandise were destroyed. Worse, perhaps, in the eyes of the men and women of one of Europe’s great Catholic capitals, sixteen churches collapsed, including the patriarchal cathedral. The opera house and thirty-three townhouses belonging to aristocratic families were also destroyed.

We will now focus for a while on how word of the disaster spread. While the tremors themselves were felt across much of Western Europe, it took around a month for the news to reach gazettes and news-sheets. In Germany, a Cologne gazette was first to break the news, on 21 November. The *Gazette de France* [*France Gazette*] printed it the following day. By the end of the month, the news had reached most of the German-language press. Until February 1756, the 'disaster' was often described as a 'dreadful catastrophe', with articles highlighting the scale of the destruction. On 29 November 1755, for instance, a gazette in Bern recorded that 'seven-eighths of the houses in the city of Lisbon were torn down in six or seven minutes'. It informed its readers that three volcanoes had caused a fire and that 100 to 130 locals had found themselves trapped in the ruins. The total destruction of trade in one of Europe's busiest commercial cities was the focus of much interest. News-sheets and almanacs soon followed suit, eager to shed sensational light on the parlous state of the world with many a Biblical reference. Though the term 'catastrophe' was widely used in the press in the aftermath of the Lisbon earthquake, the much-discussed news of the disaster does not seem to have profoundly challenged an optimistic world view and the idea of God's providence, particularly in Germany.

The history of the earthquake involves the event itself, its impact, and the subterranean mechanisms that cause such tremors. Societies of the past – the eighteenth century, in this case – did not know what caused the earthquakes they frequently experienced: as we have seen, between 1600 and 1800, at least twenty-seven quakes caused considerable damage. The 1750s were the second major period of seismic activity since the seventeenth century, even before the Lisbon disaster. Not knowing what caused the tremors was difficult to live with and the disastrous

consequences were hard to overcome. Since the numerous sources on earthquakes had no idea what caused them, their principal focus was on the local impact, damage, institutional reaction to the chaos, how the news spread, and on recording the memory of the disaster. The folk memory of earthquakes was also focused on the destruction of urban centres. The many earthquakes that shook France in the seventeenth century were almost completely forgotten, remembered at most locally or regionally. In the latter half of the eighteenth century, however, earthquakes across France were recorded in hundreds of narratives, scholarly and academic debates and dozens of articles in periodicals, maps and catalogues. Scholars began to study the country's seismic activity. The years 1755–64 represent a high point in interest in the topic, before a slight decline. Interestingly, earthquakes became a hot topic for debate prior to the Lisbon disaster, though the event certainly also drove the process subsequently.

From the point of view of a history of ignorance, the most important issue is that scholars began to ask questions: what triggered the disaster and how did it unfold? From 1755 on, the French Academy of Sciences launched a fully fledged earthquake research programme[10] that built an archive of such events. According to the *Journal encyclopédique* [*Encyclopedic Journal*] of 1 May 1756, 'All physicists are working to find the actual cause of earthquakes. […] The cleverest circles […] are making it a topic of conversation.' Of particular interest for this book is the article's claim that 'even the ignorant dare talk about it. […] In a word, everyone wants to discover this terrible secret of nature.'[11]

The mid-eighteenth century saw the rise of subscription libraries and educational and scientific publications. The closing quarter of the century was a golden age of popular

scientific debate. In this context, the problem of earthquakes was still widely discussed in fashionable salons at the end of the century. It is no exaggeration to call this the ‘earthquake craze’,[12] akin to the fashion for hot-air ballooning. Even the rural population took an interest in the topic. The curiosity and suffering caused by the shortfall in scientific knowledge were still intense in the closing years of the eighteenth century, though curiosity about earthquakes was tending to give way to an interest in volcanoes. Even so, a play about the Great Lisbon Earthquake was still being performed in Paris in the very early nineteenth century. As late as 1878, a set of clockwork figures was shown in Orleans, performing two events from history: Joan of Arc delivering the city – and the Lisbon earthquake.

Scholars spent the half-century following the disaster arguing about its causes. Lisbon opened up a space for debate. Three types of explanation were put forward. The first argued for a subterranean inflammation of sulphurous and bituminous matter, attributing the earthquake to an underground fire. The second, which held most sway in the latter half of the century, believed that a dilation in the air triggered the tremors. This explanation was driven by the fashion for studying the physical properties of gases. The third explanation was based on theories of electricity that were highly popular at the end of the century; it held that the disaster was caused by the instantaneous propagation of electric fluid through all conducting bodies.

What is most interesting is that people were now trying to understand the disaster, to interpret it, protect themselves from its effects and measure its impact on society, quite apart from the question of salvation. The catastrophe played a significant role in establishing the earth sciences.

At the same time, a new research focus on fossils and the fledgling study of geological strata led to renewed challenges to the unity and universality of the Great Flood, as scholars began to posit a series of local floods and modify their thinking about the age of the earth.

The Lisbon earthquake and the series of disasters that followed it also had an impact on the emotional range of responses to such cataclysms. From that point on, descriptions of the destruction they wrought and their scientific study went hand in hand with the expression of a feeling of pity and compassion for those affected. There was also sometimes an urge to aestheticize the tragedy – a point I will return to later. A new fear took over from the fear of divine wrath: the potential collapse of civilization. This feeling is still with us today.

We now turn to the cognitive and emotional consequences of the Lisbon earthquake. It was long argued that Voltaire's poem about the disaster set out to radically challenge God's goodness and the optimistic philosophy of Leibniz's *Theodicy*. This is true as far as it goes, but requires further explanation. Unlike d'Holbach, Voltaire did not wholly exclude God from his reflections and his denunciation. He doubtless thought society was not yet ready for a fully secular response to natural disasters. Diderot was more outspoken in his opinion that it was 'the movement inherent in matter, not the will of God that transforms the world';[13] Jean-Jacques Rousseau held that natural disasters such as volcanic eruptions, major earthquakes and terrible fires caused by lightning were the cause of the social state, since they brought men together in large numbers to repair the damage. More immediately relevant for a history of ignorance are the gaps in knowledge filled by the Lisbon earthquake, which revived *libido sciendi*, the thirst for knowledge. In this context, the disaster proved a turning point. As well as the printed press, handwritten

communications in the form of letters and even handcopied gazettes played a significant role. Later sources documented the importance of oral memory in handing details of the Lisbon earthquake all the way down to the late nineteenth century. Grégory Quenet has argued that the event ‘led to an unprecedented unification of Europe, perhaps unrivalled until the French Revolution’.[14] The Lisbon earthquake long remained the archetypal deadly disaster in the European imaginary, almost completely supplanting the Lima earthquake of 1751.

I have chosen to take the Lisbon disaster as a key date marking a turning point in the history of contemporary representations of the earth. Between 1755 and the opening decades of the nineteenth century, a series of questions and issues were hotly debated, demonstrating gaps in contemporary knowledge, the first hesitant steps towards filling them in, and a lack of clarity in how even the most cultivated thinkers pictured the earth and sought to understand its secrets.

It is worth briefly stating the main issues explored as part of this wide-ranging debate, which varied across the social spectrum:

1. How old is the earth? How best to understand the timescales of its history?
2. What is inside the earth? Fire, water or viscous matter? This question gave rise to theories on earthquakes: when these became fashionable, the same process was extended to volcanoes, with various interpretations put forward to explain the magnificent spectacle.
3. A series of questions focused on the poles, which lay beyond human reach at that point. Did they have inner Arctic and Antarctic seas? Where did sea ice come from?